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# Humboldt Bay Sea Level Rise Regional Planning Feasibility Study **Stakeholder Catalogue**

March 2022

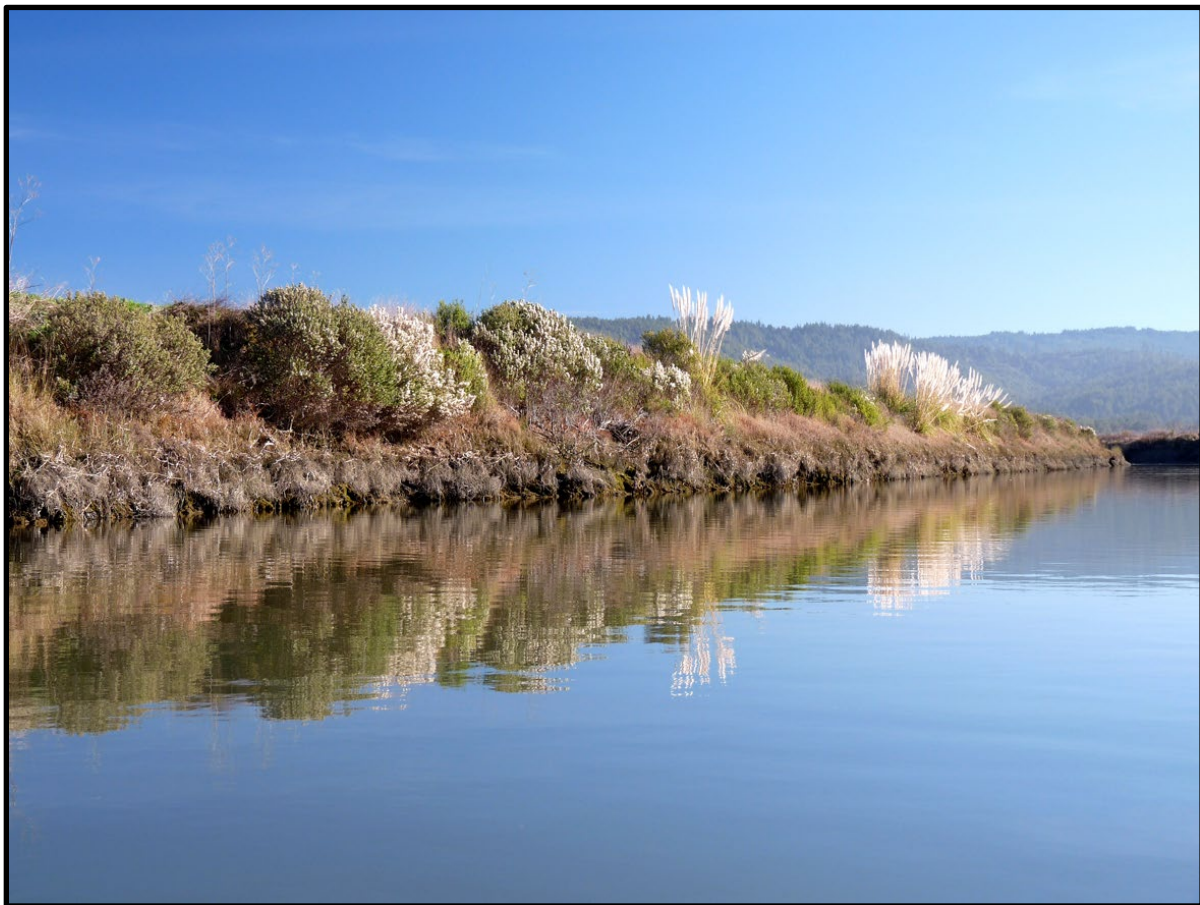


Photo by Aldaron Laird



# Humboldt Bay Sea Level Rise Regional Planning Feasibility Study **Stakeholder Catalogue**

March 2022

Prepared by:

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Kristen Orth-Gordinier – Greenway Partners

The Humboldt Bay Sea Level Rise Regional Planning Feasibility Study is part of California Climate Investments, a statewide program that puts billions of Cap-and-Trade Dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment-particularly in disadvantaged communities. The Cap-and-Trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investments projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low-income communities, and low-income households across California. For more information, visit the California Climate Investments website at: [www.caclimateinvestments.ca.gov](http://www.caclimateinvestments.ca.gov).

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Reference links relevant to a specific stakeholder are included in each stakeholder section.



# Introduction

## Purpose and Intended Uses of Catalogue

This catalogue seeks to identify asset owners, managers, and other parties that will or could be implicated in a regional Humboldt Bay sea level rise (SLR) planning effort. It provides information regarding assets they own or manage, their authority or area of interest within the SLR regional planning area, or other concerns as they may pertain to regional SLR management. The parties identified range from those that would be significantly or directly involved in regional SLR planning to those that could be indirectly involved or have a tangential interest in such an effort.

This catalogue will serve as a tool in helping to identify which parties should be involved in a regional SLR planning effort and in what capacity. Given the dynamic nature of climate change and sea level rise, this catalogue will be updated at least every five years to ensure it remains a relevant and useful tool for sea level rise planning in the Humboldt Bay region.

There is approximately 102 miles of Humboldt Bay shoreline connected to six **hydrologic units (HU)**. On Humboldt Bay, a hydrologic unit is defined as a tidally influenced drainage area. Six hydrologic units have been identified and are as follows: **Mad River Slough (MRS, 13.7 shoreline miles)**, **Arcata Bay (AB 20.5 shoreline miles)**, **Eureka Slough (ES, 20.8 shoreline miles)**, **Eureka Bay (EB, 15.9 shoreline miles)**, **Elk River Slough (ERS, 9.7 shoreline miles)** and **South Bay (SB, 21.8 shoreline miles)**, displayed in Figure 1. The hydrologic unit boundary between the Arcata Bay HU and Eureka Bay HU is essentially the Highway 255 bridges. The boundary between the Eureka Bay HU and the South Bay HU is the entrance to South Bay between King Salmon and the South Spit. The Mad River, Eureka and Elk River Sloughs all drain through a single channel that connects them to the adjacent Bay. The upland boundary for these HUs is the projected mean monthly maximum water (tidal) inundation area with 2.0 meters (6.6 feet) of sea level rise. Within the six HUs there are 24 smaller drainage areas behind dike shoreline structures that share a common vulnerability of being tidally inundated if the shoreline is compromised (breached or overtopped). Each individual HU shares a common shoreline and exposure to tidal inundation. This shared shoreline is a mosaic consisting of natural habitats and artificial structures such as dikes, railroad structures, roads, fill structures, and fortified structures. Each HU contains one or more local agency jurisdictions and overlapping permitting and resource trustee agency jurisdictions.

For this catalogue, assets will be reported according to their associated HU. This catalogue method will help to identify overlapping jurisdictional and SLR concerns, a primary issue driving the need to consider a coordinated regional SLR planning. It will also help to better understand and identify asset owner and manager SLR concerns based on site specific hydrologic conditions.

Today, there is no single entity responsible for the maintenance of the shoreline on Humboldt Bay, which consists of 670 Assessor's parcels, many different property owners, and several layers of overlapping development and natural resource jurisdictions and authorities. Additionally, within the Humboldt Bay region, there are 2,342 parcels within the area that could potentially be impacted by 3-feet of SLR. These parcels come with even more independent property owners and managers. As sea level rise issues do not recognize jurisdictional or property boundaries, consideration of a regional coordinated effort for sea level rise adaptation involving the various stakeholders within the Humboldt Bay area, is a necessity.

In an effort to facilitate outreach to asset owners and managers who could potentially participate in regional sea level rise planning efforts, this catalogue includes stakeholders categorized as one of the following:

**Tribal Government**

**Land Use Authority**

**Resource Management/Protection/Regulator**

**Shoreline Structure Owner**

**Vulnerable Property Owner**

**Utility Infrastructure Owner/Service Provider**

**Transportation Infrastructure Owner**

**Academic/Public Interest Organizations**

The Academic/Public Interest Organizations stakeholder category was included at the end of the catalogue in order to provide a comprehensive understanding of the stakeholders that would be involved with Humboldt Bay area SLR planning.

Some of the stakeholders or interested parties have multiple roles and fit multiple categories or have multiple departments which fit different roles and categories. In order to avoid redundancy, their description is included in their initial listing, with each additional listing under other categories only having a reference to their initial listing included with its page number.

There have been several SLR related assessments prepared for the Humboldt Bay region. This catalogue builds on previous assessments prepared by Northern Hydrology and Engineering (NHE) and Aldaron Laird of Trinity and Associates for SLR projections (Gilkerson 2014), impacts and inundation areas (Anderson 2014), current shoreline conditions on Humboldt Bay (Laird 2013), as well as vulnerability and risk assessments that were prepared by regional sea level rise adaptation planning efforts on Humboldt Bay (Laird 2013, Laird and Powell 2014, Anderson 2015, Laird 2015, Laird 2016, Laird 2018, Laird 2018b, Laird 2018c, Laird 2018d, and Laird 2020). Additional information specific to stakeholder role and responsibilities, assets, and general concerns was found in resources provided in the “related links” section of each stakeholder listing.

### Community Input

Throughout 2021, the County implemented an outreach campaign complimentary to this catalogue to identify and understand the roles, responsibilities, needs, and concerns of those that could be involved in sea level rise planning efforts within the Humboldt Bay region. Outreach began in May 2021 when the County, in partnership with Cal Poly Humboldt (formerly known as Humboldt State University or HSU), conducted two outreach surveys, each with a different target audience and focus.

One survey was prepared for property owners that could be impacted by 1 meter of sea level rise, as well as for the general public (i.e., anyone who wished to take the survey). The survey was published online and announced via a press release to local news outlets, and all property owners in the 1-meter sea level rise inundation area (984 property owners) were also sent physical copies of the survey in the mail. Of the 984 surveys mailed to property owners, 159 completed surveys were returned, resulting in a 16% completion rate. The online survey received 645 views, and there were 418 completed online survey

entries resulting in a 64% completion rate. A total of 577 online and mail-in responses were received by the cut off collection date. The closing date for the online surveys and return date for mail-in surveys was June 21, 2021, although all mail-in surveys returned prior to August 1, 2021, with 30% or more of the survey filled out, were included in our calculations. For simplification, all results reported within the descriptions are aggregated responses from both modes of online and mail-in collection unless otherwise mentioned in the description. In order to understand participation for each question, total number of survey respondents will be reported (as n=) in each description.

The second survey that was conducted targeted “Coastal Professionals” which was defined using the same definition as the 2016 California Coastal Adaptation Needs Assessment: “...individuals involved in California coastal resource management, conservation, and protection from coastal hazards.” This includes “...planners, resource managers, public works engineers, transportation managers, emergency response managers, public health officials, harbor managers, port commissioners, and elected officials, as well as representatives of environmental organizations working on coastal issues, private-sector consultancies, and officials at farm bureaus. Public sector respondents were drawn from the local, regional, state, and federal levels (Moser, Finzi Hart, Newton Mann, Sadrpour, & Grifman, 2018).”

Randomization was not used because participants needed to have a moderate-high relative level of knowledge in SLR planning and conditions on Humboldt Bay. However, nonrandom sampling and self-selection could introduce areas of bias, so in an effort to reduce this bias, a broad and inclusive list of potential participants was developed. Participants were recruited through email and asked to voluntarily participate in the survey, and several follow-up emails were sent to encourage participation. No incentives were provided. A total of 297 people were sent links to participate in the survey and 140 of those potential participants responded. Upon closure of the survey, 33 of the 140 surveys collected were deemed incomplete and removed from our calculations because the respondents completed less than 30% of the survey questions. Therefore, responses from 107 respondents were utilized for this report. This results in a response rate of 36%. In order to understand participation for each question, total number of survey respondents will be reported (as n=) in each description.

The Coastal Professionals survey was conducted in order to capture a representative sample of views among coastal professionals operating in the Humboldt Bay region. Results presented within this catalogue are intended to provide general guidance in future planning and collaboration efforts. Though useful for understanding people's knowledge, attitudes, perceptions, and expectations of sea level rise planning on Humboldt Bay, it is important to note that analysis done at the specific agency level may not represent an official view of the agency/organization respondents work for, and therefore should not be treated as such.

For the purpose of confidentiality, respondents were asked to identify themselves by stakeholder category. Sample size within certain categories was very limited (<10 participants). Also, some respondents had multiple roles within the community and therefore self-identified with both a primary stakeholder category as well as another agency/organization. For these specific responses, answers were reported with the primary Stakeholder Group the participant chose when responding to the survey. However, it is possible their survey responses may have been influenced by their secondary agency/organization affiliation.

In addition, since the Coastal Professionals survey was performed in partnership with Humboldt State University (now known as Cal Poly Humboldt), the stakeholders were grouped into 11 categories that are

similar but not identical to the categories in this document in order to meet the needs of this Stakeholder Catalogue as well as the additional research needs of the collaborating graduate student. While this Stakeholder Catalogue hopes to provide a profile for entities that will be directly involved in regional SLR planning for the Humboldt Bay region, the research scope for the graduate student was aimed at gaining insights into the knowledge, attitudes, and perceptions of all coastal professionals connected to the Humboldt Bay region. For this reason, results reported in this document will not identify responses by exact numbers per organization, but rather by Coastal Professionals Stakeholder Group.

Respondents represented 47 agencies/organizations, some of which are included in this Stakeholder Catalogue (as indicated with a \*) in the following comprehensive SLR Coastal Professionals 2021 survey category list:

#### **Academia/Research**

- California Sea Grant Extension\*
- Humboldt State University (Now known as Cal Poly Humboldt)\*
- San Francisco State University

#### **City Government**

- City of Arcata\*
- City of Eureka\*

#### **County Government**

- Humboldt County\*

#### **Federal Government**

- Bureau of Land Management\*
- US Fish & Wildlife Service\*
- US Department of Agriculture-Natural Resources Conservation Service\*

#### **Infrastructure/Service Provider/Community Services District**

- Humboldt Bay Municipal Water District\*
- Humboldt CSD\*
- Manila CSD\*
- Peninsula CSD\*
- Vero Networks\*

#### **Non-Government Organization**

- Coalition for Responsible Transportation Priorities
- Friends of the Arcata Marsh\*
- Friends of the Dunes\*
- Friends of Elk River\*
- Humboldt Baykeeper\*
- Redwood Community Action Agency\*
- Redwood Region Audubon\*
- Surfrider Foundation\*
- Timber Heritage Association\*

#### **Private Sector Consultant**

- GHD
- Greenway Partners
- H. T. Harvey & Associates

ICF  
 Michael Love & Associates, Inc.  
 Northern Hydrology & Engineering  
 Stillwater Sciences

**Regional District or Association or Special District**

Humboldt Bay Harbor, Recreation and Conservation District\*  
 Humboldt County Association of Governments\*  
 Redwood Coast Energy Authority\*

**State Government**

California Coastal Commission\*  
 California Department of Fish & Wildlife\*  
 California Geological Survey\*  
 California State Coastal Conservancy\*  
 Caltrans\*  
 Governor’s Office of Planning and Research  
 Humboldt County Resource Conservation District\*  
 North Coast Regional Water Quality Control Board\*  
 State Lands Commission\*

**Trade/Business/Industry Group**

Coldwell Banker Sellers Realty  
 Hog Island Oyster Co.  
 Humboldt Association of Realtors

**Tribal Government**

Blue Lake Rancheria\*  
 Wiyot Tribe\*

For more information on the surveys, refer to the surveys themselves in Appendix i - SLR Public Survey 2021 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results . See also the Masters Thesis of Kristen Orth-Gordinier titled: “Social science research to help advance regional coordination and collaboration of sea level rise adaptation and planning on Humboldt Bay.” of HSU (now Cal Poly Humboldt).

To supplement the surveys, key stakeholder group interviews were conducted in July and August 2021. Eighteen stakeholder groups were selected which included members from all stakeholder categories used in this catalogue, aside from Academic/Public interest. The number of participants for each interview ranged from one to five, depending on staff availability. The stakeholder groups interviewed are the following:

**Agricultural Property Owner** (one individual associated with the Farm Bureau)

**California Coastal Commission**

**California Fish and Wildlife**

**Caltrans**

**City of Arcata**

**City of Eureka**

**Humboldt Bay Harbor, Recreation, & Conservation District**

**Humboldt Bay Municipal Water District**  
**Humboldt Community Services District**  
**Humboldt County**  
**Humboldt County Resource Conservation District**  
**Manila Community Services District**  
**NOAA**  
**Peninsular Community Services District**  
**PG&E**  
**US Army Corps**  
**US Fish and Wildlife Service/Humboldt Bay National Wildlife Refuge staff**  
**Wiyot Tribe**

During these interviews, stakeholder groups were asked a series of questions seeking to (1) confirm the information in the stakeholder general description of roles and responsibilities contained in this document; (2) identify the threshold for which they would no longer be able to provide services or their assets would be severely impacted due to sea level rise impacts; (3) identify ways to increase feasibility and effectiveness of regional sea level rise planning, and of adaptation projects protecting assets; (4) explore ways collaboration might help with sea level rise planning and adaptation; and (5) identify desired outcomes for regional sea level rise planning, adaptation, and management in the Humboldt Bay region. Answers to questions in each of these categories were organized and coded to identify shared themes. Over the course of these interviews, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. These themes seek to provide general guidance in future planning and collaboration efforts and are listed and explained further beginning on page 12 of this document. It is important to note that themes and interview results do not necessarily represent the official view of a respondent's agency/organization. For further information on the interviews, please refer to the script and questions in Appendix iii - SLR Stakeholder Interview 2021.

Results of these surveys and the interviews will be incorporated into aspects of this catalogue and will be referred to as simply **SLR Public Survey 2021**, **SLR Coastal Professionals Survey**, or **SLR Stakeholder Interview 2021** respectively throughout the rest of this document.

# Catalogue Geographic Scope

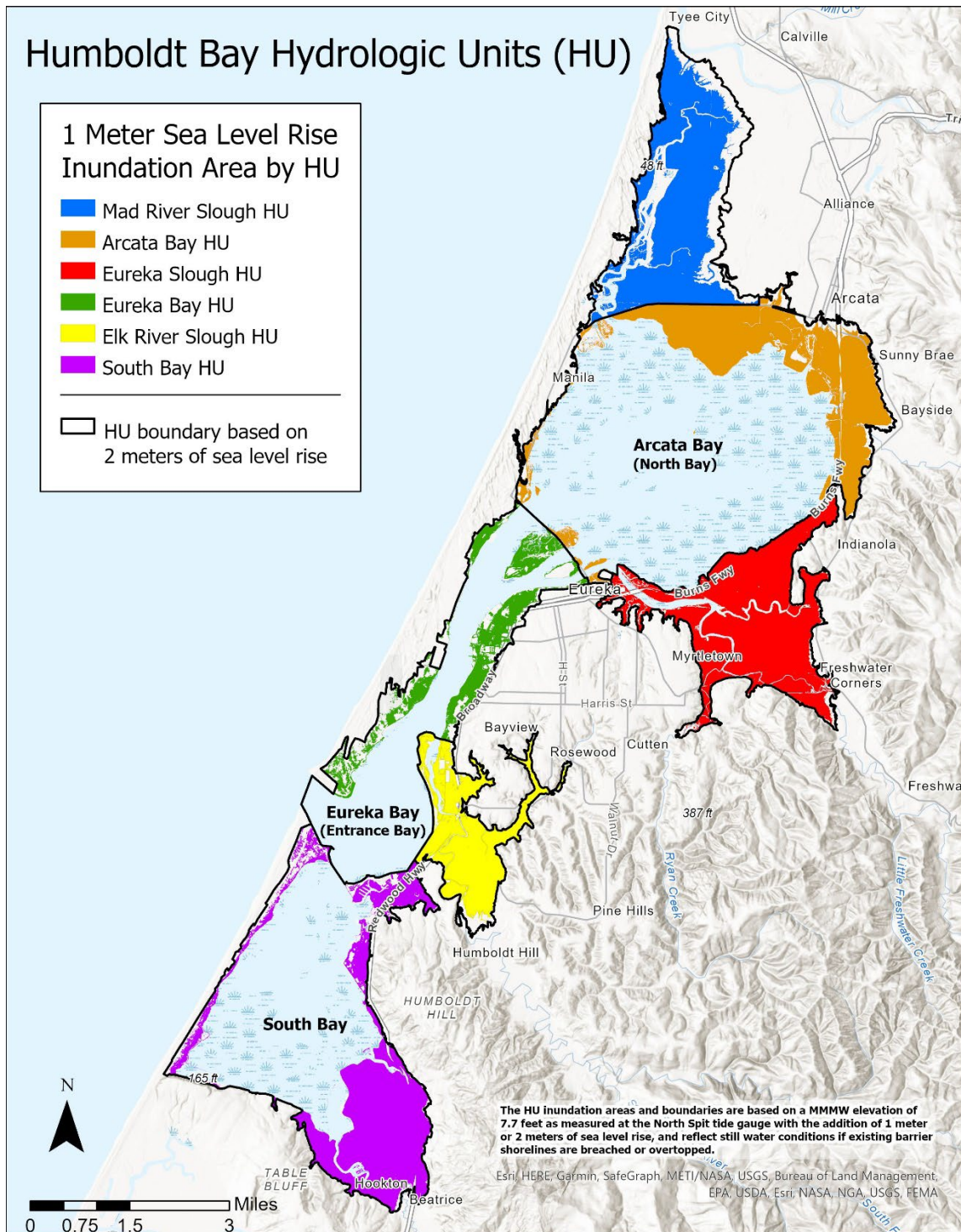


Figure 1. Humboldt Bay’s 6 hydrologic units with inundation areas and boundaries based on a MMMW elevation of 7.7 feet as measured at the North Spit tide gauge with the addition of 1 meter (inundation area) or 2 meters (HU boundary) of sea level rise under still water conditions if existing barrier shorelines are breached or overtopped.

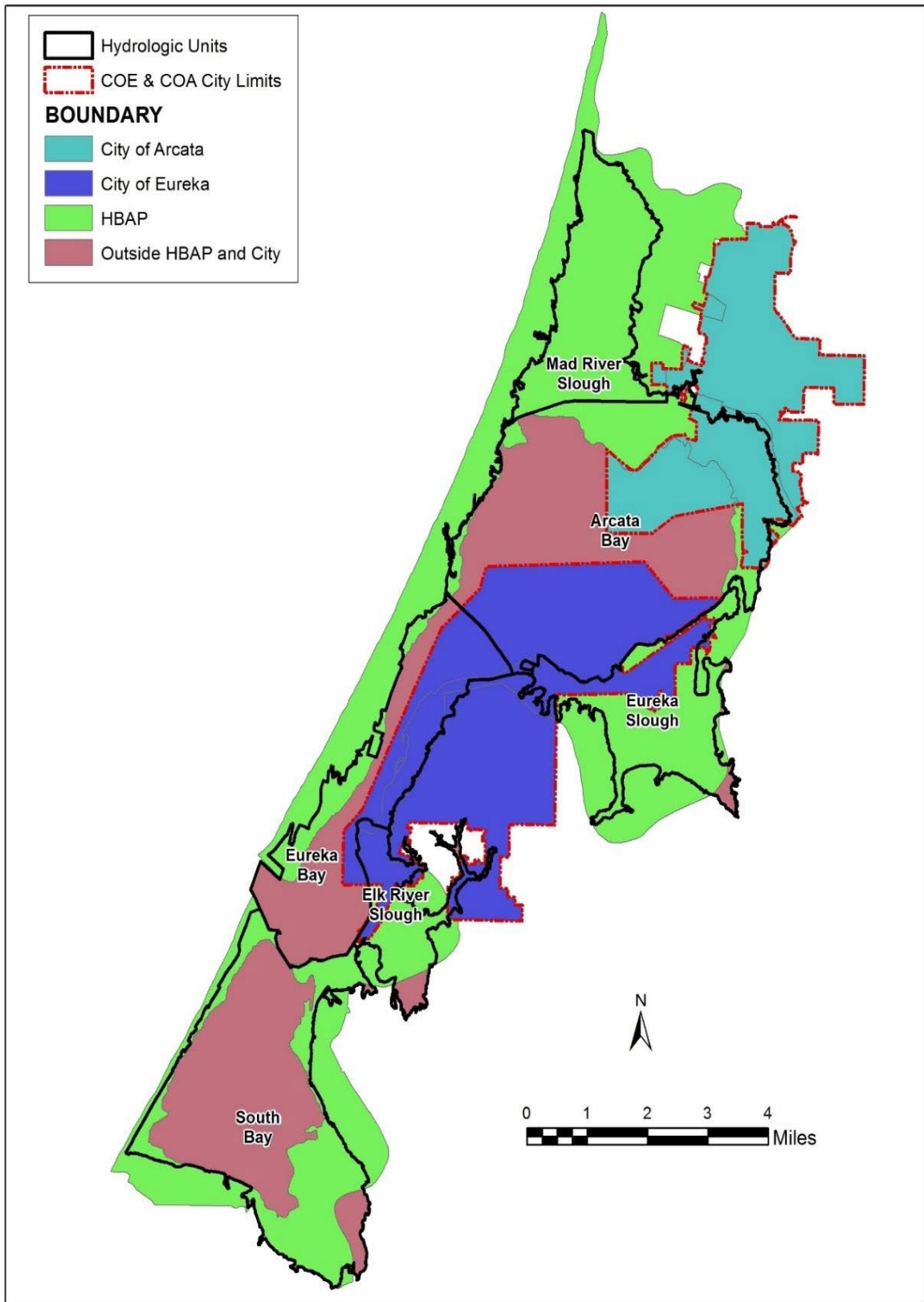


Figure 2. Humboldt Bay's hydrologic units in relation to local coastal program jurisdictions.



## Roles and Assets

The following icons are utilized throughout this document to describe various authorities and roles that stakeholders may have, as well as the assets each stakeholder may be concerned about, in the context of SLR on Humboldt Bay. The Role and Responsibility of “Other” will be used for unique situations and will include the identified role or responsibility for a particular stakeholder.



Most of the roles and responsibilities listed above are self-explanatory, while a couple may benefit from further explanation. A “Public Trust Agency” is one that has management oversight over public trust resources. “Operator” refers to an agency or organization that provides public utilities such as water, wastewater, storm drainage, power, and telecommunication services. In most if not all instances, the utilities listed are regulated by the California Public Utilities Commission.

## Stakeholder SLR Concerns

Each stakeholder section includes a table of possible concerns regarding SLR-related topics. The following table describes each of the possible concerns in more detail.

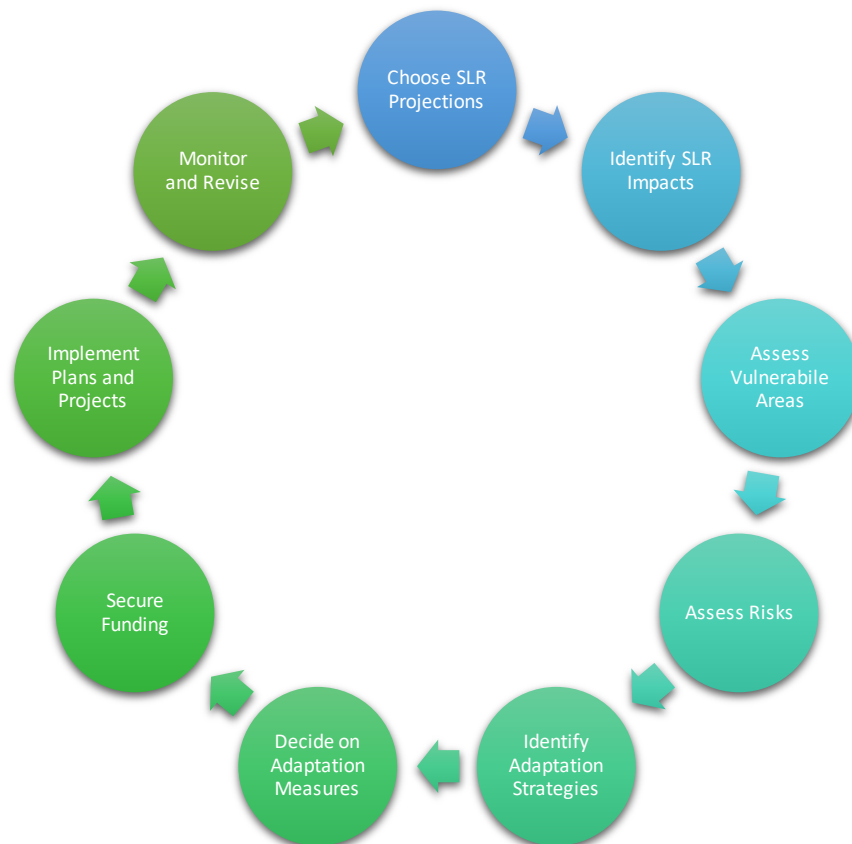
✓	<p>Shoreline Management</p> <ul style="list-style-type: none"> <li>• Who is managing and maintaining the shoreline?</li> <li>• How is the shoreline currently managed and maintained?</li> <li>• What shoreline management changes may be needed to accommodate current and future uses while also addressing SLR?</li> </ul>
✓	<p>Property Ownership and Adaptation Responsibility</p> <ul style="list-style-type: none"> <li>• Who owns the property and who is their neighbor?</li> <li>• How will adaptation measures on one property impact other properties?</li> <li>• Who is going to take the lead for implementation of SLR adaptation measures?</li> </ul>
✓	<p>Regulatory Authorization and Compliance</p> <ul style="list-style-type: none"> <li>• Can permits/authorizations to implement SLR adaption measures be obtained?</li> <li>• Can the permits and requirements of various regulatory agencies be coordinated?</li> </ul>
✓	<p>Feasible Adaptation Strategies</p> <ul style="list-style-type: none"> <li>• What do we do to address SLR impacts?</li> <li>• How do we decide?</li> </ul>
✓	<p>Funding</p> <ul style="list-style-type: none"> <li>• How should SLR adaptation be funded?</li> </ul>
✓	<p>Sea Level Rise Impacts:</p> <ul style="list-style-type: none"> <li>• Erosion</li> <li>• Tidal inundation</li> <li>• Backwater flooding</li> <li>• Emerging groundwater flooding</li> <li>• Saltwater intrusion</li> </ul>

## Stages of Planning

The 2018 California Coastal Commission Sea Level Rise Policy Guidance document outlined a six-step planning process for Local Coastal Programs and other SLR plans. For the purposes of evaluating the progress of local planning efforts, additional steps were added, and the Commission's flowchart was modified to create the figure below which outlines the steps for addressing SLR locally:

- Choose range of SLR projections relevant to a selected planning area
- Identify potential SLR impacts within the planning area
- Identify areas vulnerable to SLR impacts based on selected SLR projections
- Assess SLR risks to coastal resources and development in identified vulnerable areas
- Identify SLR adaptation strategies
- Decide on SLR adaptation measures
- Secure funding to implement SLR adaptation measures/project
- Implement project (permitting, engineering, construction)
- Monitor project outcomes and revise project as necessary

This figure can be found in each stakeholder section, when applicable, to illustrate the SLR planning progress for each stakeholder. Steps that are grey in the stakeholder sections have not been started yet.



## Key Stakeholder Coordination Themes

During the SLR Stakeholder Interview 2021, eighteen stakeholder groups<sup>1</sup> were asked a series of questions focused on (1) confirming the accuracy of the general description of their roles and responsibilities contained in this Catalogue; and seeking their input on (2) potential thresholds for which they would no longer be able to provide services or their assets would be severely impacted due to sea level rise impacts; (3) ways to increase feasibility and effectiveness of regional sea level rise planning, and of adaptation projects protecting assets; (4) ways collaboration might help with sea level rise planning and adaptation; and (5) desired outcomes for regional sea level rise planning, adaptation, and management in the Humboldt Bay region. From these conversations, 22 response themes were identified as being explicitly mentioned by two or more stakeholders. It is important to note. These identified themes seek to provide general guidance in future planning and collaboration efforts and do not necessarily represent the official view of the agency/organization for which the stakeholder interviewees work for. Below is a general description of each theme category:

**Additional Governmental Guidance** – When it came to SLR planning or collaboration, some interviewees thought that they, or a regional effort, would need additional governmental guidance. There were also some stakeholders that mentioned waiting to plan for SLR until government plans were released for certain infrastructure they were dependent on. Other participants expressed uncertainty about what could be done or what would be allowed to address SLR by government agencies.

**Dedicated Time Constraints** – Often described in terms of undertaking SLR planning or implementing SLR adaptation measures as being a challenge, many interviewees mentioned the lack of allocated time or the inability to allocate time to these activities due to already busy schedules. Some participants mentioned that time dedicated to SLR sometimes needed to be put into their calendar for them to actively think about it. A few interviewees even expressed gratitude for being interviewed because it forced them to dedicate time to SLR that they would not normally be able to allocate in their normal schedule.

**Diked Former Tidelands** – As a possible single asset focus for regional coordination, interviewees identified diked former tidelands and other areas protected by dikes as important for collaboration, particularly due to the large number of individual private and public property owners responsible for the maintenance, or lack thereof, for these dikes. Some expressed concern for their assets due to their location in, or proximity to, diked former tidelands.

**Dredged Material** – A few interview participants cited difficulty either obtaining or discarding dredged material and expressed interest in coordinating the transfer of this material. Some participants cited coordinated dredge material utilization as a possible focus for regional coordination.

**Fishing Coordination** – Some interviewees expressed interest in coordinating SLR adaptation or mitigation efforts to protect fishing resources or to avoid limiting access to fishing resources.

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<sup>1</sup> These groups are: Agricultural Property Owner, California Coastal Commission, California Fish and Wildlife, Caltrans, City of Arcata, City of Eureka, Humboldt Bay Harbor, Recreation, & Conservation District, Humboldt Bay Municipal Water District, Humboldt Community Services District, Humboldt County, Humboldt County Resource Conservation District, Manila Community Services District, NOAA, Peninsular Community Services District, PG&E, US Army Corps, US Fish and Wildlife Service, and Wiyot Tribe

**Include more NGOs** – In terms of collaboration, a few stakeholders thought that NGOs should be or could be more involved in SLR planning. Some also expressed interest in collaborating with more NGOs or had specific organizations in mind.

**Communication between Stakeholders** – A majority of interviewees expressed interest in increasing communication among stakeholders or cited that increased communication among stakeholders would be important for regional collaboration. Some cited lack of communication among stakeholders as a challenge for current SLR planning or coordination. It was also mentioned by a few participants that a unified communication effort would be useful to reduce stakeholder fatigue and the number of overlapping community workshops on similar topics. There were also some stakeholders that were unaware of what other stakeholders were doing and expressed interest in knowing more in order to be more informed or to possibly collaborate.

**Interest in County Leading** – Some stakeholders interviewed expressed interest in having the County lead a regional effort, and a few said that the County was the only entity who would really be able to lead regional SLR collaboration.

**Landowner Participation** – A majority of interview participants cited landowner participation as vital to future SLR collaboration, or expressed interest in increasing landowner participation in SLR adaptation efforts. Some had involvement in current or past projects in collaboration with landowners, but many agreed that SLR participation could determine the success of regional SLR coordination. Many identified landowners of diked former tidelands in particular as important stakeholders who could be participating more in planning. Some felt that landowners do not feel involved in current SLR planning and are therefore less receptive to SLR adaptation or planning because they are not being consulted on issues that directly affect their land and livelihoods.

**Permitting** – A majority of participants either identified permitting issues as a constraint for SLR planning and/or as a possible point of collaboration if permitting could be streamlined. Some expressed confusion or frustration about obtaining permits, and a few explicitly said a more programmatic approach to permitting was needed to address SLR regionally.

**Personnel Constraints** – Similar to dedicated time constraints, many stakeholders cited lack of personnel dedicated to SLR or limited personnel in general as a challenge to SLR planning and collaboration. Some mentioned that regional SLR coordination might require a framework with dedicated staff to push the effort forward due to the limited personnel within their own organization.

**Recreational Coordination** – A few stakeholders identified collaboration on recreational assets as a possible point of interest for regional SLR coordination. Examples given for recreational assets were areas for walking or observing nature, living shorelines, and areas for recreational fishing.

**Regional Coordination in General** – A majority of the interview participants supported regional collaboration in general or identified it as key to addressing SLR in the Humboldt Bay region. Among those few participants who did not explicitly say they wanted regional coordination on SLR in general, they did not express that they did not want regional coordination.

**Regional Prioritization of Projects** – Some interviewees suggested that having a regional prioritization or ranking system would be a useful outcome or point of focus for regional SLR coordination. They cited the importance of consolidating effort on projects on a regional level, particularly due to limited funding.

**Relocation Coordination** – A few interview participants mentioned that plans should be made for relocation and/or there should be some governmental guidance on relocation of assets regionally in the face of SLR. One interviewee identified managed retreat as a possible opportunity for mitigation.

**Restoration and Mitigation** – Many interviewed stakeholders identified restoration and mitigation as a possible focal point for SLR regional collaboration. Example projects mentioned by stakeholders include a seagrass mitigation plan, coordinated living shoreline mitigation, a Regional Mitigation Bank that would aggregate conserved land to protect other land, and some type of program to incentivize SLR mitigation.

**Safety and Hazard Mitigation** – Several participants suggested a local hazard mitigation plan might be an outcome or possible focus of SLR regional coordination.

**Shared Funding Coordination** – A vast majority of interviewees mentioned funding as a constraint, expressed interest in seeking shared funding for projects, and/or identified the need to collaboratively seek funding due to limited or competitive funding options. Some stakeholders did not identify funding as a current issue but recognized that if there was a regional effort to address SLR, funding would become an issue.

**Shoreline** – Many participants identified the shoreline as a possible single asset focal point of SLR regional collaboration. Some mentioned shoreline coordination would be useful for living shoreline implementation, selective hard armoring installation, and preventing increased erosion caused by refracted wave energy from hard armoring sites.

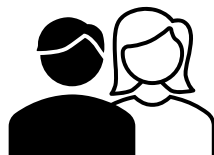
**Transportation Infrastructure** – Interviewees mentioned local roads, Highway 101, and/or Highway 255 as important to SLR planning, or as a single asset focus for collaboration among stakeholders. Some participants not in control of transportation infrastructure said their ability to make plans for future SLR adaptation depended on updates and plans for road infrastructure such as paving height or manhole cover height.

**Utilities Concerns** – A few stakeholders identified utilities as a potential focal point of regional SLR coordination, or expressed concerns such as saltwater intrusion for utilities in the face of SLR impacts.

**Wastewater Concerns** – Many participants mentioned wastewater issues related to SLR and assets involving wastewater that could be impacted by SLR. A few interviewees suggested a regional wastewater management effort could be a focal point of a regional SLR approach.

The following table shows all 22 shared themes about SLR regional planning and adaptation explicitly mentioned by two or more stakeholder groups during their SLR Stakeholder Interview 2021 shown in order of highest percent to lowest percent of stakeholder groups interviewed that shared each theme out of all 18 stakeholder groups.

<b>Shared Interview Themes</b>	<b>% Shared</b>
Shared Funding Coordination	94%
Regional Coordination in General	82%
Landowner Participation	65%
Diked Former Tidelands	59%
Restoration and Mitigation	59%
Permitting	59%
Communication between Stakeholders	59%
Shoreline	47%
Personnel Constraints	47%
Transportation Infrastructure	41%
Dedicated Time Constraints	41%
Wastewater Concerns	35%
Interest in County Lead Effort	35%
Dredged Material	29%
Additional Governmental Guidance	29%
Regional Prioritization of Projects	29%
Relocation Coordination	24%
Fishing Coordination	18%
Include more NGOs	18%
Utilities Concerns	18%
Recreational Coordination	12%
Safety and Hazard Mitigation	12%



# Stakeholder Catalogue

## Tribal Government

### Wiyot Tribe

Bear River Band of the Rohnerville Rancheria

Blue Lake Rancheria

#### *Roles & Responsibilities*

Federally Recognized Tribe



Private Property Owner



The entire Humboldt Bay region, which is referred to as Wigi by the Wiyot people, is part of the Wiyot ancestral home. Three federally recognized tribes are located within Wiyot ancestral territory and have Wiyot members: the Wiyot Tribe (Table Bluff

Reservation), the Bear River Band of the Rohnerville Rancheria, and the Blue Lake Rancheria. All three tribes are governed by a tribal council. Projects undertaken by local governments in the Humboldt Bay region are referred to all three tribes for their comments and concerns as part the project review process, as all three tribes have an interest in cultural resources and other relevant assets in the region. However, the Wiyot Tribe is the most active tribe in the Humboldt Bay region in terms of land ownership and project implementation, and particularly in regard to addressing sea level rise. Therefore, the information in this section is focused on the Wiyot Tribe.

According to the Wiyot Tribe's constitution, their jurisdiction extends to the fullest extent permitted by applicable tribal and federal law to the following:

1. All land encompassing the Tribe's ancestral territory, including all that area from Little River to the north, Bear River Ridge to the south, and from the Pacific Coast out to as far as Berry Summit in the northeast and Chalk Mountain in the southeast.
2. All lands, water and resources as may be hereafter acquired by the Tribe or by the Federal Government in trust for the Tribe, or its citizens, under any grant, transfer, purchase, adjudication, treaty, Executive Order, Act of Congress, or other acquisition, including but not limited to, eighty-eight acres of land held in trust by the United States for the Tribe's benefit, and located on the south end of Humboldt Bay, California, five miles from the town of Loleta. This new Reservation was established in 1991.

The Wiyot people inhabited permanent villages along the waterways of their ancestral lands that also served as routes for travel and trade, in addition to seasonal camps in other regions. According to the County's Humboldt Bay Area Plan Sea Level Rise Vulnerability Assessment, there are a number of Wiyot villages and other cultural sites that would be impacted in all six HUs with 1.0 meter of SLR<sup>2</sup>.

<sup>2</sup> Evidence of Wiyot villages and other cultural sites exists in 83 locations within a 2.0-meter SLR inundation zone.



The Wiyot Tribe is actively working to recover their language, ceremonies, and lifeways. The Tribe is dedicated to preserving their native history and cultural material of their ancestors, including ancient village sites and shell middens within and surrounding Humboldt Bay such as Tuluwat Island, as well as sites beyond.

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- **Cultural resources sites are located within in each HU and are vulnerable to 1 meter of SLR.**

#### **Arcata Bay**

- **Tuluwat Island**
  - Two Wiyot cultural sites located in Humboldt Bay are the ancient villages of Tuluwat ("Toulouwat") and Hutverroulh ("Etpidolh", "Etpidalh Watpuroulh"), located on Tuluwat Island also known as Indian Island. Tuluwat Island is a culturally significant location to the Wiyot people. The island was the site of the Tribe's annual World Renewal Ceremony for thousands of years until what became known as the 1860 Wiyot Massacre, when white settlers murdered all but a few Wiyot people, resulting in the Tribe's loss of the island. The ownership of the majority of Tuluwat Island has since returned to the Wiyot Tribe.
  - Located beneath what was the village of Tuluwat is a culturally significant 1,000-year-old mound of clamshells known as a midden that measures over six acres and contains the ancient remnants of meals, tools, ceremonies, and sacred burial sites, and is considered irreplaceable by the Wiyot. Due to modifications in tidal action along the shoreline stemming from dikes and channels built by settlers at the end of the 19<sup>th</sup> century, the midden beneath Tuluwat has lost an estimated 2000 cubic yards to erosion from 1913-1985 alone. In addition to this continuing erosion, the shell mound was subject to uncontrolled archaeological digging in the early part of the 20<sup>th</sup>. Furthermore, the Wiyot people have permanently lost to nature structures of the Tuluwat village that were still reportedly visible as late as 1913.
  - The Tribe created the Tuluwat project for the purpose of restoring the cultural heritage and ecological resources of the site and surrounding habitat, constructing a cultural center for the public, and rehabilitating the site so it would be suitable again for tribal ceremonies. The Tribe first had to clean up scattered metal, wood debris, hazardous materials, dilapidated structures, and contaminated soil resulting from the ship repair facility.



#### **Eureka Bay**

- **Southern end of Tuluwat Island**

*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:	
✓	Property Ownership and Adaptation Responsibility		✓	Erosion
✓	Regulatory Authorization and Compliance		✓	Tidal Inundation
✓	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding		✓	Saltwater Intrusion

*Planning Efforts*

In 2020, the Wiyot Tribe received a \$100,000 grant from PG&E and \$60,000 from the Bureau of Indian Affairs, and in 2021 a \$250,000 grant from the Ocean Protection Council, to fund their Climate Change Adaptation Planning (CCAP) Project. The project will identify cultural and natural resources within Wiyot ancestral lands and waters vulnerable to climate change and at risk from flooding. Phase 1 of the project involves identifying cultural and natural resources vulnerable to sea level rise by interviewing and meeting with tribal elders, youth, and community members to share experiences, and collect cultural and natural resources information, stories, concerns, and advice. The Tribe will also inventory and collect existing



GIS data and mapping of cultural and natural resources and assets of interest which are vulnerable to climate change in Wiyot ancestral lands and waters. In Phase 2, the Tribe will draft its Climate Change Adaptation Plan. Phase 3 will include implementation of the plan, Tribal land acquisition, and expanding co-management and Tribal decision making in regional adaptation planning.

The 2018 Sea Level Rise Vulnerability Assessment conducted by Humboldt County included the number of Wiyot villages and other cultural sites that were vulnerable within the 2.0-meter SLR inundation zone. Cultural sites were identified from a 1918 field map from an ethnographic report on the Wiyot by L.L. Loud in combination with consultation with a Wiyot Tribal Historic Preservation Officer (THPO). In total 83 locations were identified within the six HU.

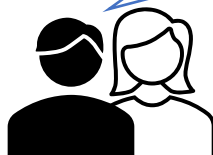
The Wiyot Tribe was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more of the 18 stakeholder groups interviewed. The Wiyot Tribe interview contained 10 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to the Wiyot Tribe**

- Shared Funding Coordination
- Regional Coordination in General
- Restoration and Mitigation
- Communication between Stakeholders
- Transportation Infrastructure
- Interest in County Leading
- Regional Prioritization of Projects
- Fishing Coordination
- Include more NGOs
- Safety and Hazard Mitigation



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Respondents were given several opportunities to contribute additional comments and write-in options to the formal questions. The Wiyot Tribe and tribal governments in general were referenced by several survey participants, some suggesting increased involvement of the Tribe as illustrated by the word cloud on the right. Survey respondents were also asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Of the 577 participants, only 536 assigned a rating to “Places of Cultural Importance”; this represents a lower than average survey participation. For those that did participate, 69% of these respondents rated these cultural sites as a moderate or higher priority. Results are reported in the graph on the next page.



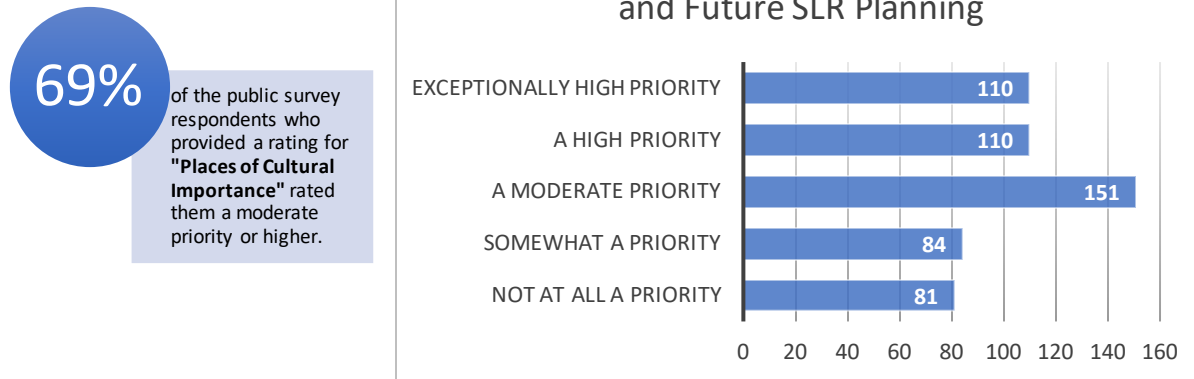


Figure 3. Priority Ratings for Places of Cultural Importance regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n = 536)

### *Relevant Coastal Professional Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

There were 7 total respondents from both Blue Lake Rancheria and the Wiyot Tribe during the SLR Coastal Professionals Survey 2021, though participation for individual questions varied. These tribal government members were asked a variety of questions including their preferred level of involvement in SLR planning for the tribal government they represented. Respondents were given a sliding scale to rate their preferred role ranging from "not involved" to "participate" and "lead". The results for the Tribal Government category ranged from just above not involved to right below leading, with a 60% preference for a level of involvement mixed between leading and participating in the planning effort as shown in the graph on the next page.

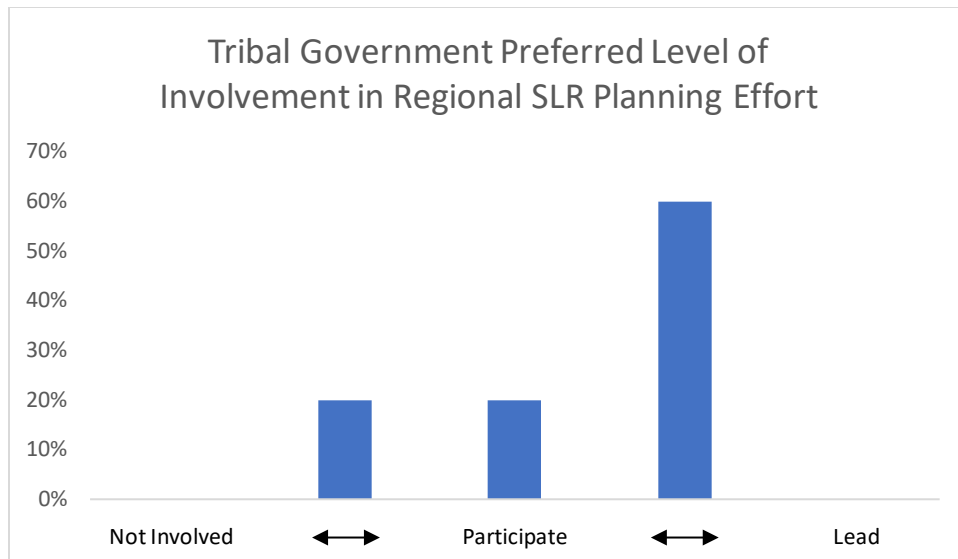


Figure 4. Tribal Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=5).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Tribal Government category ranged from just above a project by project basis to right below a Humboldt Bay scale, with a 40% preference for a mix between a Watershed/HU and Humboldt Bay scale approach as shown in the graph below.

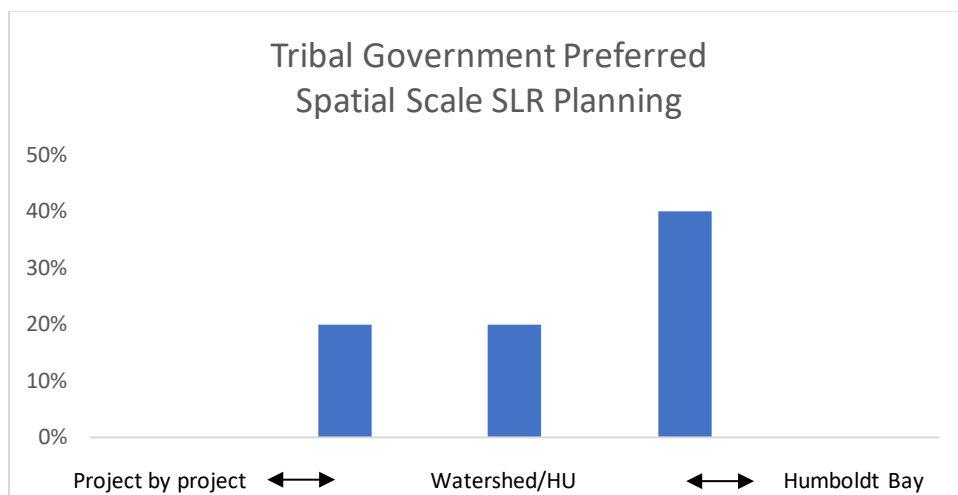


Figure 5. Tribal Government respondents' preferred spatial scale to focus regional SLR coordination efforts from the SLR Coastal Professionals Survey 2021 (n=4)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for Tribal Government favored a new regional authority, with 84% of respondents rating this option as somewhat favorable or higher. On the

other end of the spectrum, only half of respondents answered they somewhat opposed not having any regional planning as shown in the graph below.

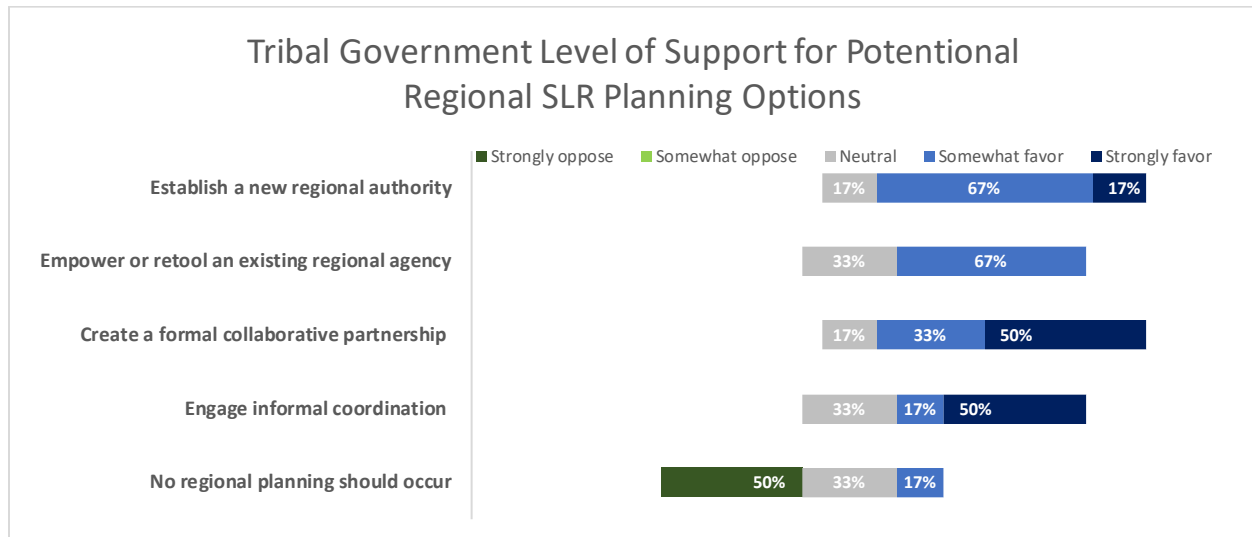


Figure 6. Tribal Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4-5)

### Reference Links

<https://www.wiyot.us/>

<http://www.brb-nsn.gov/>

<https://bluelakerancheria-nsn.gov/>

<https://www.wiyot.us/101/Natural-Resources>

<https://www.northcoastjournal.com/humboldt/were-coming-home/Content?oid=12849841>

<https://humboldt.gov/DocumentCenter/View/87242/Humboldt-Bay-shoreline-cultural-landscape-investigation-Rohde-2020?bidId=>

<https://humboldt.gov/DocumentCenter/View/62872/Humboldt-Bay-Area-Plan-Sea-Level-Rise-Vulnerability-Assessment-Report-PDF?bidId=HBAP>

## Land Use Authorities

### City of Arcata

#### *Roles & Responsibilities*



The City of Arcata (COA) is a coastal city located in the northern region of Humboldt Bay. There are several departments of the COA currently or likely to be involved with SLR planning and adaptation: Community Development, Environmental Services, Building and Engineering, and Transportation. The COA has stated their goal is to take a sea level rise adaptation approach that balances agriculture, coastal access, wetlands, development, and economic feasibility.

#### Community Development – Planning Division

This division of the COA oversees land use and development within the city, guided by their General Plan and Zoning Code, and by their Local Coastal Program (LCP) within the coastal zone. The LCP was originally certified in 1989 and is in the process of an update that will include the addition of SLR policies.

#### Environmental Services

Parks, Facilities and Natural Resources Division – This Division oversees recreation, natural resources, open spaces, parks, fields, government buildings and facilities, forests, wetlands and creeks, and trails.

Parks and Recreation Division – This Division provides programs, facility rentals, classes, and community events.

Streets/Utilities Division – This Division is in charge of street construction and maintenance, water distribution and maintenance, wastewater collection, confined drainage ways, traffic control, vegetation management

Water/Wastewater Division – The City of Arcata is a municipal water and sewer operator for residents within the City of Arcata, Jacoby Creek Water District, and a small community across from Mad River Community Hospital called Pacific Manor. The Humboldt Bay Municipal Water District is the primary source for Arcata’s water. This Division monitors, reports, tests and treats all drinking water for the city and the Jacoby Creek Water District; and monitors, reports, tests and treats all wastewater, including the Arcata Marsh and Wildlife Sanctuary's 55 acres of oxidation ponds and 225 acres of treatment and enhancement marshes.

## Building and Engineering

Engineering Division – This Division provides design assistance for the repair and improvement of the City's infrastructure and oversees capital improvement projects for the city.

Public Transportation Division – This Division operates as a regional hub and serves as a regional Greyhound agency.

## *Specific Hydrological Unit Assets and Concerns*

### **Arcata Bay**

- **Highway 101 and Highway 255**
- **Arcata Wastewater Treatment Facility and Collection System/Arcata Marsh**
  - The most critical and vulnerable asset that could be impacted by sea level rise is the COA wastewater treatment facility which is a component of the Arcata Marsh and Wildlife Sanctuary. The sanctuary acts as a distributor (and not an operator) of water distribution.
- **Municipal water transmission lines and a booster pump station**
  - Jacoby Creek Community Service District gets their water from the City of Arcata
- **Sewer lines and lift stations**
- **Gas lines**
- **Power lines**
- **Public coastal access points**
  - Humboldt Bay Trail
  - Arcata Marsh Trails
- **Humboldt Bay Trail**
- **Bayside Wildlife Preserve**
- **South Samoa Boulevard**
  - Areas west of Old Arcata Road with associated infrastructure and land use is vulnerable on these former tidelands.



### **Eureka Slough**

- **Dikes in vicinity of City of Eureka Mad River Pipeline**
- **Highway 101**

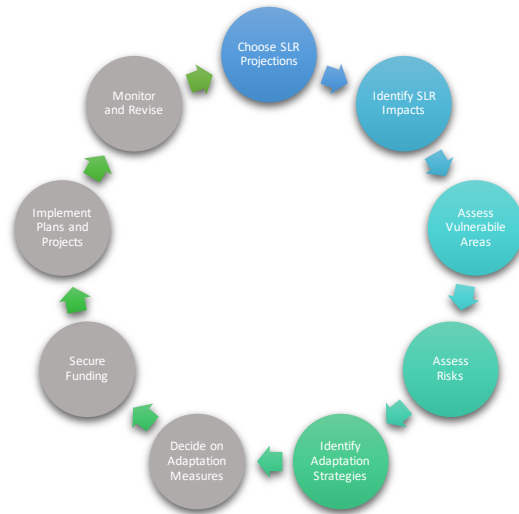


*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:	
	Property Ownership and Adaptation Responsibility		✓	Erosion
✓	Regulatory Authorization and Compliance		✓	Tidal Inundation
✓	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding		✓	Saltwater Intrusion

*Planning Efforts*

The city has prepared a number of documents addressing sea level rise, available at the following link: <https://www.cityofarcata.org/DocumentCenter> under Community Development, Sea Level Rise. In 2018 Arcata completed a SLR Vulnerability Assessment and update to Sea-Level Rise in the Humboldt Bay Region (Update 2). In 2017 Arcata produced draft SLR policies to consider for the Coastal Land Use Element (CLUE) update and in 2018 produced a draft CLUE. Arcata is hosting virtual public engagement to obtain feedback on CLUE policies in 2020-2021.



The Arcata Living Shorelines Pilot Project proposes to test various living shoreline construction methods and materials at multiple sites within the Arcata Marsh and Wildlife Sanctuary. This project is in a planning stage and could provide important information on sediment accretion and salt marsh vegetation establishment.

In 2019, Arcata city officials held a meeting regarding the Arcata Wastewater Treatment Plant (WWTP) where they said they were discussing moving the WWTP to a different location in the future, but not presently due the expense. They cited a 40- year projection until the WWTP would need to be moved and decided to pursue the Wastewater Treatment Facility Plan and Plant Improvement Project in the meantime, which will make upgrades to the existing facility to help comply with state regulations. The planning process for the WWTP with a 25-year design timeline is almost done and includes a SLR evaluation due to its location and grant funding for levee improvements.

The City of Arcata has had a strategy for decades now of acquiring and restoring greenspace with SLR in mind during planning and implementation, often working in partnership with CDFW. An example project would be the McDaniels Slough Project. Restoration at McDaniel Slough involved over 250 acres of former tidelands and included raising existing levees to an elevation of between 12’ to 15’ to address future SLR.

The city is still in the process of working with the CCC to update their LCP and SLR policies. These updates have not yet been approved by Council.

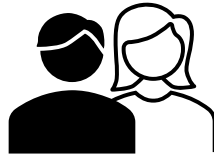
This agency was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### Key Stakeholder Coordination Themes

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The City of Arcata interview contained 7 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

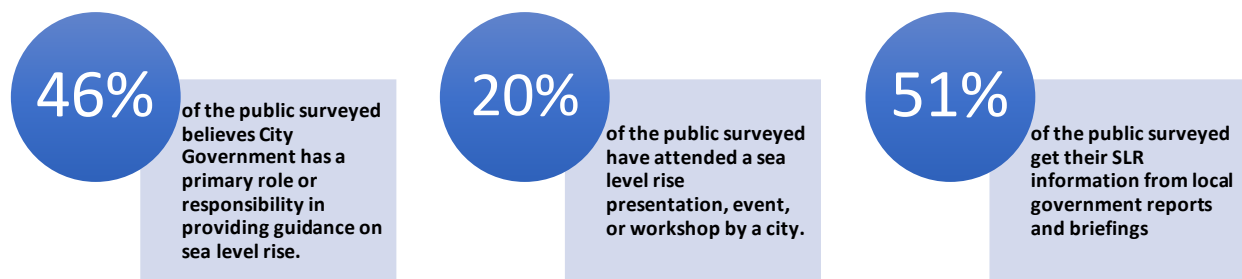
#### Interview Themes Important to City of Arcata

- Shared Funding Coordination
- Regional Coordination in General
- Communication between Stakeholders
- Permitting
- Wastewater Concerns
- Interest in County Leading
- Regional Prioritization of Projects



### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to identify one or more entities that had a primary role or responsibility in providing guidance on SLR, and had the option of “City Government”, “County Government”, “State Government”, “Federal Government”, and “Other”. There were 266 respondents, or 46% of those responding to the question, who identified City Government as having a primary role or responsibility. Participants were also asked to estimate how many sea level rise presentations, events, or workshops they had attended in the last five years. Out of 308 respondents who had attended events, 20% (n=64) had attended a SLR outreach event hosted by a City Government. When asked where survey participants got their information about sea level rise, 51% (n=296) said local government reports and briefings.



Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning. Some of these assets are identified above in

this catalogue section as City of Arcata assets that could be subject to sea level rise impacts, confirmed as such by City of Arcata representatives during the Stakeholder Interview 2021. Responses for priority ratings for the various assets ranged from “not at all a priority” to “exceptionally high priority”. The top three assets for priority ratings at moderate priority and above were “Sewer/water collection and treatment facilities” (89%, n=549), “Local roads and highways” (88%, n=546), and “Domestic water and treatment and conveyance facilities” (87%, n=548). In contrast, “Parks and similar public spaces” received far fewer ratings at moderate priority or higher and had less survey participation (n=539). Results for priority ratings are reported in the graph below.

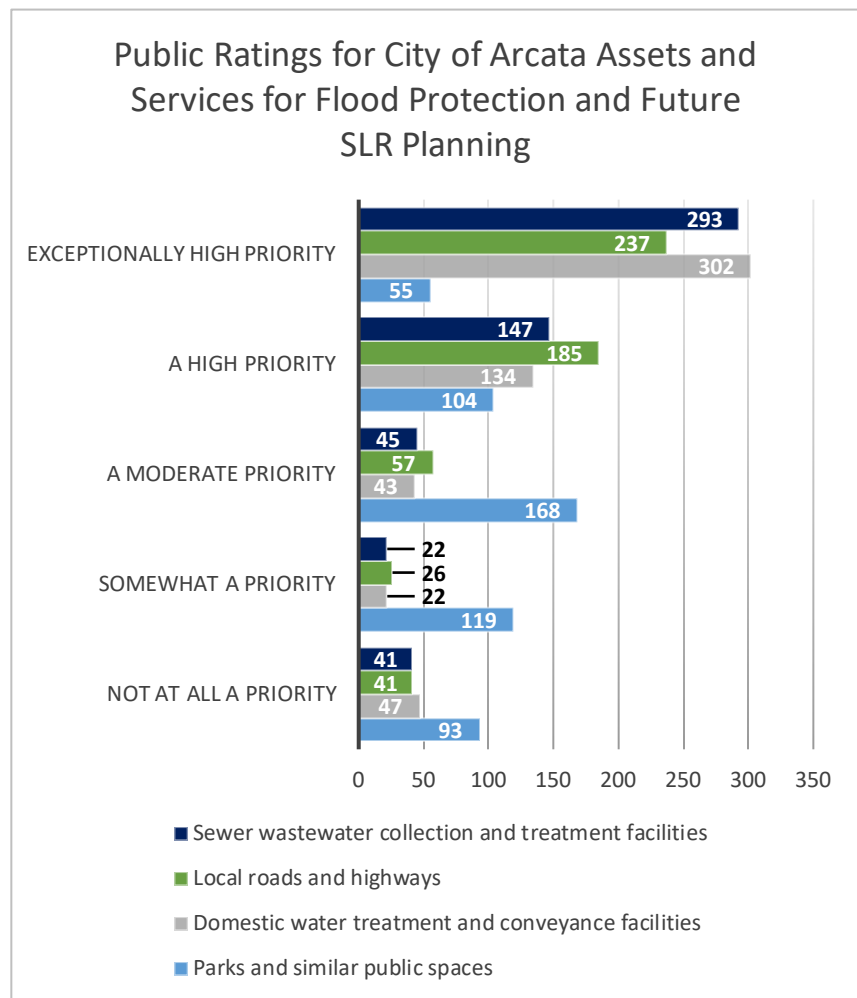
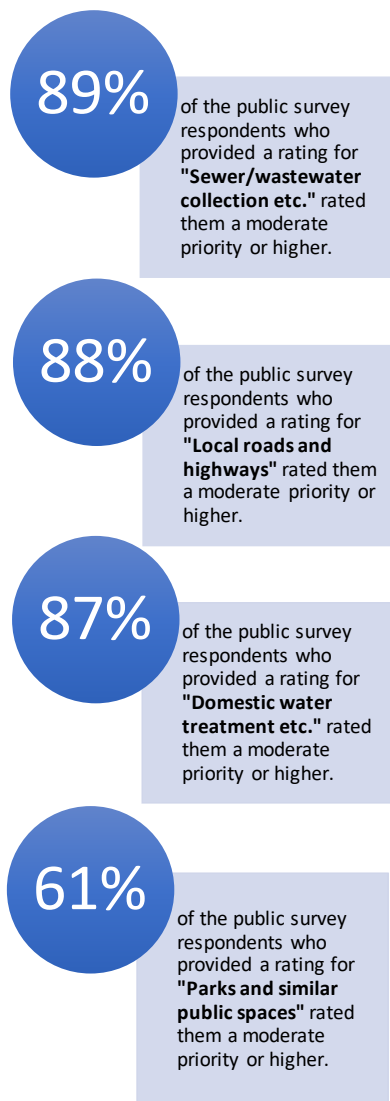
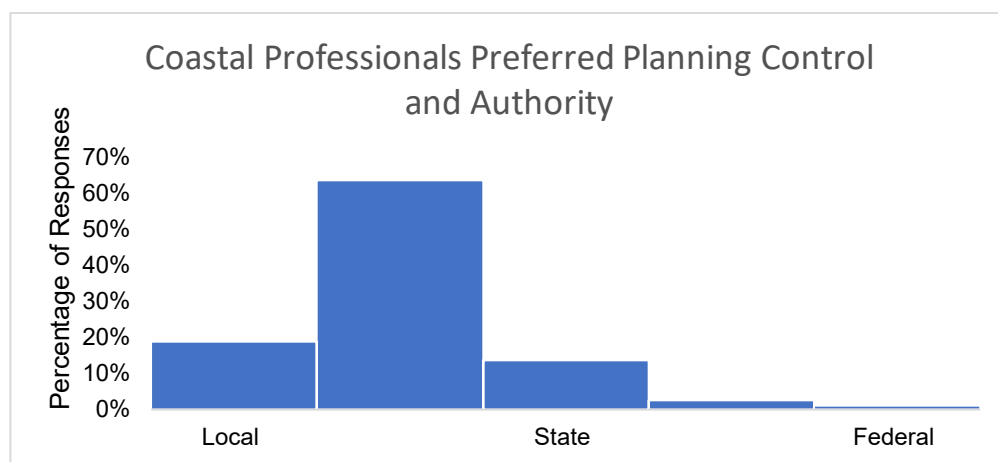


Figure 7. Priority Ratings for various assets that pertain to City of Arcata regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=539-548)

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, survey participants were given a sliding scale ranging from “Local” to “State” to “Federal” to show what level of government they thought should hold the majority of the planning control and authority for SLR. A total of 80 individuals provided responses, a majority (64%) of which preferred the planning authority to include a mix of local-and-state control as shown in the graph below.



*Figure 8. Survey respondents' preference for what level of government should hold the majority of the planning control and authority from the SLR Coastal Professionals Survey 2021 (n=80)*

For the City Government category of participants, there was a total of 12 respondents from both the City of Arcata and the City of Eureka though participation for individual questions varied. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the City Government they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for City Government ranged from “participate” to right below leading with a 50% split of effort preference as shown on the next page.

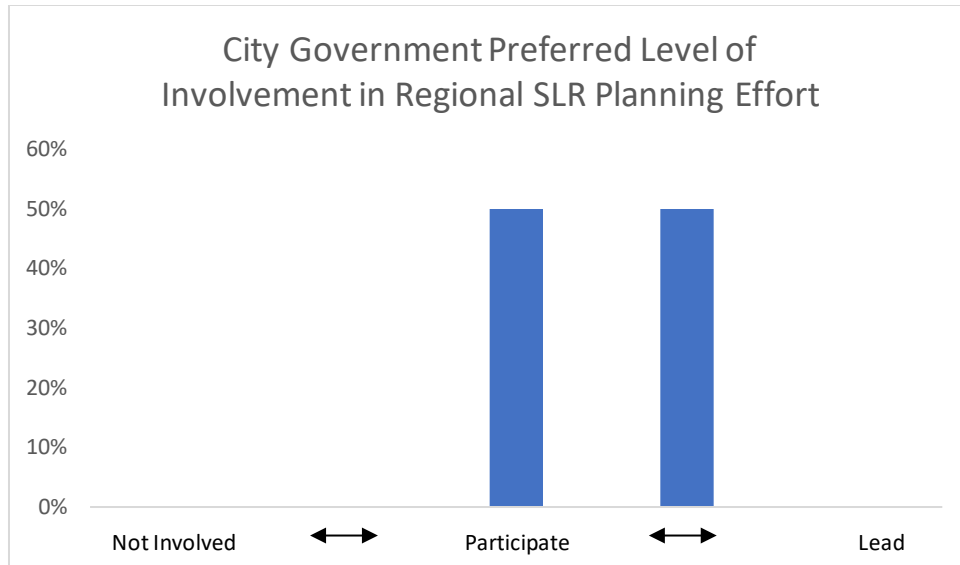


Figure 9. City Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=10).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the City Government category ranged from a “Watershed/HU” to a “Humboldt Bay” spatial scale, with a 60% preference for a Humboldt Bay approach as shown in the graph below.

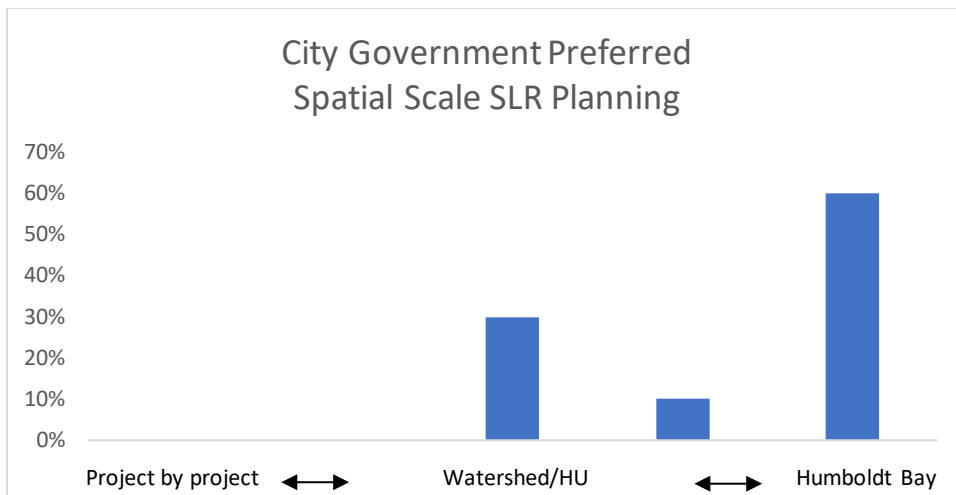


Figure 10. City Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=10)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for City Governments favored creating a formal collaborative partnership with 100% of respondents rating this option somewhat favorable or

higher. Similarly, 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

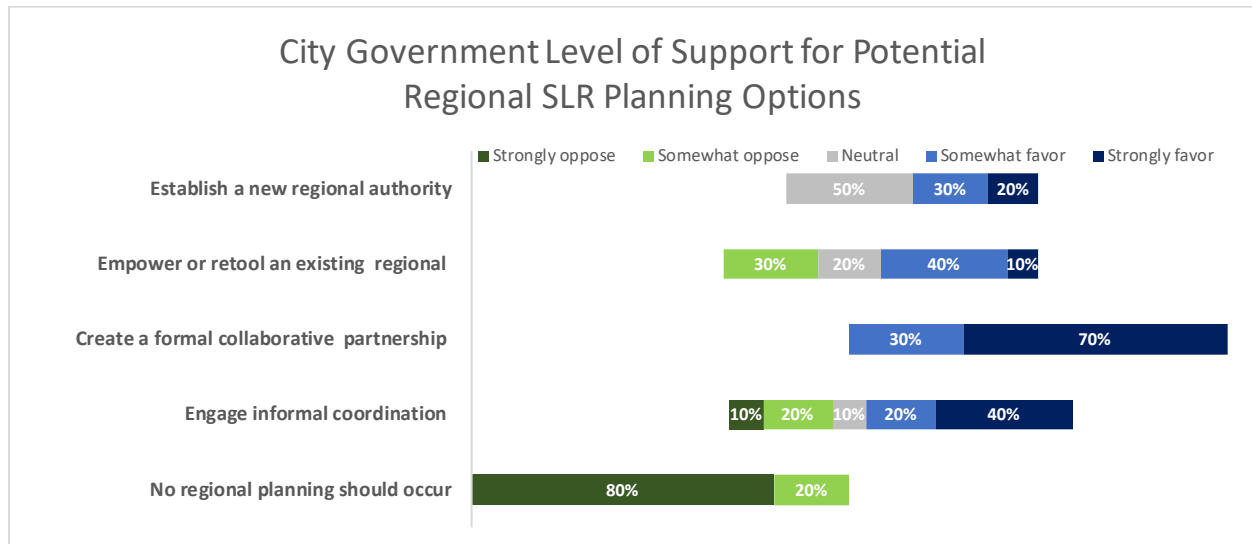


Figure 11. City Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 10)

#### Reference Links

<https://www.cityofarcata.org/759/Sea-Level-Rise>

<https://www.cityofarcata.org/161/Certified-Local-Coastal-Program>

<https://www.cityofarcata.org/DocumentCenter> (under Community Development, Sea Level Rise)

<https://www.humboldtbykeeper.org/images/PDF/vulnerabilityrating.pdf>

<https://www.cityofarcata.org/DocumentCenter/View/7193/City-of-Arcata-Sea-Level-Rise-Risk-Assessment-04-2018?bidId=>

<https://www.times-standard.com/2019/11/16/arcata-city-officials-say-they-want-to-use-the-wetlands-for-wastewater-treatment-for-as-long-as-possible>

<https://www.cityofarcata.org/227/McDaniel-Slough-Project>

## City of Eureka

### *Roles & Responsibilities*



The City of Eureka (COE) is a coastal city centrally located within the Humboldt Bay region. There are several departments of the COE that are currently or likely to be involved with SLR planning and adaptation: Development Services – Planning, Zoning and Community Development Division, Community Services, and Public Works.

Development Services – Planning, Zoning and Community Development Division

The mission of this department is to foster opportunity and guide growth through partnerships with the community. The Planning Department oversees land use and development within Eureka, guided by their General Plan and Zoning Code, and by their Local Coastal Program (LCP) within the coastal zone. The city recently updated their General Plan and is in the process of updating their LCP which was originally certified in 1984. These two plans are tied together because the Land Use Plan component of the City's LCP is integrated into the General Plan.

The City's general plan states: *“Sea level rise policies address shoreline protective structures, requirements for new and existing development along the shoreline, and preservation of natural shoreline areas. Sea level rise adaptation policies cover protection of key coastal assets, establishment of a coordinated protection strategy, relocation of development where shoreline structures can no longer be maintained, and consideration of sea level impacts when designing City projects. Lastly, there are policies that cover disclosure and education of residents on potential sea level rise impacts.”* While these policies are included in the City's general plan, they have not been incorporated into the City's LCP and thus have not been certified by the Coastal Commission.

Key issues related to SLR from the General Plan Issues and Concerns Report include:

- Utilities, particularly in relation to flood prevention and protection
- Flooding could impose limitations on development projects in low lying areas along the coastline and bay shores
- Impact on existing and future land uses, critical transportation networks, and wastewater and drinking water infrastructure assets including the wastewater treatment plant
- Increasing difficulty of stormwater management and operation of mechanical tide gates and water control structures)
- Impacts to natural shoreline and shoreline structures due to increased erosion, and wave height and wave force
- Changes to sediment supply and movement that could worsen beach erosion and adversely impact coastal wetlands
- Saltwater intrusion that could contaminate drinking water and increase corrosion of subsurface infrastructure

### Community Services

The Community Services Department consists of several divisions. Those divisions most relevant in regard to sea level rise concerns are Parks, Harbor Operations, and Facility Operations.

**Harbor Operations Division** – This division is responsible for overseeing the operation and maintenance of the Eureka Public Marina, and maintenance of other waterfront property and structures including the Samoa Bridge Boat Ramp, several docks, the Waterfront Boardwalk, the Del Norte Street Pier, the EDA fish plant, and PALCO Marsh and other City-owned wetland areas. The Waterfront Revitalization Program operates out of this division and involves planning, coordination, and review of twelve waterfront projects including dock reconstructions and others.

**Parks Division** – This division develops and maintains park and landscape facilities. These include six community park facilities, one of which is Halvorsen Park on the Humboldt Bay shoreline, seven neighborhood park facilities, and numerous landscape facilities, parking lots, and street trees.

**Facility Operations** – This division is responsible for the maintenance and systems operation of over eighty City buildings, including the Adorni Center and the Wharfinger Building located on Humboldt Bay. Facility maintenance is also provided to recreational facilities and traffic signal electrical services throughout the city system.

### Public Works

The City of Eureka Public Works provides a variety of services potentially affected by SLR such as road and stormwater facility maintenance, and municipal utility services. This department consists of four main divisions:

- **Engineering** – responsible for the planning, design and capital improvement of the City’s infrastructure.
- **Field Operations** – responsible for fleet management, water distribution, wastewater collection and code enforcement
- **Building Safety**
- **Utilities Operations** – responsible for operating and maintaining the city’s potable water treatment and storage facilities, and the city’s wastewater treatment facilities.

Eureka is a municipal water and sewer provider for residents within Eureka city limits, and in some cases outside city limits within the HCSD service area. Conversely, HCSD provides sewer and water service within some areas of Eureka. The COE Public Works Department provides installation and maintenance of the water distribution and transmission system, installation of new domestic water connections, as well as provides fire service connections and fire hydrants. They maintain the Mad River Pipeline from Arcata to Eureka, which conveys the City’s water purchased from the Humboldt Bay Municipal Water District.

City of Eureka owns the Samoa Field Airport, a municipal airport on the Samoa Peninsula, within the jurisdiction of the County’s HBAP.



## Specific Hydrological Unit Assets and Concerns

### All hydrological units

- **Navigable channels**

### Eureka Slough

- **Municipal water transmission line**

### Eureka Bay

- **Highway 101 (Caltrans state highway)**
- **Wharfinger Building and Eureka Public Marina**
- **Waterfront industrial areas**
- **Highway 101/Broadway Corridor**
  - The 101-Broadway corridor is a Caltrans state highway, and is the most highly traveled corridor in COE. The Humboldt County Association of Governments (HCAOG), COE, and California Department of Transportation are working together to develop a plan to address safety issues and multimodal transportation in this SLR vulnerable location. Potential plans to address these corridor issues have included a new section of roadway built near or through the area of the PALCO Marsh, but specific proposals have not been made. Portions of the new roadway section in the PALCO Marsh area would be within CCC jurisdiction for issuance of a coastal development permit and could potentially be inundated with 1 meter of SLR under current shoreline conditions. There is also a reportedly high number of homeless encampments near this area.
- **Samoa Field Airport**
  - Formerly known as Eureka Municipal Airport and covering over 300 acres, significant portions would be tidally inundated by 1.5 meters of SLR.
- **Industrial areas**
  - The Eureka Waterfront has a long history of industrial operations that includes lumber mills, bulk oil storage, bulk oil handling facilities, wrecking yards, and railroad yards. These operations have given rise to the presence of contaminants such as heavy metals, petroleum products, and pentachlorophenols in both the soil and ground water of the surrounding areas. As a result, COE is coordinating the cleanup and redevelopment of the Waterfront with several responsible parties including Union Pacific Railroad, Simpson Timber Company, Chevron, Unocal, and Tosco oil companies, and others. Most of this area is under CCC retained or appeal coastal development permit jurisdiction.
- **Downtown**
  - There is an identified need for affordable housing within the COE downtown region and Humboldt County in general, through possibly mixed-use development and new condominiums. The Downtown area is mostly outside the coastal zone.
  - According to the Eureka 2040 Issues and Objectives Report, there is a *“large and visible group of the homeless living in encampments in the vicinity of Downtown and the Broadway Corridor and/or spending daylight hours on the streets”*.
- **Old Town**



- Several portions within this area are at risk of increased inundation and many of the main roadway corridors within it need substantial improvements for safety. There is also a desire to underground utility lines to beautify the area, which would need consideration for potential inundation as well. Old Town is, for the most part, located within the coastal zone with the majority either in local CDP jurisdiction or CCC appeal jurisdiction.

**Elk River Slough**

- **Highway 101 (Caltrans state highway)**
- **Mad River Pipeline**
- **Greater Eureka Area Wastewater Treatment Plant**

*General Concerns*

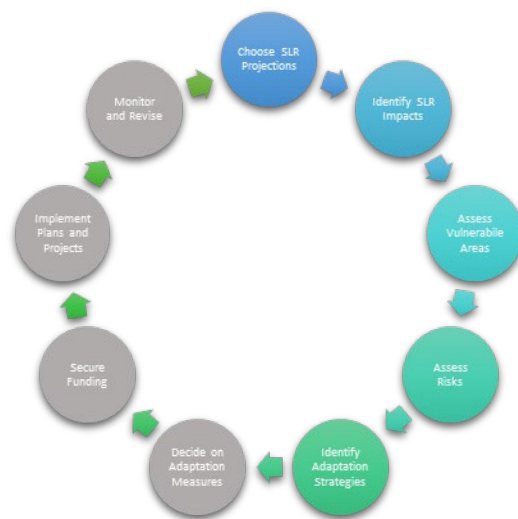
✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

*Planning Efforts*

Eureka has prepared a number of documents addressing sea level rise, available in the Project Document Library for the City’s 2040 General Plan Update. This work included a SLR Adaptation Planning Report (2016) and Addendum (2016), and a SLR Assets Vulnerability and Risk Assessment to evaluate high priority assets, timing of impacts, and community consequences.

COE staff are members of the technical advisory team for the Sea Level Rise Adaptation Plan for Humboldt Bay/Eureka Slough Area (2018-2021).

Eureka conducted a Vulnerability Assessment for WWTP facilities (2019) to identify climate change and SLR primary and secondary facility and operations impacts.



In 2021, Humboldt County Public Works completed a “Sea Level Rise Adaptation Plan for Transportation Infrastructure and Other Critical Resources in the Eureka Slough Hydrographic Area, Humboldt Bay” which includes a planning framework, vulnerability assessment, and adaptation project planning. The study focuses on the Eureka Slough HU which includes the northeast border of the City of Eureka. The three new project concepts identified include two projects involving the Jacobs Avenue area of Eureka as well as a living shoreline between the unincorporated Humboldt County communities of Bracut and Brainard.

The Jacobs Avenue analysis portion of the study is particularly useful to Eureka due to the vulnerable nature of the area to flooding hazards and other SLR impacts.

Eureka is working on its LCP update, anticipated to include SLR policies.

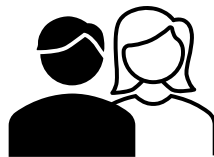
As a State Lands Commission Granted Lands Authority, the City of Eureka is required to prepare a SLR Impact Assessment pursuant to AB 691 and is compliant as of 2022. See the California State Lands Commission section for further information.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The City of Eureka interview contained 10 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

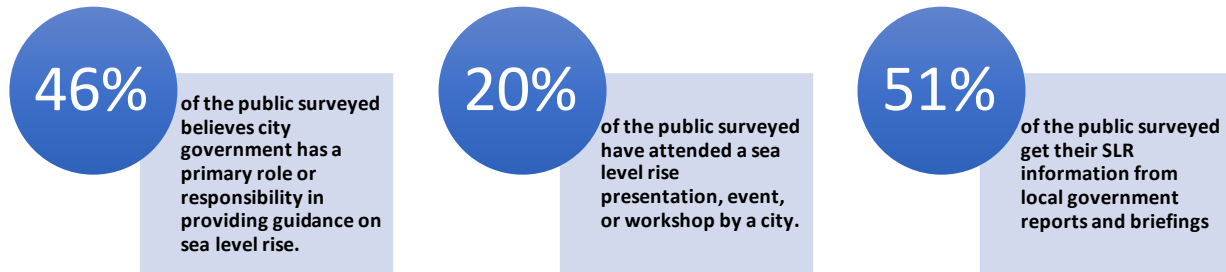
#### **Interview Themes Important to City of Eureka**

Regional Coordination in General  
 Permitting  
 Diked Former Tidelands  
 Shoreline  
 Personnel Constraints  
 Dedicated Time Constraints  
 Transportation Infrastructure  
 Wastewater Concerns  
 Dredged Material  
 Additional Governmental Guidance



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to identify one or more entities that had a primary role or responsibility in providing guidance on SLR and had the option of “City Government”, “County Government”, “State Government”, “Federal Government”, and “Other”. There were 266 respondents (46%) who identified City Government as having a primary role or responsibility. Participants were also asked to estimate how many sea level rise presentations, events, or workshops they had attended in the last five years. Out of 308 respondents who had attended events, 20% (n=64) had attended SLR outreach events hosted by a City Government. When asked where survey participants got their information about sea level rise, 51% (n=296) said local government reports and briefings.



Survey respondents were also asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning. Some of these assets are identified above in this catalogue section as City of Eureka assets that could be subject to sea level rise impacts, confirmed as such by City of Eureka representatives during the SLR Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. The top three assets for priority ratings at moderate priority and above were “Sewer/water collection and treatment facilities” (89%, n=549), “Local roads and highways” (88%, n=546), and “Domestic water and treatment and conveyance facilities” (87%, n=548). In contrast, “Coastal-Dependent Industrial Lands spaces” received far fewer ratings at moderate priority or higher (66%) and had less survey participation (n=534). Results for priority ratings are reported in the graph on the next page.

**89%** of the public survey respondents who provided a rating for **"Sewer/wastewater collection etc."** rated it a moderate priority or higher for flood protection and future SLR planning.

**88%** of the public survey respondents who provided a rating for **"Local Roads and highways"** rated them a moderate priority or higher for flood protection and future SLR planning.

**87%** of the public survey respondents who provided a rating for **"Domestic water treatment etc."** rated them a moderate priority or higher for flood protection and future SLR planning.

**66%** of the public survey respondents who provided a rating for **"Coastal-Dependent Industrial lands etc"** rated them a moderate priority or higher for flood protection and future SLR planning.

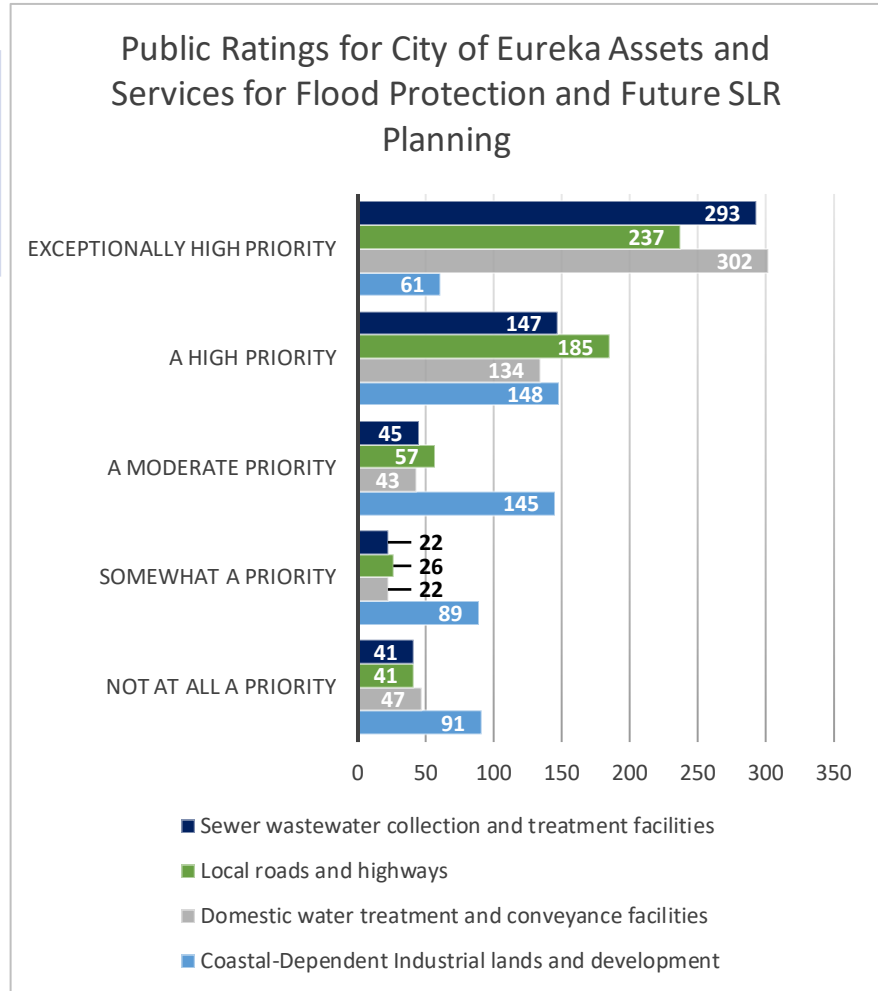
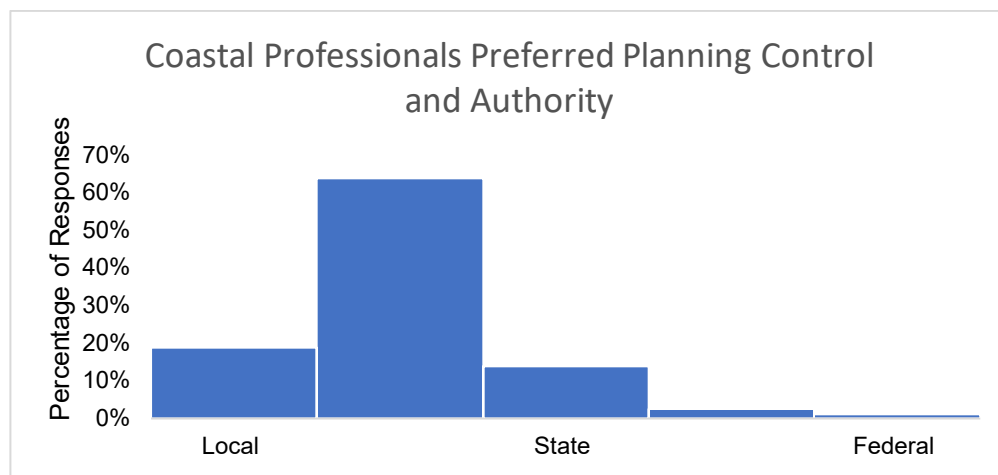


Figure 12. Priority Ratings for various assets that pertain to City of Eureka regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=534-548)

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, survey participants were given a sliding scale ranging from “Local” to “State” to “Federal” to show what level of government they thought should hold the majority of the planning control and authority for SLR. A total of 80 individuals provided responses, a majority (64%) of which preferred the planning authority to include a mix of local-and-state control as shown in the graph below.



*Figure 13. Survey respondents' preference for what level of government should hold the majority of the planning control and authority from the SLR Coastal Professionals Survey 2021 (n=80).*

For the City Government category of participants, there was a total of 12 respondents from both City of Arcata and City of Eureka though participation for individual questions varied. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the City Government they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for City Government ranged from “participate” to right below leading with a 50% split of effort preference as shown in the graph on the next page.

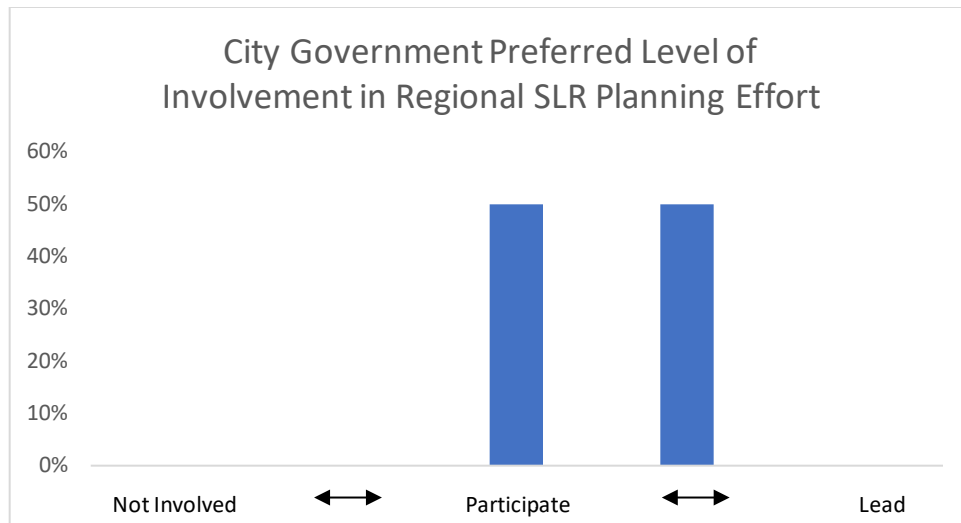


Figure 14. City Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=10).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from “project by project” basis to “Watershed/HU” and “Humboldt Bay”. The results for the City Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale, with a 60% preference for a Humboldt Bay approach as shown in the graph below.

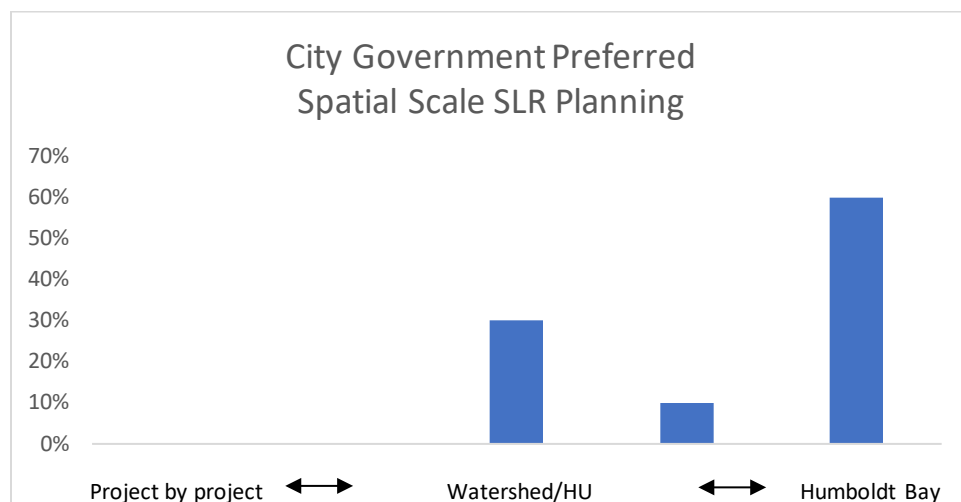


Figure 15. City Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=10)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for City Governments favored creating a formal collaborative partnership with 100% of respondents rating this option somewhat favorable or

higher. Similarly, 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

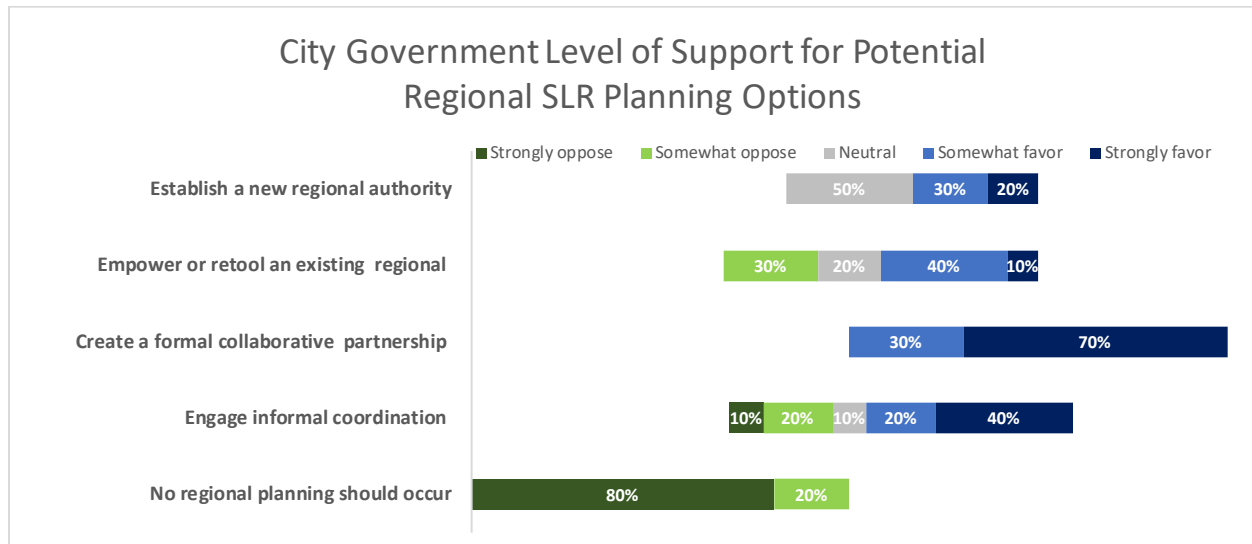


Figure 16. City Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 10)

### Reference Links

[http://www.eureka2040gpu.com/project\\_document\\_library.html](http://www.eureka2040gpu.com/project_document_library.html)

[http://www.eureka2040gpu.com/Links/pdfs/Final%20LCP%20Policy%20Paper\\_021715.pdf](http://www.eureka2040gpu.com/Links/pdfs/Final%20LCP%20Policy%20Paper_021715.pdf)

<http://www.eureka2040gpu.com/Links/pdfs/Issues%20and%20Objectives%20Report%20FINAL%201.9.15.pdf>

[http://www.eureka2040gpu.com/Links/pdfs/COE%20SLR%20Adaptation%20Plan\\_Final\\_161230.pdf](http://www.eureka2040gpu.com/Links/pdfs/COE%20SLR%20Adaptation%20Plan_Final_161230.pdf)

[http://www.eureka2040gpu.com/Links/pdfs/Eureka%20Adaptation%20Plan%20Addendum\\_Final\\_161230.pdf](http://www.eureka2040gpu.com/Links/pdfs/Eureka%20Adaptation%20Plan%20Addendum_Final_161230.pdf)

<https://www.humboldtkeeper.org/humboldt-bay-information/bay-issues/49-toxics>

<https://humboldt.gov/DocumentCenter/View/94677/Eureka-Slough-SLR-Adaptation-Plan---Executive-Summary>



## Humboldt County

### *Roles & Responsibilities*



Humboldt County is the agency undertaking the feasibility study on regional coordination for sea level rise adaptation on Humboldt Bay. There are several Humboldt County departments that are currently or likely to be involved with SLR planning and adaptation: Planning and Building, Public Works, Health and Human Services, Airports, and Sheriff's Office.

#### Planning and Building Department

The Humboldt County Planning and Building Department is responsible for building permit review and inspections consistent with California model codes as well as planning and development review and approval consistent with the county's General Plan and Zoning Code, and consistent with the County's certified Local Coastal Program (LCP) within the coastal zone. The county's Long Range Planning Division is in the process of updating the Humboldt Bay Area Plan (HBAP), one of six coastal area plans that comprise the Land Use Plan (LUP) portion of the County's LCP. A significant component of the HBAP update will be the addition of policies to address sea level rise in the Humboldt Bay region. The County does not have land use or coastal development permit jurisdiction over the unincorporated waters and tidelands of Humboldt Bay. These sovereign lands were granted in trust by the California Legislature to the Humboldt Bay Harbor District.

In addition to the HBAP update, the County Board of Supervisors formed a temporary ad hoc sub-committee of two board members to strategize for impending sea level rise in October 2019.

#### Public Works Department

The County owns and operates a wide variety of property, public buildings, and public structures that could be impacted by SLR. The Public Works Department is responsible for managing and maintaining County roads and bridges, County properties, and County infrastructure, including the maintenance of three County levee systems, seventeen County Park units, the County Trail systems and community forests, and the administration of solid waste franchises and facilities. Emergency response plans by the Sheriff's Office is reliant on Public Works facilities. It is additionally in charge of the preparation of plans and specifications, inspection of construction projects, preparation of environmental documents, and procurement of regulatory permits.

**Road Maintenance Division-** The Road Maintenance Division of the Public Works Department is responsible for maintaining roads and bridges. This includes appurtenant facilities such as storm drains, culverts and tide gates.

**Environmental Services Division -** The Environmental Services division of the Public Works Department is responsible for environmental permitting and compliance, resource management, natural hazard planning and mitigation, and recreation facilities. These responsibilities include serving as the regional grant administrator for the seven-county North Coast Resource Partnership and coordinator of the Humboldt County Fire Safe Council. Program areas include:

- Natural Resources – Responsibilities include environmental review and permitting for Public Works projects and operations to support environmental stewardship and appropriate resource management, and environmental regulatory compliance for county infrastructure and natural areas.
- Natural Resources Planning – Responsibilities include development and administration of programs for water resources, environmental restoration, habitat conservation, multi-hazard mitigation, and climate change adaptation projects.
- Parks & Trails – Responsibilities include operation and maintenance of recreational facilities and management of land for public safety, and for resource protection and conservation. The parks and trails system features 17 park units (nearly 950 acres) and the five-mile-long Hammond Trail in McKinleyville; county parks include ten beach parks, five parks with river access, five boat ramps, and five campgrounds.
- Water Management – Responsibilities include managing three levee systems including Mad River, assisting with technical studies, and planning related to flood management and sea level rise adaptation, among other water resource responsibilities.

#### Department of Health & Human Services

Environmental Health Division – This division is critical to the prevention of diseases within the local community by addressing challenges stemming from safe drinking water, pollution, proper sewage disposal, foodborne illness outbreaks, childhood lead poisoning, hazardous material spills, and solid waste management. SLR affects this division’s ability to regulate onsite water and wastewater systems.

Emergency Preparedness & Response Program – This program provides the tools and the staff to plan for emergency response to public health critical events, purchase the equipment necessary for these plans, and provide training valuable to the implementation of emergency plans.

#### Airports Department

Humboldt County owns and operates six public-use airports: California Redwood Coast-Humboldt County Airport (ACV), a FAR 139 certificated air carrier facility; and the general aviation facilities including Dinsmore (D63), Garberville (O16), Kneeland (O19), Murray Field (EKA) and Rohnerville (FOT) Airports. The only airport listed that is within the Humboldt Bay Area is Murray Field. This division ensures aeronautical safety, the safety of the traveling public, continued air service, and compliance with aviation rules, regulations, and advisories at a federal, state and/or local level.

#### Sheriff’s Office

Office of Emergency Services – The Humboldt County Sheriff’s Office of Emergency Services (OES) is the primary coordination agency for emergencies and disasters involving Humboldt County residents, public infrastructure, and government operations. They coordinate and participate in emergency planning, response, and recovery under the direction of the Sheriff and in collaboration with local, state, and federal partners. The Sheriff’s Office rely on Public Works facilities for emergency response.

## Specific Hydrological Unit Assets and Concerns

### All hydrological units

- **Roads**
  - Private levees with tide gates that protect county roads

### Eureka Slough

- **Murray Field (EKA)**
  - One critical facility that the County operates that is highly susceptible to SLR is Murray Field, a county-owned regional general aviation airport located on filled land immediately east of Humboldt Bay in the City of Eureka. As a public general aviation facility, Murray Field provides a base of operation for local pilots and serves as a point of air access to Humboldt County communities. It was once used by FedEx Express for package delivery, but operations have moved to ACV. In addition, it plays a critical role for nearby communities by providing emergency services in the event of an emergency or natural disaster.
  - This airfield is built on reclaimed filled land. The California Coastal Commission has coastal development permit jurisdiction over its 131 acres. The entire airfield would be tidally inundated by 1.0 meter of SLR under current shoreline conditions.
- **Jacobs Garage**
  - This facility provides maintenance for the County's motor pool fleet and heavy equipment fleet.
- **Humboldt Bay Trail**

### Eureka Bay

- **(Future) Samoa Wastewater Treatment System**
  - The communities of Fairhaven and Finntown currently do not have a wastewater treatment system and rely on individual septic systems for wastewater treatment and disposal, resulting in ongoing impacts to water quality. The process of implementing a wastewater treatment system to serve these communities is complicated by its location within the coastal zone, and in areas subject to tsunami and sea level rise impacts. Humboldt County is currently working in collaboration with PCSD to get CCC approval for the project, and the infrastructure funding effort has been initiated.
- **Samoa Campground**
- **Beach access points maintained by Public Works**
  - Fairhaven "T"
  - Samoa Power Pole Access Points
- **Fairhaven and Finntown**
  - Public Works maintains community streets and drainage infrastructure. New Navy Base Road is the only means of vehicular access to these communities.
- **Old Arcata Road at Jacoby Creek**
  - Road is subject to inundation during storm events coinciding with king tides



- **Humboldt Bay Trail**

### Elk River Slough

- **City of Eureka Wastewater Treatment Plant (WWTP) facility**
  - HCSD owns capacity rights in this facility which services much of the County, but the County has no ownership in or jurisdiction over this facility.

### South Bay

- **King Salmon**
  - Public Works maintains King Salmon Avenue and its bridge, the only means of vehicular access to King Salmon, and community streets as well as several stormwater control structures. Roads are subject to inundation during king tides. This is further exacerbated during storm events.
- **Fields Landing**
  - Public Works maintains community streets and stormwater runoff control structures in Fields Landing. Roads are subject to inundation during king tides. This is further exacerbated during storm events.
- **Berta Road**
  - Portions of this road border the Elk River. During storm events, this road currently floods. Sea level rise will extend the period of inundation as it will take longer for the river to drain into the bay.

### *General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

## Planning Efforts

### Planning Department

The HBAP update will further existing coordinated sea level rise planning efforts throughout the Humboldt Bay region. The update will provide policies for SLR adaptation for priority land uses, will include tsunami safety planning, and will also address a variety of coastal issues that have arisen in the roughly forty years since HBAP was originally certified in 1982. Policies for SLR adaptation will address a variety of SLR impacts, including those to:

- Coastal-dependent uses (Industry, recreation, etc.)
- Critical public facilities (Roads, wastewater treatment plants, shoreline protection, etc.)
- Communities (Particularly vulnerable and economically disadvantaged areas within the County including King Salmon, Fields Landing, and Fairhaven/Finntown)
- Agricultural land
- Environmentally sensitive habitat areas (ESHA)



The Humboldt Bay SLR Regional Planning Feasibility Study funded by the Coastal Commission LCP Planning Grant is a feasibility study to develop options for implementing a Humboldt Bay regional sea level rise adaptation planning effort to facilitate regional coordination and cooperation in developing and implementing sea level rise adaptation policies and strategies.

### Public Works

The Environmental Services Division of Public Works has led multiple SLR projects including:

- The Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015 and included partnerships with 22 entities. Humboldt County co-led this project with the Humboldt Bay Harbor Recreation and Conservation District.
- Sea Level Rise Adaptation Plan for Humboldt Bay/Eureka Slough Area (2018-2021) was funded by Caltrans Adaptation Planning Grant program and included input from the following stakeholders: City of Eureka, HCAOG, Caltrans, North Coast Railroad Authority, California Department of Fish & Wildlife, the Humboldt Bay Harbor, Recreation and Conservation District, Humboldt County Farm Bureau and Pacific Gas & Electric Company. A Cultural Landscape Investigation (June 2020 by Jerry Rohde) was conducted to inform this project.
- Natural Shoreline Infrastructure in Humboldt Bay for Intertidal Coastal Marsh Restoration and Transportation Corridor Protection (2020-2021) was funded by NFWF and OPC to perform site characterization and prepare preliminary design (50%) for a project utilizing natural shoreline infrastructure techniques to help protect a portion of the Eureka-Arcata transportation corridor along Humboldt Bay from flood hazards.

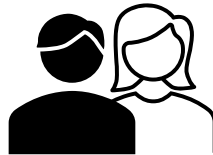
- Humboldt Bay Trail South Project – Although not a SLR project, the Project Description Report and 60% design plans completed in September 2020 discusses how the project proposes to integrate with the railroad and Highway 101 transportation corridor and how the project proposes to address flooding hazards and sea level rise along the Humboldt Bay shoreline. The project would expand the Humboldt Bay Trail by 4.25 miles and complete the trail connection between Eureka and Arcata.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The County of Humboldt interview contained 9 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

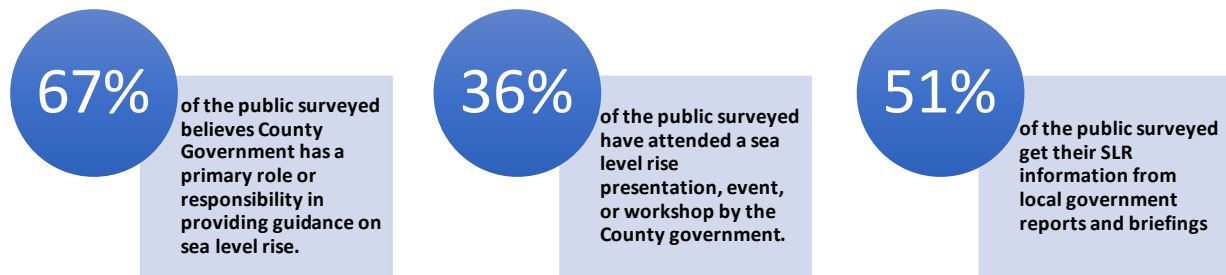
#### **Interview Themes Important to County of Humboldt**

Regional Coordination in General  
 Permitting  
 Diked Former Tidelands  
 Shoreline  
 Personnel Constraints  
 Dedicated Time Constraints  
 Transportation Infrastructure  
 Wastewater Concerns  
 Dredged Material



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to identify one or more entities that had a primary role or responsibility in providing guidance on SLR and had the option of “City Government”, “County Government”, “State Government”, “Federal Government”, and “Other”. There were 387 respondents (67%) who identified the County Government as having a primary role or responsibility. Participants were also asked to estimate how many sea level rise presentations, events, or workshops they had attended in the last five years. Out of 308 respondents who had attended events, 36% (n=112) had attended SLR outreach events hosted by a County Government. When asked where survey participants got their information about sea level rise, 51% (n=296) said local government reports and briefings.



Survey respondents were also asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning. Some of these assets are identified above in this catalogue section as Humboldt County assets that could be subject to sea level rise impacts, confirmed as such by County representatives during the SLR Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. The top three assets for priority ratings at moderate priority and above were “Sewer/water collection and treatment facilities” (89%, n=548), “Local roads and highways” (88%, n=546), and “Government Facilities” (70%, n=543). In contrast, “Parks and similar public spaces” received much less ratings at moderate priority or higher (68%) and had less survey participation (n=539). Results for priority ratings are reported in the graph on the next page.

**89%** of the public survey respondents who provided a rating for **"Sewer/water collection and treatment facilities"** rated them a moderate priority or higher.

**88%** of the public survey respondents who provided a rating for **"Local roads and highways"** rated them a moderate priority or higher.

**76%** of the public survey respondents who provided a rating for **"Government facilities"** rated them a moderate priority or higher.

**60%** of the public survey respondents who provided a rating for **"Parks and similar public spaces"** rated them a moderate priority or higher.

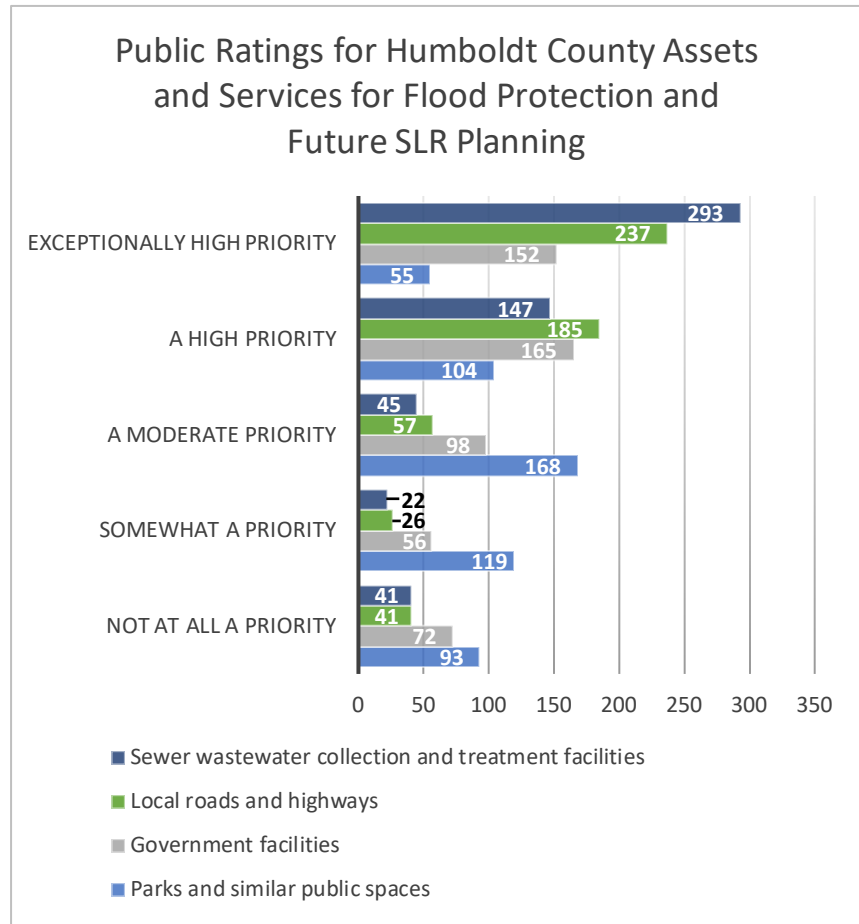


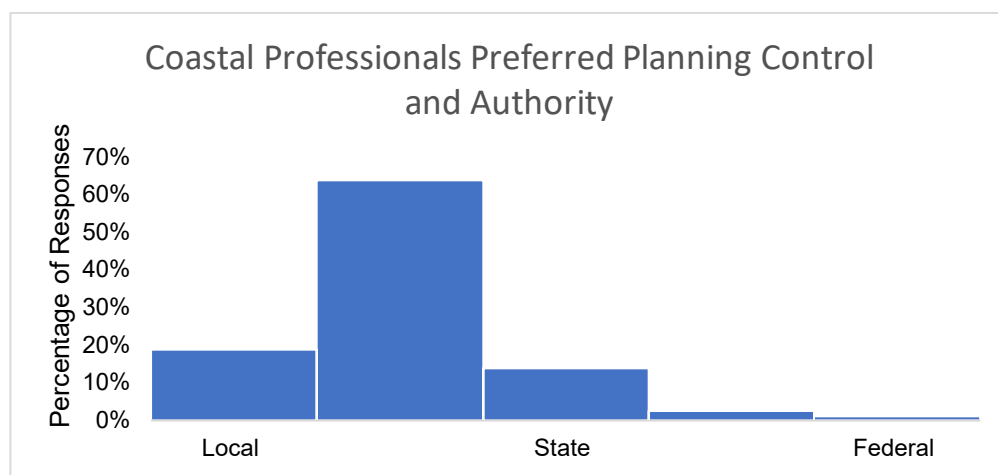
Figure 17. Priority Ratings for various assets that pertain to Humboldt County regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n = 539-548)



### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, survey participants were given a sliding scale ranging from “Local” to “State” to “Federal” to show what level of government they thought should hold the majority of the planning control and authority for SLR. A total of 80 individuals provided responses, a majority of which preferred the planning authority to include a mix of local-and-state control at 64% as shown in the graph below.



*Figure 18. Survey respondents' preference for what level of government should hold the majority of the planning control and authority from the SLR Coastal Professionals Survey 2021 (n=80).*

For the County Government category of participants, there was a total of 5 respondents. These Coastal Professionals were asked a variety of questions including the preferred level of involvement in SLR planning for the County Government. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the County Government ranged from “participate” to “lead” with a 60% preference for a mix of participation and leading as shown in the graph on the next page.

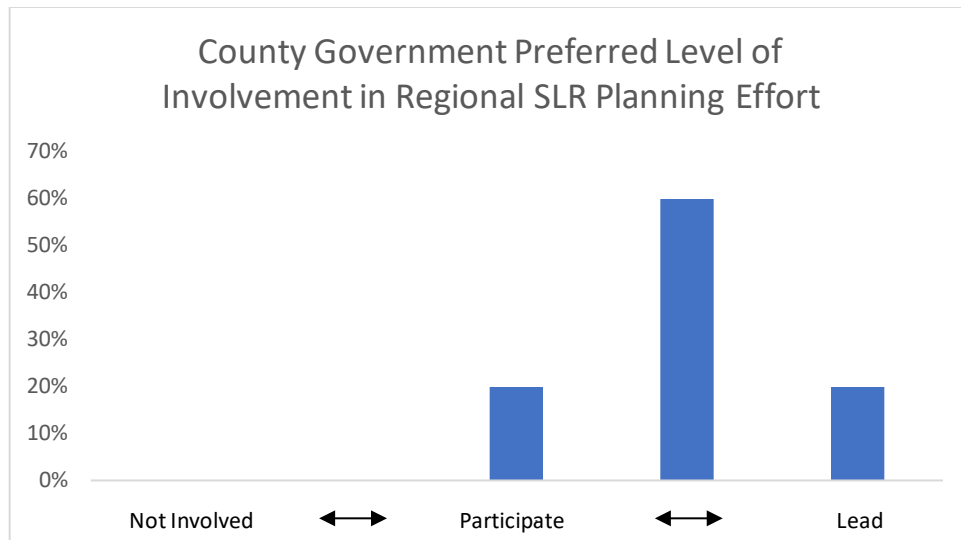


Figure 19. County Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=5).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the County Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale, with an 80% preference for a Humboldt Bay approach as shown in the graph below.

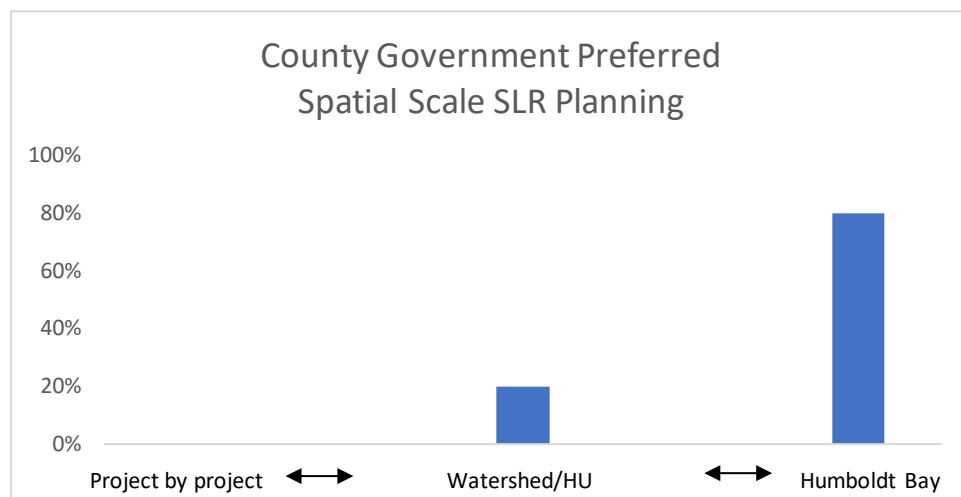


Figure 20. County Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=5)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the County Government favored creating a formal collaborative partnership with 100% of respondents rating this option somewhat

favorable or higher. Similarly, 80% of respondents answered they strongly opposed having no regional planning as shown in the graph below.

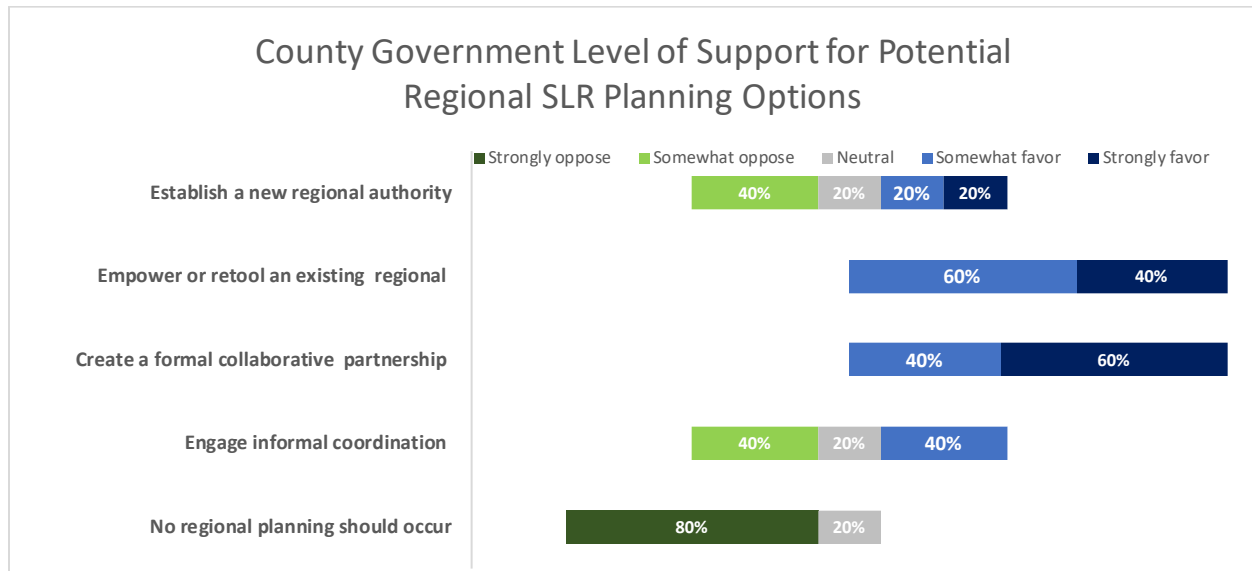


Figure 21. County Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 5)

### Reference Links

<https://humboldt.gov/2487/Sea-Level-Rise>

<https://humboldt.gov/1678/Local-Coastal-Plan-Update>

<https://www.slc.ca.gov/granted-public-trust-lands/grantees/humboldt-bay-harbor-recreation-and-conservation-district/>

<https://humboldt.gov/330/Public-Health>

<https://humboldt.gov/1400/Environmental-Services>

<https://humboldt.gov/562/Emergency-Preparedness-Response>

<https://humboldt.gov/1396/Airports>

<https://humboldt.gov/356/Office-of-Emergency-Services>

## Resource Management/Protection/Regulator

### Humboldt Bay Harbor, Recreation, & Conservation District

#### *Roles & Responsibilities*



The Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District) is a special district of the State of California created in 1973 that manages the tidelands, bays and estuaries of Humboldt County. The Harbor District oversees planned development of the harbors and ports within the District including Humboldt Bay, as well as protection of natural resources within its jurisdiction.

The District is a countywide agency with development permit jurisdiction over all tide, submerged and other lands granted to the District, including all of Humboldt Bay. The Harbor District does not have a port master plan certified by the Coastal Commission pursuant to the Coastal Act for the Port of Humboldt Bay, and thus does not have coastal development permitting authority within Humboldt Bay, nor does the District have coastal development permit authority anywhere within their jurisdiction or for lands the District owns. That authority remains either with the Coastal Commission or with the appropriate LCP jurisdiction. The Harbor District is within the land use jurisdiction of Humboldt County.

Harbor District operations focus on three primary areas: commercial use, recreational use, and conservation. The Harbor District oversees and promotes many port development projects and programs including dredging; retention and improvement of commercial fishing facilities; improvement of transportation and maritime facilities; pilotage licensing; oil spill co-op coordination; erosion control; shoreline protection projects; port marketing; mariculture; aquaculture; and permitting for development.

As a State Lands Commission Granted Lands Authority, the Harbor District is required to prepare a SLR Impact Assessment pursuant to AB 691 and have not yet completed an Impact Assessment as of 2022. See the California State Lands Commission section for further information.

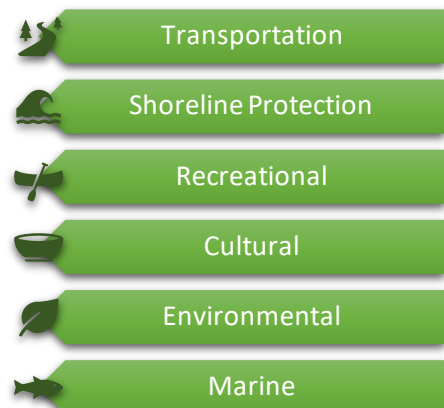
#### *Specific Hydrological Unit Assets and Concerns*

##### Arcata Bay

- Owns Coastal-Dependent Industrial waterfront property.

##### Eureka Slough

- Owns Coastal-Dependent Industrial waterfront property.



**Eureka Bay**

- **Owns Coastal-Dependent Industrial waterfront property.**
- **Humboldt Bay entrance, jetties, and navigation channels**
  - Impacts from SLR on these assets are unknown but are likely related to sediment transport, channel scour or aggradation, dune/spit formation and maintenance. Access to the jetties and South and North Spits may be affected by tidal inundation and shoreline erosion.
- **Woodley Island Marina**
- **Harbor District Redwood Marine Terminal 1 and 2 and associated docks**
- **Ocean outfall pipe**
- **Leased fiber optic cable**
  - The District has a lease agreement with RTI Infrastructure for the landing of up to four underground trans-Pacific fiber optic cables that run from Singapore to the Evergreen pulp mill site at the District's Redwood Terminal 2 property. RTI has indicated they would land three cables in 2021.

**Elk River Slough**

- **Owns Coastal-Dependent Industrial waterfront property.**

**South Bay**

- **Owns Coastal-Dependent Industrial waterfront property.**
- **Maintains and owns property and facilities in two disadvantages and vulnerable communities.**
  - King Salmon
    - The Harbor District owns and maintains the riprap on the south facing shoreline, two rock jetties, and a beach/dune ecosystem with associated recreational area.
  - Fields Landing
    - The Harbor District owns and maintains the **Fields Landing boat yard** along with dry dock facilities used for commercial and recreational boat repairs.

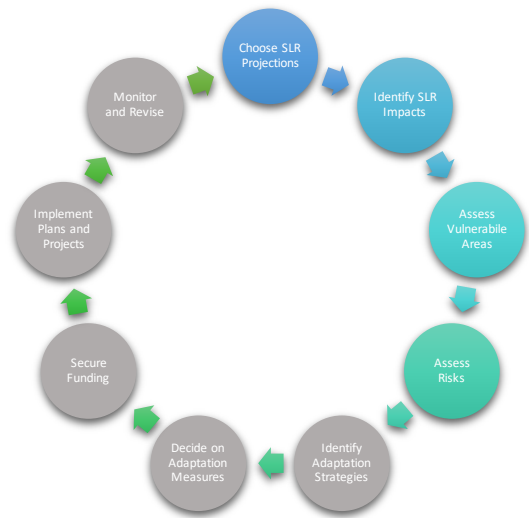
***General Concerns***

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
✓	Funding		Saltwater Intrusion

### Planning Efforts

The Harbor District has been involved with sea level rise planning on Humboldt Bay, including the Humboldt Bay Sea Level Rise Adaptation Planning Project. The District is working on a Program Environmental Impact Report for Humboldt Bay Sediment Management to evaluate alternatives and provide an analysis of dredging methods, sediment processing, and sediment placement at beneficial-use sites, such as for use in SLR adaptation projects.

The District was a co-lead for the APWG for the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

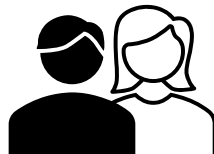


### Key Stakeholder Coordination Themes

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The Harbor District interview contained 7 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

**Interview Themes Important to the Harbor District**

- Shared Funding Coordination
- Regional Coordination in General
- Increased Landowner Participation
- Permitting
- Personnel Constraints
- Dredged Material
- Regional Prioritization of Projects



### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One of these assets, “Coastal-Dependent Industrial Lands and Development”, was identified above in this catalogue section as a Harbor District asset that could be subject to sea level rise impacts, confirmed as such by the Harbor District representatives during the Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Although

there was a total of 577 participants for the survey, 534 provided ratings for “Coastal-Dependent Industrial Lands and Development” and 66% of those respondents rated this asset as a moderate to exceptionally high priority. Results are shown in the graph below.

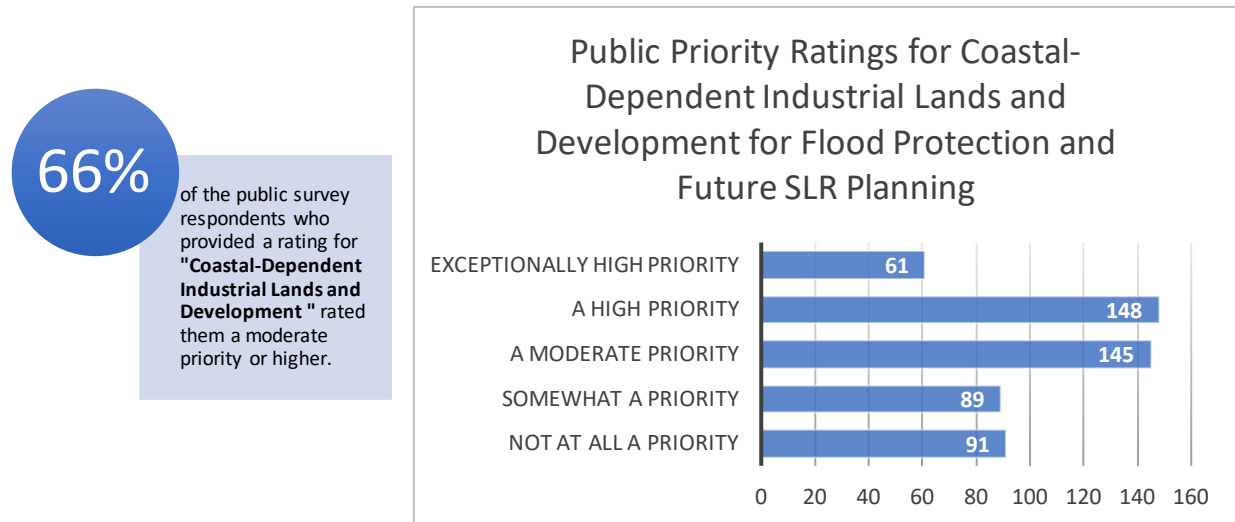


Figure 22. Priority Ratings for Coastal-Dependent Industrial Lands and Development regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n = 534)

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents that were representatives from the Regional District or Association or Special District category though participation for individual questions varied. Participants included the Harbor District, Humboldt County Association of Governments, and Redwood Coast Energy Authority. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category ranged from just above “not involved” to “lead” with a 45% preference for a mix of participation and leading as shown in the graph on the next page.

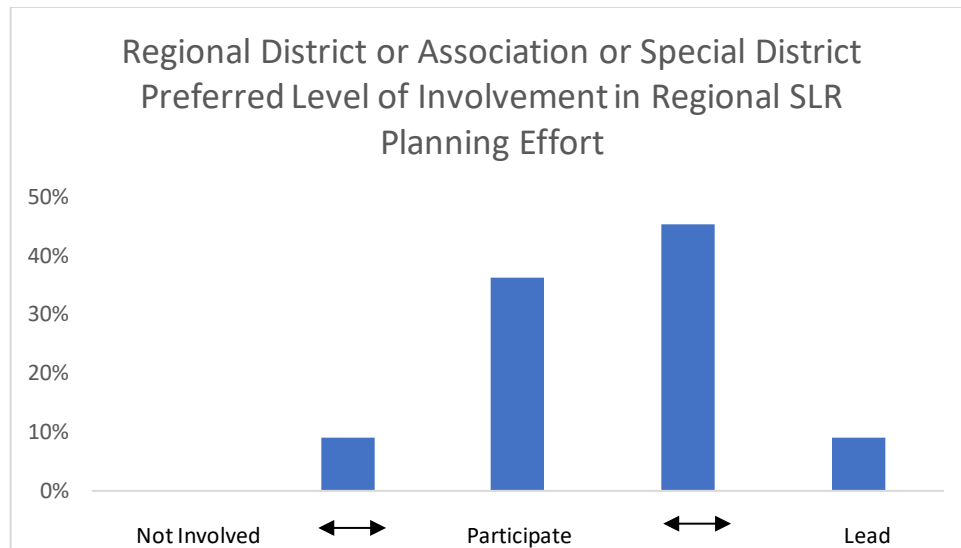


Figure 23. Regional District or Association or Special District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Regional District or Association or Special District category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 64% preference for a Humboldt Bay approach as shown in the graph below.

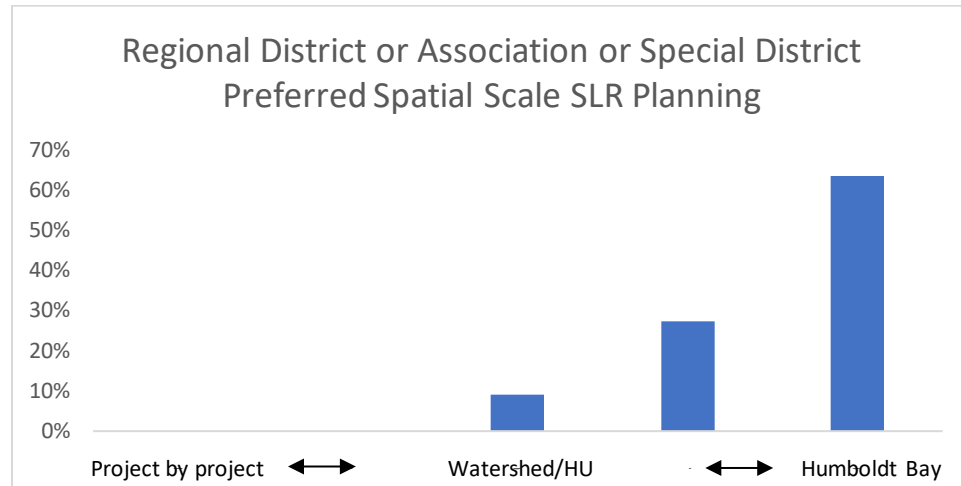


Figure 24. Regional District or Association or Special District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Regional District or Association or Special District category favored creating a formal collaborative partnership with 75% of respondents



rating this option somewhat favorable or higher. Similarly, 83% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

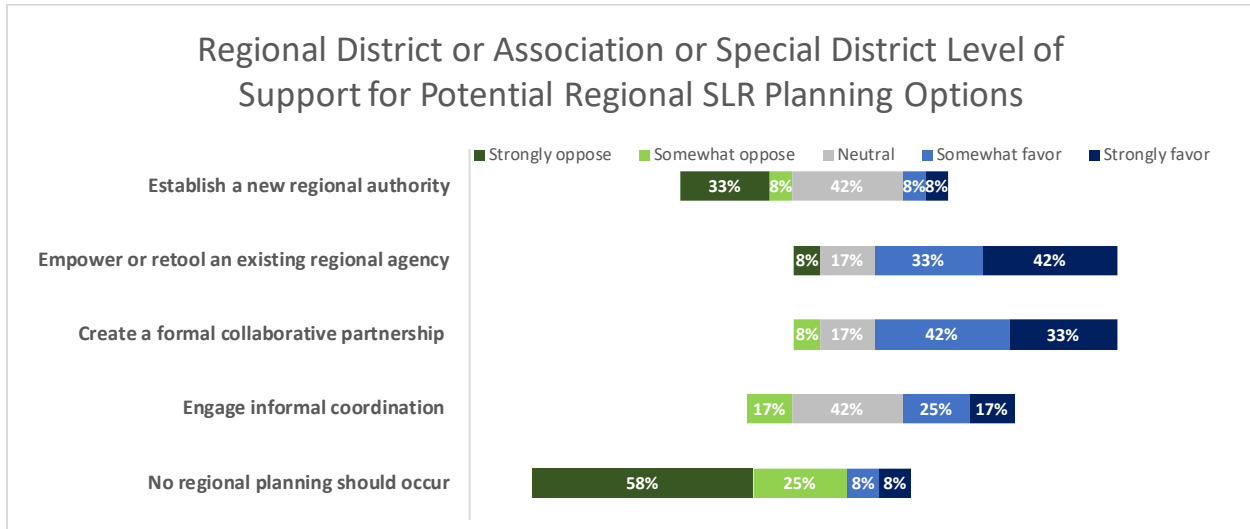


Figure 25. Regional District or Association or Special District respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 12)

*Reference Links*

<http://humboldtbay.org/>

<http://humboldtbay.org/humboldt-bay-sea-level-rise-adaptation-planning-project>

<http://humboldtbay.org/sites/humboldtbay2.org/files/HB%20Sediment%20Management%20PEIR%20-%20DEIR.pdf>

## Humboldt County Association of Governments

*Roles & Responsibilities*



The Humboldt County Association of Governments (HCAOG) is a Joint Powers Agency composed of the seven incorporated cities (Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell, Trinidad), and the County of Humboldt. They are the designated Regional

Transportation Planning Agency (RTPA) as well as the Service Authority for Freeway Emergencies (SAFE). This means they are largely responsible for programming state highway, local street and road improvements, public transportation resources, and the preparation/implementation of the Regional Transportation Plan (RTP).

HCAOG has a Board of Directors composed of mayors from the seven city members and the Chairman of the County Board of Supervisors, or their designees. The Board is the final authority for all decisions generated in the region's transportation planning and programming arena.

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- **Transportation infrastructure**



#### **Arcata Bay**

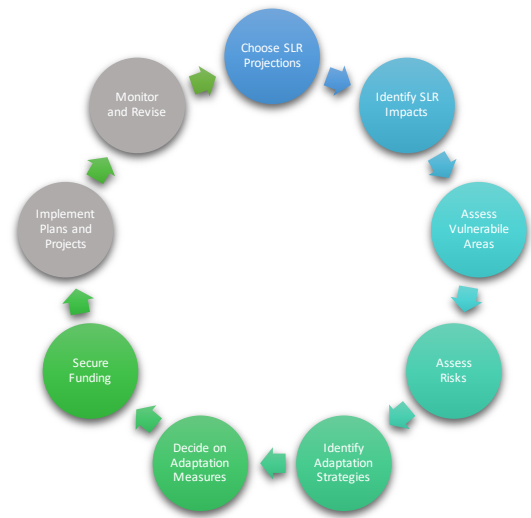
- **Eureka to Arcata US 101 Corridor**
  - Caltrans, in cooperation with the Humboldt County Association of Governments (HCAOG) and the Federal Highway Administration (FHWA), proposes to make improvements to this corridor. The corridor improvement project will also assess and respond to sea level rise by incremental raising of structures (such as medians, curbs and ramps) and Caltrans will remain flexible about future on-alignment adaptation projects. The current proposal will:
    - Improve safety and reduce delays at intersections.
    - Reduce operational conflicts.
    - Resurface, restore, and rehabilitate the existing Route 101.
    - Extend or construct right-turn acceleration and deceleration lanes.

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

### Planning Efforts

One project involving HCAOG that addresses SLR is the Broadway Multimodal Corridor Plan. This plan is the product of a partnership between HCAOG, the City of Eureka, and Caltrans District 1. The purpose of developing this plan was to accommodate all modes of transportation and in doing so “*improve safety, non-motorized transportation, transit, congestion, long-term sustainability and economic vitality along the Broadway Highway 101 Corridor*”. The ultimate objective of the plan was to develop a Preferred Concept that would comprehensively address the corridor’s long-standing issues of high collision rates, incidences of pedestrian injury or fatality, and congestion through multimodal improvements.



A Preferred Concept was created which, among other things, plans for sea level rise. The Preferred Concept “*proposes new parallel and connecting transportation facilities that have the potential to enhance corridor safety, enhance multimodal connectivity, reduce corridor congestion, improve corridor reliability, plan for sea level rise, and expand access to coastal visitor destinations, essential local services, and regional commerce.*”

The Preferred Concept would split northbound and southbound travel along two segments of the Broadway Corridor creating two “*one-way couplets*”. Travel northbound would maintain its existing alignment, and southbound travel “*would shift to an improved one-way Koster Street and a new one-way facility north of Vigo Street to Bayshore Mall. South Broadway would be improved with bike lanes and pedestrian safety improvements within the existing right of way*”. According to the Final Draft of the Eureka Broadway Multimodal Corridor Plan released in February 2021, “*The Preferred Concept has the potential to support the City’s overall climate adaptation strategy, including vulnerability of utility corridors, and mitigating shoreline vulnerabilities. Specifically, the southbound couplets could provide a linear corridor that could protect the commercial and residential properties landward that are currently vulnerable to mid- to late-century sea level rise projections. State guidance for sea level rise planning and adaptation would be applied in the project design and would consider a range of sea level rise projections relative to serviceability needs through mid to late century and its adaptive capacity beyond late century.*”

### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, two of which are identified above in this catalogue section as assets to HCAOG but was not confirmed as such by interview: “Highway 101” and “local roads and highways”. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Both assets received high overall priority ratings with over 80% of respondents rating these assets as a moderate priority to exceptionally high priority with “Highway

101" getting 89% (n=553) and "Local roads and highways" getting 88% (n=546). Results are shown in a graph below.

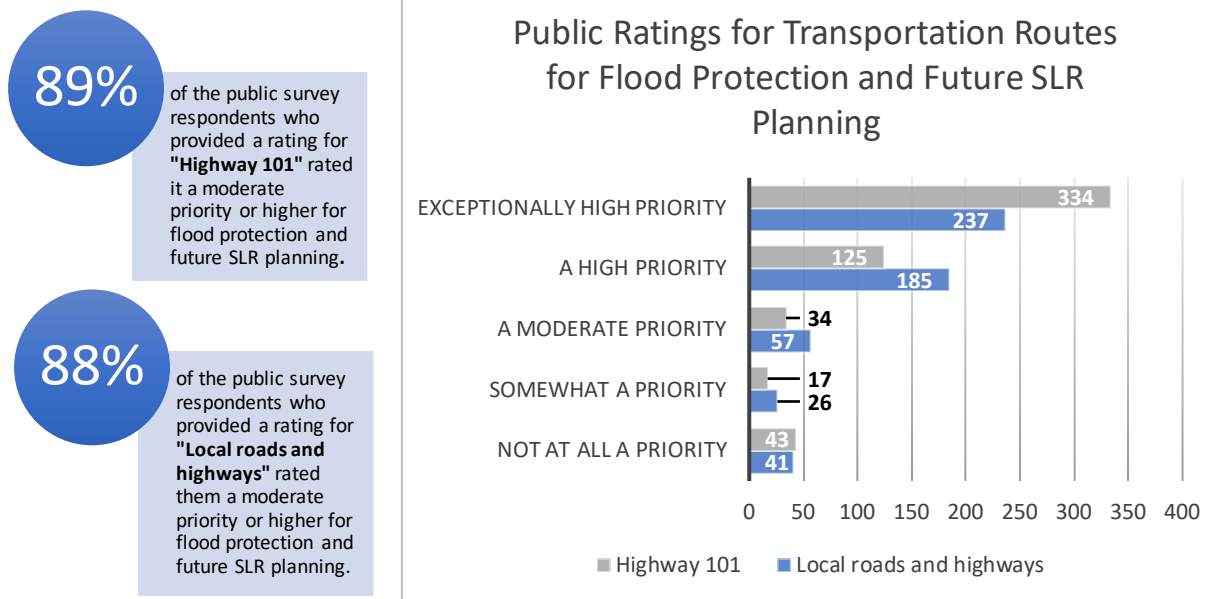


Figure 26. Priority Ratings for Highway 101 (n=553 in grey) and Local roads and highways (n=546 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, survey participants were given a sliding scale ranging from "Local" to "State" to "Federal" to show what level of government they thought should hold the majority of the planning control and authority for SLR. A total of 80 individuals provided responses, a majority of which preferred the planning authority to include a mix of local-and-state control at 64% as shown in the graph on the next page.

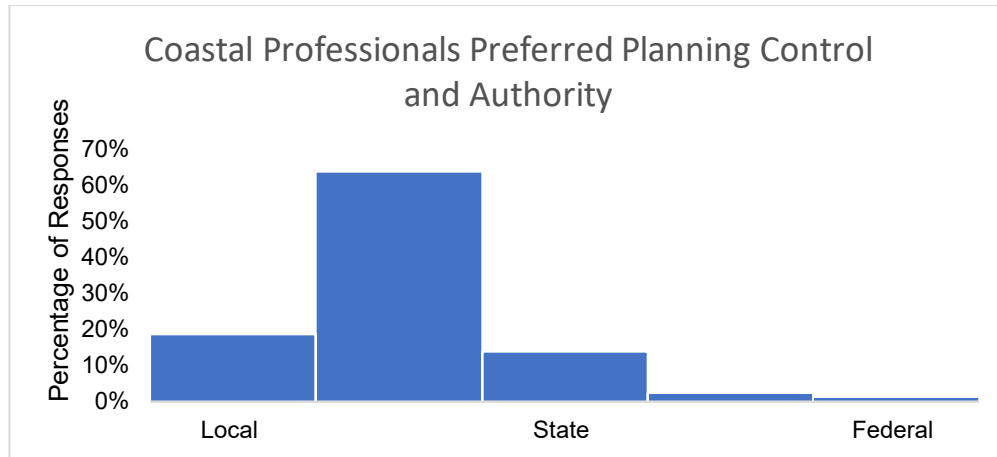


Figure 27. Survey respondents' preference for what level of government should hold the majority of the planning control and authority from the SLR Coastal Professionals Survey 2021 (n=80)

For the Regional District or Association or Special District category of participants, there was a total of 12 respondents that were representatives from the Harbor District, Humboldt County Association of Governments, and Redwood Coast Energy Authority, though participation for individual questions varied. These Coastal Professionals were asked a variety of questions, including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category ranged from just above “not involved” to “lead” with a 45% preference for a mix of participation and leading as shown in the graph below.

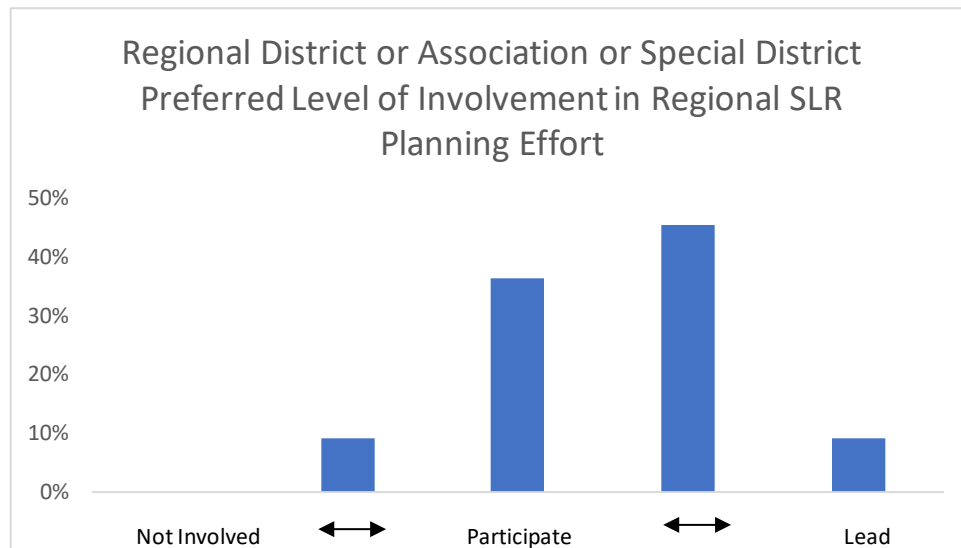


Figure 28. Regional District or Association or Special District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Regional District or

Association or Special District category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 64% preference for a Humboldt Bay approach as shown in the graph below.

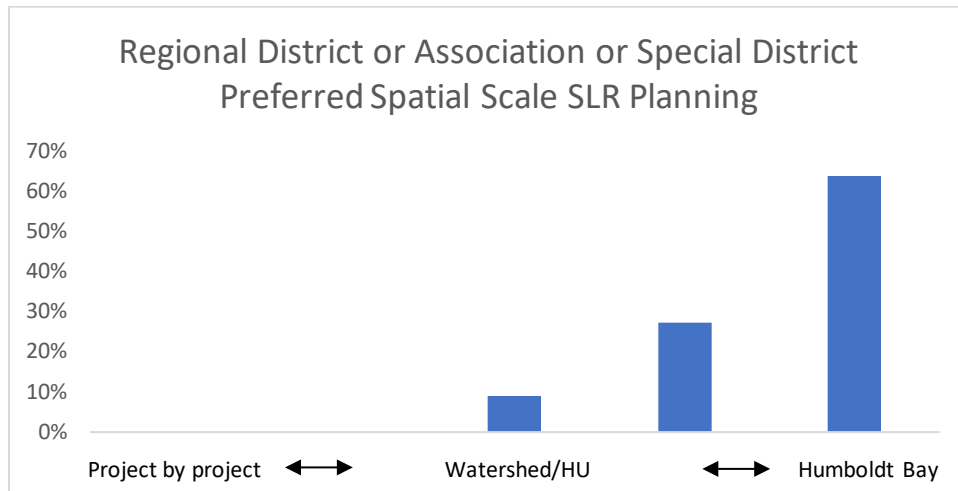


Figure 29. Regional District or Association or Special District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Regional District or Association or Special District category favored creating a formal collaborative partnership with 75% of respondents rating this option somewhat favorable or higher. Similarly, 83% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

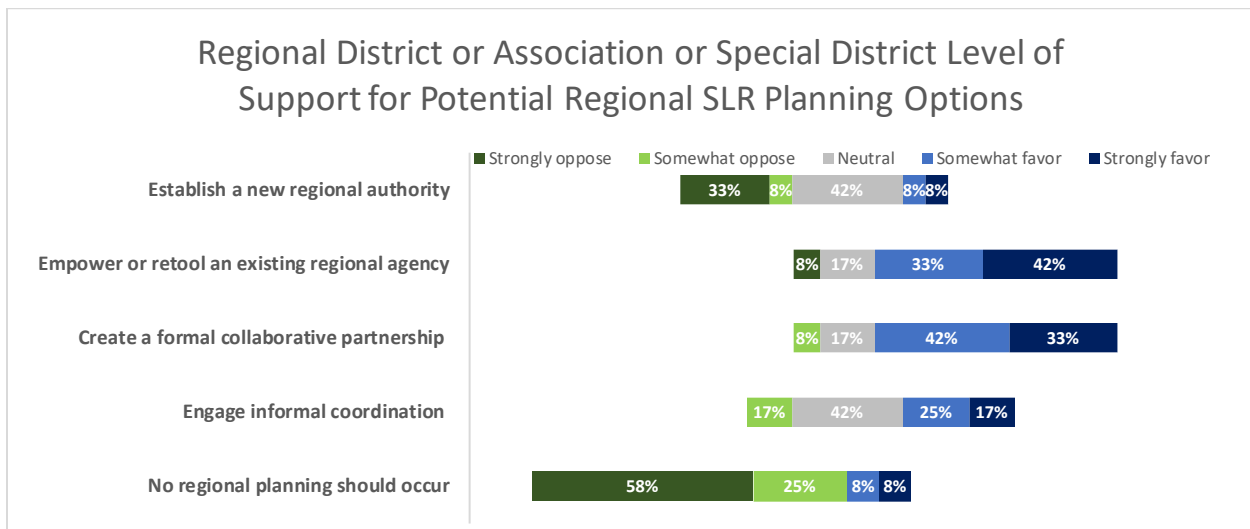


Figure 30. Regional District or Association or Special District respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 12)

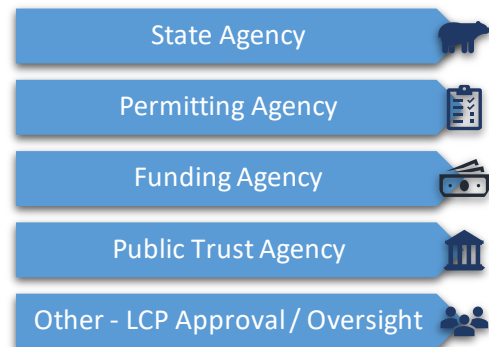
*Reference Links*  
<https://www.hcaog.net>

<https://www.hcaog.net/documents/eureka-broadway-multimodal-corridor-plan>

[https://www.hcaog.net/sites/default/files/eureka\\_broadway\\_multimodal\\_corridor\\_final\\_report.pdf](https://www.hcaog.net/sites/default/files/eureka_broadway_multimodal_corridor_final_report.pdf)

## California Coastal Commission

### *Roles & Responsibilities*



The California Coastal Commission (Commission or CCC) is an independent quasi-judicial state agency established by voter initiative in 1972 (Proposition 20) and later made permanent by the Legislature through adoption of the California Coastal Act of 1976. In partnership with coastal cities and counties, the Coastal Commission plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings,

divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or a local government.

The Coastal Act includes specific policies that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works. The policies of the Coastal Act constitute the statutory standards applied to planning and regulatory decisions made by the Commission and by local governments.

California's coastal management program is carried out through a partnership between state and local governments. Implementation of Coastal Act policies is accomplished primarily through the preparation of Local Coastal Programs (LCPs) that must be submitted to the Commission for review and certification. An LCP includes a land use plan (LUP) which may be the relevant portion of the local general plan, including any maps necessary to administer it, and an implementation plan which includes the zoning ordinances, zoning district maps, and other legal instruments necessary to implement the land use plan. Coastal Act policies are the standards by which the Commission evaluates the adequacy of LCPs.

Development within the coastal zone may not commence until a coastal development permit has been issued by either the Commission or a local government that has a Commission-certified LCP. After certification of an LCP, coastal development permit authority is delegated to the appropriate local government, but the Commission retains original permit jurisdiction over certain specified lands (such as tidelands and public trust lands). The Commission also has appellate authority over development approved by local governments in specified geographic areas as well as certain types of developments. In areas where the Commission retains original permit jurisdiction, they rely on Chapter 3 of the Coastal Act for issuance of coastal development permits. There is a large number of acres susceptible to 1.0 meter of

SLR within the LCP jurisdictions of the City of Eureka and City of Arcata as well as the Humboldt County HBAP that are under the CCC coastal development permit jurisdiction.<sup>3</sup>

Humboldt County is located in the CCC's North Coast District, with the District office located in Arcata, CA. The cities of Eureka and Arcata, and Humboldt County, work directly with North Coast District staff on issues within the coastal zone. Staff seeks to collaborate with local governments/regional players in trying to jointly develop SLR policies through the process of LCP updates and or participation in regional planning efforts.

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- **Section 30001.5 of the California Coastal Act provides the basic goals of the state for the coastal zone:**
  - Protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.
  - Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.
  - Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of private property owners.
  - Assure priority for coastal-dependent and coastal-related development over other development on the coast.
  - Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.



<sup>3</sup> The number of acres under CCC coastal development permit jurisdiction within the City of Eureka's LCP, City of Arcata's LCP and Humboldt County's HBAP susceptible to 2.0 meters of SLR totals approximately 10,769, or 75.5% of these certified LCPs. This means 76 % of the Humboldt Bay area local jurisdiction's LCPs is not actually subject to the provisions of the LCP within which they are located for the issuance of coastal development permits. This is because the CCC relies on Chapter 3 of the Coastal Act for issuance of their coastal development permits in state retained jurisdiction, and LCPs are used only as guidance.



*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:	
	Property Ownership and Adaptation Responsibility		✓	Erosion*
✓	Regulatory Authorization and Compliance			Tidal Inundation
✓	Feasible Adaptation Strategies			Backwater and/or Emerging Groundwater Flooding
✓	Funding			Saltwater Intrusion

\* The CCC has a particular interest in protecting/retaining and restoring beaches and coastal resource habitats. As an organization they focus on SLR impacts on habitat in accordance with the California Coastal Act.

*Planning Efforts*

This agency was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

In 2015 the Coastal Commission adopted the SLR Policy Guidance document as interpretive guidelines to assist LCPs and CDP applicants prepare for SLR within the context of the Coastal Act. A Science Update to this Guidance document was adopted in 2018. The Coastal Commission released the Draft SLR Adaptation Guidance for Residential Development in 2018 and CCC staff continue to work on this draft guidance document. CCC staff have also begun developing a companion guidance document specific to critical infrastructure.



In May 2020 the Coastal Commission adopted “Making California’s Coast Resilient to Sea Level Rise: Principles for Aligned State Action”. In early 2020 under the leadership of the California Natural Resources Agency Secretary and CalEPA Secretary, the principles were co-developed and endorsed by 17 state agencies with coastal climate resilience responsibilities, including the Coastal Commission. These principles are meant to “support California’s ongoing efforts related to climate change adaptation by creating consistent, efficient decision-making processes and improving collaboration across state, local tribal, and federal partners,” and “are meant to guide unified, effective action towards sea level rise resilience for California’s coastal communities, ecosystems, and economies, and are consistent with and complementary to the Coastal Commission’s ongoing work to address sea level rise” according to CCC staff. The adopted principles include the principle to “utilize SLR targets based on the best available science and a minimum of 3.5 feet of SLR by 2050.”

The CCC has a Local Coastal Program Local Assistance Grant Program that provides funds to support local governments in completing or updating their LCPs, with special emphasis on planning for sea level rise and climate change. The Commission has awarded six rounds of LCP Local Assistance grants beginning in Fiscal Year 2013/2014 for the first round of grant funding. The sixth round of grants was awarded in Fiscal Year 2019/2020, which included grant funding awarded to Humboldt County for the Humboldt Bay Sea

Level Rise Regional Planning Feasibility Study, of which this catalogue report is a part. Humboldt County has also received funding from this program awarded in previous rounds, as has the City of Arcata.

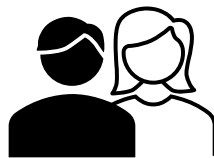
The CCC released a Public Review Draft of their Critical Infrastructure at Risk SLR Planning Guidance for California’s Coastal Zone document in August 2021). The goal of the guidance document is to promote resilient critical infrastructure by providing local governments, asset managers, and other stakeholders with relevant policy and planning information to help inform sea level rise adaptation decisions. The Guidance document addresses two main types of critical infrastructure, transportation (coastal roads, highways and railroad facilities) and water (wastewater treatment, stormwater, and water supply facilities) and other utilities (including utilities that serve inland communities). The document presents five key considerations and corresponding recommendations for successful infrastructure adaptation planning. These key considerations include: (1) Coordinated Planning, (2) Environmental Justice, (3) Phased Adaptation, (4) Adaptation Costs and Funding, and (5) Nature-Based Adaptation. It also contains *“details on the expected impacts of sea level rise on transportation and water infrastructure, describes the regulatory framework that applies to adaptation planning for infrastructure, provides model policies that can be used by local governments as a tool for updating Local Coastal Programs (LCPs), and gives direction to asset managers on how to develop infrastructure adaptation projects that can help to ensure resilience while protecting resources consistent with the Coastal Act. Detailed information is available in the Appendices relating to the laws, reports, data, and authorities cited throughout the report”*.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The CCC interview contained 10 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

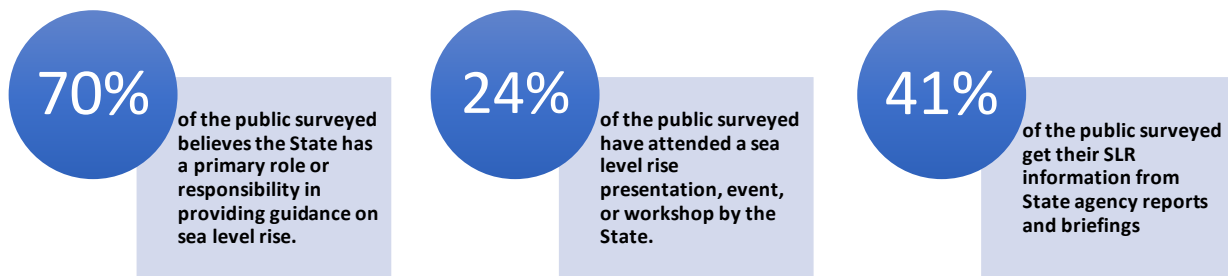
#### **Interview Themes Important to the Coastal Commission**

- Shared Funding Coordination
- Regional Coordination in General
- Increased Landowner Participation
- Diked Former Tidelands
- Restoration and Mitigation
- Shoreline
- Personnel Constraints
- Transportation Infrastructure
- Dedicated Time Constraints
- Utilities Concerns



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to identify one or more entities that had a primary role or responsibility in providing guidance on SLR and had the option of “City Government”, “County Government”, “State Government”, “Federal Government”, and “Other”. There were 403 respondents who identified the State Government (70%) as having a primary role or responsibility. Participants were also asked to estimate how many sea level rise presentations, events, or workshops they had attended in the last five years. Out of 308 respondents who had attended events, 24% (n=75) had attended SLR outreach events hosted by a State Government. When asked where survey participants got their information about sea level rise, 41% (n=236) said State agency reports and briefings.



### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, survey participants were given a sliding scale ranging from “Local” to “State” to “Federal” to show what level of government they thought should hold the majority of the planning control and authority for SLR. A total of 80 individuals provided responses, a majority of which preferred the planning authority to include a mix of local-and-state control at 64% as shown in the graph on the next page.

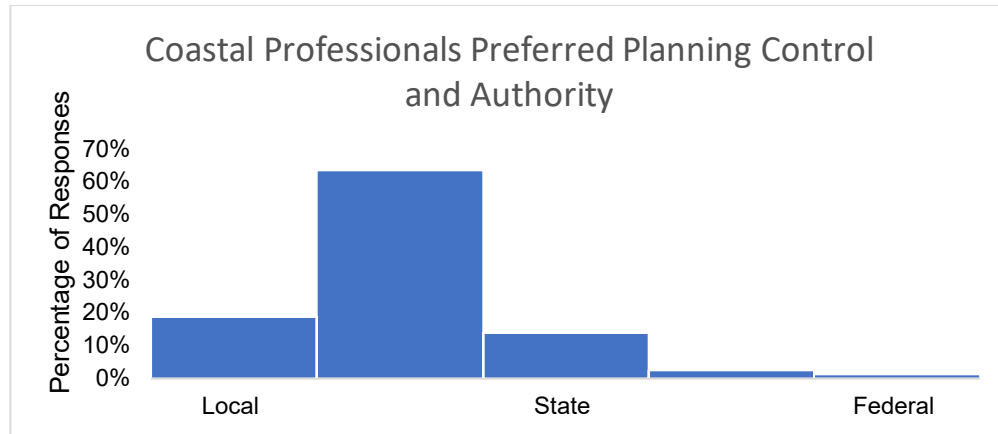


Figure 31: Survey respondents' preference for what level of government should hold the majority of the planning control and authority from the SLR Coastal Professionals Survey 2021 (n=80)

For the State Government category of participants, there was a total of 25 respondents though participation for individual questions varied. Participants included the California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors' Office of Planning and Research, and State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results for the State Government category ranged from "participate" to "lead" with a 65% preference for participation as shown in the graph below.

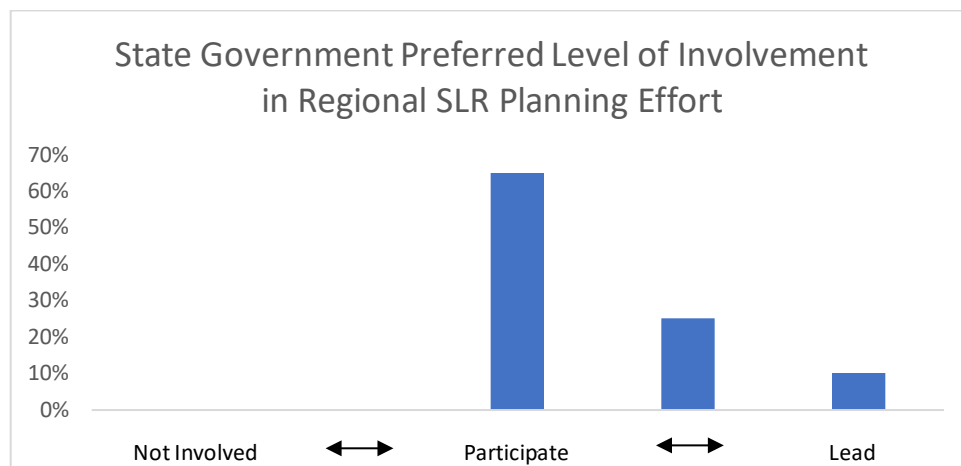


Figure 32. State Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a "project by project" basis to planning on a larger scale of "Watershed/HU" and "Humboldt Bay". The results for the State Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 68% preference for a Humboldt Bay approach as shown in the graph on the next page.

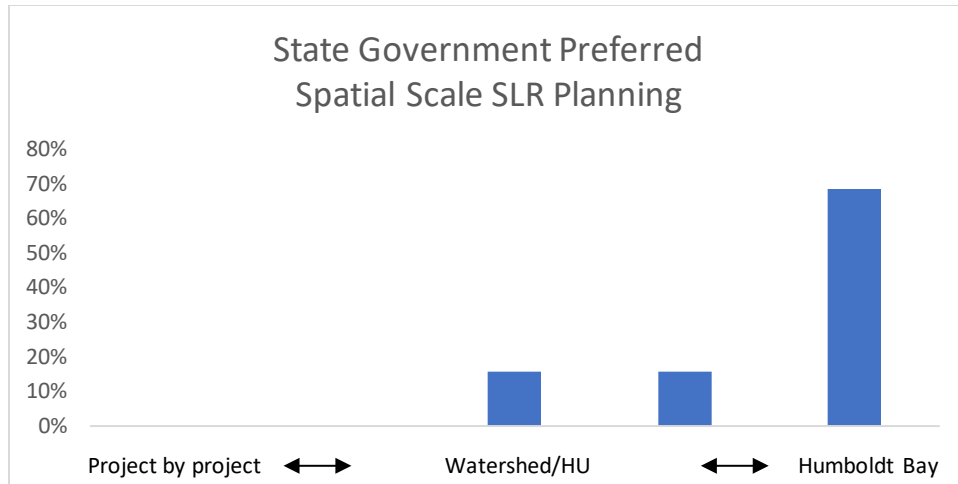


Figure 33. State Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

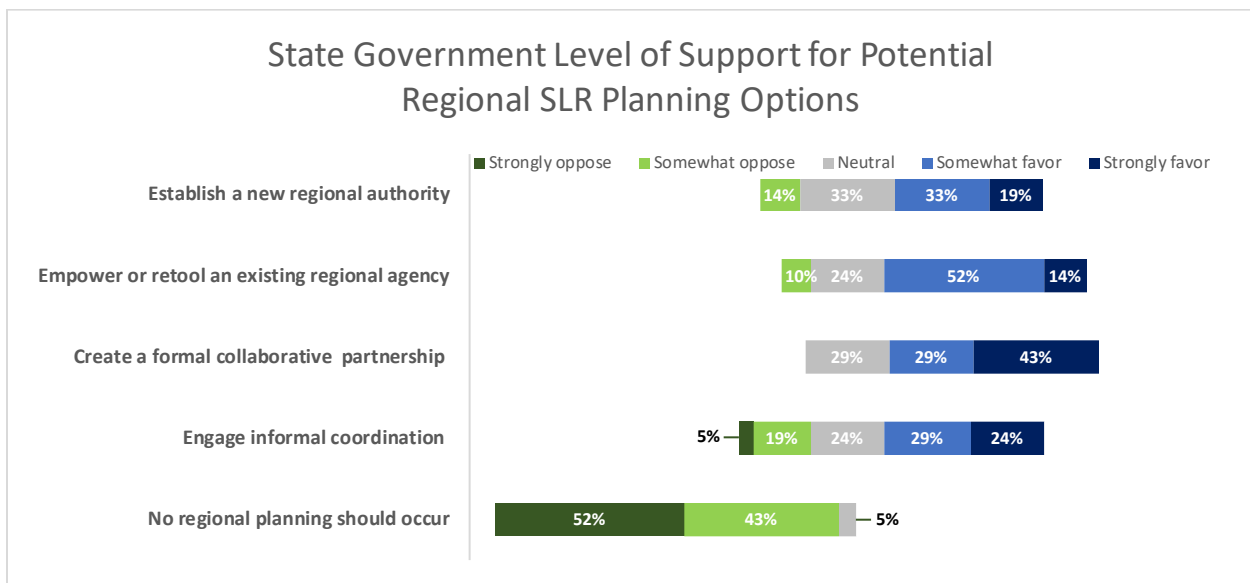


Figure 34. State Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

*Reference Links*

<https://www.coastal.ca.gov/>

<https://www.coastal.ca.gov/lcps.html>

<https://www.coastal.ca.gov/climate/whyinvolved.html>

<https://www.coastal.ca.gov/climate/slr/> - CCC sea level rise policy documents

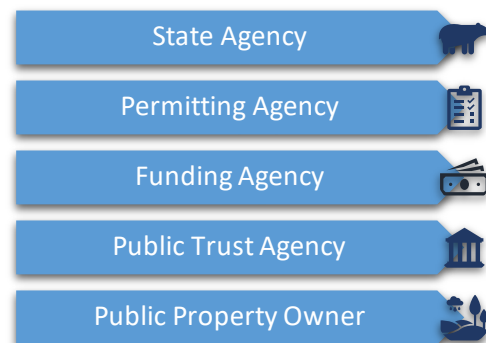
[https://documents.coastal.ca.gov/assets/slr/CCCendorsement\\_SLRPrinciples.pdf](https://documents.coastal.ca.gov/assets/slr/CCCendorsement_SLRPrinciples.pdf) - CCC adopted “Making California’s Coast Resilient to Sea Level Rise: Principles for Aligned State Action.”

<https://www.coastal.ca.gov/lcp/grants/>

[https://documents.coastal.ca.gov/assets/slr/SLR%20Guidance\\_Critical%20Infrastructure\\_12.6.2021.pdf](https://documents.coastal.ca.gov/assets/slr/SLR%20Guidance_Critical%20Infrastructure_12.6.2021.pdf)  
Public Review Draft of CCC’s Critical Infrastructure at Risk SLR Planning Guidance for California’s Coastal Zone document, August 2021

## California Department Fish & Wildlife

### *Roles & Responsibilities*



California Department of Fish and Wildlife (CDFW), a California Natural Resources Agency department, is a public trust agency charged with managing California's flora, fauna, and the habitats they depend on to preserve their ecological value as well as their use and enjoyment by the public. The agency manages California hunting and fishing including the issuance of hunting and fishing licenses, manages wildlife species throughout the state, owns or manages properties statewide, and is responsible for species and habitat conservation.

CDFW has a field office located in Eureka. According to the Agency’s December 2020 inventory, the agency owns or manages 735 properties that total 1,180,948 acres, which includes several wildlife areas and public access points within the Humboldt Bay region.

### *Specific Hydrological Unit Assets and Concerns*

#### **Arcata Bay**

- **Mad River Slough Wildlife Area**
  - McDaniel Slough Unit
  - Mad River Slough Unit
- **Bracut Tidelands Public Area**

#### **Eureka Slough**

- **Fay Slough Wildlife Area**



**Eureka Bay**

- Samoa Peninsula Public Access

**Elk River Slough**

- Elk River Wildlife Area

**South Bay**

- South Spit Wildlife Area (Mike Thompson Wildlife Area)

*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

*Planning Efforts*

CDFW has completed or funded a number of climate change vulnerability assessments for fish, wildlife and plants. CDFW notes the climate vulnerability ranks and associated maps developed by these assessments provide a comprehensive view of climate vulnerability of wildlife species and habitats in California as of the date of publication, and further notes that wildlife species identified as climate vulnerable by these studies were included in the 2015 State Wildlife Action Plan as Species of Greatest Conservation Need. Every ten years CDFW update their action plan and sets goals to meet federal funding and grant funding requirements.

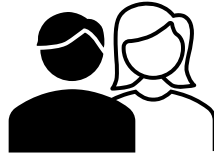
This organization was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The CDFW interview contained 10 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to CDFW**

- Regional Coordination in General
- Increased Landowner Participation
- Permitting Limitations
- Diked Former Tidelands
- Restoration and Mitigation
- Personnel Constraints
- Shoreline
- Dedicated Time Constraints
- Dredged material
- Additional Governmental Guidance



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which was identified above in this catalogue section as CDFW assets that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Three assets were identified as assets to CDFW and was confirmed as such by CDFW representatives during the SLR Stakeholder Interview 2021, all of which received a moderate priority rating or higher by at least 50% of respondents: “Parks and similar public spaces” (63%, n=544), “Natural wetlands, wildlife areas, etc.” (61%, n=537), and “Beaches and similar spaces” (58%, n=537). Overall, these assets received lower than average participation. Results are reported in the graph on the next page.

63%

of the public survey respondents who provided a rating for **"Parks and similar public spaces"** rated them a moderate priority or higher for flood protection and future SLR planning.

61%

of the public survey respondents who provided a rating for **"Beaches and similar coastal areas"** rated them a moderate priority or higher for flood protection and future SLR planning.

58%

of the public survey respondents who provided a rating for **"Natural wetlands, wildlife areas, etc."** rated them a moderate priority or higher for flood protection and future SLR planning.



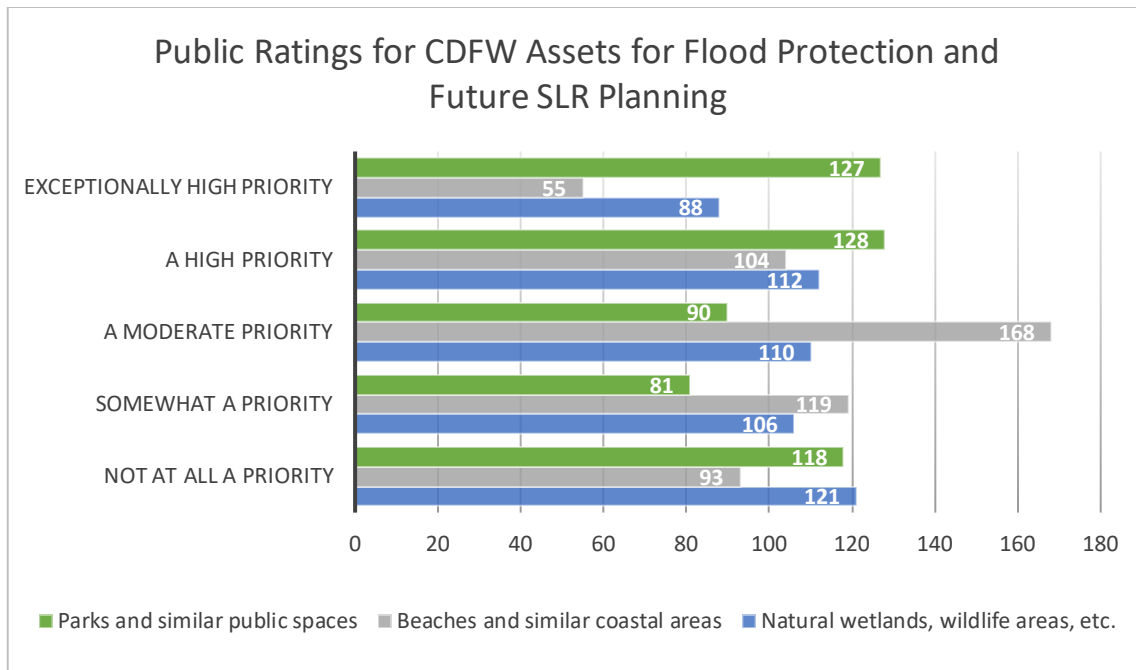


Figure 35. Priority Ratings for Parks and similar public spaces (n=544 shown in green), Beaches and similar coastal areas (n= 539 shown in grey), and Natural wetlands, wildlife areas, etc. (n=537 shown in blue), regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 25 respondents for the State Government category though participation for individual questions varied. Participants included the California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors' Office of Planning and Research, and State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results for the State Government category ranged from "participate" to "lead" with a 65% preference for participation as shown in the graph on the next page.

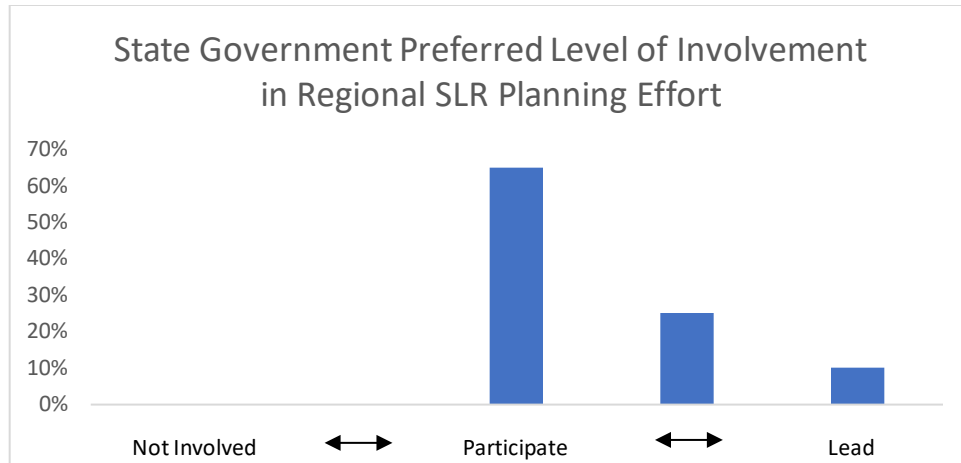


Figure 36. State Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the State Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 68% preference for a Humboldt Bay approach as shown in the graph below.

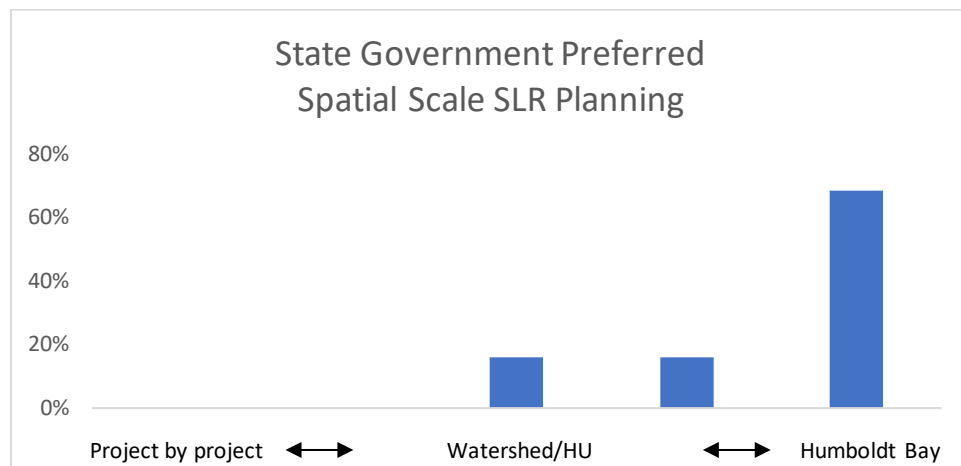


Figure 37. State Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or

higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

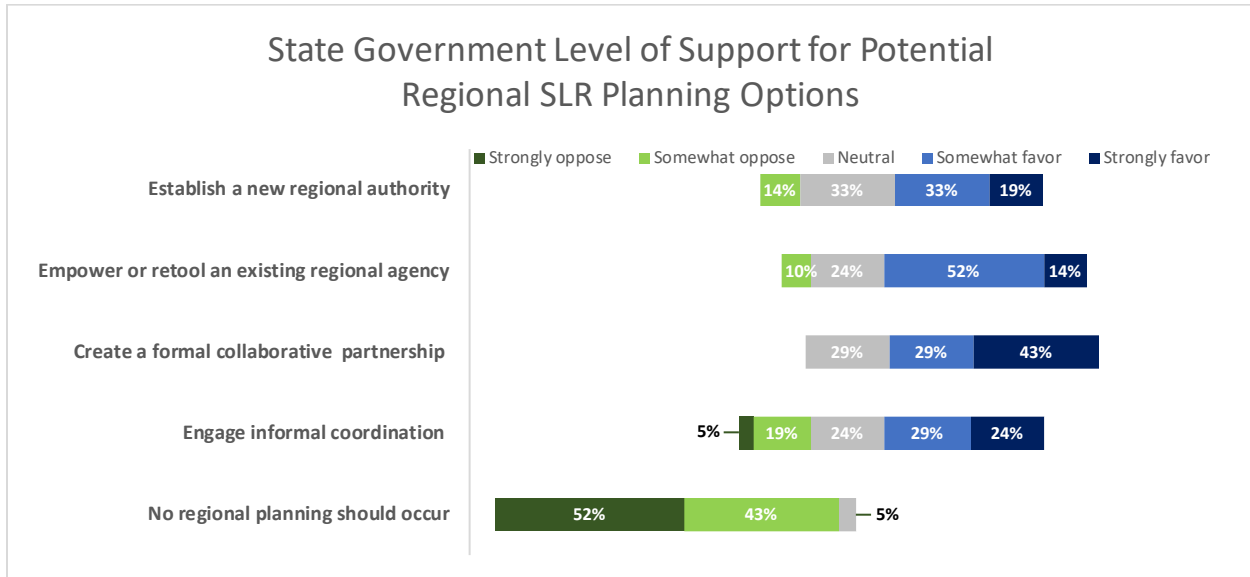


Figure 38. State Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)


*Reference Links*

<https://wildlife.ca.gov/Conservation/Climate-Science/Resources/Vulnerability>

<https://wildlife.ca.gov/SWAP>

## California Geological Survey

*Roles & Responsibilities*

- State Agency 
- Other - Science Provider 

The California Geological Survey (CGS) is a division of the California Department of Conservation. Their stated mission is to provide scientific products and services about the state's geology, seismology and mineral resources, including their related hazards, that

affect the health, safety, and business interests of the people of California.

*Specific Hydrological Unit Assets and Concerns*

**All hydrological units**

- Tsunami Hazard Area

-  Shoreline Protection
-  Environmental

### General Concerns

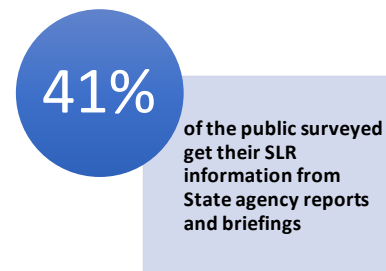
	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

### Planning Efforts

One of the programs within CGS is the California Tsunami Program. CGS works closely with the California Office of Emergency Services and the Tsunami Research Center at the University of Southern California to produce statewide Tsunami Hazard Area Maps and preparedness information for California. CGS is also the scientific representative for California on the National Tsunami Hazard Mitigation Program Coordinating Committee, a state and federal cooperative responsible for developing policies and standards for tsunami mitigation efforts in the United States and its territories. CGS is in the process of developing updated tsunami safety mapping and regulations that when finalized, will be required to be implemented within Humboldt County.

### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. When asked where survey participants got their information about sea level rise, 41% (n=236) said State agency reports and briefings.



### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 25 respondents for the State Government category though participation for individual questions varied. Participants included the California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors' Office of Planning and Research, and the State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results

for the State Government category ranged from “participate” to “lead” with a 65% preference for participation as shown in the graph below.

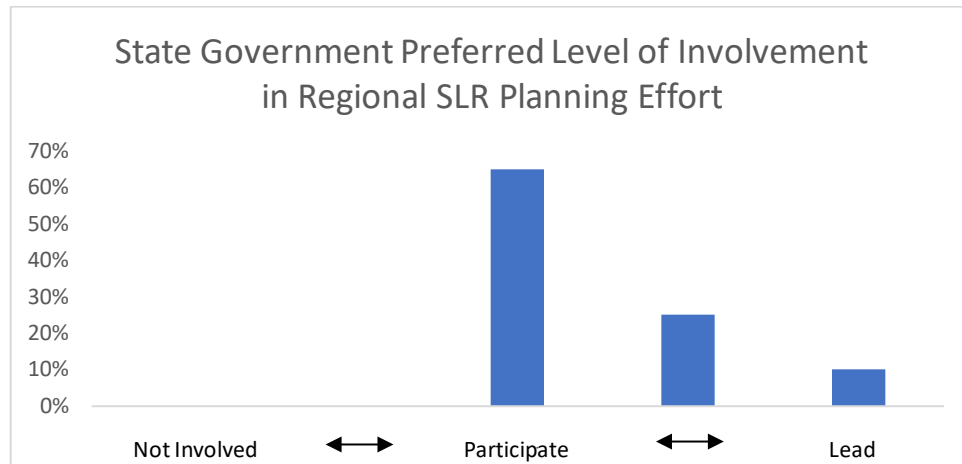


Figure 39. State Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the State Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 68% preference for a Humboldt Bay approach as shown in the graph below.

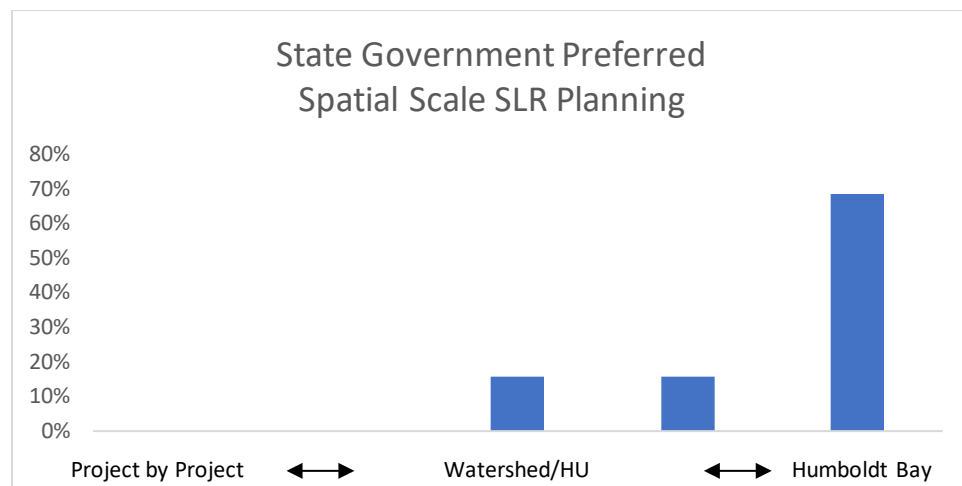


Figure 40. State Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or

higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

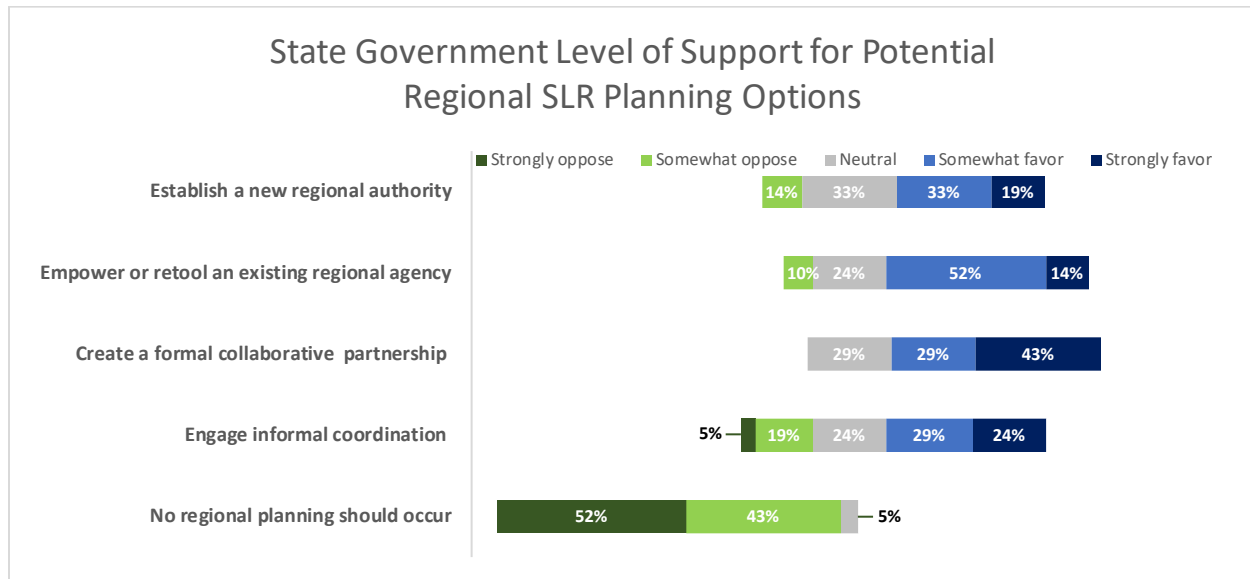


Figure 41. State Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

### Reference Links

<https://www.conservation.ca.gov/cgs/Pages/Index.aspx>

<https://www.conservation.ca.gov/cgs/tsunami>

## California State Coastal Conservancy

### Roles & Responsibilities



The California State Coastal Conservancy (CSCC) is a non-regulatory state agency focused on protecting and improving natural lands and waterways while promoting public access to outdoor recreation, and to sustaining local coastal economies. They implement

statewide resource plans through projects such as the California Water Action Plan and the Wildlife Action Plan. The agency works along the entire California coast and within watersheds of rivers and streams that extend inland from the coast. CSCC is governed by a seven-member Board of Directors appointed by the Governor and California Legislature. The North Coast Region (Del Norte, Humboldt, Mendocino, coastal Sonoma and coastal Marin counties) staff include a regional manager and five project managers.

The Conservancy provides grant funding and technical assistance to local communities, nonprofit organizations, businesses, private landowners, and other government agencies to projects that:

- Protect the natural and scenic beauty of the coast
- Enhance wildlife habitat
- Help the public to get to and enjoy beaches and parklands
- Keep farmland and timberlands in production
- Improve water quality
- Revitalize working waterfronts
- Prepare communities for the impacts of climate change

CSCC’s North Coast Program supports projects to preserve open space and working lands, protect and restore fish and wildlife habitat, provide new and improved opportunities for public access, and revitalize harbors and waterfronts. Major focus areas include:

- Protect Working Landscapes
- Protect, Restore and Enhance Fish and Wildlife Habitat
- Support Restoration of Waterfronts
- Complete the Coastal Trail

*Specific Hydrological Unit Assets and Concerns*

**All hydrological units**

- Natural lands and waterways



*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

The CSCC is involved with addressing the impacts of climate change. Their Climate Ready Program is intended to help the natural and human environment adapt to the impacts of climate change, including adaptation to the impacts of sea level rise.

The CSCC adopted climate change policy in 2009 and updated it in 2011. The CSCC explains their policy as follows: It describes the strategies and actions that the Conservancy will use to address climate change and states the Conservancy's intention to collaborate with other agencies and entities to develop, support, and implement climate change adaptation plans, strategies, and projects. It further describes the Conservancy's interest in funding certain types of climate change research and pilot or demonstration projects for innovative adaptation approaches that support the Conservancy's work.

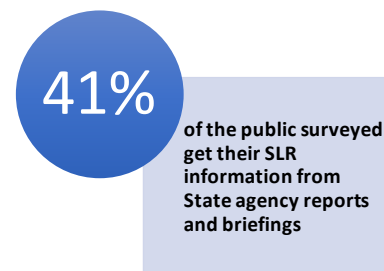


The policy describes various ways in which the Conservancy will provide guidance and work closely with prospective grantees and other entities to understand climate change impacts to coastal resources, to reduce greenhouse gas (GHG) emissions from Conservancy projects, and to improve adaptive management and monitoring to address climate change. The policy directs Conservancy staff to explore opportunities to reduce and offset GHG emissions from its operations. In order to make more informed decisions regarding the expected lifespan of projects proposed for Conservancy funding, the policy directs staff to consider vulnerabilities to sea level rise and other climate change impacts when evaluating potential projects for funding.

This organization was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. When asked where survey participants got their information about sea level rise, 41% (n=236) said State agency reports and briefings.



### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection,



refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 25 respondents for the State Government category though participation for individual questions varied. Participants were from the California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors' Office of Planning and Research, and the State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results for the State Government category ranged from "participate" to "lead" with a 65% preference for participation as shown in the graph below.

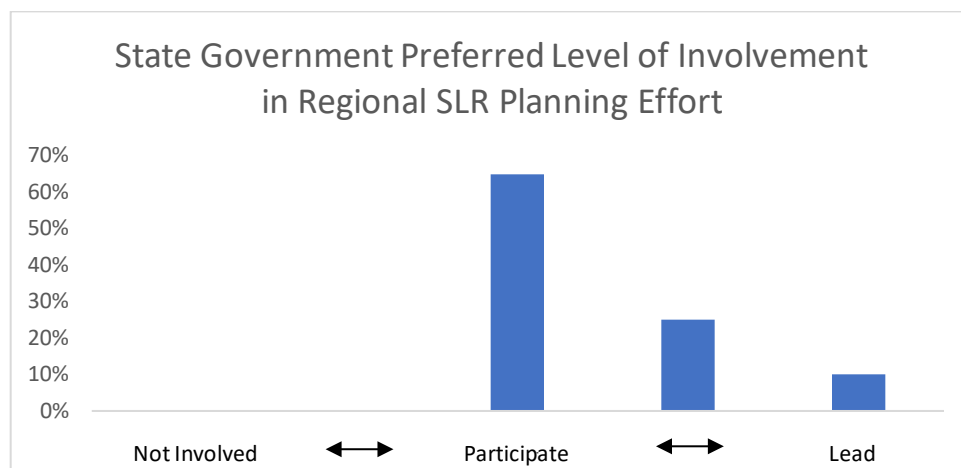


Figure 42. State Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a "project by project" basis to planning on a larger scale of "Watershed/HU" and "Humboldt Bay". The results for the State Government category ranged from Watershed/HU to Humboldt Bay in scale with a 68% preference for a Humboldt Bay approach as shown in the graph on the next page.

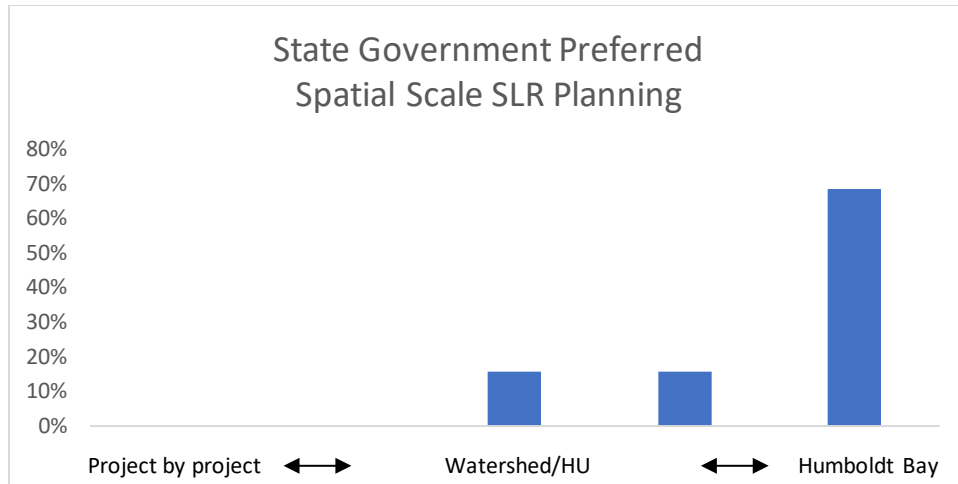


Figure 43. State Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

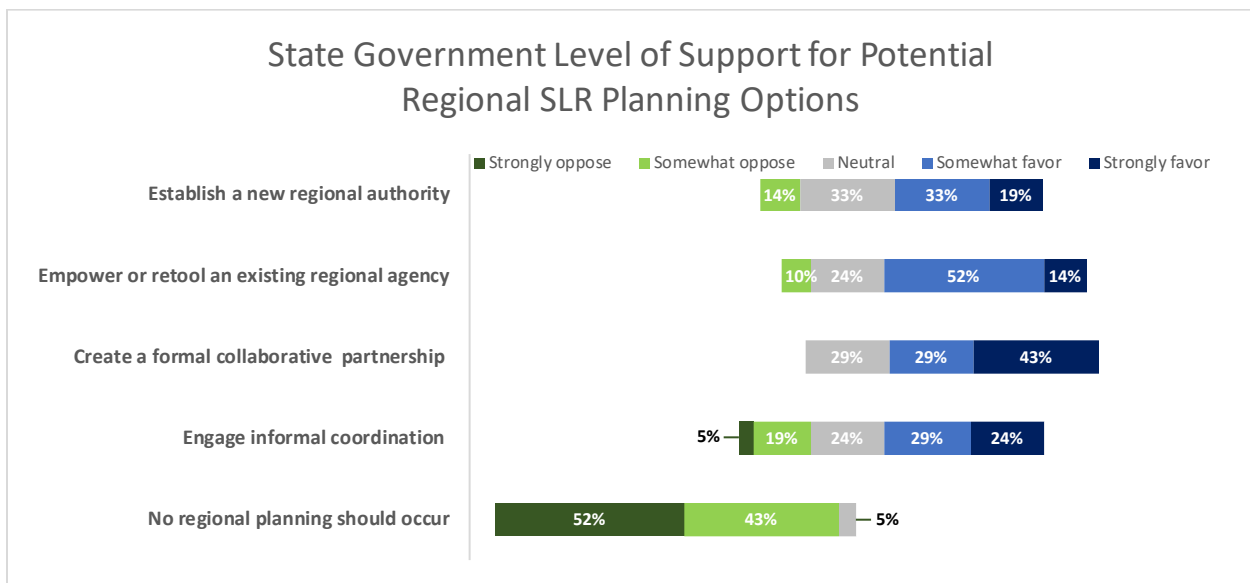


Figure 44. State Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

*Reference Links*

<https://scc.ca.gov/climate-change/>

<https://scc.ca.gov/climate-change/climate-change-projects/#slr-adaptation>

<https://scc.ca.gov/climate-change/climate-change-policy/>

## California State Lands Commission

### *Roles & Responsibilities*



The California State Lands Commission (CSLC) is a state agency that manages 4 million acres of tide and submerged lands; the beds of natural navigable rivers, streams, lakes, bays, estuaries, inlets, and straits, and school lands. These managed lands, often referred to as sovereign or Public Trust lands, stretch from the

Klamath River and Goose Lake in the north to the Tijuana Estuary in the south, and the Colorado River in the east, and from the Pacific Coast 3 miles offshore in the west to Lake Tahoe in the east, and includes California's two longest rivers, the Sacramento and San Joaquin.

The stated mission of CSLC is to provide the people of California with effective stewardship of the lands, waterways, and resources entrusted to its care through preservation, restoration, enhancement, responsible economic development, and the promotion of public access. CSLC issues leases for the use, preservation, protection, and development of state lands and resources; provides public access; resolves boundaries between public and private lands; and implements regulatory programs to protect state waters from oil spills and invasive species introductions. In addition, CSLC has broad oversight authority over sovereign lands granted to local jurisdictions by the state legislature. The management, protection, and enhancement of sovereign lands and natural resources is guided by the common law Public Trust Doctrine, the California Constitution, various laws and regulations specific to the CSLC, and statutory trust grants.

The Commission monitors sovereign land granted in trust by the California Legislature to approximately 70 local jurisdictions that generally consist of prime waterfront lands and coastal waters. Public trust lands have been granted to the City of Arcata (<https://www.slc.ca.gov/granted-public-trust-lands/grantees/arcata/>), the City of Eureka (<https://www.slc.ca.gov/granted-public-trust-lands/grantees/city-of-eureka/>), and the Humboldt Bay Harbor District (<https://www.slc.ca.gov/granted-public-trust-lands/grantees/humboldt-bay-harbor-recreation-and-conservation-district/>).

CSLC and the California Coastal Commission (CCC) have a 2019 Memorandum of Understanding, the purpose of which is to encourage and facilitate the coordination and exchange of information between and among staffs of these two agencies for project proposals requiring an approval by the CCC which may also implicate the CSLC's leasing jurisdiction, granted lands oversight responsibilities, or trustee interests under the Public Trust Doctrine. The MOU states that as global climate changes and sea levels rise, it has never been more critical than it is now for these two agencies to coordinate early and often, share expertise, and combine efforts.

### Specific Hydrological Unit Assets and Concerns

#### All hydrological units

- Natural lands and waterways



### General Concerns

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance		Tidal Inundation
	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

### Planning Efforts

CSLC has a Climate Change and Sea Level Rise program. As part of this program, they adopted “Making California’s Coast Resilient to Sea-Level Rise: Principles for Aligned State Action” on April 29, 2020. The intent of these principles is to unify state agencies in effective action toward sea-level rise resilience that is grounded in science, partnership, communication, and local support.

CSLC has its a SLR viewer that can be accessed via the agency’s sea level rise website. CSLC staff is a member of several interagency workgroups and initiatives dealing with climate change and sea level rise, including the Coastal and Ocean Resources Working Group for the Climate Action Team, the State Coastal Leadership Group on Sea-Level Rise, and the California Collaborative on Coastal Resilience.

AB 691, effective January 1, 2014, is intended to prepare California for the impacts of sea level rise by requiring holders of public trust lands to assess the impacts and report the results to the State Lands Commission. From the Assembly Floor analysis: *“A local trustee’s failure to plan for sea level rise may be considered a breach of its trust responsibilities since the trustee has a fiduciary duty to the people of California to take reasonable steps under the circumstances to take and keep control of and to preserve the trust property (this duty is codified in Public Resources Code Section 6009.1). To assist in avoiding such a breach, this bill will require a local trustee to assess the impacts of sea level rise on granted public trust lands and describe how the local trustee proposes to protect those lands. The local trustee is in the best position to conduct this assessment because it has the administrative control over its granted trust land and, in most cases, generates revenues off of the land, which must be used for purposes such as managing and preserving the trust assets.”* From the California Legislative Information website: *“This bill would provide that addressing the impacts of sea level rise for all of its legislatively granted public trust lands shall be among the management priorities of a local trustee, as defined. The bill would require a local trustee whose gross public trust revenues average over \$250,000 annually between January 1, 2009, and*

January 1, 2014, to prepare and submit to the commission, no later than July 1, 2019, except as provided, an assessment of how it proposes to address sea level rise.” There are two trustee agencies in the Humboldt Bay region: City of Eureka and the Harbor District. Both are subject to the requirements of AB 691 although City of Eureka is the only entity currently compliant as of 2022.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 25 respondents for the State Government category though participation for individual questions varied. Participants were from the California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors’ Office of Planning and Research, and the State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the State Government category ranged from “participate” to “lead” with a 65% preference for participation as shown in the graph below.

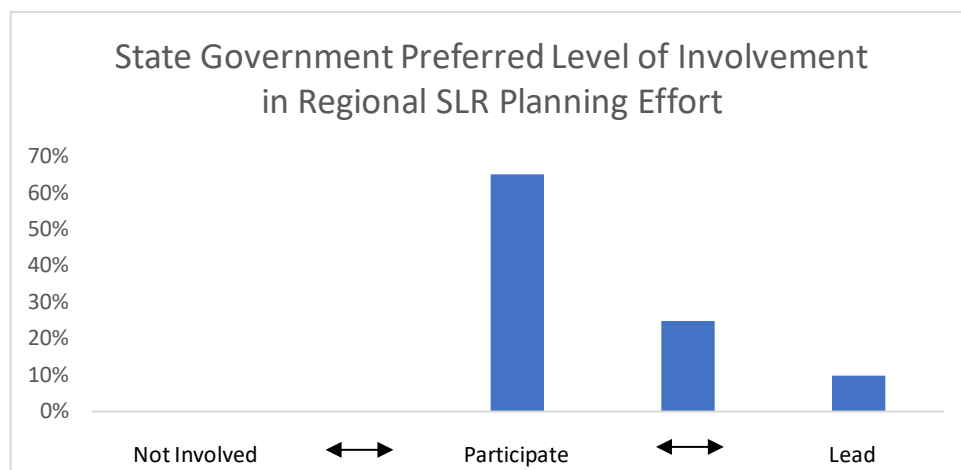


Figure 45. State Government respondents’ preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the State Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 68% preference for a Humboldt Bay approach as shown in the graph below.

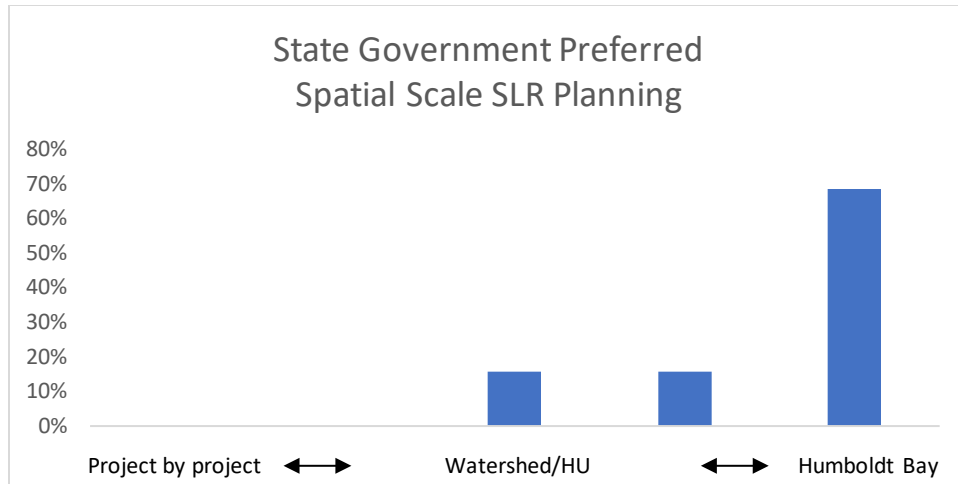


Figure 46. State Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

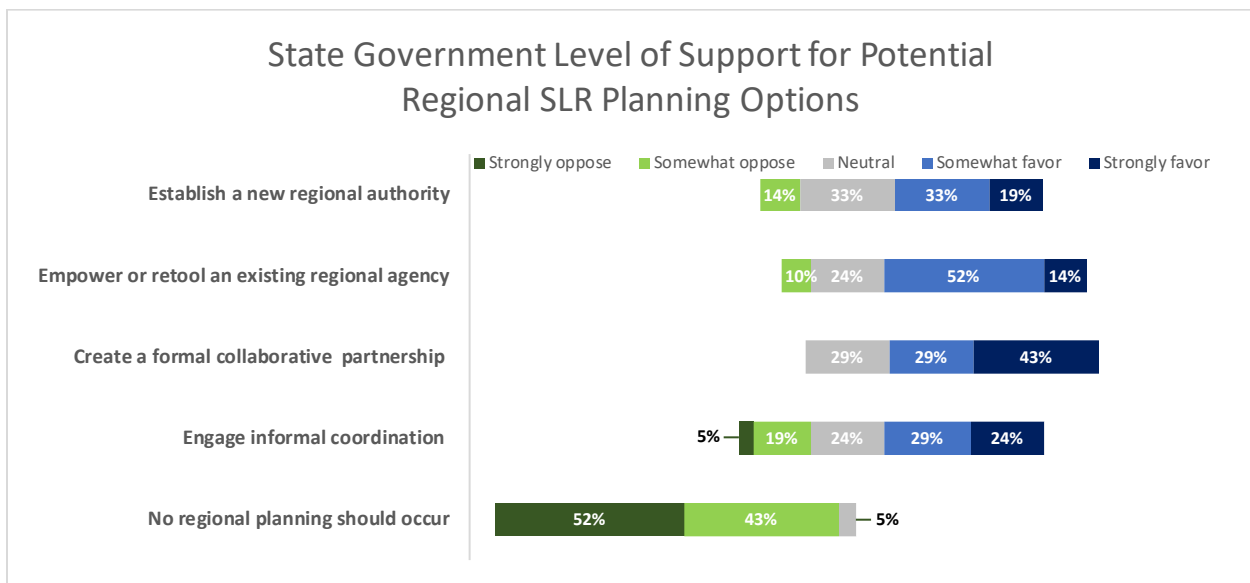


Figure 47. State Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

*Reference Links*

<https://www.slc.ca.gov/sea-level-rise/>

<https://www.slc.ca.gov/granted-public-trust-lands/grantees/arcata/>

<https://www.slc.ca.gov/granted-public-trust-lands/grantees/city-of-eureka/>

<https://www.slc.ca.gov/granted-public-trust-lands/grantees/humboldt-bay-harbor-recreation-and-conservation-district/>

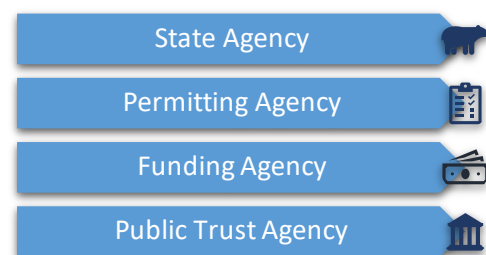
<https://www.slc.ca.gov/ab691/>

[https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB691](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB691)

<https://www.adaptationclearinghouse.org/resources/california-ab-691-state-lands-granted-trust-lands-sea-level-rise.html>

## California Water Boards

### *Roles & Responsibilities*



The California Water Boards are state government departments that protect and enhance the quality of California's waters for present and future generations. They are comprised of the State Water Quality Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). The SWRCB develops statewide policy and regulations for water quality control and allocates water rights. The RWQCBs

provide local implementation of policy and regulations, develop long range plans for their areas, issue waste discharge permits, and take enforcement actions against violators.

### SWRCB

The mission of the SWRCB is to preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations. The SWRCB protects water quality by setting statewide policy, coordinating and supporting the Regional Water Boards, and reviewing petitions that contest Regional Board actions. Together with the regional boards, they are authorized to implement the federal Clean Water Act in California.

The SWRCB, part of the California Environmental Protection Agency, has jurisdiction throughout California. The Board is comprised of five members appointed by the Governor and confirmed by the Senate, each filling a specialized position representing the public, and engineering, water quality and water supply expertise.

The SWRCB has four major divisions described as follows:

- Water Quality

The SWRCB works in coordination with the Regional Water Boards to preserve, protect, enhance and restore water quality. The SWRCB sets statewide water quality standards, issues statewide general permits, conducts statewide surface and groundwater monitoring and assessment, and issues orders for cleaning up contaminated sites. The SWRCB and Regional Water Boards also work with federal, state and local agencies as well as other environmental agencies to ensure a coordinated approach to protecting human health and the environment.

- Financial Assistance

The SWRCB provides loans and grants for constructing drinking water treatment and distribution systems, municipal sewage and water recycling facilities, remediation for groundwater contamination and underground storage tank releases, stormwater capture and use, and for nonpoint source pollution control projects. The State Water Board has several financial programs to help local agencies, public water systems, California Native American Tribes, non-profit organizations, and individuals prevent or clean up pollution of the state's water and provide safe drinking water.

- Water Rights

Anyone wanting to divert water from a stream or river not adjacent to their property must first apply for a water right permit from the State Water Board. The State Water Board issues permits for water rights specifying amounts, conditions and construction timetables for diversion and storage. Decision-making stems from water availability, senior water rights, flows needed to preserve instream uses such as recreation and fish habitat, and whether the diversion is in the public interest.

- Drinking Water

The Division of Drinking Water's twenty-four Field Operation Branches are responsible for the regulation of public water systems to provide safe water to all Californians. The field offices conduct inspections, issue permits, determine compliance with the Safe Drinking Water Act, and conduct enforcement activities. DDW's Program Management Branch develops regulations, approves innovative treatment technologies, accredits environmental laboratories, maintains water quality databases and websites, integrates recycled water with potable water uses, and maintains quality assurance systems

### NCRWQCB

There are nine semi-autonomous regional water quality control boards statewide that exercise rulemaking and regulatory activities by basins. This organization is a result of the Porter-Cologne Water Quality Control Act. Humboldt County is located within the jurisdiction of Region 1 – North Coast Regional Water Quality Control Board. The regional boards are comprised of seven part-time members appointed by the Governor and confirmed by the Senate. Regional boundaries are based on watersheds and water quality requirements are based on the unique differences in climate, topography, geology and hydrology for each watershed. Each Regional Board makes critical water quality decisions for its region, including setting standards, issuing waste discharge requirements, determining compliance with those requirements, and taking appropriate enforcement actions.



*Specific Hydrological Unit Assets and Concerns*

**All hydrological units**

- Many contaminated sites are located within in each HU and are vulnerable to SLR.

**Elk River Slough**

- They partner with CalTrout on Elk River Watershed Stewardship Program to coordinate private landowner backed watershed management.

**South Bay**

- The board has concerns over septic systems in Fairhaven and Finntown due to unmet water quality objectives in soil and ground water conditions.

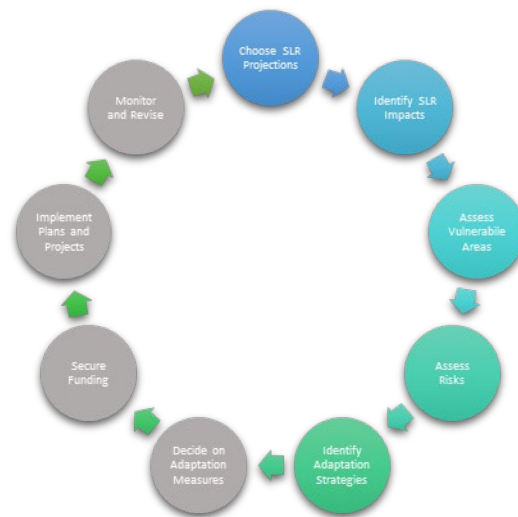


*General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

*Planning Efforts*

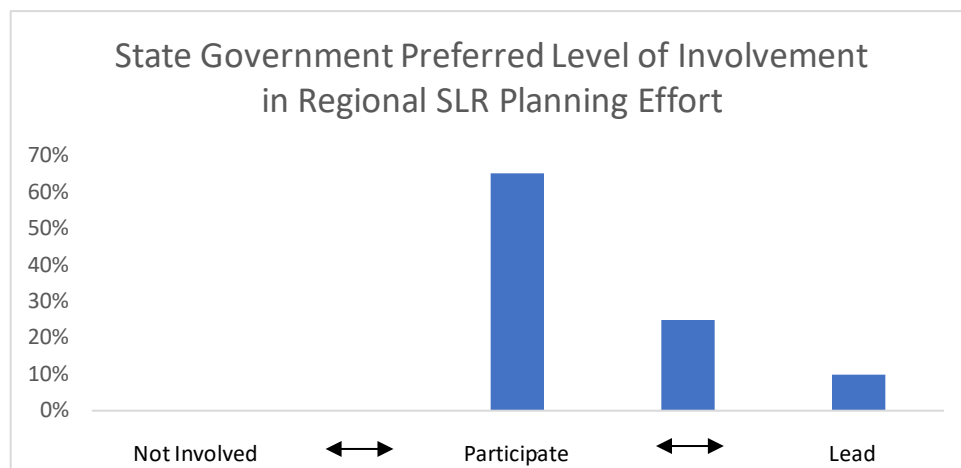
The climate portal for the NCRWQCB, Climate Change Adaptation Strategy provides information on the past, current, and future NCRWQCB activities related to climate change adaptation. The webpage notes: *“In addressing climate change, the North Coast Regional Water Quality Control Board adopted the 2014 Triennial Review that prioritizes climate adaptation. The recently adopted 2018 Triennial Review has identified the initial steps required for adaptation to climate change impacts, as part of the development of a Climate Change Adaptation Strategy. These initial steps include developing or modifying existing methodology to perform a landscape assessment in GIS.”*



### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

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*Figure 48. State Government respondents’ preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the State Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 68% preference for a Humboldt Bay approach as shown in the graph on the next page.

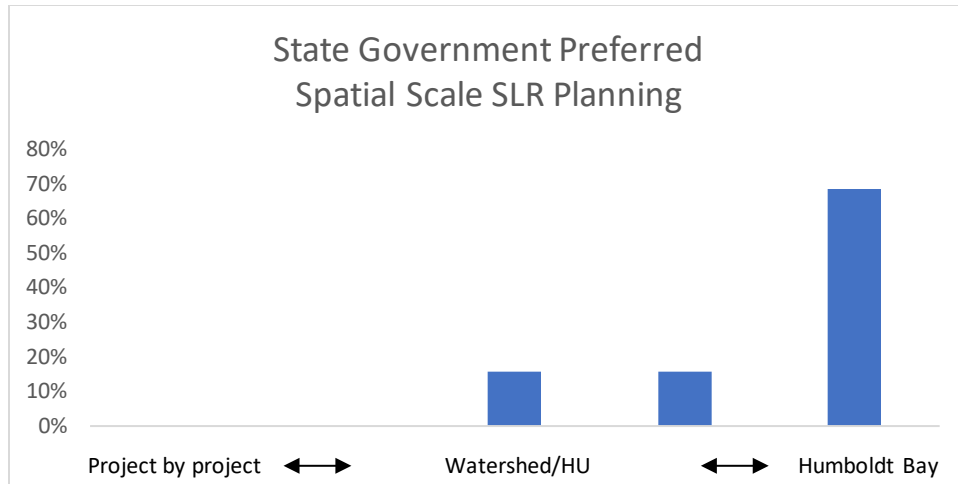


Figure 49. State Government respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

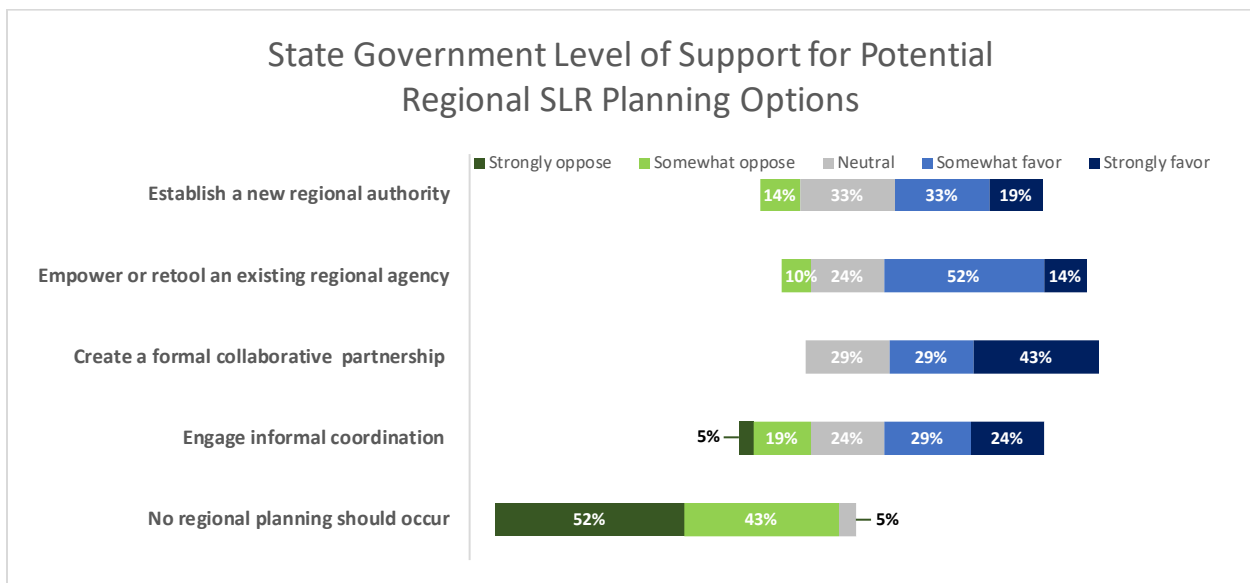


Figure 50. State Government respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

*Reference Links*

<https://www.waterboards.ca.gov/northcoast/>

[https://www.waterboards.ca.gov/northcoast/water\\_issues/programs/watershed\\_info/eureka\\_plain/](https://www.waterboards.ca.gov/northcoast/water_issues/programs/watershed_info/eureka_plain/)

<https://humboldt.gov/DocumentCenter/View/60325/RFP-17-03-Samoa-Project?bidId=>

[https://www.waterboards.ca.gov/northcoast/water\\_issues/programs/basin\\_plan/climate\\_change/index.html](https://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/climate_change/index.html)

## Ocean Protection Council

### *Roles & Responsibilities*

State Agency 

Funding Agency 

The Ocean Protection Council, a division of the California Department of Natural Resources, is a state policy body created pursuant to the California Ocean Protection Act (COPA) that works on ensuring healthy coastal and ocean ecosystems by supporting adaptive science-based policy and

management, strategic investments, and creating action through partnerships and collaboration. As provided in OPC's 2020-2025 Strategic Plan, the core function of OPC as directed by COPA is to protect California's coastal and ocean resources by effectively and strategically providing best-available science to decision-makers; supporting targeted initiatives to protect and restore coastal and marine systems; collaboratively advancing policy; and coordinating relevant agency activities across jurisdictional, programmatic, and regional boundaries.

The OPC is guided by principles included in COPA:

- Recognizing the interconnectedness of the land and the sea, supporting sustainable uses of the coast, and ensuring the health of ecosystems
- Improving the protection, conservation, restoration, and management of coastal and ocean ecosystems through enhanced scientific understanding, including monitoring and data gathering
- Recognizing the "precautionary principle": where the possibility of serious harm exists, lack of scientific certainty should not preclude action to prevent the harm
- Identifying the most effective and efficient use of public funds by identifying funding gaps and creating new and innovative processes for achieving success
- Making aesthetic, educational, and recreational uses of the coast and ocean a priority
- Involving the public in all aspects of OPC process through public meetings, workshops, public conferences, and other symposia

The council is tasked with the following responsibilities:

- Coordinate activities of ocean-related state agencies to improve the effectiveness of state efforts to protect ocean resources within existing fiscal limitations
- Establish policies to coordinate the collection and sharing of scientific data related to coast and ocean resources between agencies

- Identify and recommend to the Legislature changes in law
- Identify and recommend changes in federal law and policy to the Governor and Legislature

The North Coast has benefitted from OPC grant funding opportunities for projects such as updating Humboldt County’s Humboldt Bay Area Plan, studying the feasibility of offshore wind generation for the Northern California Coast (Schatz Energy Research Center at Humboldt State University), and the Friends of the Dunes Humboldt Coastal Resilience Project.

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- **Coastal and ocean ecosystems**



### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

According to the OPC update *“The State of California Sea-Level Rise Guidance Document, initially released in 2010 and updated in 2013, provides guidance to state agencies for incorporating sea-level rise projections into planning, permitting, investment and other decisions.”*

*“Catalyzed by direction from Governor Brown in 2016, the update to the State of California Sea-Level Rise Guidance (Guidance) reflects advances in sea-level rise science and addresses the needs of state agencies and local governments as they incorporate sea-level rise into their planning, permitting, and investment decisions. The updated Guidance provides: 1) a synthesis of the best available science on sea-level rise projections and rates for California; 2) a stepwise approach for state agencies and local governments to evaluate those projections and related hazard information in decision-making; and 3) preferred coastal adaptation approaches.”*

### *Reference Links*

[https://www.opc.ca.gov/webmaster/ftp/pdf/agenda\\_items/20200226/OPC-2020-2025-Strategic-Plan-FINAL-20200228.pdf](https://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20200226/OPC-2020-2025-Strategic-Plan-FINAL-20200228.pdf)

<https://www.opc.ca.gov/updates-californias-sea-level-rise-guidance/>

[https://opc.ca.gov/webmaster/ftp/pdf/agenda\\_items/20180314/Item3\\_Exhibit-A OPC SLR Guidance-rd3.pdf](https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A OPC SLR Guidance-rd3.pdf)

## Bureau of Land Management

### *Roles & Responsibilities*

Federal Agency



Public Property Owner



The Bureau of Land Management (BLM) is a federal agency under the US Department of Interior. Their stated mission is to sustain the health, diversity, and productivity of public lands for the use and enjoyment

of present and future generations. Congress tasked the BLM with a mandate of managing public lands for a variety of uses such as energy development, livestock grazing, recreation, and timber harvesting while ensuring natural, cultural, and historic resources are maintained for present and future use. To do this, their mission includes managing public lands to maximize opportunities for commercial, recreational, and conservation activities. They manage this way to promote healthy and productive public lands that create jobs in local communities while supporting traditional land uses such as responsible energy development, timber harvesting, grazing, and recreation, including hunting and fishing.

The BLM manages one in every 10 acres of land in the United States, and approximately 30 percent of the Nation's minerals. These lands and minerals are found in every state in the country and encompass forests, mountains, rangelands, arctic tundra, and deserts. They manage 245 million acres of public lands and 700 million acres of mineral estate nationwide. In California where the State Office is in Sacramento and the Northern California District Office is in Redding, they manage 15 million acres of public lands (about 15% of California's total land mass), and 47 million acres of subsurface mineral estate. BLM's Fisheries and Aquatics program acknowledges that climate change poses serious risks and management challenges to the way the BLM manages inland freshwater ecosystems (e.g., lakes, streams, rivers, wetlands) and coastal wetlands.

The Arcata Field Office is charged with administering approximately 200,000 acres of public land in Northwestern California. The Area includes the King Range National Conservation Area, Headwaters Forest Reserve and the Trinidad Gateway to the California Coastal National Monument.

### *Specific Hydrological Unit Assets and Concerns*

#### **Mad River Slough**

- **Lanphere and Mal'el Dunes**
  - According to a January 19, 2021 news release, Lanphere and Ma-le'l Dunes, located west of Arcata within the Humboldt Bay National Wildlife Refuge and Ma-Le'l Dunes Cooperative Management Area and owned by the Bureau of



Land Management and the US Fish and Wildlife Service, was designated as a National Natural Landmark. The National Natural Landmarks Program, administered by the National Park Service, recognizes and encourages the conservation of sites that contain outstanding biological and geological resources. Sites are designated by the Secretary of the Interior for their outstanding condition, illustrative character, rarity, diversity, and value to science and education. The news release states Lanphere and Ma-le'l Dunes represents one of the most diverse and highest quality remnants of coastal dunes habitat in the North Pacific Border physiographic province, includes a diverse array of native vegetation, is known for several species of rare flora, and is very scenic and affords the public an inspiring view of a natural coastal ecosystem that was once common along the western coast.

### **Eureka Bay**

- **Samoa Dunes State Recreation Area (North Spit)**
  - Located at the south end of the North Jetty at the entrance to Humboldt Bay, this 300-acre site, formerly a U.S. military property, is still owned by the federal government. The site is managed by BLM for public recreational use, including hiking, surfing, fishing, sightseeing, beachcombing, off-highway vehicle (OHV) use, picnicking, and birdwatching.

### **South Bay**

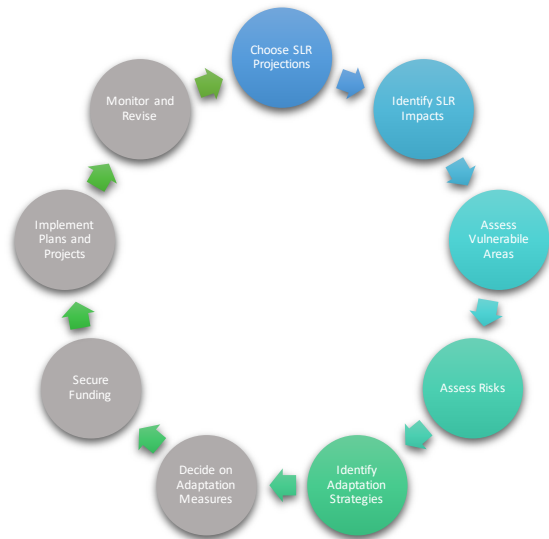
- **Mike Thompson Wildlife Area (South Spit)**
  - This South Spit property was designated as a wildlife area by the Fish and Game Commission in 2007. This site is owned by CDFW and managed by BLM. This long, narrow spit of land is 598 acres of coastal beach dunes that provides habitat for dune plant species, wildlife such as ravens, foxes, and raccoons, as well shorebirds and waders. Activities at this site include fishing, hunting, beach driving, equestrian use, beachcombing, birdwatching, and beach walking.

### *General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

### Planning Efforts

The Federal Land Policy and Management Act of 1976 (FLPMA) requires that the BLM “develop[s], maintain[s], and, when appropriate, revise[s] land use plans” (43 United States Code [U.S.C.] 1712 (a)). In 1992, BLM created an Arcata Resource Area Resource Management Plan (RMP) and in 1993 created the Redding Resource Management Plan. According to the below referenced Analysis document: *“BLM’s RMPs form the basis for every action and approved use on BLM lands. A RMP is a planning-level document, generally prepared by BLM FOs for lands within their boundaries, explaining how the BLM will manage areas of public land over a period of time. RMPs contain decisions that guide future management actions and subsequent site-specific implementation decisions, establish goals and objectives for resource management (desired outcomes), and identify measures needed to achieve these goals and objectives (management actions and allowable uses).”*



An evaluation of the Arcata and Redding RMPs was conducted in 2009 (Arcata) and in 2002/2009 (Redding). The Arcata RMP evaluation found that climate change and sea level rise, among other issues such as changes in land tenure, wilderness designations, new species listings, and new forest pathogens, were not addressed by the 1992 RMP. In 2016, the Arcata and Redding BLM Field Offices started the initial planning for single new RMP that will cover both field offices, with one of the first steps being preparation of an Analysis of the Management Situation for the Northwest California Integrated Resource Management Plan. The Analysis document discusses the threat posed by sea level rise to BLM lands and identifies opportunities for the new RMP to achieve desired future conditions for coastal resources and management in regards to sea level rise.

This agency was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 4 respondents for the Federal Government category though participation varied by individual questions. Participants were from the Bureau of Land Management, US Fish & Wildlife Service, and US Department of Agriculture Natural Resources Conservation Service. These Coastal Professionals were asked a variety of questions including



what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. All Federal Government respondents preferred the participation level of involvement as shown in the graph below.

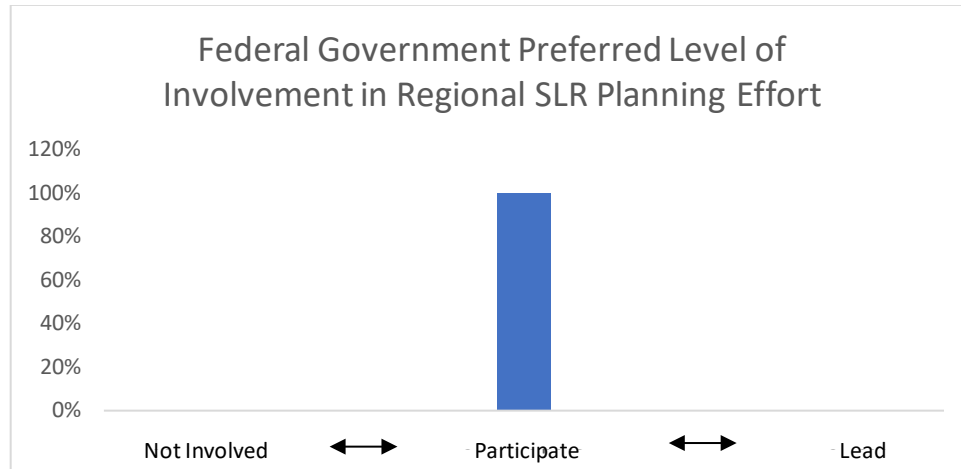


Figure 51. Federal Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Federal Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 75% preference for a Watershed/HU approach as shown in the graph below.

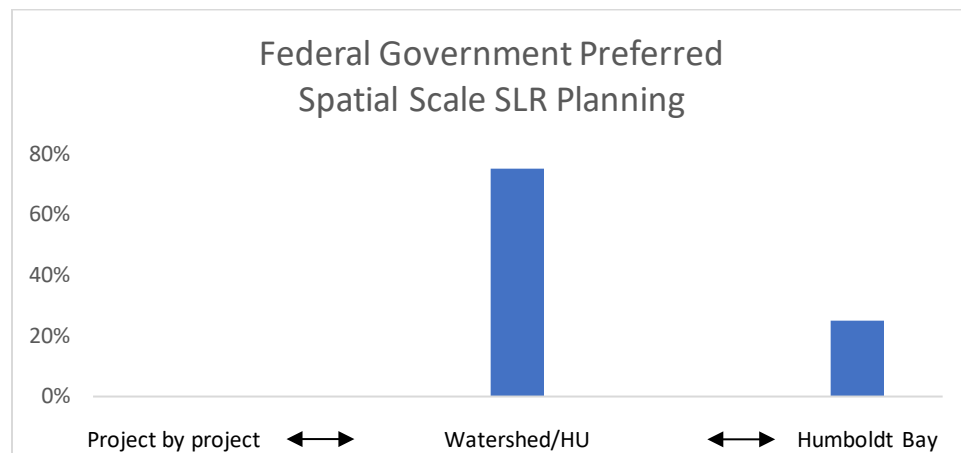


Figure 52. Federal Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=4)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Federal Government favored empowering or retooling an existing regional agency with 100% of respondents rating this option

somewhat favorable or higher. Similarly, 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

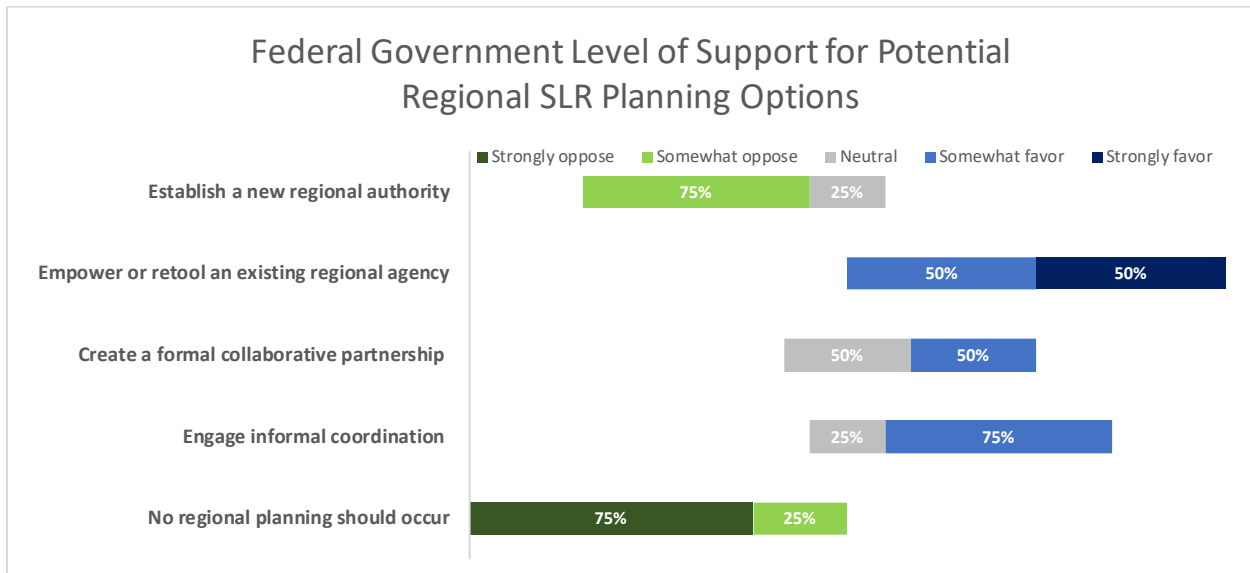


Figure 53. Federal Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

### Reference Links

<https://www.blm.gov/>

<https://www.blm.gov/programs/planning-and-nepa>

[https://eplanning.blm.gov/public\\_projects/lup/63960/89216/106713/NCIP\\_RMP\\_AMS\\_Report\\_Nov\\_2016.pdf](https://eplanning.blm.gov/public_projects/lup/63960/89216/106713/NCIP_RMP_AMS_Report_Nov_2016.pdf)

<https://www.blm.gov/programs/planning-and-nepa/plans-in-development/california/northwest-california-integrated-rmp>

## Natural Resources Conservation Service

### Roles & Responsibilities

Federal Agency



The Natural Resources Conservation Service (NCRS) is a federal agency within the United States Department of Agriculture dedicated to the conservation of our nation's soil and water resources by helping people help the land. The agency works with private landowners, local and state governments, and other federal agencies to maintain healthy and productive working landscapes. NRCS works with farmers, ranchers, and forest landowners to enact conservation practices that will benefit the nation's soil, water, air, wildlife, and other natural resources. Their programs are voluntary and offer science-based solutions for the benefit of the landowner and the environment.

NRCS's natural resources conservation programs support projects that reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters for private landowners.

Within Humboldt County, NRCS has implemented a voluntary conservation program called the Environmental Quality Incentives Program (EQIP). This program enables farmers to access financial and technical assistance to install or implement structural or management practices on agricultural land deemed eligible. According to the NRCS website, this program addresses the following Humboldt County resource concerns:

- Water Quality Degradation
  - Nutrients in surface water and groundwater
  - Pesticides in surface water and groundwater
- Soil Erosion
  - Sheet and rill erosion
  - Ephemeral gully erosion
  - Classic gully erosion
- Fish and Wildlife Inadequate Habitat
  - Inadequate Shelter/Cover
- Livestock Production Limitation
  - Inadequate Water
  - Inadequate Feed and Forage
  - Inadequate Shelter
- Soil Quality Degradation
  - Organic Matter Depletion
  - Compaction

*Specific Hydrological Unit Assets and Concerns*

**All hydrological units**

- **Soil and water resources**



*General Concerns*

✓	Shoreline Management	Sea Level Rise Impacts:		
	Property Ownership and Adaptation Responsibility		✓	Erosion
	Regulatory Authorization and Compliance		✓	Tidal Inundation
	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
	Funding		✓	Saltwater Intrusion

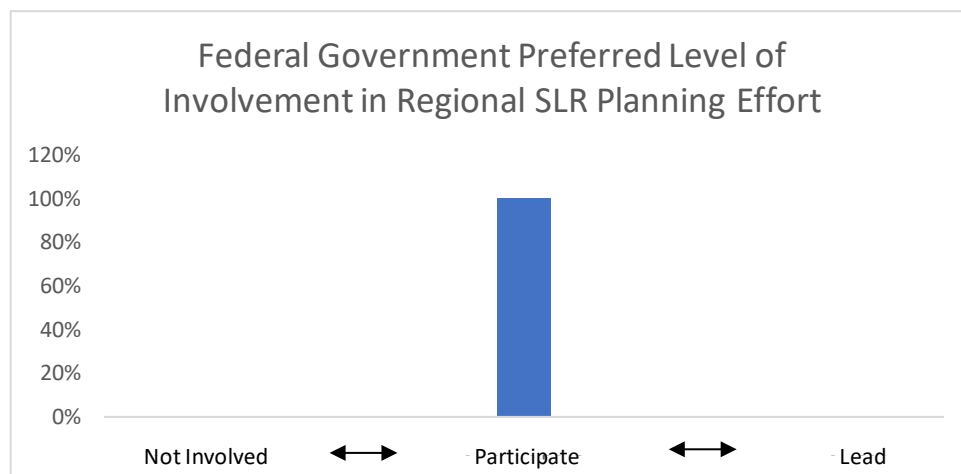
*Planning Efforts*

This organization was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 4 respondents for the Federal Government category. Participants were from the Bureau of Land Management, US Fish & Wildlife Service, and US Department of Agriculture Natural Resources Conservation Service. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. All Federal Government respondents preferred the participation level of involvement as shown in the graph below.



*Figure 54. Federal Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Federal Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 75% preference for a Watershed/HU approach as shown in the graph on the next page.

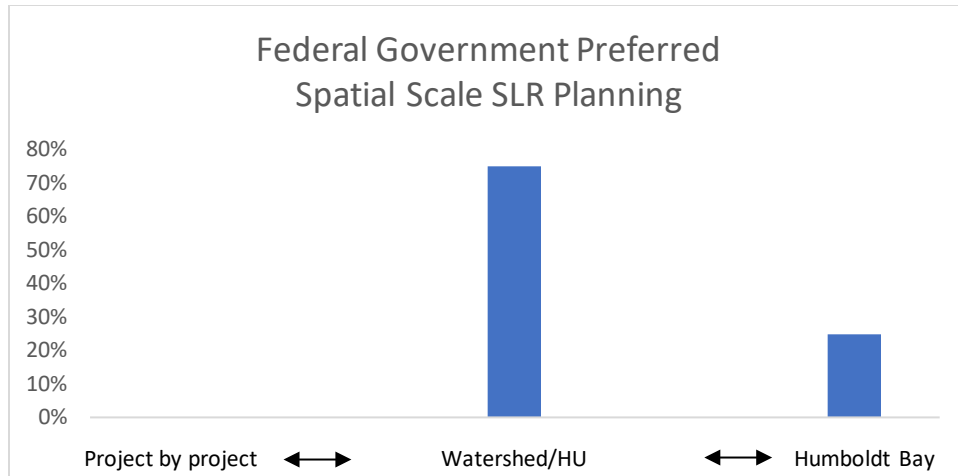


Figure 55. Federal Government respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=4)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Federal Government favored empowering or retooling an existing regional agency with 100% of respondents rating this option somewhat favorable or higher. Similarly, 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

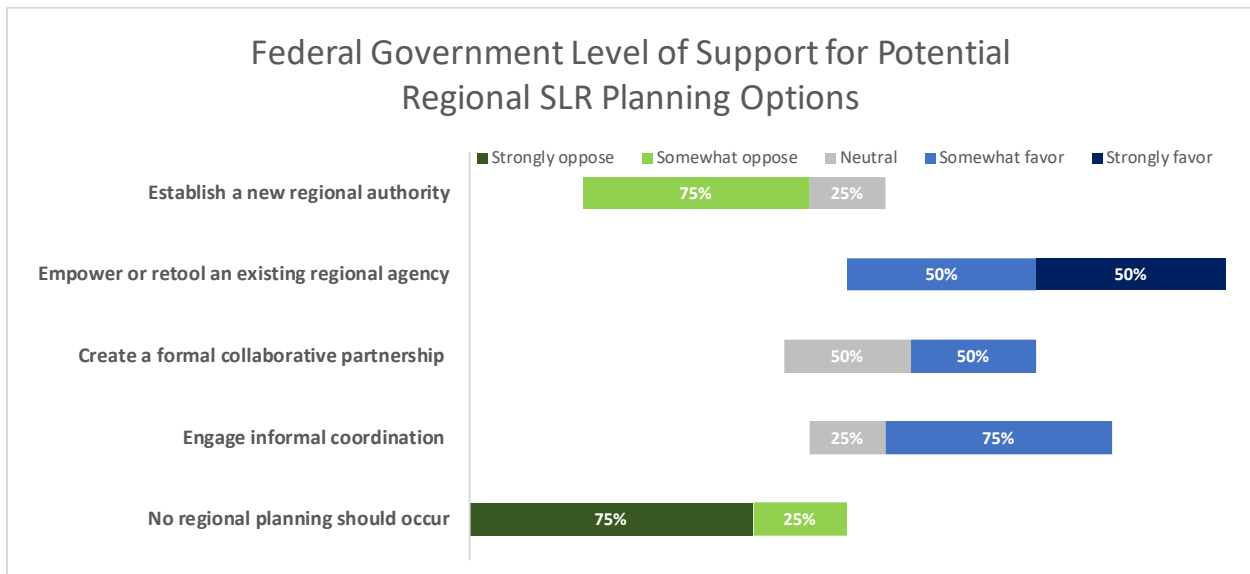


Figure 56. Federal Government respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

*Reference Links*

[https://www.nrcs.usda.gov/wps/portal/nrcs/detail//?cid=nrcs142p2\\_008023](https://www.nrcs.usda.gov/wps/portal/nrcs/detail//?cid=nrcs142p2_008023)

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/ca/home/>

## NOAA Fisheries

### *Roles & Responsibilities:*



NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS) is an office of the National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce that is responsible for the nation's ocean resources and their habitat within the United States' Exclusive Economic Zone, the 4.4-million-square-mile zone that extends from 3 to 200 nautical miles off the coast of the United

States. Individual states are generally responsible for fishery management from their coastline out to three miles.

Through the management, conservation, and protection of these marine resources, NOAA Fisheries works to prevent lost economic potential associated with declining species and degraded habitats within the regulatory framework of the Endangered Species Act (ESA) of 1973, and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) which is the primary law that governs marine fisheries management in U.S. federal waters. They regulate commercial and recreational ocean fishing and manage marine life and associated habitats. This agency assesses and predicts fish stocks as well as ensures fishery regulation compliance. Their two main functions are regulatory and scientific research. This is done to aid other federal agencies, in addition to regional, state, and local governments working to conserve and manage their marine life. NOAA Fisheries has an enforcement field office in Arcata.

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- **Marine resources**



### General Concerns

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance		Tidal Inundation
	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

### Planning Efforts

Though not specific to sea level rise, California Cooperative Oceanic Fisheries Investigations (CalCOFI), the longest-running ocean monitoring program on the planet, provides 70 years of data and discoveries to help NOAA Fisheries better manage West Coast fisheries. The Pacific Ocean changes constantly. Making sense of those changes and what they mean for our coastal communities is facilitated by CalCOFI, a longstanding partnership between NOAA Fisheries' Southwest Fisheries Science Center, Scripps Institution of Oceanography, and California Department of Fish and Wildlife.

CalCOFI provides important long-term records to detect environmental change, and to distinguish recurring change such as El Nino cycles from more lasting shifts. Scientists describe CalCOFI data as the marine gold standard. It is one of only a few ocean science collaborations that have gathered such a definitive record of one of the most productive ecosystems on Earth, making CalCOFI's monitoring extremely important.

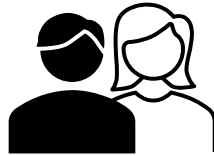
NOAA has publicly available informal success stories and guidance on climate change and sea level rise in general. There is NOAA guidance for evaluating permitting projects with considerations for SLR in regard to EFH, but not yet MSA or Essential Fish Habitat (EFH). Planning for resilient mitigation is a current administrative priority.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The NOAA interview contained 14 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to NOAA**

Shared Funding Coordination  
 Regional Coordination in General  
 Increased Landowner Participation  
 Permitting Limitations  
 Diked Former Tidelands  
 Restoration and Mitigation  
 Shoreline  
 Transportation Infrastructure  
 Wastewater Concerns  
 Regional Prioritization of Projects  
 Relocation Coordination  
 Fishing Coordination  
 Utilities Concerns  
 Recreational Coordination



### *Reference Links*

<https://www.fisheries.noaa.gov/>

<https://www.fisheries.noaa.gov/about/fisheries-ecology-division-southwest-fisheries-science-center>

<https://www.fisheries.noaa.gov/about/southwest-fisheries-science-center>



<https://humboldt.gov/DocumentCenter/View/2474/2-National-Marine-Fisheries-Service-PDF>

<http://www.allgov.com/departments/department-of-commerce/national-marine-fisheries-service?agencyid=7135>



## U.S. Army Corps of Engineers

### Roles & Responsibilities

- Federal Agency 
- Permitting Agency 
- Funding Agency 
- Public Trust Agency 

The U. S. Army Corps of Engineers (USACE) is the engineer formation within the United States Army dedicated to engineer regiment, military construction, and civil works. The Corps’ responsibilities include designing and constructing flood control systems, such as navigation locks and dams, beach nourishment projects, environmental regulation, ecosystem restoration, and engineering services. The USACE is

also involved in a wide range of public works projects pertaining to the Department of Defense. Under their civil works mission, they are obligated to annually maintain the shipping channels in Humboldt Bay, although any further improvement or modernization of these channels requires a local sponsor. The Harbor District has participated as the local sponsor for two federally authorized channel-deepening projects in partnership with the Corps of Engineers. USACE has a Eureka field office which works under the San Francisco District to deliver vital engineering solutions, in collaboration with their partners, to secure the Nation, energize the economy, and reduce disaster risk.

### Specific Hydrological Unit Assets and Concerns

#### Eureka Bay

- They maintain the Samoa navigation channel to a depth of 45 feet in front of Fairhaven and Finntown.

-  Transportation
-  Shoreline Protection
-  Environmental
-  Marine

#### South Bay

- Constructed two protective jetties and a barrier dune system to protect King Salmon.
- Maintain the Fields Landing navigational channel to a depth of 30 feet.

### General Concerns

✓	Shoreline Management		Sea Level Rise Impacts:	
	Property Ownership and Adaptation Responsibility		✓	Erosion
✓	Regulatory Authorization and Compliance		✓	Tidal Inundation
✓	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
	Funding			Saltwater Intrusion

### Planning Efforts

According to the headquarters website, USACE has been concerned about coastal erosion and changing sea levels since the 1960's, which led to them undertaking a National Shoreline Study in 1971 and raising awareness within USACE to the potential threats that SLR posed to missions and operations. A 1987 National Research Council (NRC) report addressing the engineering implications of global SLR concluded that *“the most appropriate present engineering strategy is not to adopt one particular sea level rise scenario, but instead to be aware of the probability of increasing sea level and to keep all response options open”*. This concept has formed the basis of USACE policy and technical guidance since 1989, beginning with a 1986 guidance letter requiring SLR change considerations in the planning and design of coastal flood control and erosion projection projects.



Subsequent planning guidance in 1989 required project plans to be *“formulated based on the observed local relative rate of change (historic rate), and consider the consequences to the project of the full range of NRC scenarios”*. This was further updated in 2000, 2009, 2011, 2013, and 2014 with increased requirements and guidance on sensitivity to high SLR rate scenarios, and on incorporating and adapting to changing sea levels in all planning and engineering studies. The last update as of 2019 was a permanent continuing guidance that all planning and engineering studies must follow a policy to *“incorporate the effects of sea-level change on coastal processes, project performance, and project response within a tiered, risk-based planning framework”*.

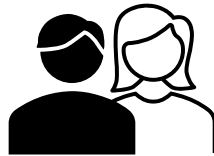
USACE has created two tools to visualize sea level rise and its impacts: Sea-Level Change Curve Calculator and Sea Level Tracker.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The USACE interview contained 11 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to USACE**

- Shared Funding Coordination
- Increased Landowner Participation
- Permitting Limitations
- Diked Former Tidelands
- Restoration and Mitigation
- Increased Communication between Stakeholders
- Shoreline
- Personnel Constraints
- Dedicated Time Constraints
- Dredged material
- Include more NGOs



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to identify one or more entities that had a primary role or responsibility in providing guidance on SLR and had the option of “City Government”, “County Government”, “State Government”, “Federal Government”, and “Other”. There were 356 respondents (62%) who identified the Federal Government as having a primary role or responsibility. When asked where survey participants got their information about sea level rise, 32% (n=182) said Federal agency reports and briefings.



*Reference Links*

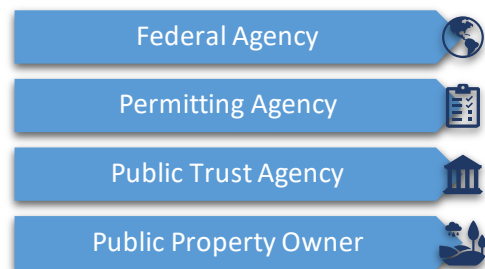
<https://www.usace.army.mil/>

[https://www.usace.army.mil/corpsclimate/Public\\_Tools\\_Dev\\_by\\_USACE/sea\\_level\\_change/](https://www.usace.army.mil/corpsclimate/Public_Tools_Dev_by_USACE/sea_level_change/)

[https://cwbi-app.sec.usace.army.mil/rccslc/slcc\\_calc.html](https://cwbi-app.sec.usace.army.mil/rccslc/slcc_calc.html)

[https://climate.sec.usace.army.mil/slr\\_app/](https://climate.sec.usace.army.mil/slr_app/)

## U.S. Fish and Wildlife

*Roles & Responsibilities*

The U.S. Fish and Wildlife Service (USFWS) is a government agency under the Department of the Interior that is dedicated to the conservation, protection, and enhancement of flora, fauna, and the habitats they depend on. They are the only agency in the federal government whose primary responsibility is the conservation and management of these natural resources for the American public. This agency is

responsible for implementing some of our nation's most important environmental laws, such as the Endangered Species Act, Migratory Bird Treaty Act, Pittman-Robertson/Dingell-Johnson wildlife and sportfish restoration laws, Lacey Act, North American Wetlands Conservation Act, and Marine Mammal Protection Act. There are two major divisions in USFWS as it pertains to SLR: the refuge and the environmental services office in Arcata.

*Refuge Managers*

The USFWS manages the Humboldt Bay National Wildlife Refuge complex located within several Humboldt Bay hydrologic units. Refuge managers act as landowners of the refuge and has cooperative management with BLM.

*Environmental Services – Arcata Office*

The Arcata office manages public trust assets dealing with habitat conservation and regulation.

*Specific Hydrological Unit Assets and Concerns***Mad River Slough**

- Humboldt Bay National Wildlife Refuge
- Lanphere Adaptation Site
- Wadulh Restoration Project

**Arcata Bay**

- Humboldt Bay National Wildlife Refuge



**Eureka Slough**

- **Humboldt Bay National Wildlife Refuge**

**South Bay**

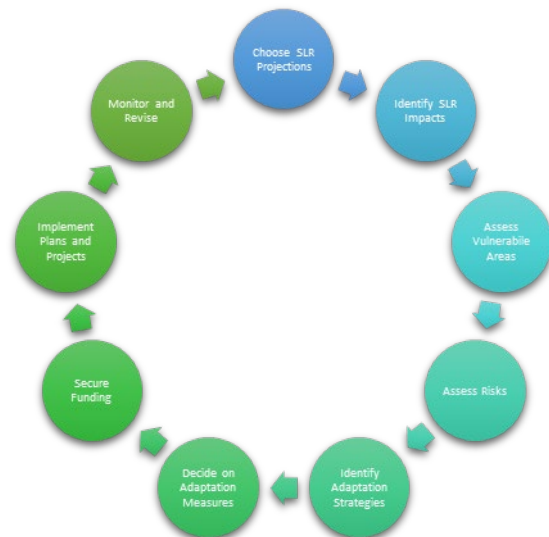
- **Humboldt Bay National Wildlife Refuge**
  - Including a floating dock non-motorized boat launch at Hookton Slough.
  - White Slough Tidal Wetlands Restoration Project
- **Richard J. Guadagno Headquarters and Visitor Center**

*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:	
	Property Ownership and Adaptation Responsibility		✓	Erosion
	Regulatory Authorization and Compliance		✓	Tidal Inundation
✓	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
	Funding		✓	Saltwater Intrusion

*Planning Efforts*

According to the USFWS Pacific Southwest Region website (<https://www.fws.gov/cno/climate.html>), the agency’s climate change strategy, “Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change,” establishes a basic framework within which the USFWS will work as part of the larger conservation community to help ensure the sustainability of fish, wildlife, plants and habitats in the face of accelerating climate change. The plan is implemented through a dynamic action plan that details specific steps the USFWS will take during the next five years. The website states the Strategic Plan focuses on three key elements to address climate change: Adaptation (helping to reduce the adverse impacts of climate change on fish, wildlife, plants and their habitats); Mitigation (reducing levels of greenhouse gases in the earth’s atmosphere), and Engagement (reaching out to USFWS employees; local, national and international partners in the public and private sectors; key constituencies and stakeholders; and the broader citizenry of this country to join forces and seek solutions to the challenges to fish and wildlife conservation posed by climate change.)



The White Slough Tidal Wetlands Restoration Project, which is located on the Humboldt Bay National Wildlife Refuge and is for the most part complete, regained lost salt marsh by repairing eroded diked sections of the wetlands. This area was threatened by dike failure exacerbated by ongoing sea level rise

which would have affected roughly ten acres of un-diked wetlands, 65 acres of diked wetlands, small areas of freshwater marsh, and riparian habitat. Dike failure in this area would impact the flood resilience of the Tompkins Hill Road/Highway Interchange, an important access point for College of the Redwoods. As of 2021, this project is 98% complete. The next proposed restoration project USFWS is developing is the Wadulh Restoration Project in Mad River Slough.

USFWS is a partner in a collaborative research project known as the Humboldt Coastal Resilience Project (HCRP, formerly Climate Ready Project). The USFWS hope to gain information about the response of the refuge’s dunes to sea level rise and extreme events, and what measures they can take to increase resiliency. One of the project’s study sites is the Lanphere Adaptation Site at the refuge. The project has been funded by the State Coastal Conservancy, Bureau of Land Management, and the Ocean Protection Council. Geographically the project spans the Eureka littoral cell (a littoral cell is a stretch of coastline characterized by a closed sediment circulation cell, i.e., sediment does not enter or leave the cell; the Eureka littoral cell stretches from Trinidad to Centerville beach). The HCRP is an ongoing project that aims to document historic and seasonal changes in shoreline position, beach-dune morphology, and vegetation along the Eureka littoral cell in order to develop decision support tools and adaptation measures for sea-level rise and extreme events. The project team, including partners from the State Coastal Conservancy and Friends of the Dunes, are developing an empirical model of dune response to SLR, conducting a SLR vulnerability analysis, testing adaptation strategies at demonstration sites, and developing recommendations for adaptation strategies.

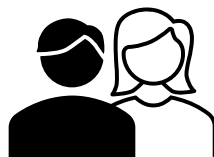
This agency was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The USFWS interview contained 7 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to USFWS**

Shared Funding Coordination  
 Increased Landowner Participation  
 Permitting  
 Diked Former Tidelands  
 Restoration and Mitigation  
 Increased Communication between Stakeholders  
 Shoreline



### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which have also been identified above in this catalogue section as USFWS assets that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Three assets were identified as assets to USFWS and were confirmed as such by USFWS representatives during the SLR Stakeholder Interview 2021. All three received a moderate priority rating or higher by at least 50% of respondents: “Parks and similar public spaces” (63%, n=544), “Natural wetlands, wildlife areas, etc.” (61%, n=537), and “Beaches and similar spaces” (58%, n=537). Overall, these assets received lower than average participation. Results are reported in the graph below.

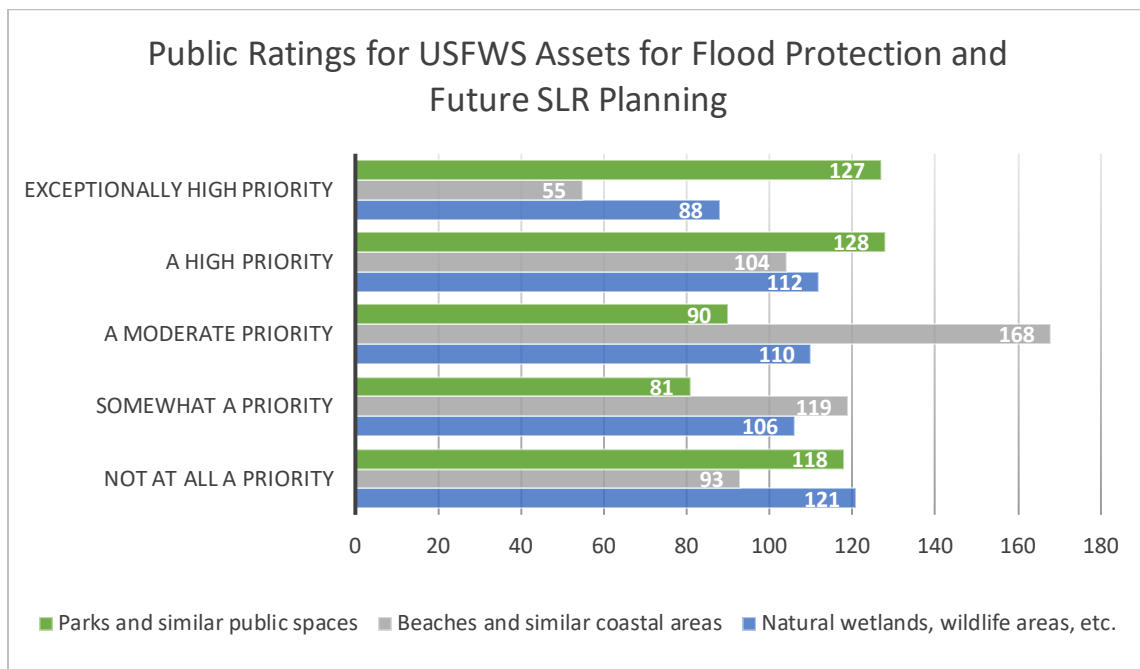
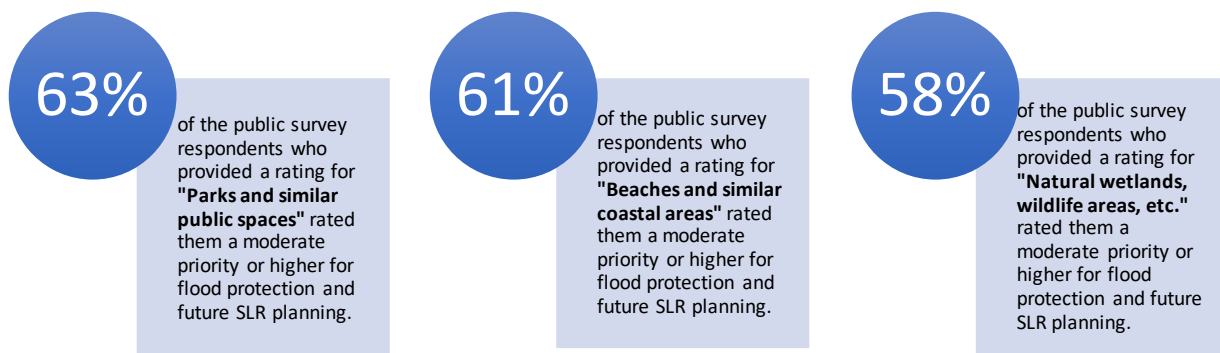
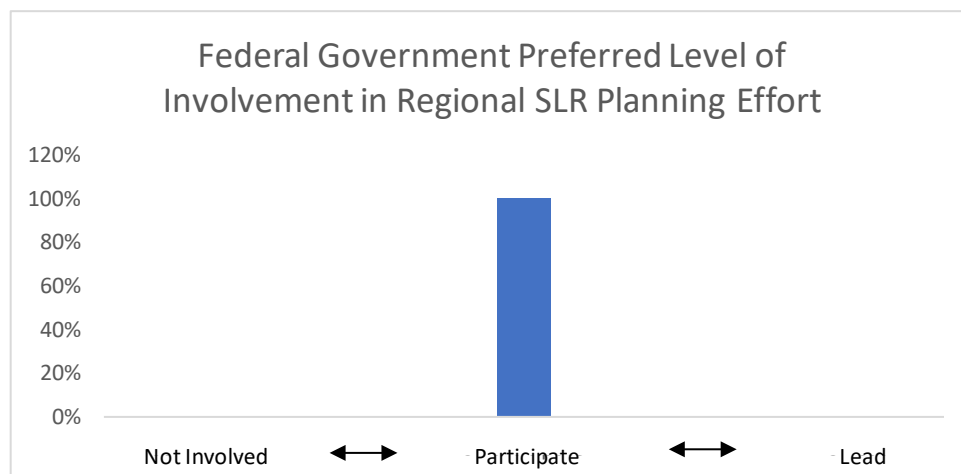


Figure 57. Priority Ratings for Parks and similar public spaces (n=544 shown in green), Beaches and similar coastal areas (n= 539 shown in grey), and Natural wetlands, wildlife areas, etc. (n=537 shown in blue), regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 4 respondents for the Federal Government category. Participants were from the Bureau of Land Management, US Fish & Wildlife Service, and US Department of Agriculture-Natural Resources Conservation Service. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. All Federal Government respondents preferred the participation level of involvement as shown in the graph below.



*Figure 58. Federal Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Federal Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 75% preference for a Watershed/HU approach as shown in the graph on the next page.



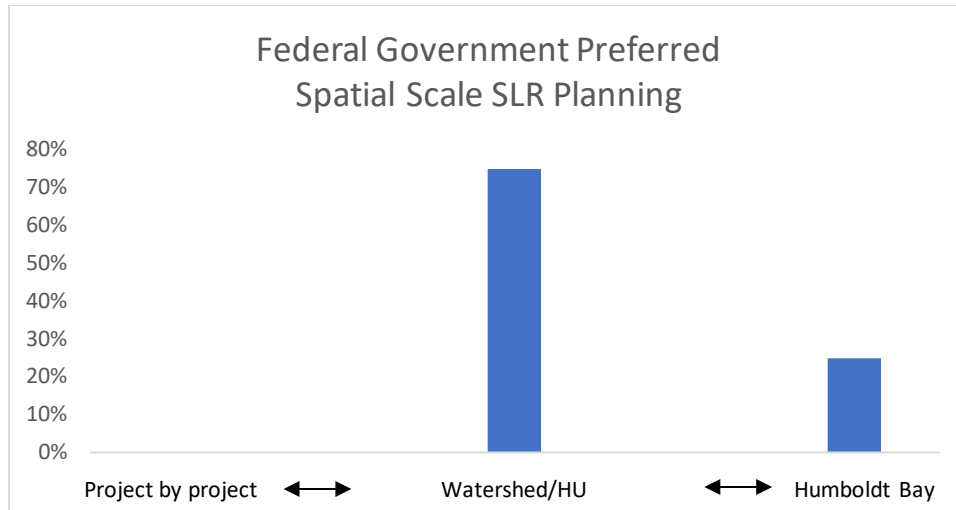


Figure 59. Federal Government respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=4)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Federal Government favored empowering or retooling an existing regional agency with 100% of respondents rating this option somewhat favorable or higher. Similarly, 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

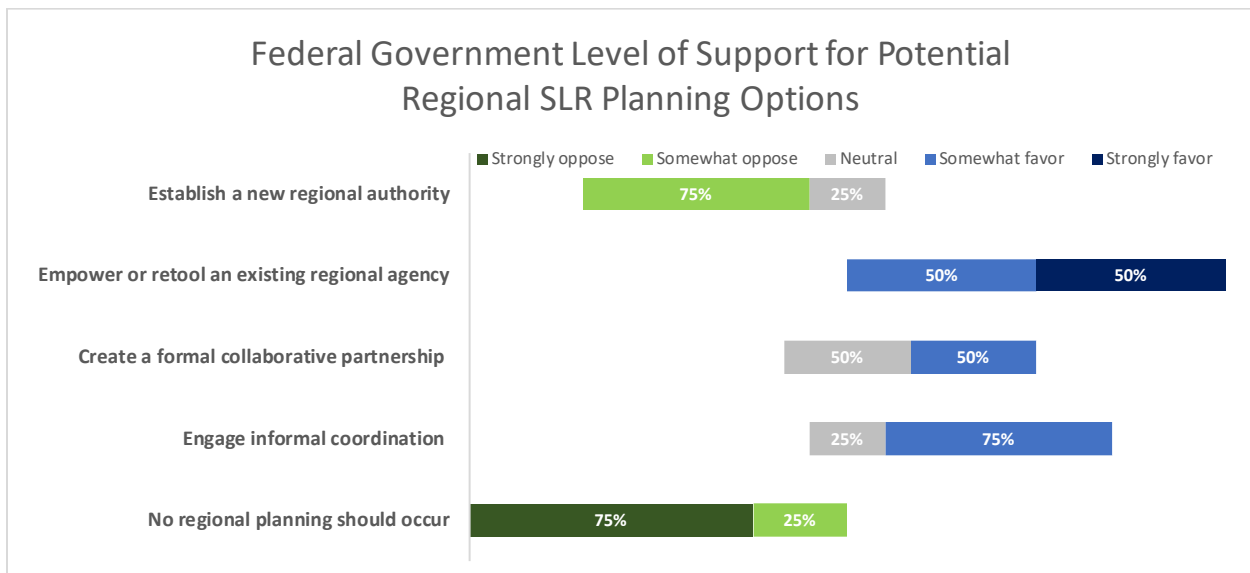


Figure 60. Federal Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

*Reference Links*

<https://www.fws.gov/cno/climate.html>

[http://humboldtrcd.org/projects/white\\_slough\\_wetlands\\_enhancement\\_project](http://humboldtrcd.org/projects/white_slough_wetlands_enhancement_project)

<https://www.fws.gov/nwrs/threecolumn.aspx?id=6442461340#:~:text=The%20Lanphere%20Adaptation%20Site%20at,level%20rise%20and%20extreme%20events>

## U.S. Geological Survey

### *Roles & Responsibilities*

Federal Agency 

Other - Science Provider 

The U.S. Geological Survey (USGS) is a science bureau within the United States Department of the Interior. It provides science about the natural hazards that threaten lives and livelihoods; the water, energy, minerals, and other natural resources we rely on; the health of our ecosystems and environment; and the impacts of climate and land-use change. This science includes natural resource conditions and problems such as SLR. Within Humboldt County they have performed and are actively still performing studies regarding SLR including:

- Assessing Suspended-Sediment Supply and Marsh Accretion in Humboldt Bay, CA (Currently Active)
- Sea Level Rise and the Coastal Storm Modeling System for Humboldt Bay and North Coast of California USGS (2018 – 2022)
- Ecosystem and community vulnerability to surface and subsurface flooding and salinity dynamics with sea level rise and adaptation strategies, Humboldt Bay, USGS, University of Wyoming, and EPA (2019-2022).
- Humboldt Bay: Sea Level Rise, Hydrodynamic Modeling, and Inundation Vulnerability Mapping 2015
- Humboldt Bay NWR Sea-level rise modeling 2011

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- Natural resources, natural ecosystems, and natural hazards
- Scientific studies

 Shoreline Protection

 Environmental

### General Concerns

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

### Planning Efforts


USGS has conducted multiple studies throughout multiple sites around Humboldt Bay to assess salt marsh response to sea-level rise (2016) and changes to fine sediment supply conditions (preliminary results 2019). A current study (2019-2022) entitled Exploring Ecosystem and Community Vulnerability to Surface and Subsurface Flooding with Sea Level Rise and Adaptation Strategies in California includes USGS as a partner and is funded by NOAA's Effects of Sea Level Rise (ESLR) Program. The project considers coastal water movement, groundwater flow, and processes that change wetland elevation to compare the effectiveness of natural and nature-based features (NNBFs) and conventional infrastructure to reduce sea level rise-driven flood hazards. The project will use a model to investigate two different coastal areas in California: Santa Monica Bay and Humboldt Bay. The model results and input from stakeholders will be used to quantify the non-protective ecosystem services provided by NNBFs and to test several different mitigation strategies that could be implemented. These strategies will range from conventional designs, such as seawalls and bulkheads, to natural approaches, such as marshes and oyster reefs. This project will advance current knowledge of the effectiveness of NNBF and conventional infrastructure approaches at reducing surface and sub-surface flood hazards and providing additional ecological and socioeconomic benefits. In addition to USGS, project partners include the University of Arkansas, University of Texas Arlington, Point Blue Conservation Science, Greenway Partners, and USC and UC Sea Grant.

Coastal Storm Modeling System (CoSMoS), developed by the USGS, models coastal flooding with SLR, storm events, and long-term coastal evolution (i.e., beach changes and cliff/bluff retreat) over large geographic areas (100s of kilometers). Areas from Point Arena to California's southern boarder have been modeled and the north coast and Humboldt Bay is expected to be completed in 2022.

The USGS Coastal and Marine Hazards and Resources Program (CMHRP) conducts a wide variety of research in coastal and marine environments to support scientific understanding, develop tools and technology, and provide maps, data, and other information needed by resource managers and decision-makers, as noted on the Program website. This program addresses coastal hazards and coastal change including sea level rise. The above-described CoSMoS is part of this program. The CMHRP also includes the Decadal Strategic Plan, described as containing the CMHRP's vision and mission and the strategic framework needed to support key program goals: Conduct research and develop science-based tools that lead to safer, more productive coastal communities and improved stewardship of natural resources.

### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. When asked where survey participants got their information about sea level rise, 32% (n=182) said Federal agency reports and briefings.



32%

of the public surveyed  
get their SLR  
information from  
Federal agency  
reports and briefings

### *Reference Links*

<https://www.usgs.gov/>

[https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1036&context=hsuslri\\_local](https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1036&context=hsuslri_local)

[https://www.usgs.gov/centers/pcmsc/science/coastal-storm-modeling-system-cosmos?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/pcmsc/science/coastal-storm-modeling-system-cosmos?qt-science_center_objects=0#qt-science_center_objects)

<https://www.usgs.gov/natural-hazards/coastal-marine-hazards-and-resources/science>

<https://www.usgs.gov/natural-hazards/coastal-marine-hazards-and-resources/science/coastal-change>

<https://coastalscience.noaa.gov/project/exploring-ecosystem-and-community-vulnerability-to-surface-and-subsurface-flooding-in-california/>

## Shoreline Structure/Property Owners

### City of Arcata

*See page 23. - Environmental Services*

*See page 24. - Building and Engineering*

### City of Eureka

*See page 32. - Public Works*

### Friends of the Dunes

#### *Roles & Responsibilities*

Private Property Owner



Nonprofit Organization



Friends of the Dunes (FOD) is a regional land trust and non-profit community organization involved in conserving coastal environments. FOD focuses on coastal ecosystem restoration, education programs,

and guided walks. In its role as a land trust, FOD owns and maintains the Humboldt Coastal Nature Center (HCNC) and recently became interim owner (a long-term conservation owner will be identified in the future) of 357 acres of coastal dune and bayfront property on the north spit of Humboldt Bay, referred to as the Samoa Dunes and Wetlands. This acquisition was accomplished in partnership with Security National, the Harbor District, the Wildlife Conservation Board, the California Natural Resources Agency, and the California State Coastal Conservancy for the purposes of conservation and public access. FOD manages the Samoa Dunes and Wetlands in partnership with the Harbor District, BLM, Humboldt County, the State Coastal Conservancy, and the Wiyot Tribe. The addition of this property to existing north spit conservation lands creates a 1600-acre continuous area of native dunes managed for habitat conservation and public access. FOD's main goals as an organization include:

- Provide community education that fosters understanding and appreciation and inspires conservation
- Build community-based restoration programs that serve to maintain and enhance the natural diversity of coastal environments
- Conserve strategically located coastal properties through conservation easements and land acquisition to ensure that land use is consistent with the ecological values of native coastal dune systems
- Develop an effective and efficient organization capable of conserving coastal environments in perpetuity

*Specific Hydrological Unit Assets and Concerns*

- **Samoa Dunes and Wetlands**

- FOD does not intend to be the long-term landowner for the Samoa Dunes and Wetlands. They also do not intend develop trails, parking areas, or implement restoration activities while they act as the interim land manager. They plan to cooperate with county, state, federal, and Tribal partners to determine what long-term ownership or management would look like and what the best long-term options are for this land and community.



- **Humboldt Coastal Nature Center (HCNC)**

- The HCNC is 118 acres of coastal dune property with a nature learning facility that acts as a public gateway to surrounding coastal lands. The facility’s exhibits, trails, and programs combine experiential education with conservation-minded recreational access and hands-on restoration activities. The goal of this programming is to increase public understanding and awareness of local coastal environments as well as inspire community-driven stewardship.

*General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
	Regulatory Authorization and Compliance		Tidal Inundation
	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

*Planning Efforts*

Beginning in 2015, the State Coastal Conservancy awarded Friends of the Dunes \$249,000 for the first two years of the Dunes Climate Ready Study. Friends of the Dunes is the fiscal sponsor of the grant, and the US Fish & Wildlife Service has taken the lead in this collaborative project involving multiple partners. The goal of this study, originally scheduled for five years, is to improve understanding of sediment movement along the entire Eureka littoral cell, a 32-mile unit of coastline and to identify potential vulnerabilities to climate change and potential response to future sea level rise.

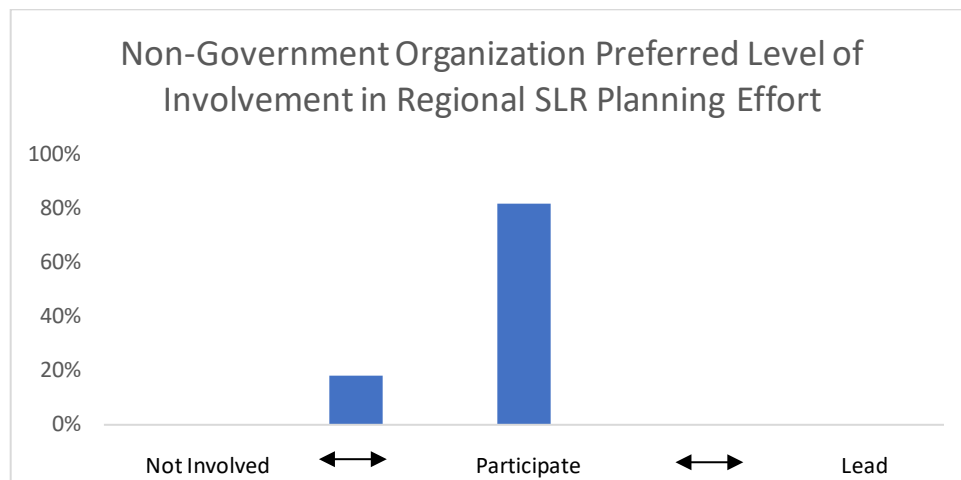
Renamed the Humboldt Coastal Resilience Project (HCRP), the project has been extended for another three years with grant funding from the Ocean Protection Council and the California State Coastal Conservancy. A combined total of \$430,750 has been awarded to FOD, who is the fiscal receiver of project grant funds and is overseeing the outreach component of the project. The project aims to document historic and seasonal changes in shoreline position, beach-dune morphology, and vegetation along the Eureka littoral cell in order to develop decision support tools and adaptation measures for sea-level rise and extreme events. The project team, including partners from the State Coastal Conservancy and USFWS,

are developing an empirical model of dune response to SLR, conducting a SLR vulnerability analysis, testing adaptation strategies at demonstration sites, and developing recommendations for adaptation strategies.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, Friends of the Dunes was sent a survey categorized as a Non-Governmental Organization since it is a non-profit in addition to being a land trust. There was a total of 12 respondents for this category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for Non-Governmental Organization ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph below.



*Figure 61. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph on the next page.

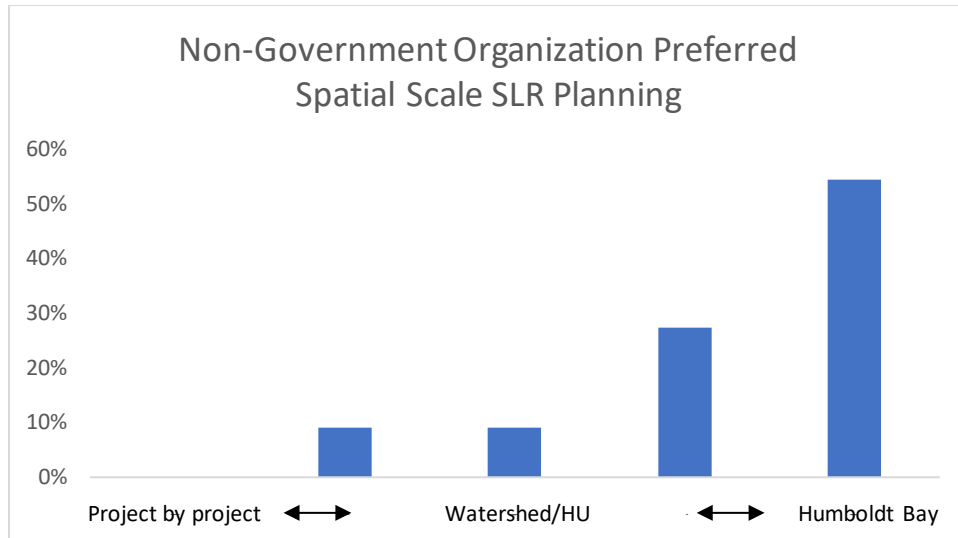


Figure 62. Non-Government Organization respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Similarly, 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

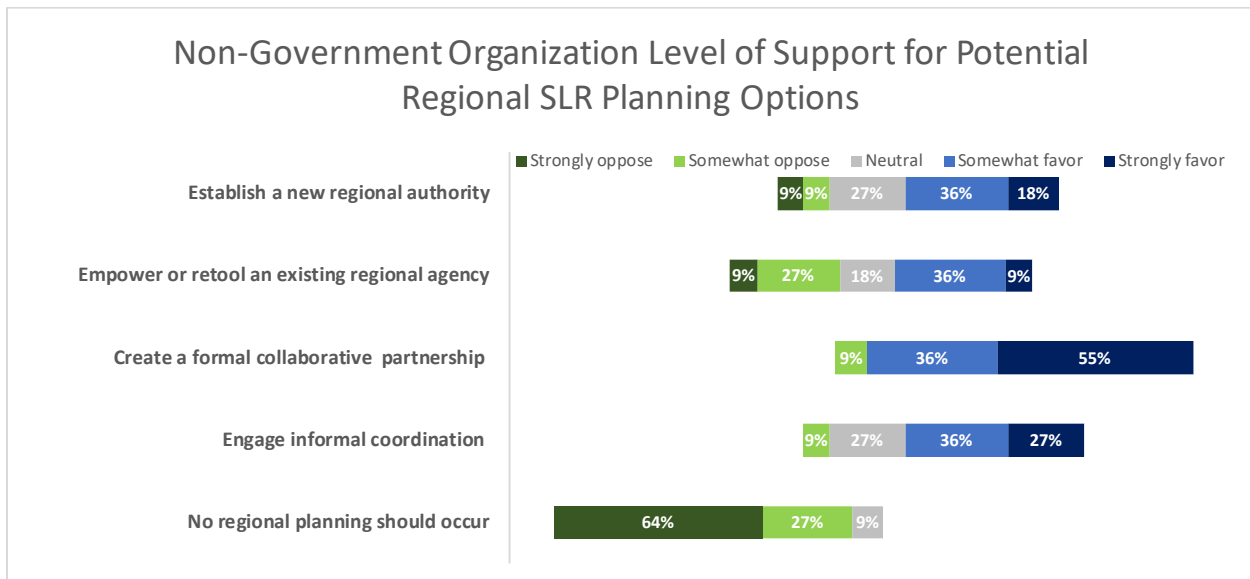


Figure 63. Non-Government Organization respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)

**Reference Links**

<https://www.friendsofthedunes.org/>



## Humboldt County

*See page 41.*

## Humboldt County Resource Conservation District

### *Roles & Responsibilities*



The Humboldt County Resource Conservation District (HCRCD) is a non-regulatory organization that works in voluntary cooperation with landowners, residents, and community groups in unincorporated Humboldt

County. HCRCD's stated mission is to enhance and improve the sustainability of natural resources by educating, providing training, and assisting private and public landowners and land users. HCRCD has successfully helped landowners and managers complete multiple implementation projects to restore ecosystems, remove fish barriers, reduce sediment delivery to local tributaries, and improve grazing management. The District has also maintained a successful dairy program on behalf of producers needing assistance with structural improvements, nutrient management, and regulation compliance. Their work also includes providing the general public and private landowners with information on drought and water conservation practices so that environmental resources can be preserved and protected.

Humboldt County Resource Conservation District was originally the Eel River Resource Conservation District, created by popular vote in 1987. In 1993 the District was expanded to be a countywide Special District under Division 9 of the California Public Resources Code which authorizes Resource Conservation Districts (RCDs) as legal subdivisions of the state government. This Division also defines the State of California's framework for conducting the business of resource conservation within the State and details the general powers and operations of RCDs. The district is governed by a voluntary Board of Directors consisting of community leaders appointed by the Humboldt County Board of Supervisors. The District provides primary technical services through a cooperative partnership with the United States Department of Agriculture's Natural Resource Conservation Service (NRCS) and provides technical staff specifically hired by the District through grant funding.

### *Specific Hydrological Unit Assets and Concerns*

#### **All hydrological units**

- **Natural resources in unincorporated Humboldt County**



#### **Mad River Slough**

- **Mad River Slough Demello Parcel Restoration Project**

## **South Bay**

- **White Slough Wetlands Enhancement Project**

### *General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
	Regulatory Authorization and Compliance		Tidal Inundation
	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

### *Planning Efforts*

HCRCDC handles planning for sea level rise on a case by case basis for easements they acquire, and for existing easements associated with restoration plans still in the implementation phase. They also import and re-use fill to adapt restoration sites for SLR impacts. There are a few completed projects that have incorporated plans for SLR. At the time of the SLR Stakeholder Interview, there were two that they were focused on: the Mad River Slough Demello Parcel Restoration Project and White Slough Wetland Enhancement Project.

Mad River Slough Demello Parcel Restoration Project is a parcel acquired in 2010 by USFWS and transferred to the Humboldt Bay National Wildlife Refuge. There is proposed coastal dune restoration to this site and nearby parcels. Dune restoration is intended to build up sand in the foredune and backdune habitat.

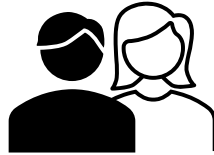
The White Slough Wetland Enhancement Project was undertaken in cooperation with the USFWS at the Humboldt Bay National Wildlife Refuge at the White Slough Unit. Because the area behind existing dikes has subsided, dike failure would result in a conversion of brackish marsh to mudflat, and would expose the Tompkins Hill Road-Highway 101 Interchange, which provides access to the College of the Redwoods, to increased threat of flooding. The threat of dike failure is exacerbated by sea level rise. This project restored salt marsh, enhanced brackish and freshwater wetlands, and will help to maintain the Tompkins Hill-101 interchange and access to the College of the Redwoods.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The HCRCDC interview contained 10 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to HCRCDC**

Shared Funding Coordination  
 Regional Coordination in General  
 Increased Landowner Participation  
 Permitting Limitations  
 Diked Former Tidelands  
 Restoration and Mitigation  
 Personnel Constraints  
 Dedicated Time Constraints  
 Dredged Material  
 Additional Governmental Guidance



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which were identified above in this catalogue section as HCRCDC assets that could be subject to sea level rise impacts and were confirmed as such by HCRCDC representatives during the SLR Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. The top-rated prioritized asset by the public related to HCRCDC is “Agricultural land to protect inland infrastructure” with 81% of respondents rating them a moderate to exceptionally high priority (n=545). Two other assets are related to HCRCDC assets and concerns but were rated much lower: “Agricultural land to preserve agricultural activities” (66%, n=542) and “Natural wetlands, wildlife areas, etc.” (57%, n=537). Results for priority ratings are reported in the graph on the next page.

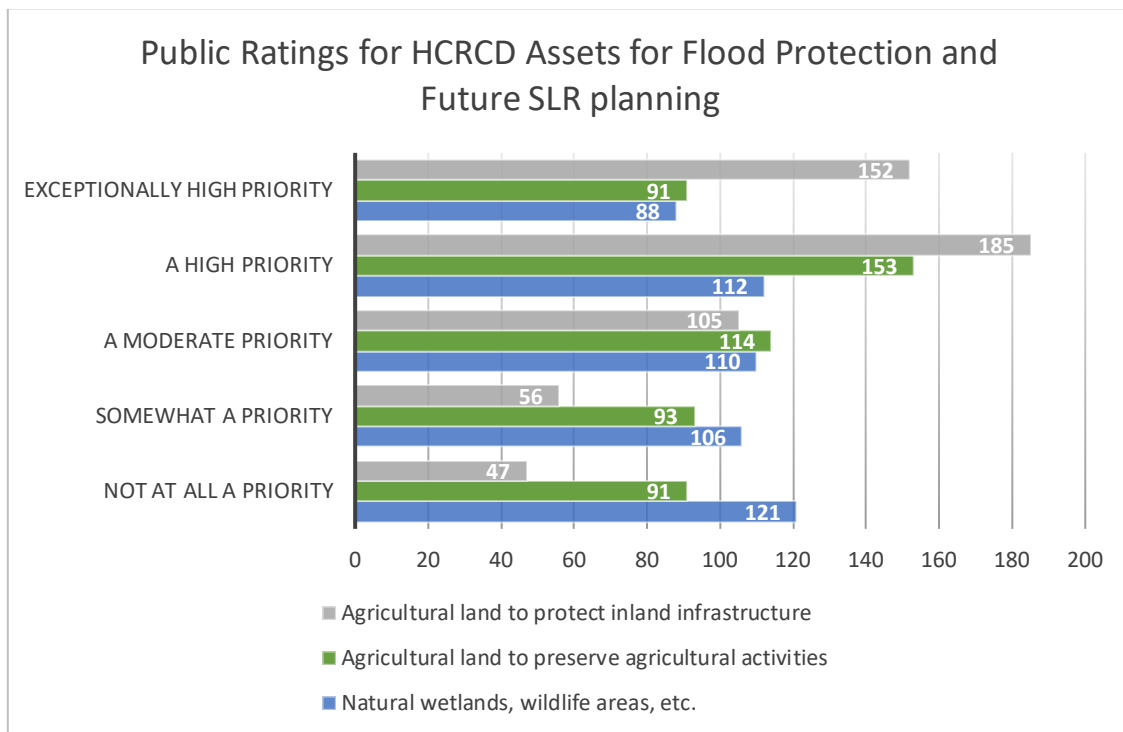
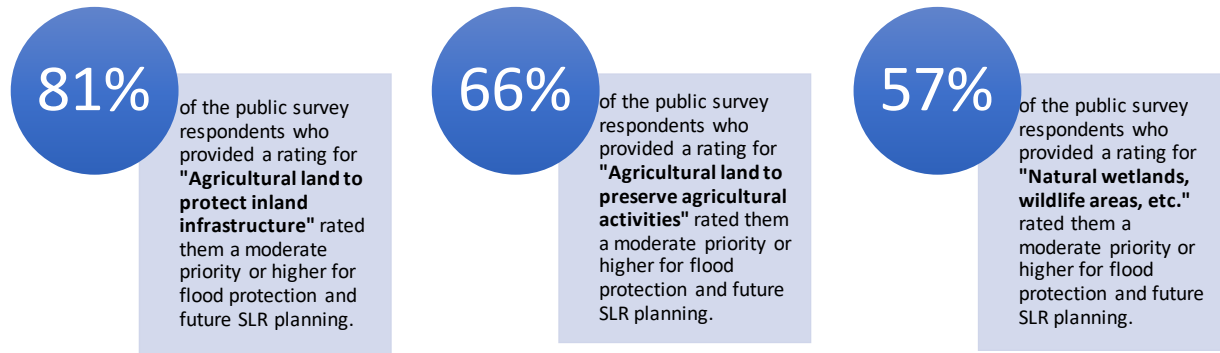


Figure 64. Priority Ratings for Agricultural land to protect inland infrastructure (n= 545 shown in grey), Agricultural land to preserve agricultural activities (n=542 shown in green), and Natural wetlands, wildlife areas, etc. (n=537 shown in blue), regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021 there was a total of 25 respondents for the State Government category though participation for individual questions varied. Participants included the

California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors’ Office of Planning and Research, and State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the State Government category ranged from “participate” to “lead” with a 65% preference for participation as shown in the graph below.

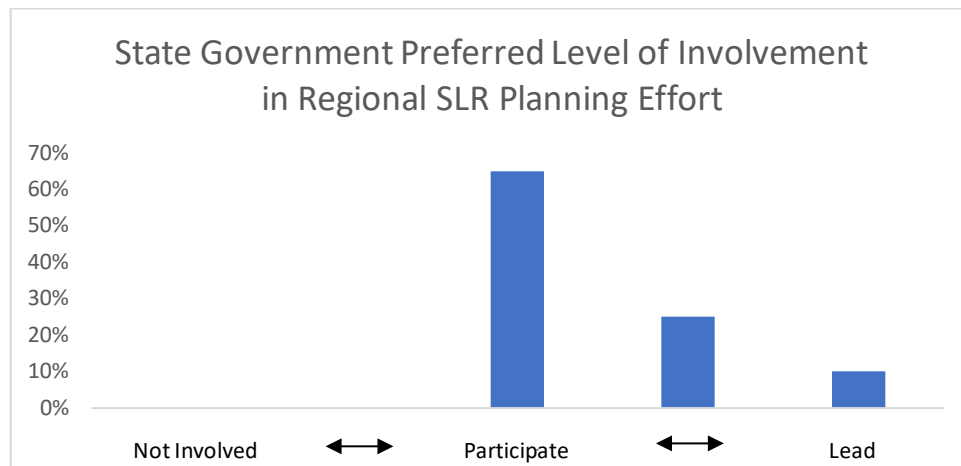


Figure 65. State Government respondents’ preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the State Government category ranged from Watershed/HU to Humboldt Bay in scale with a 68% preference for a Humboldt Bay approach as shown in the graph below.

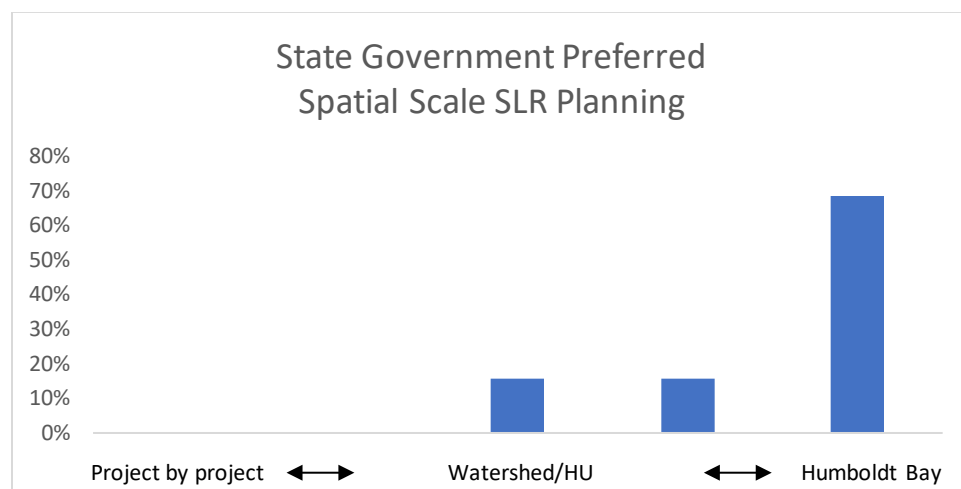


Figure 66. State Government respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

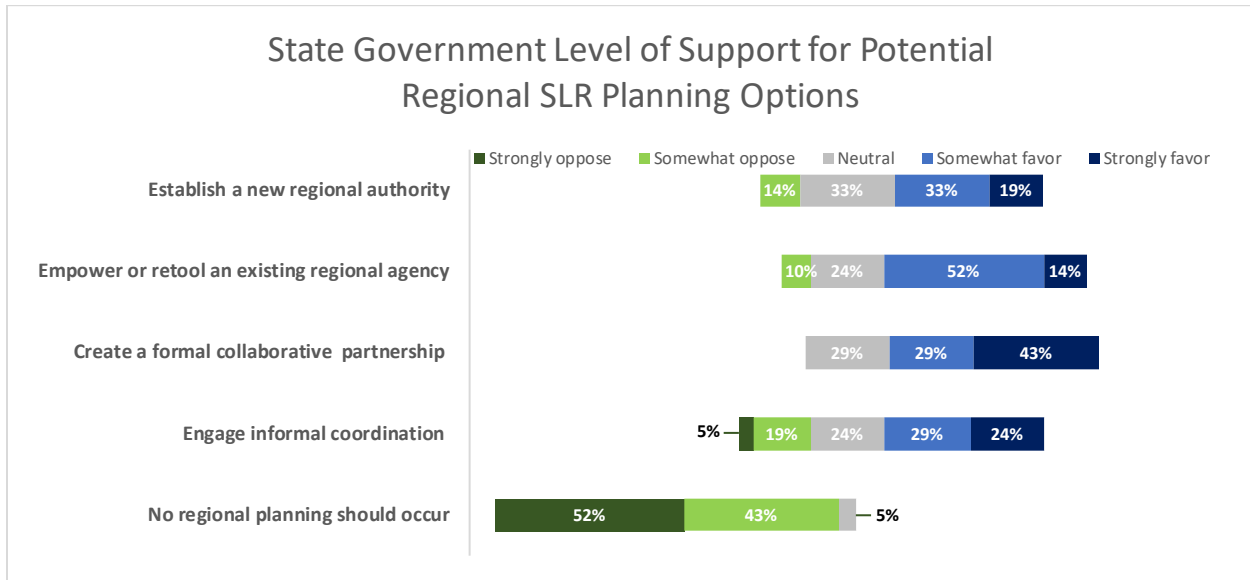


Figure 67. State Government respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

*Reference Links*



<http://humboldtrcd.org/>

[https://files.ceqanet.opr.ca.gov/262306-2/attachment/\\_C-CoVNgF0v4YpPGRDiDsLvHrFo1jFAA\\_wYwJO0QgmfF1Ombkejx1mjxXHLclKB58MULaiURW\\_egqFM0](https://files.ceqanet.opr.ca.gov/262306-2/attachment/_C-CoVNgF0v4YpPGRDiDsLvHrFo1jFAA_wYwJO0QgmfF1Ombkejx1mjxXHLclKB58MULaiURW_egqFM0)

[http://humboldtrcd.org/projects/in-stream\\_and\\_habitat\\_restoration](http://humboldtrcd.org/projects/in-stream_and_habitat_restoration)

## Northcoast Regional Land Trust

*Roles & Responsibilities*

- Private Property Owner 
- Nonprofit Organization 

The Northcoast Regional Land Trust (NCRLT) is a nonprofit organization headquartered in Arcata governed by a large Board of Directors. NCRLT is focused on protection of land and water resources in California’s north coast region including Humboldt, Del

Norte, and Trinity Counties, and has conserved more than 50,000 acres of wild and working land on the North Coast alone.

NCRLT is dedicated to the protection and economic viability of working landscapes, farms, forests, and grazing lands, and to the preservation and protection of land for its natural, educational, scenic, and historic values. Working with landowners on a voluntary basis, they promote stewardship of the region's resource base, natural systems, and quality of life. Their program areas include Land Conservation (conservation easements or acquisitions), Conservation Planning, and Building Community for Conservation (outreach and education).

### *Specific Hydrological Unit Assets and Concerns*

#### **Eureka Slough**

- **Freshwater Farms Reserve**



Shoreline Protection



Environmental

#### **Elk River Slough**

- **Martin Slough**

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
	Regulatory Authorization and Compliance		Tidal Inundation
	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

### *Planning Efforts*

This organization was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.

### *Reference Links*

<https://ncrlt.org/>

## Reclamation District 768

### *Roles & Responsibilities*

Local Agency 

Public Property Owner 

Reclamation District 768 is a California special district with legal and regulatory oversight over Land Reclamation and Levee Maintenance in Humboldt County. It is the only existing reclamation district on Humboldt Bay. The District was formed in 1904 via

petition by E.B. Jackson et al to the County Board of Supervisors under the Green Act. According to the petition for the formation of the District, the District covers 1,499 acres, and borders Humboldt Bay on the south, Mad River Slough on the west, and Daniels Slough runs through the eastern portion of the District (presumed to be McDaniels Slough). More specifically, it covers the northern portion of Arcata Bay west of Arcata and up Mad River Slough to the junction with Liscom Slough. The District is comprised of “Swamped Overflowed Land” that was mostly salt marsh and deemed unfit for cultivation because it was at times covered by salt water prior to its reclamation.

According to the formation petition, the District’s plan of reclamation “contemplates the keeping of salt water off said land by means of a system of dykes (sic) or levees constructed along the margin of said Bay the bank of said Mad River Slough and Daniels Slough, of heighth (sic), size and character sufficient to prevent the salt water from the bay and sloughs from flowing upon said land within the District.” The original plan of reclamation was completed prior to the formation of the District. Dikes on the east side of Mad River Slough and along the Bay margin that connected to the Arcata and Mad River Railroad bed on the east end, and along both banks of McDaniel Slough from the mouth north approximately one-half mile, were constructed at the time the District was formed. The dikes had an average width of 20 feet at the base and an average height of 3.5 feet, with a ditch on the inside, and included flood gates.

Reclamation, defined primarily as flood control and drainage but also includes irrigation of any land subject to any manner of overflow, is one of the earliest forms of public improvement in California. Lands subject to overflow, also commonly referred to as wetlands, were granted to the state by the Federal Swamp Land Act of 1850. These Reclamation Districts were intended to help landowners coordinate the local reclamation of land. Reclamation districts now operate under Water Code Division 15 section 50000 et seq. Under *Id* section 50932 and 50933, a District is authorized to specifically “construct, maintain and operate such drains, canals, sluices, bulkheads, water gates, levees, embankments, pumping plants, dams, diversion works, or irrigation works” in order to support reclamation public works. This also includes bridges and road systems that ensure access to reclamation works.

As a special district, this public entity is able to exercise certain governmental functions within the boundaries of its District such as acquire, build, and operate reclamation projects but is also subject to all laws generally applicable to local districts such as the Brown Act and public bidding. A reclamation district also has the authorization to join powers with other entities for a common purpose. Following a major breach on Mad River Slough in 2003 and Hurricane Katrina in 2005, the Reclamation District was the recipient of emergency funds from the Federal Emergency Management Agency to fortify its dikes.



*Specific Hydrological Unit Assets and Concerns***All hydrological units**

- Reclaimed tidal wetland and levees



Shoreline Protection

*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility	✓	Erosion
	Regulatory Authorization and Compliance	✓	Tidal Inundation
	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
	Funding		Saltwater Intrusion

*Planning Efforts*

No known planning has or is occurring.

*Reference Links*

<https://ceqanet.opr.ca.gov/Project/2004092095>

<https://documents.coastal.ca.gov/reports/2009/6/F6a-6-2009.pdf>

<http://www.balmd.org/reclamation-levee-maintenance-district.html>

[Petition of E.B. Jackson for the formation of Reclamation District 768, Book A of Land Claims, Page 117, Records of the County of Humboldt \(no link\)](#)

<https://humboldt.gov/DocumentCenter/View/89123/Historical-Resource-Evaluation-Report-April-2018?bidId=>

<https://humboldtbay.org/sites/humboldtbay2.org/files/Humboldt%20Bay%20Sea%20Level%20Rise%20Adaptation%20Planning%20Project%20Phase%20I%20Report%20-%20Compressed.pdf>

## California Department of Fish & Wildlife

*See page 70.*

## North Coast Railroad Authority (Great Redwood Trail Agency)

### *Roles & Responsibilities*



The North Coast Railroad Authority (NCRA) was formed in 1989 by the California Legislature under the North Coast Railroad Authority Act, which was intended to insure continuation of railroad service in northwestern California. NCRA has various powers and duties for the north coast areas intended to ensure

service continues on the Northwestern Pacific (NWP) rail line. In addition to overseeing policy, the NCRA has the authority to acquire, own, operate, and lease property related to the operation and maintenance of the railroads without operational funding from the state or governmental agencies. They have responsibility for all repairs and maintenance derived from a budget comprised of a variety of property leases along the NWP line, the lease of rolling stock and equipment, and lease payments made by the operator NWP Co.

The 2017 Update of the HCOAG 20-Year Regional Transportation Plan includes a Goods Movement Element, which includes an assessment of rail transport needs. This assessment notes that to reinstate service on a belt line from South Fork, around Humboldt Bay to Samoa, would require \$30 million for repairs, environmental clearance, and a rail-barge transfer would be desirable. For restoration through the Eel River Canyon, the assessment notes the requirement of a Business Plan identifying freight volume sufficient to justify repair and maintenance costs, an Environmental Impact Report, repair costs have been determined, and funding for repairs has been identified.

The NCRA allows bike and pedestrian paths on their right of way and although their tracks are in disrepair, they remain in place. In 2018 SB 1029, a bill to establish a Great Redwood Trail in the rail corridor from Marin County to Humboldt County, was signed by Sen. Mike McGuire and Gov. Jerry Brown. This bill includes a pathway to the dissolution of NCRA as a railroad authority. SB 69, introduced in 2020 and amended in 2021, would rename NCRA the Great Redwood Trail Agency (GRTA), and would require NCRA to transfer all rights, interests, privileges, and responsibilities relating to the northern portion of their right-of-way (this would include the portion within Humboldt County) to the Agency. In early March 2022 this transfer began when the newly created GRTA held its inaugural meeting and was given control of a key segment of line in Humboldt and Mendocino counties amounting to 200 miles. Senator McGuire declared the NCRA officially ceased to exist in a speech on March 14, 2022, and the new trail-focused GRTA began with the same board of directors as the NCRA.

Although the Sonoma Marin Area Rail Transit (SMART) will be in charge of the Great Redwood Trail from Larkspur to Cloverdale, the GRTA will be building the trail from Cloverdale to Humboldt Bay. However, there remains challenges to the completion of the trail from Humboldt Bay onward. For instance, in 2021 portions of the North Coast railroad were targeted for redevelopment in a federal application by a Wyoming company interested in shipping coal.

### *Specific Hydrological Unit Assets and Concerns*

#### **Mad River Slough**

- **Railway tracks**

#### **Arcata Bay**

- **Railway tracks**
  - The city of Arcata and the county of Humboldt have left the tracks in place while constructing the trails around Humboldt Bay in the NCRA right-of-way. Along the Eureka and Arcata 101 corridor, NCRA property includes dikes that are documented to be vulnerable to SLR inundation.



#### **Eureka Slough**

- **Railway tracks**

#### **Eureka Bay**

- **Railway tracks**
  - The city of Eureka also has plans to leave the tracks in place as they construct trails around Humboldt Bay on NCRA right-of-way. Eureka has an interest in promoting the utilization of the rail assets around Humboldt Bay by cooperatively developing a belt line between South Fork to the Port of Humboldt Bay and possibly excursion services around the Bay. Beginning in 2009, the Timber Heritage Association (THA) began offering a limited number of regular speeder car rides from Samoa to Manila and special rides in other locations. However, further maintenance needed to maintain a full-size locomotive is currently out of budget. Infrastructure improvements on NCRA right-of-way will need to consider the impacts of SLR.

#### **Elk River Slough**

- **Railway tracks**

#### **South Bay**

- **Railway tracks**
- **Abandoned railroad grade and water control structures that divide the commercial/industrial waterfront from the residential area of Fields Landing.**

*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance		Tidal Inundation
✓	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
✓	Funding		Saltwater Intrusion

*Planning Efforts*

No known planning has or is occurring by NCRA, however SLR vulnerability assessments performed by other entities have included shoreline structures within the railroad right of way. Portions of the line now under GRTA control will be part of a new Masterplan for the Trail, a process that will begin in July 2022 in partnership with the State Coastal Conservancy who is also in charge of the California Coastal Trail.

*Reference Links*

<http://www.northcoastrailroad.org/>

<http://www.northcoastrailroad.org/sb-1029-state-mandate.html>

[https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180SB1029](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1029)

[http://www.hcaog.net/sites/default/files/rtp\\_maps\\_appendices\\_included\\_0.pdf](http://www.hcaog.net/sites/default/files/rtp_maps_appendices_included_0.pdf)

[https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=202120220SB69](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB69)

<https://www.times-standard.com/2019/04/11/rail-authority-environmental-groups-reach-settlement-after-nearly-a-decade-of-legal-battle/>

<https://www.pressdemocrat.com/article/news/great-redwood-trail-to-stretch-from-sf-bay-to-humboldt-bay-enters-plannin/?artslide=0>

<https://mendovoice.com/2020/11/whats-the-status-of-the-great-redwood-trail-we-looked-into-it/>

<https://www.sfchronicle.com/travel/article/Great-Redwood-Trail-stretching-from-S-F-Bay-to-17001982.php>

<https://kymkemp.com/2022/03/16/the-great-redwood-trail-agency-takes-over-the-north-coast-rail-line/>

<https://www.petaluma360.com/article/news/north-coast-railroad-authority-shuts-down-board-rebrands-as-great-redwood/>

## U.S. Fish and Wildlife Service

*See page 108.*

## Agricultural Properties

*See page 138.*

## Vulnerable Property Owners

### At-Risk Communities

#### *Roles & Responsibilities*

##### Private Property Owner



There are three communities located in the area of unincorporated Humboldt County that are vulnerable to and at risk from sea level rise of 3.3 feet (1.0 meter):

King Salmon, Fields Landing, and Fairhaven (which includes the area referred to as Finntown). A significant area of each of these communities is located in the Coastal Commission's state retained jurisdiction area in the HBAP.

King Salmon has residential property owners, trailer park and RV park owners and residents, several commercial and recreational businesses, the region's largest privately-owned (PG&E) power generating station, public recreational facilities, public utilities and roads, and publicly utilized beach. Fields Landing has residential property owners and residents; several commercial and Coastal-Dependent Industrial properties, facilities, and businesses; and public roads, public facilities and public utilities. Humboldt County Public Works maintains community streets and several water control structures for stormwater runoff, and Humboldt Community Services District provides municipal water and wastewater service for both communities. PG&E provides natural gas and electricity, and several private companies maintain communications infrastructure to deliver their services to the communities.

Fairhaven was built on a sand dune formation located on the Samoa Peninsula/North Spit on the western shore of Humboldt Bay. It can be accessed from the County maintained New Navy Base Road and Highway 255. In the 19<sup>th</sup> century, this community area was associated with ship building. It currently includes a former pulp mill, which is now the Fairhaven Business Park, an unused bulk cargo dock, several commercial warehouses, and a residential area. The Samoa Peninsula Fire District Station is located adjacent to this residential area. Finntown has an active marine repair/dry dock facility, aquaculture pier, other commercial uses, and waterfront residential parcels. Both Fairhaven and Finntown are served by individual septic tank-leach field systems.

There is no known community entity or organization (i.e., homeowners association, special district, or municipality) to represent the specific interests of residents and business owners in these areas other than the County and HCSD.

*Specific Hydrological Unit Assets and Concerns*

**Eureka Slough**

- **Fairhaven/Finntown**
  - This is a SLR-vulnerable community with residential property owners and residents, several commercial businesses, and a Fairhaven Business Park.
  - Zerlang & Zerlang Marine Services and boat yard



**South Bay**

- **King Salmon**
  - King Salmon is a SLR-vulnerable community that has residential property owners and residents, and a trailer and RV park owners and residents. There are several privately owned commercial and recreational fishery service providers including a fuel dock, bilge, and sewage pump-out station, 80 boat berths, and many private docks.
  - EZ Landing boat launch ramp
  - Johnny’s Landing boat launch ramp
  
- **Fields Landing**
  - Fields Landing is a SLR-vulnerable community with residential property owners, residents, and commercial property as well as Coastal-Dependent Industrial properties, facilities, and businesses. There is also a multi-purpose dock and a commercial fishing dock in poor repair. The Harbor District owns and maintains the Fields Landing boat yard with dry dock facilities for commercial and recreational boat repairs. The County-owned boat launch ramp and parking lot are vulnerable to 1.6 feet of SLR.

*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

*Planning Efforts*

As part of the update to the Humboldt Bay Area Plan (HBAP), a component of Humboldt County’s Local Coastal Program (LCP), the County conducted a Communities at Risk Vulnerability Assessment (2018) and an Adaptation Planning Report (2019) focused on these three communities. This work included interviews

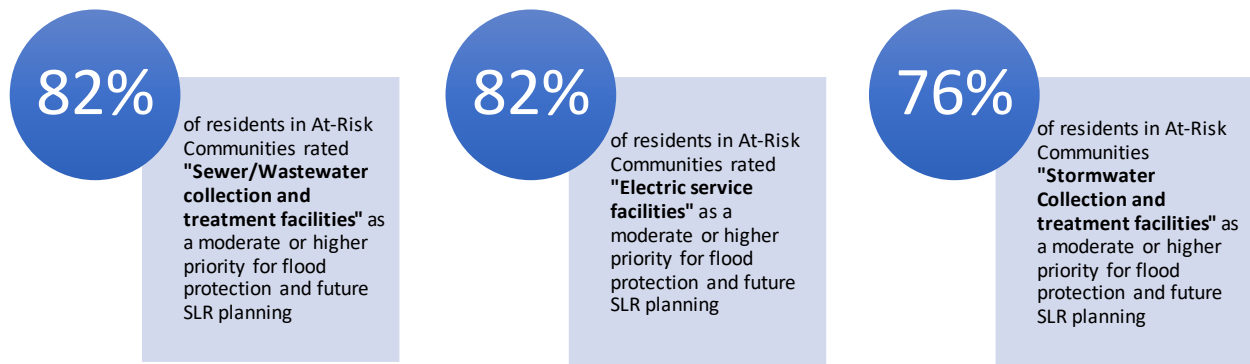
with multiple residents from King Salmon (coordinated with HSU graduate research project 2019), one workshop for King Salmon and Fields Landing, and one workshop for Fairhaven and Finntown.

### Relevant SLR Public Survey Findings

During the SLR Public Survey 2021, respondents were asked to self-identify if they belonged to one of the at-risk communities listed above. A total of 59 participants self-identified as such, only one of which identified as a resident of Fairhaven/Finntown. Survey participants were asked to report if they had considered relocating and/or selling their property due to SLR related hazards, and were given the option to provide additional comments to establish context for their answers, which garnered 25 comments illustrated in the word cloud to the right. Many of these comments expressed concern for particular properties or canals while some expressed very strong political views particularly regarding government spending on SLR planning or mitigation.



When asked to rate the priority of different assets in regard to flood protection and future SLR planning, most assets were rated by more than 50% of these at-risk community respondents as a moderate or higher priority, with the top three prioritized assets being “Sewer/wastewater collection and treatment facilities”, “Electric service facilities”, and “Stormwater Collection and treatment facilities”. The full results are reported in the graph on the next page.





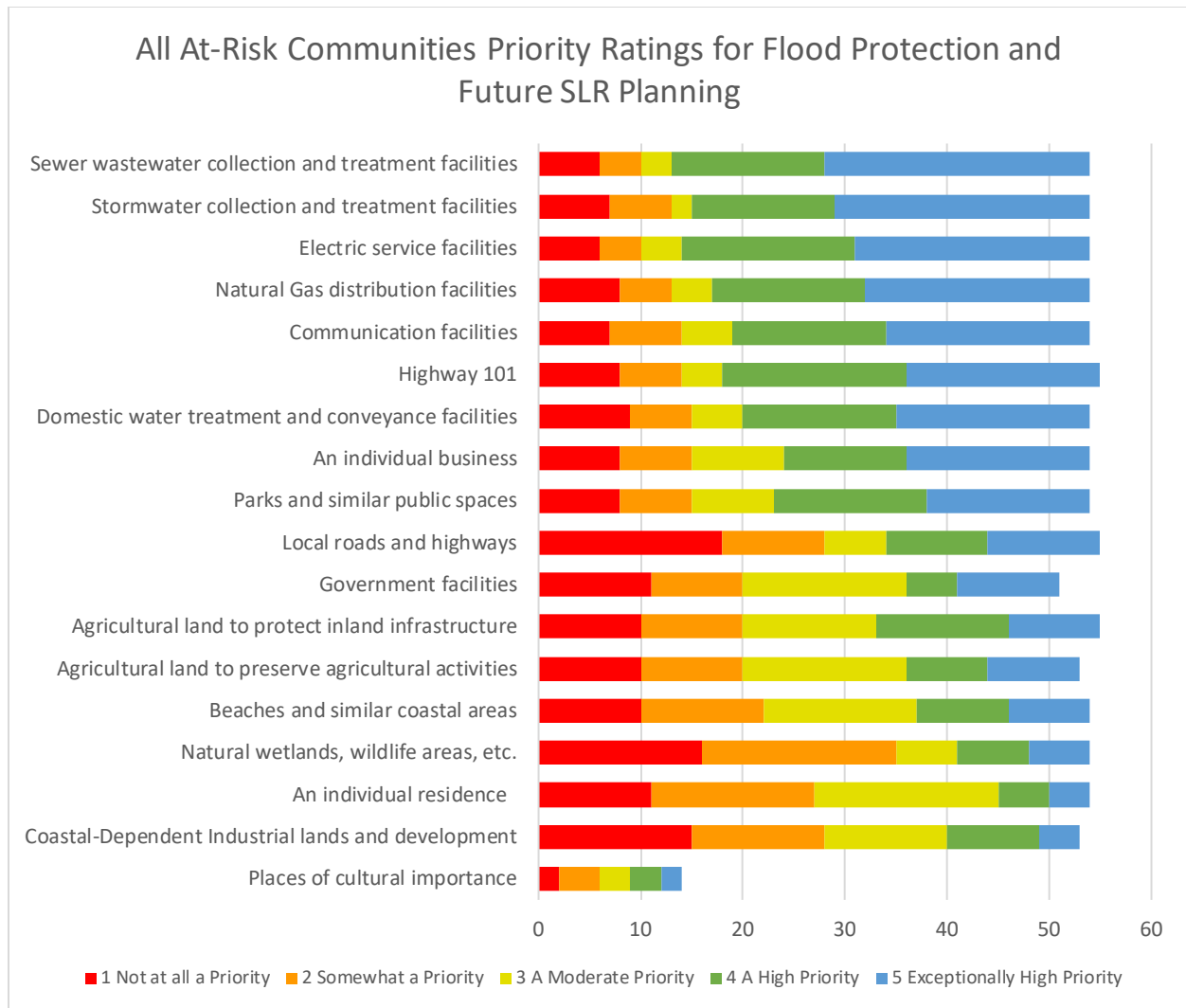


Figure 68. Priority Ratings for various assets (n=14-54) with priorities categorized as Not at all a Priority (red), Somewhat a Priority (orange), A moderate Priority (yellow), a High Priority (green), and Especially High Priority (blue) regarding Flood Protection and Future SLR Planning by participants who self-identified as part of the At-Risk Communities identified by the County as Fairhaven/Finntown, King Salmon, and Fields Landing in the SLR Public Survey 2021

### Reference Links

Humboldt Bay Area Plan Communities at Risk Sea Level Rise Vulnerability Assessment (2018) <https://humboldt.gov/DocumentCenter/View/81418/Humboldt-Bay-Area-Plan-Communities-at-Risk-SLR-Vulnerability-Assessment-12-02-2019-?bidId=>

Humboldt Bay Area Plan Communities at Risk Strategic Sea Level Rise Adaptation Planning Report (2019) <https://humboldt.gov/DocumentCenter/View/81417/Humboldt-Bay-Area-Plan-Communities-at-Risk-Strategic-SLR-Adaptation-Report-11-30-2019-final-reduced>

Exploring Community Knowledge and Perceptions of Flooding and Sea-Level Rise in King Salmon, California (HSU 2019) [https://digitalcommons.humboldt.edu/hsuslri\\_student/9/](https://digitalcommons.humboldt.edu/hsuslri_student/9/)

## Agricultural Properties

### *Roles & Responsibilities*

#### Private Property Owner

A majority of land vulnerable to sea level rise in the Humboldt Bay region is planned and zoned for agricultural use. These lands are utilized as pastureland

for livestock grazing as well as for raising livestock feed.

Agricultural lands on Humboldt Bay have two origins that indicate different vulnerabilities: (1) alluvial bottom lands and 2) diked former tidelands. Alluvial bottom lands are generally higher in elevation than the current tidal regime. From 1880 to 1910, approximately 8,000 acres of salt marsh and tidal channel habitat (tidelands) on Humboldt Bay were diked off and drained for agricultural use. The earthen dikes are the primary source of protection for the agricultural lands from saltwater inundation during daily high tides. If these dikes were breached, tidal inundation would cover a substantial area around Humboldt Bay.

Significant portions of these diked former tideland areas are in the unincorporated area of the County, while much of the Fay Slough bottom land is in City of Eureka's jurisdiction, and similarly much of the Bayside bottom land is in the City of Arcata. Almost all of the diked former tidelands are within the retained jurisdiction area of the Coastal Commission. These agricultural lands have a mix of both private and public ownership, with much of the public lands being managed for wildlife and open space/recreation (City of Eureka and City of Arcata, California Department of Fish and Wildlife, Humboldt Bay National Wildlife Refuge, Bureau of Land Management, and several land trusts).

There are almost 8,000 acres of agricultural land that could be tidally inundated with 3 meters of SLR under current shoreline conditions within the Humboldt County's HBAP, and within Eureka and Arcata. This is close to 40% of all the approximately 20,000 acres agricultural land within these three areas. The majority of these lands are diked former tidelands.

According to Humboldt County 2016 Crop Report, the County's dairy livestock were valued at \$26,820,000, and livestock products, specifically milk products, were valued at almost \$75,000,000 excluding cheese and goat milk. The value of cheese was \$24,251,000 and based on the relatively lower value of goat milk (\$503,000) as compared to cow's milk, it is presumed the majority of the cheese value is also associated with conventional and organic cattle dairies. Together, these values total over \$125 million and are the County's leading commodities. Although these numbers are not all associated with the Humboldt Bay area, considering that dairies in Humboldt County and the HBAP are located on bottom lands that are most vulnerable to SLR, and considering that roughly 20,000 acres of the HBAP, Eureka, and Arcata is devoted to agricultural uses that include dairy uses, it is presumed that the value of these agricultural lands, and all bottom lands within the County that support dairies and related activities, is significant. These bottom lands are very vulnerable to SLR and cannot be relocated to upland areas in Humboldt County without displacing existing grazing operations or converting other land uses such as timberlands.

Various groups represent agricultural interests around Humboldt Bay, including Humboldt County Farm Bureau (see page 211), Buckeye Conservancy (page 202), UC Cooperative Extension - Humboldt (page 225), Humboldt County Resources Conservation District (page 121), and the USDA Natural Resource Conservation Service (page 99).

*Specific Hydrological Unit Assets and Concerns*

**Mad River Slough**

- There are 52 parcels within this HU that would be affected by SLR of one meter.

**Arcata Bay**

- There are 43 parcels within this HU that would be affected by SLR of one meter.

**Eureka Slough**

- There are 61 parcels within this HU that would be affected by SLR of one meter.

**Eureka Bay**

- There are 2 parcels within this HU that would be affected by SLR of one meter.

**Elk River Slough**

- There are 6 parcels within this HU that would be affected by SLR of one meter.

**South Bay**

- There are 33 parcels within this HU that would be affected by SLR of one meter.



*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

*Planning Efforts*

During the Humboldt Bay Sea Level Rise Adaptation Planning Project in 2015, the APWG utilized two critical assets as case studies, agricultural lands and Highway 101, to explore a regional approach to adaptation planning on Humboldt Bay (Humboldt Bay Sea Level Rise Adaptation Planning Project: Phase II Report). Agricultural dikes are important in protecting pastureland sensitive to saltwater flooding, the majority of which are also seasonal freshwater wetlands providing critical wildlife habitat. It is important to consider that protection agricultural lands from saltwater inundation will also serve to protect critical infrastructure assets such as utilities and transportation corridors located on or beneath these agricultural lands that are protected from saltwater inundation only by earthen dikes. The challenge of maintaining,

adapting, or relocating protective dike structures highlights the importance of regional coordination. The APWG report stated, “It is important to highlight that diked former tidelands cannot be protected on a parcel-by-parcel basis; where landowners who share a common dike need to hold back the tides, they must join together to protect their lands from flooding.” Multiple adaptation measures for agricultural land and dikes as well as regulatory constraints for adaptation are identified in the Phase II report.

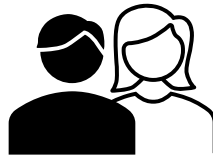
On May 4, 2017, a forum entitled Adapting to Sea Level Rise on Humboldt Bay’s Agricultural Lands was hosted by the Coastal Commission and Humboldt County at the Wharfinger Building. The forum was geared toward coastal agricultural landowners, resource management agencies, local governments, and the community, and was attended by over 100 people. Workshop information can be found at <https://www.coastal.ca.gov/agriculture/>.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The Agricultural Property Owner interview contained 6 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Shared Interview Themes for Agricultural Property Owner**

Shared Funding Coordination  
Regional Coordination in General  
Permitting  
Diked Former Tidelands  
Restoration and Mitigation  
Interest in County Leading



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, two of which are concerning agricultural land. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Agricultural land to protect inland infrastructure” received higher overall ratings with 81% of respondents (n=545) rating this asset as a moderate or higher priority compared to “Agricultural land to preserve agricultural activities” which garnered 66% of respondents (n=542) priority rating it above moderate priority. Results are shown in the graph on the next page.

**81%** of the public survey respondents who provided a rating for "Agricultural land to protect inland infrastructure" rated them a moderate priority or higher for flood protection and future SLR planning.

**66%** of the public survey respondents who provided a rating for "Agricultural land to preserve agricultural activities" rated them a moderate priority or higher for flood protection and future SLR planning.

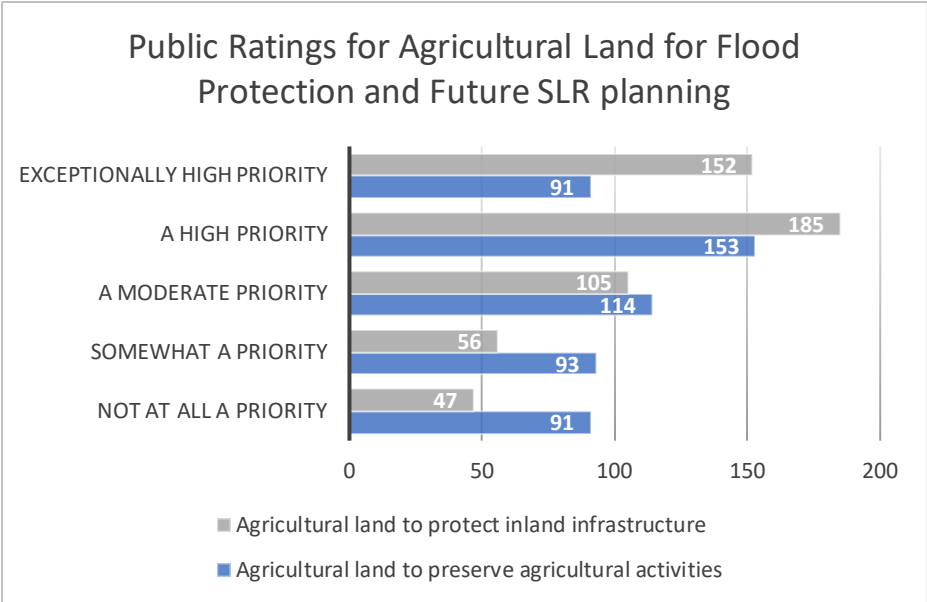


Figure 69. Priority Ratings for Agricultural land to preserve agricultural activities (n=542 in grey) and Agricultural land to protect inland infrastructure (n=545 in blue) in regard to Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

*Reference Links*

- <http://humboldt.gov/sites/humboldt.gov/files/Humboldt%20Bay%20Sea%20Level%20Rise%20Adaptation%20Planning%20Project%20Phase%20I%20Report%20-%20Compressed.pdf>
- <https://humboldt.gov/623/Agricultural-Commissioner>
- <https://humboldt.gov/ArchiveCenter/ViewFile/Item/1216>
- [https://digitalcommons.humboldt.edu/hsuslri\\_local/4/](https://digitalcommons.humboldt.edu/hsuslri_local/4/)
- <https://www.coastal.ca.gov/agriculture/>
- [https://ncrlt.org/sites/ncrlt.org/files/NRLTFarmPlan\\_Final6-05.pdf](https://ncrlt.org/sites/ncrlt.org/files/NRLTFarmPlan_Final6-05.pdf)

**Commercial & Industrial Properties**

*Roles & Responsibilities*

Private Property Owner 

Property with commercial and industrial zoning can be found within the City of Arcata, City of Eureka, and unincorporated Humboldt County, with landowner

interests generally represented by their respective elected officials. Property may be directly vulnerable from inundation or flooding as well as indirectly vulnerable from impacts to utilities or transportation corridors. Many Coastal-Dependent Industrial zoned properties that support industries such as fishing, shipping, and wood products are located along Humboldt Bay and could face unique challenges with SLR.

*Specific Hydrological Unit Assets and Concerns*

**Mad River Slough**

- There are 4 parcels within this HU that would be affected by SLR of one meter.

**Arcata Bay**

- There are 42 parcels within this HU that would be affected by SLR of one meter.

**Eureka Slough**

- There are 75 parcels within this HU that would be affected by SLR of one meter.
- The vulnerable communities of Fairhaven and Finntown are located within this HU.

**Eureka Bay**

- There are 275 parcels within this HU that would be affected by SLR of one meter.

**Elk River Slough**

- There are 23 parcels within this HU that would be affected by SLR of one meter.

**South Bay**

- There are 57 parcels within this HU that would be affected by SLR of one meter.
- The vulnerable communities of King Salmon and Fields Landing are located within this HU.



*General Concerns*

✓	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, two of which are concerning commercial and industrial land. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Coastal-Dependent Industrial lands” received higher overall ratings with 66% of respondents (n=534) rating this asset as a moderate or higher priority compared to “An individual business” which only received 37% of respondents (n=532) rating it above moderate priority. Both of these assets received lower than average survey participation. Results are shown in the graph below.

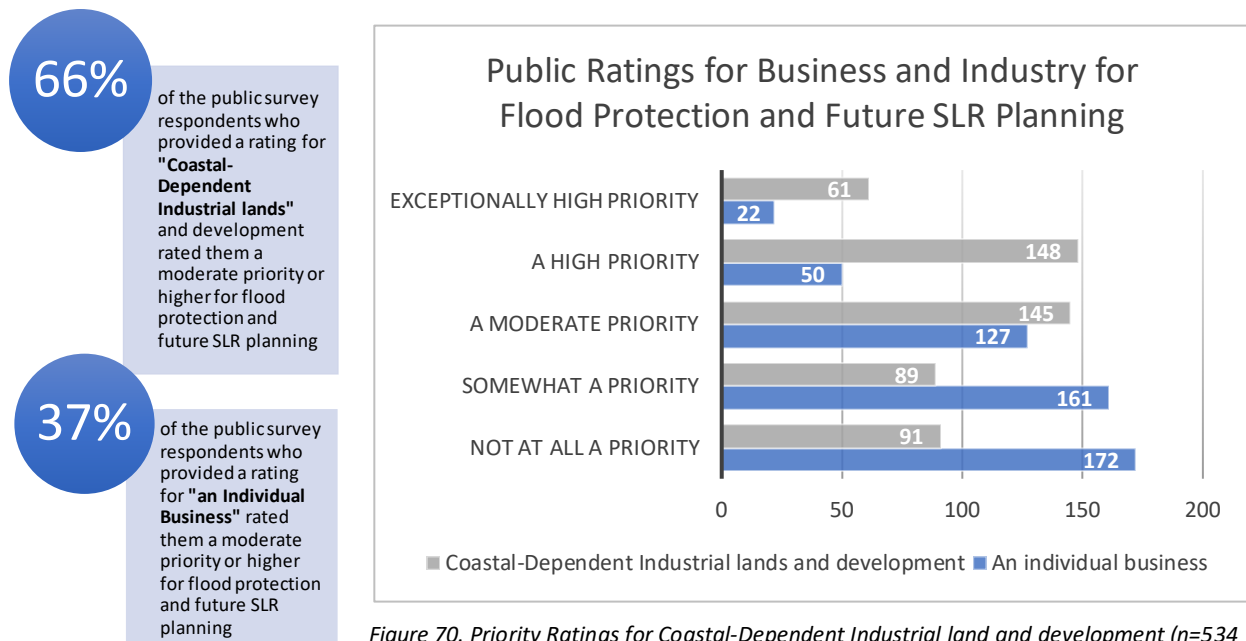


Figure 70. Priority Ratings for Coastal-Dependent Industrial land and development (n=534 in grey) and an individual business (n=532 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

### Planning Efforts

Currently City and County residents are able to participate in SLR planning mainly through public comment at public meetings (e.g., LCP update presentations at City Council, Board of Supervisors, or Planning Commission meetings) and SLR or LCP update workshops. Organizations that have been or could be engaged in SLR planning that may reflect the interests of commercial and industrial property owners include Rotary, Chambers of Commerce, and the Humboldt Fishermen’s Marketing Association.

### Reference Links

None

## Residential Properties

### *Roles & Responsibilities*

Private Property Owner 

Residential property is located within the City of Arcata, City of Eureka, and Humboldt County, with residents' interests generally represented by their respective elected officials. Property may be directly vulnerable from inundation or flooding as well as indirectly vulnerable from impacts to utilities or transportation corridors.

### *Specific Hydrological Unit Assets and Concerns*

#### Mad River Slough

- There are 17 parcels within this HU that would be affected by SLR of one meter.

#### Arcata Bay

- There are 231 parcels within this HU that would be affected by SLR of one meter.

#### Eureka Slough

- There are 213 parcels within this HU that would be affected by SLR of one meter.
- The vulnerable communities of Fairhaven and Finntown are located within this HU.

#### Eureka Bay

- There are 174 parcels within this HU that would be affected by SLR of one meter.

#### Elk River Slough

- There are 97 parcels within this HU that would be affected by SLR of one meter.
- 

#### South Bay

- There are 396 parcels within this HU that would be affected by SLR of one meter.
- The vulnerable communities of King Salmon and Fields Landing are located within this HU.





*General Concerns*

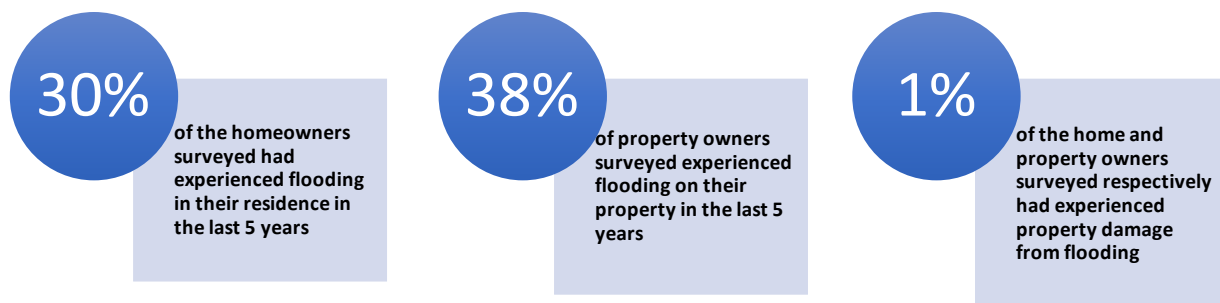
✓	Shoreline Management		Sea Level Rise Impacts:	
✓	Property Ownership and Adaptation Responsibility		✓	Erosion
✓	Regulatory Authorization and Compliance		✓	Tidal Inundation
✓	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding		✓	Saltwater Intrusion

*Relevant SLR Public Survey Findings*

During the SLR Public Survey, 984 surveys were sent out to landowners located in the 1-meter sea level rise inundation area; 159 completed surveys were successfully mailed back. An additional 418 surveys were completed online by the general public (notified of the survey via press releases, local newspapers and social media) and landowners who were mailed a survey but responded to the online survey. Survey respondents were asked to self-identify the HU in which they lived, owned property, worked, and/or visited/recreated based on a map with HU areas highlighted (See Appendix i - SLR Public Survey 2021 on page 229).



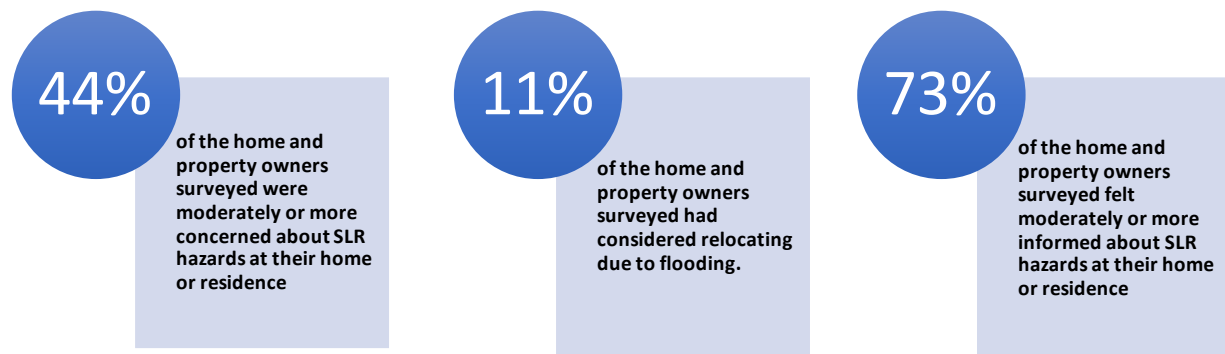
There were 314 survey respondents who identified themselves as homeowners and 95 who identified themselves as property owners within the six HU’s, for a total of 409 respondents. Of the home and property owners who responded to the question asking if they had experienced flooding at their property within the last five years, 30.3% of homeowners experienced flooding and 1% experienced property damage from flooding, while 38.2% of property owners experienced flooding and 1% experienced property damage from flooding.



Home and property owners were asked to report if they had considered relocating or selling their property due to SLR related hazards. Respondents were given the option to provide additional comments to

establish context for their answers, which garnered 115 comments illustrated in the word cloud above. Many of the comments were addressing specific locations and expressed concern for property values, but many said that these concerns were not pressing enough for them to relocate. Some expressed very strong political views or theories such as government spending on SLR research or mitigation was a waste and that the County wasn't doing enough to act on issues such as canal maintenance or landowner concerns.

When home and property owners were asked to rate their level of concern for their home or property ranging from "not concerned" to "very concerned", 42% (n=402) said they were moderately or more concerned about SLR hazards at their home or residence. Home and property owners were further asked if they had considered relocating due to flooding and only 11% (n=399) said "yes". To assess how familiar home and property owners felt about SLR hazards, these participants were asked to rate how informed/educated home and property owners felt they were about SLR hazards at their home or residence. These responses ranged from "not informed" to "extremely informed" and 73% of this subset of respondents (n=397) felt moderately or more informed.



One question asked of all public survey respondents (i.e., not just home or property owners) was to rate the priority of an individual residence located within the Humboldt Bay region for consideration in flood protection and future SLR planning. Responses for priority ratings ranged from "not at all a priority" to "exceptionally high priority". Of the 577 participants, 534 submitted a priority rating for an individual residence as an asset for flood protection and future SLR planning, and 35% of those respondents considered these residences a moderate or higher priority. Results are shown in the graph on the next page.

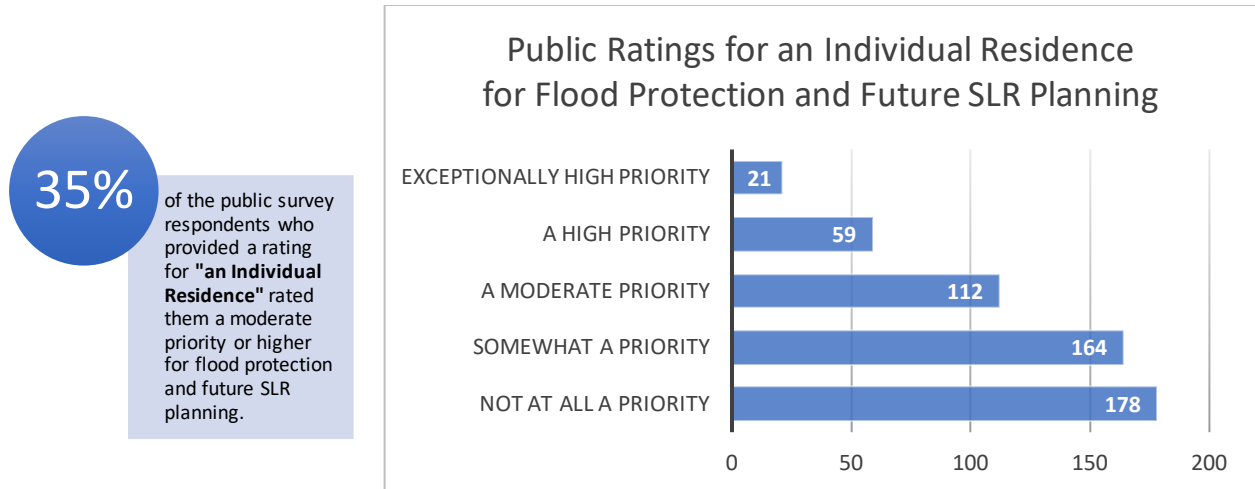


Figure 71. Priority Ratings for an Individual Residence regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=534)

### Planning Efforts

Currently City and County residents are able to participate in SLR planning mainly through public comment at public meetings (e.g., LCP update presentations at City Council, Board of Supervisors or Planning Commission meetings) and SLR or LCP update workshops that have been held by various jurisdictions (see Land Use Authorities section beginning on page 23, and At-Risk Communities section beginning on page 134).

During the SLR Public Survey, 120 general comments were collected illustrated in the word cloud to the right) in addition to the formal questions.



### Reference Links

None

## Utility Infrastructure/Service Provider

### City of Arcata

*See page 23.*

### City of Eureka

*See page 31.*

## Humboldt Bay Municipal Water District

### *Roles & Responsibilities*



The Humboldt Bay Municipal Water District (HBMWD) was formed in 1956 to develop a regional water system to provide a reliable water supply to the greater Humboldt Bay area of Humboldt County. HBMWD is an independent special district governed by an elected five-member Board of Directors. HBMWD operates

two separate and distinct water systems: a domestic water system which supplies treated drinking water and an industrial system which supplies untreated raw water to large industrial users for industrial purposes.

HBMWD operates almost exclusively at the wholesale level, supplying drinking water to seven public agencies who in turn serve their customers including residents, businesses and industries. HBMWD's wholesale municipal customers are the cities of [Arcata](#), [Eureka](#), [Blue Lake](#), and four community services districts: [Fieldbrook-Glendale](#), [Humboldt](#), [Manila](#), and [McKinleyville](#).

HBMWD facilities include: R.W. Matthews Dam which forms Ruth Lake in southern Trinity County, a hydro-electric power house at Matthews Dam; diversion, pumping and control facilities on the Mad River near Arcata; storage and treatment facilities; and two transmission systems that deliver treated drinking water or untreated surface water to customers throughout the Humboldt Bay region.

### *Specific Hydrological Unit Assets and Concerns*

#### **Mad River Slough**

- Water transmission pipeline that crosses Mad River Slough via an above ground trestle system


 Utilities

#### **Arcata Bay**

- Water transmission pipeline is outside the HU, but provides water to Manila Community Services District and the City of Arcata.

#### **Eureka Slough**

- Water transmission pipeline that provides water to Humboldt Community Services District and City of Eureka
- Samoa Peninsula
  - HBMWD has delivery systems in place for raw untreated water to industrial customers located on the Samoa Peninsula. Two former industrial partners on the Peninsula have gone out of business but the line is still operational as it provides water to the Harbor District.

#### **Eureka Bay**

- Water transmission pipeline extends along the western shoreline and crosses under Humboldt Bay to the Truesdale Pump Station in south Eureka. This pipeline provides water to Humboldt Community Services District and City of Eureka, but HBMWD ends at the Truesdale Avenue connector.

#### **Elk River Slough**

- Water transmission pipeline that provides water to Humboldt Community Services District

#### **South Bay**

- Water transmission pipeline is outside the HU, but provides water to Humboldt Community Services District which serves this area

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

No planning has or is occurring yet. Future planning is a matter of resource and priority.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The HBMWD interview contained 6 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to HBMWD**

- Shared Funding Coordination
- Regional Coordination in General
- Increased Landowner Participation
- Permitting
- Diked Former Tidelands
- Increased Communication between Stakeholders



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which were identified above in this catalogue section as HBMWD assets asset that could be subject to sea level rise impacts and were confirmed as such by HBMWD representatives during the SLR Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. There were three assets identified, all of which received a moderate priority rating or higher by more than 80% of respondents: “Sewer/wastewater collection and treatment facilities (89%, n=548), “Domestic water treatment and conveyance facilities” (87%, n=548), and “Stormwater collection and treatment facilities” (81%, n=543). Results are reported in the graph on the next page.

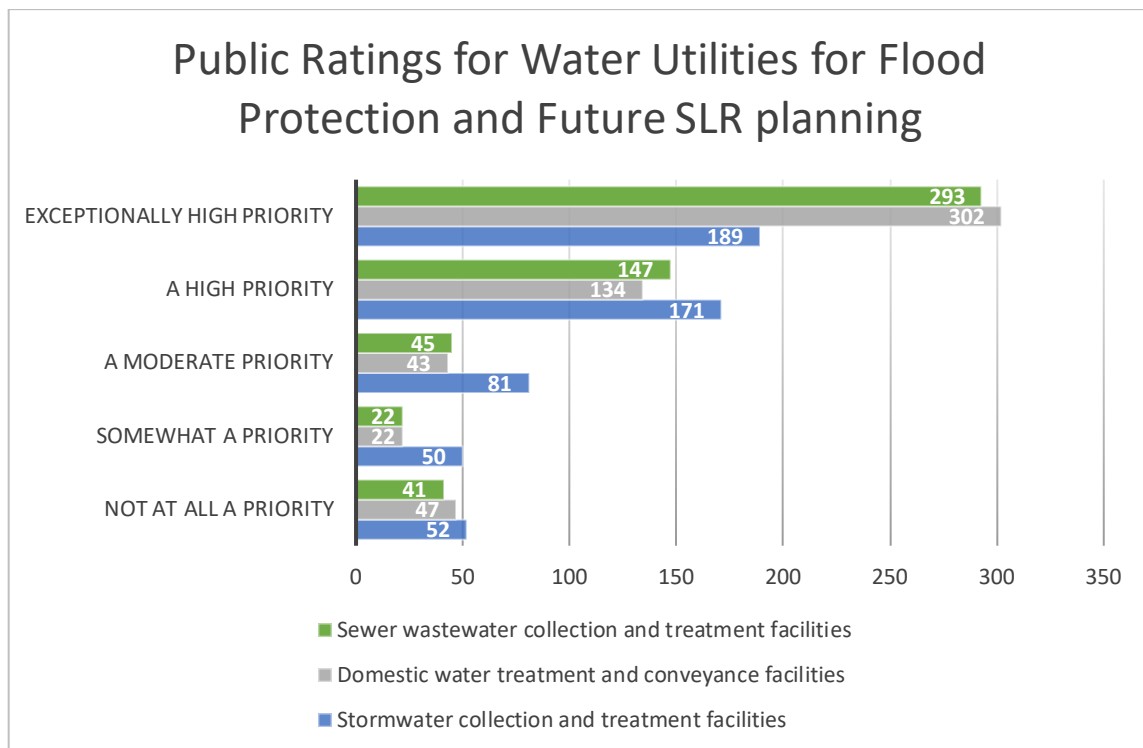
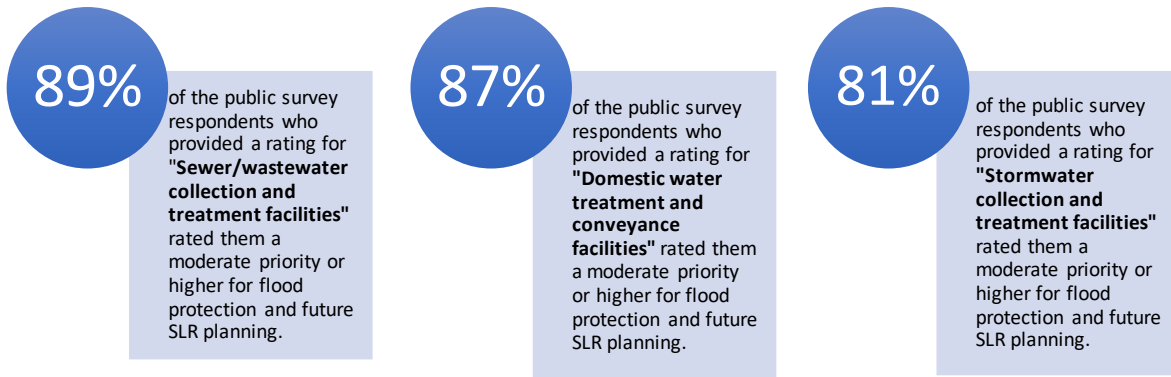


Figure 72. Priority Ratings for Sewer/wastewater collection and treatment facilities (n=548 in green), Domestic water treatment and conveyance facilities (n=548 in grey), and Stormwater collection and treatment facilities (n=543 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

#### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021 there was a total of 9 respondents for the Infrastructure/Service Provider/Community Services District category though participation for individual questions varied. Participants included the Humboldt Bay Municipal Water District, Humboldt CSD, Manila CSD, Peninsula CSD, and Vero Networks. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category had low participation (n=4) but ranged from “not involved” to “participate” with a 50% preference for a mix of “not involved” and participation as shown in the graph below.

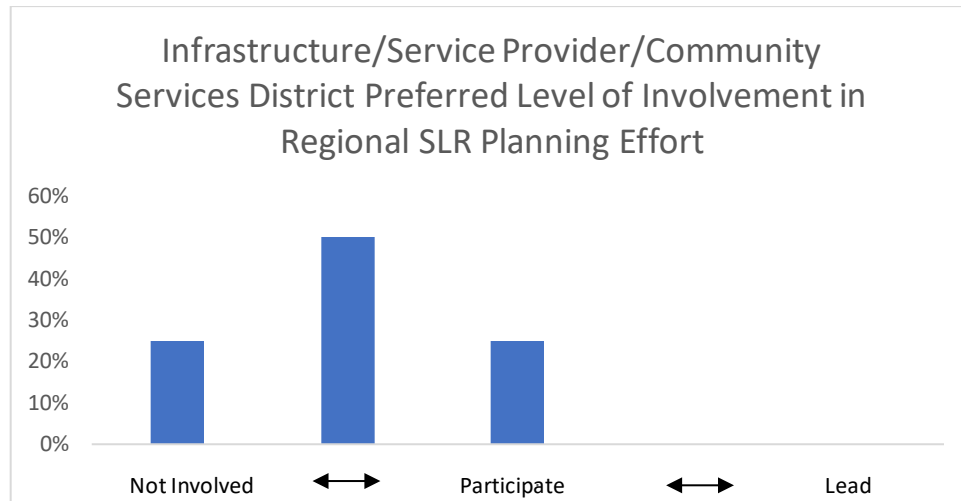


Figure 73. Infrastructure/Service Provider/Community Services District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for this category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph on the next page.



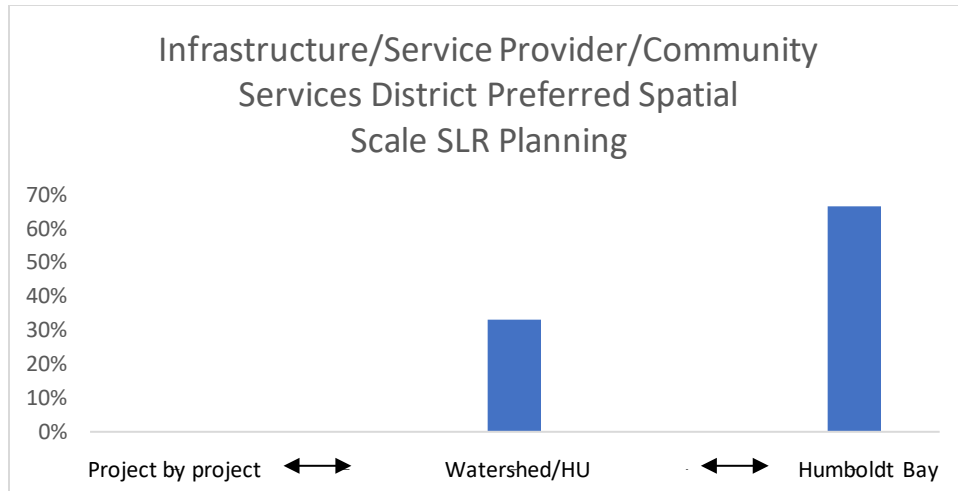


Figure 74. Infrastructure/Service Provider/Community Services District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=3)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Infrastructure/Service Provider/Community Services District category favored empowering or retooling an existing regional agency, creating a formal collaborative partnership, and engaging in informal coordination with 75% of respondents rating this option somewhat favorable or higher for all three options. Half of respondents were either neutral or somewhat opposed having no regional planning as shown in the graph below.

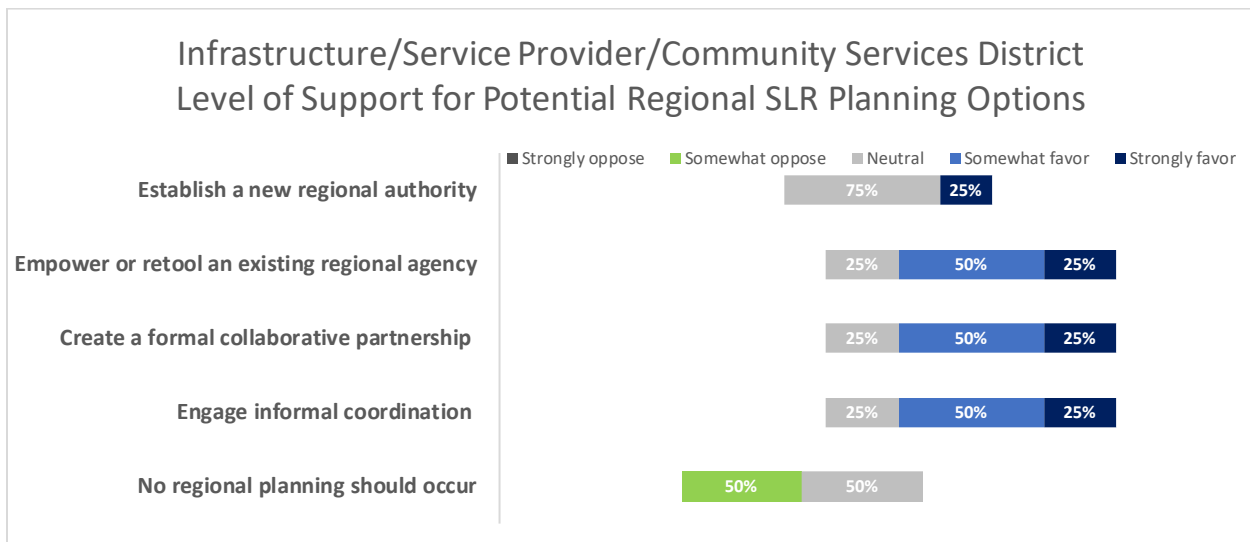


Figure 75. Infrastructure/Service Provider/Community Services District respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

**Reference Links**

<https://www.hbmwd.com/>

<http://humboldtlaico.org/wp-content/uploads/HBMWD-Adopted-MSR-May-2009.pdf>

## Humboldt Community Services District

### *Roles & Responsibilities*



Humboldt Community Services District (HCSD) provides water, sewage collection, and street lighting services to residents in the unincorporated areas south and east of Eureka. HCSD primarily serves residential uses, some commercial uses, and no industrial uses.

HCSD has two main water sources, water from the Mad River and water pumped from HCSD wells. Water from the Mad River is purchased from HBMWD directly and from the City of Eureka indirectly. HCSD purchases approximately one third of its potable water from HBMWD directly via a waterline that runs down the Samoa Peninsula and crosses under Humboldt Bay to the Tuedale pump station. This water supplies the Cutten and Ridgewood areas. Another one third of HCSD water comes from the City of Eureka; Eureka purchases it from HBMWD through the Hubbard and Harris pump station connected to the Mad River Pipeline that traverses the diked former tidelands between Arcata and Eureka. This water supplies the northern areas of Myrtle town and Freshwater. The final one third of HCSD's water supply is pumped from their wells in the Humboldt Hill area from the Elk River aquifer. These wells primarily serve the southern portion of HCSD, including Humboldt Hill, Fields Landing, King Salmon, College of the Redwoods, and some portions of the Pine Hill area. HCSD water distribution infrastructure throughout the district includes 14 different pressure zones, 87 miles of water main, 13 pump stations, 10 storage reservoirs, and 7 interties with the City of Eureka.

HCSD sewer infrastructure includes 29 lift stations and 78 miles of sewer main throughout the district. Wastewater collected by HCSD is treated at the City of Eureka's Elk River Wastewater Treatment Plant. HCSD contracts with Eureka to utilize up to 30.5% of the plant's permitted dry weather capacity.

### *Specific Hydrological Unit Assets and Concerns*

#### Eureka Slough

- **Wastewater collection system (pipes, manholes, lift/pump stations)**
- **Water distribution system (water mains, pump stations)**



#### Eureka Bay

- **Wastewater collection system (pipes, manholes, lift/pump stations)**
- **Water distribution system (water mains, pump station)**

#### Elk River Slough

- **Wastewater collection system (pipes, manholes, lift/pump stations)**

- **Water distribution system (water mains, pump stations)**
- **City of Eureka WWTP facility**
  - HCSD owns capacity rights in this facility.

### **South Bay**

- **Wastewater collection system (pipes, manholes, lift/pump stations)**
- **Water distribution system (water mains, pump stations)**
- **Municipal wells**
- **King Salmon**
  - HCSD provides water and sewer services to this vulnerable coastal community
- **Fields Landing**
  - HCSD provides water and sewer services to this vulnerable coastal community

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

There is no current plan for SLR adaptation, but HCSD intends to coordinate with Humboldt County in regard SLR adaptation for roads and associated HCSD infrastructure.

### Key Stakeholder Coordination Themes

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The HCSD interview contained 5 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

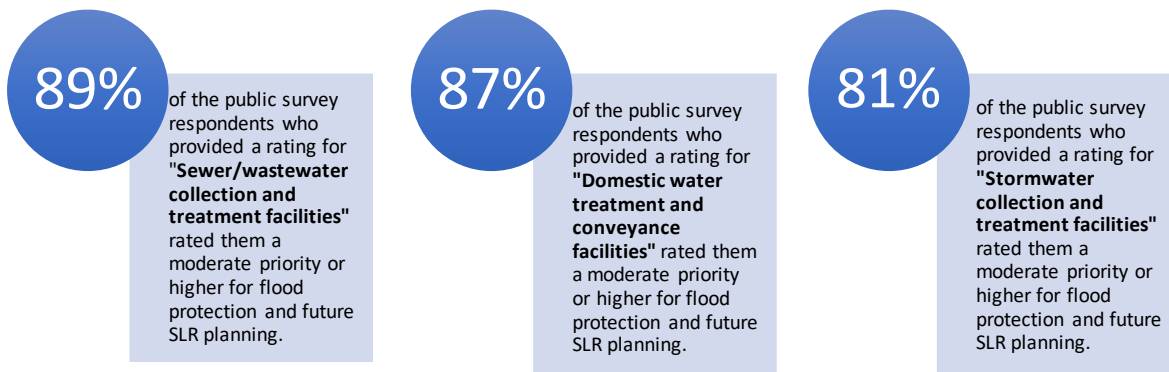
#### Interview Themes Important to HCSD

- Shared Funding Coordination
- Increased Communication between Stakeholders
- Transportation Infrastructure
- Wastewater Concerns
- Additional Governmental Guidance



### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which were identified above in this catalogue section as a HCSD asset that could be subject to sea level rise impacts and were confirmed as such by HCSD representatives during the SLR Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. There were three assets identified, all of which received a moderate priority rating or higher by more than 80% of respondents: “Sewer/wastewater collection and treatment facilities (89%, n=548), “Domestic water treatment and conveyance facilities” (87%, n=548), and “Stormwater collection and treatment facilities” (81%, n=543). Results are reported in the graph on the next page.



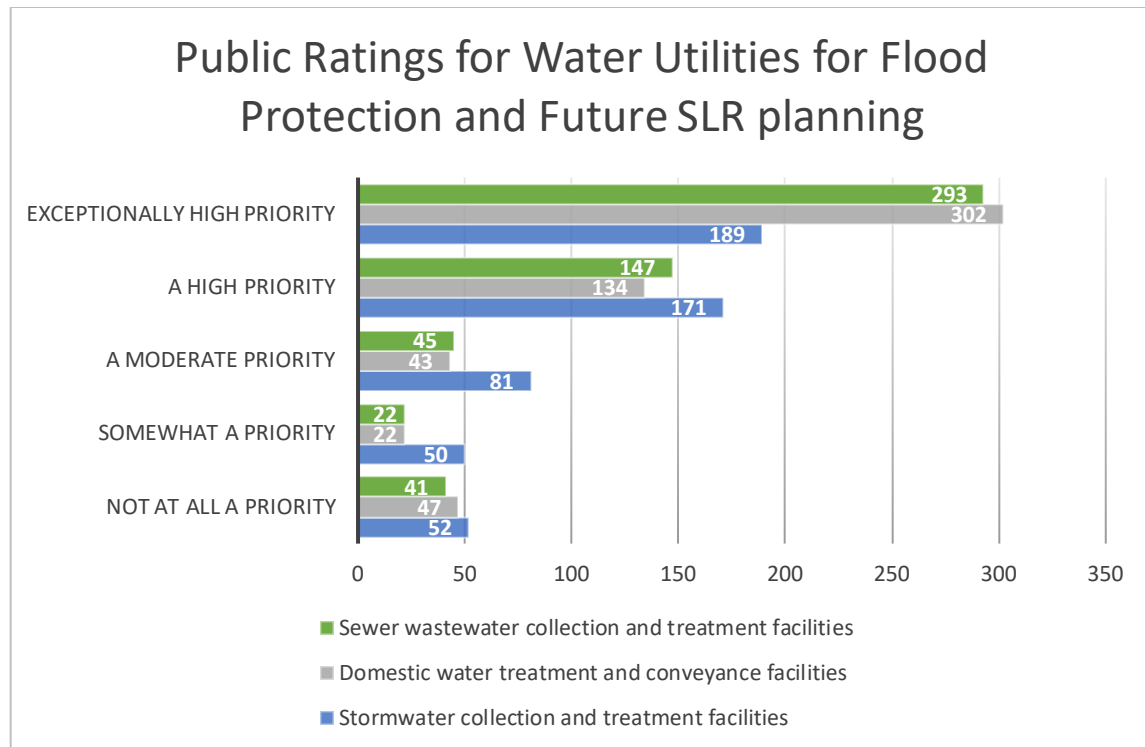


Figure 76. Priority Ratings for Sewer/wastewater collection and treatment facilities (n=548 in green), Domestic water treatment and conveyance facilities (n=548 in grey), and Stormwater collection and treatment facilities (n=543 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

#### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021 there was a total of 9 respondents for the Infrastructure/Service Provider/Community Services District category though participation for individual questions varied. Participants included Humboldt Bay Municipal Water District, Humboldt CSD, Manila CSD, Peninsula CSD, and Vero Networks. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category had low participation (n=4) but ranged from “not involved” to “participate” with a 50% preference for a mix of “not involved” and participation as shown in the graph on the next page.

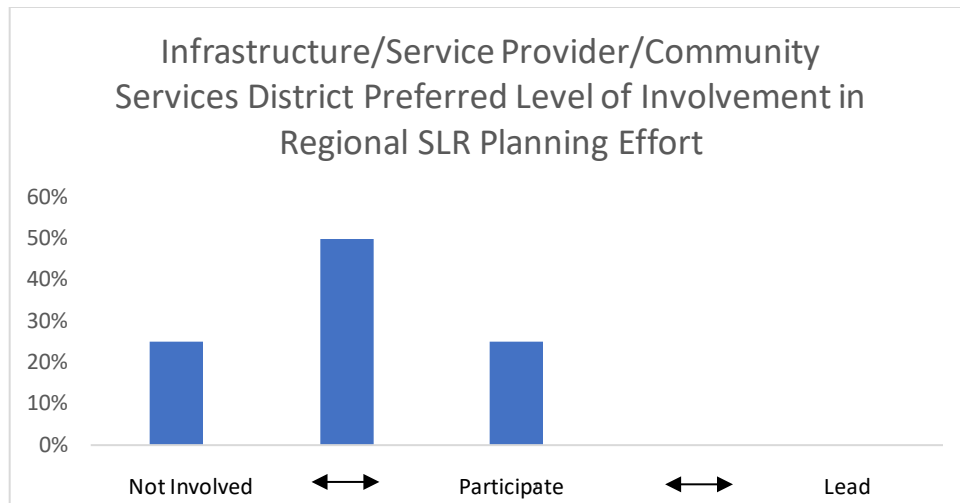


Figure 77. Infrastructure/Service Provider/Community Services District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for this category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph below.

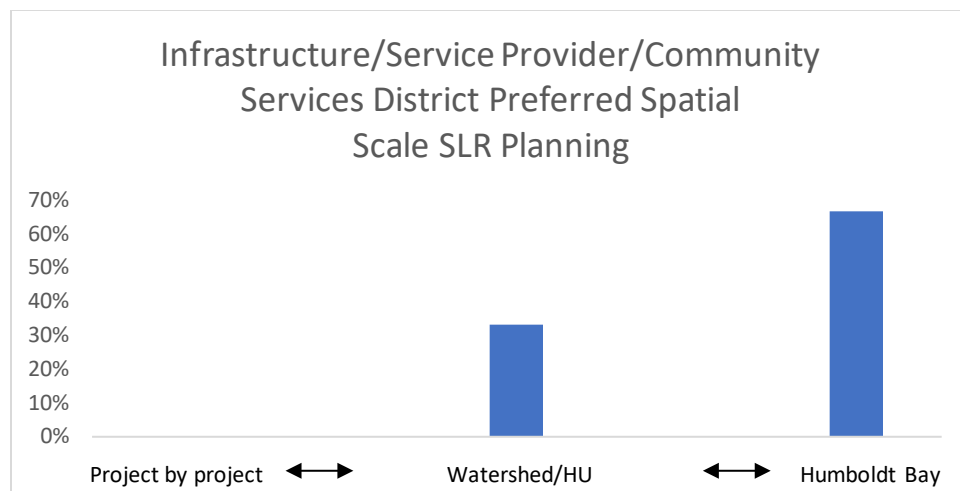


Figure 78. Infrastructure/Service Provider/Community Services District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=3)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Infrastructure/Service Provider/Community Services District category favored empowering or retooling an existing regional agency, creating a formal collaborative partnership, and engaging in informal coordination with 75% of

respondents rating this option somewhat favorable or higher for all three options. Half of respondents were either neutral or somewhat opposed having no regional planning as shown in the graph below.

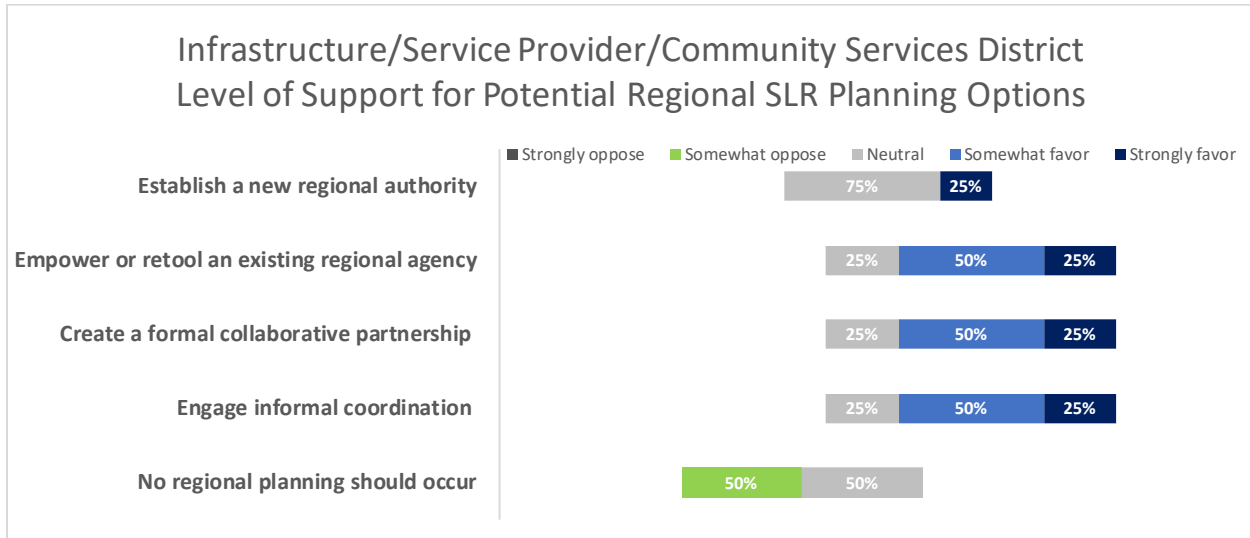


Figure 79. Infrastructure/Service Provider/Community Services District respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

### Reference Links

<https://humboldtcsd.org/>

<http://humboldtcsd.org/sites/default/files/SOI-MSR.pdf>

## Humboldt Waste Management Authority

### Roles & Responsibilities



Humboldt Waste Management Authority (HWMA) was established in 1999 by a Joint Powers Agreement between the County of Humboldt and the Cities of Arcata, Blue Lake, Eureka, Ferndale and Rio Dell. The Authority is governed by a six-member Board of Directors who provide direction to an Executive

Director. HWMA owns and operates the Hawthorne Street Transfer Station, Eureka Recycling Center, and Household Hazardous Waste Facility, all located on West Hawthorne Street in the City of Eureka. It also owns the Cummings Road Landfill located in unincorporated Humboldt County two miles southeast of Eureka (well beyond the Humboldt Bay region) and is responsible for closure/post-closure maintenance and monitoring activities at the landfill.

HWMA receives municipal solid waste (garbage) and curbside recycled materials delivered by franchise haulers, and also provides a one-stop drop-off for the public to bring self-hauled municipal solid waste,

recyclables, and other materials for waste diversion. HWMA does not provide curbside services; those are provided by Recology.

HWMA accepts a wide variety of waste at their three West Hawthorne Street facilities. Waste they accept generally includes recyclable materials (cardboard, glass, plastic, metal), mattresses for recycling, appliances and electronic waste, greenwaste, and hazardous waste such as batteries, fluorescent bulbs, paint, treated wood, medical sharps, and used oil. HWMA is a certified Electronic Waste Collector and a certified appliance recycler, but they are no longer certified for CRV redemption services.

### *Specific Hydrological Unit Assets and Concerns*

#### **Eureka Bay**



- **West Hawthorne Street Facility**

- This facility would be inundated with 1 meter of SLR under current shoreline conditions. Tidal inundation of this facility would not only impact the facility itself but could also negatively affect surrounding areas due to the nature of the materials handled at the facility.

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies		Backwater and/or Emerging Groundwater Flooding
✓	Funding		Saltwater Intrusion

### *Planning Efforts*

No known planning has or is occurring.

### *Reference Links*

<http://www.hwma.net/>



## Manila Community Services District

### *Roles & Responsibilities*



The Manila Community Services District (Manila CSD) is comprised of approximately two square miles located along the north spit of Humboldt Bay on the Samoa Peninsula along Highway 255. Within the Manila CSD, the following water, wastewater and recreation infrastructure components are present:

water mains, a storage tank, a booster pump station, a wastewater collection and treatment system, percolation ponds on the North Spit of Humboldt Bay used for year-round disposal, a community park, a community center, a recreation area, and a limited storm water drainage system.

Manila CSD is a regional retail water supplier that provides potable water to the community of Manila. The District purchases water from HBMWD which draws water from Ranney wells along the Mad River. The District owns and operates a STEP wastewater collection system (Septic Tank Effluent Pumping) that is highly vulnerable to inflow/infiltration from SLR as well as other sources. The STEP system pumps liquid effluent from residents' septic tanks into a force main to a treatment system that consists of three free surface wetlands, two surface aerated facultative ponds, and four percolation ponds for disposal.

### *Specific Hydrological Unit Assets and Concerns*

#### **Arcata Bay**

- **Manila CSD provides services to the community of Manila**



### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

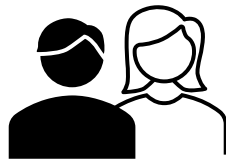
To address inflow/infiltration issues due to SLR in the District's STEP wastewater collection system, the District is increasing breach height of susceptible manholes as needed by adding ring collars.

### Key Stakeholder Coordination Themes

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The Manila CSD interview contained 8 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

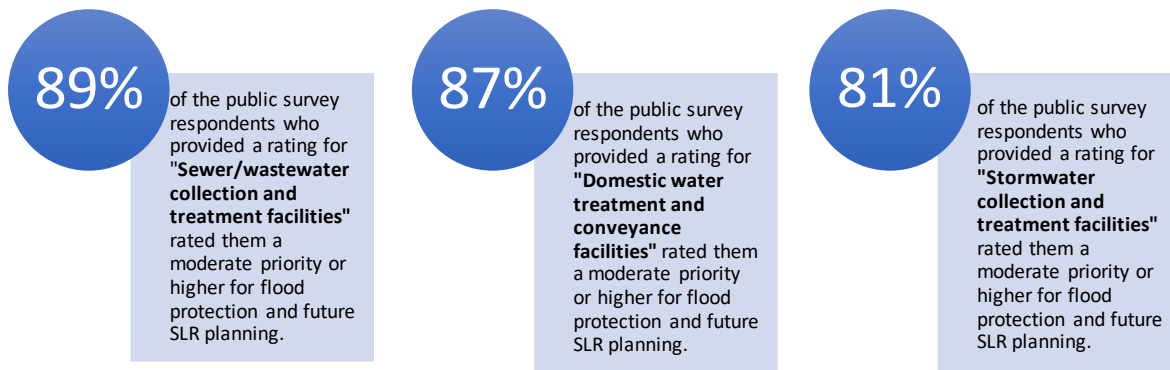
#### Shared Interview Themes

- Shared Funding Coordination
- Regional Coordination in General
- Increased Communication between Stakeholders
- Personnel Constraints
- Dedicated Time Constraints
- Wastewater Concerns
- Interest in County leading
- Safety and hazard mitigation



### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which were identified above in this catalogue section as Manila CSD assets that could be subject to sea level rise impacts, confirmed as such by Manila CSD representatives during the Stakeholder Interview 2021. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Three assets were identified as assets by Manila CSD, all of which received a moderate priority rating or higher by more than 80% of respondents: “Sewer/wastewater collection and treatment facilities” (89%, n=548), “Domestic water treatment and conveyance facilities” (87%, n=548), and “Stormwater collection and treatment facilities” (81%, n=543). Results are reported in the graph on the next page.



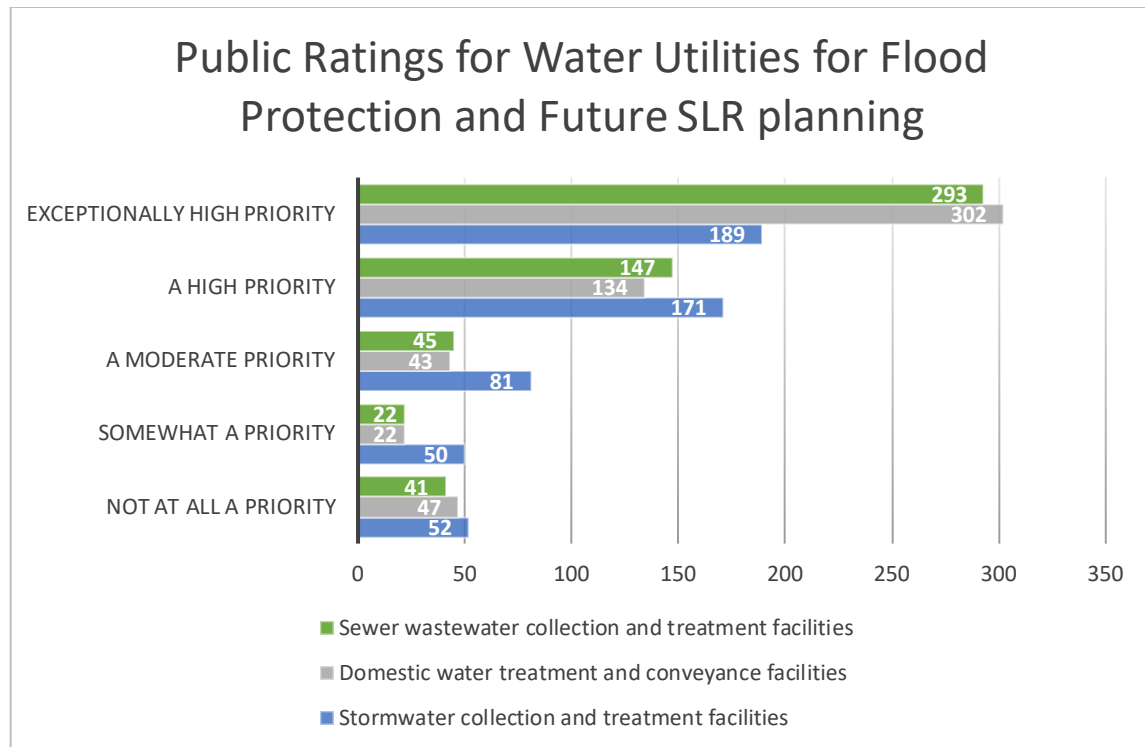


Figure 80. Priority Ratings for Sewer/wastewater collection and treatment facilities (n=548 in green), Domestic water treatment and conveyance facilities (n=548 in grey), and Stormwater collection and treatment facilities (n=543 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

#### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021 there was a total of 9 respondents for the Infrastructure/Service Provider/Community Services District category though participation for individual questions varied. Participants included Humboldt Bay Municipal Water District, Humboldt CSD, Manila CSD, Peninsula CSD, and Vero Networks. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category had low participation (n=4) but ranged from “not involved” to “participate” with a 50% preference for a mix of “not involved” and participation as shown in the graph on the next page.

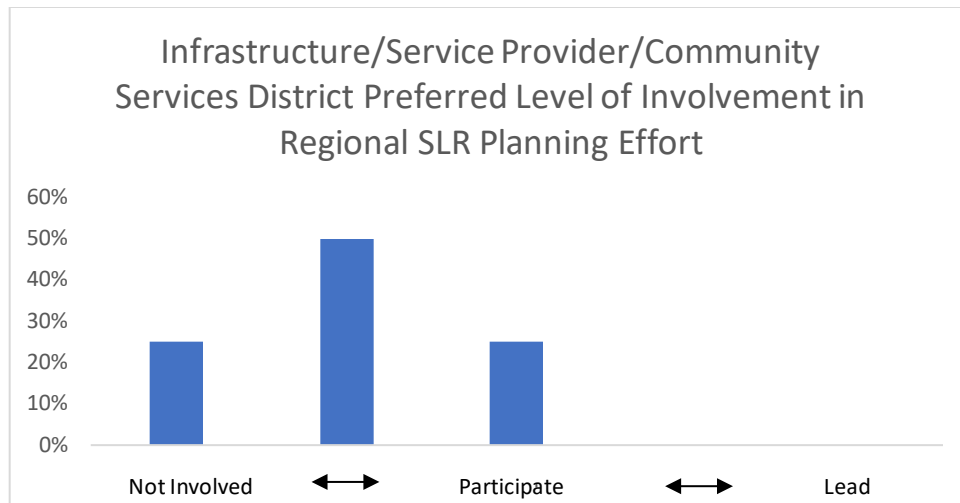


Figure 81. Infrastructure/Service Provider/Community Services District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for this category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph below.

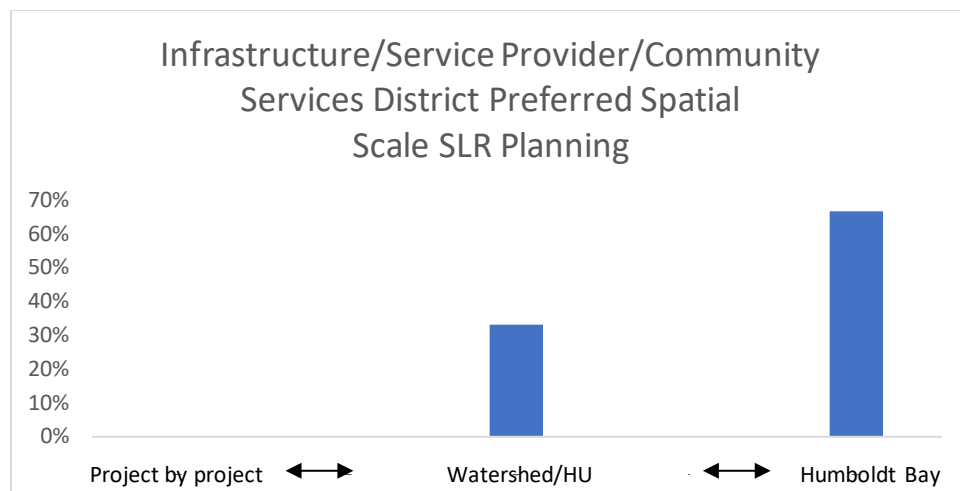


Figure 82. Infrastructure/Service Provider/Community Services District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=3)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Infrastructure/Service Provider/Community Services District category favored empowering or retooling an existing regional agency, creating a formal collaborative partnership, and engaging in informal coordination with 75% of

respondents rating this option somewhat favorable or higher for all three options. Half of respondents were either neutral or somewhat opposed having no regional planning as shown in the graph below.

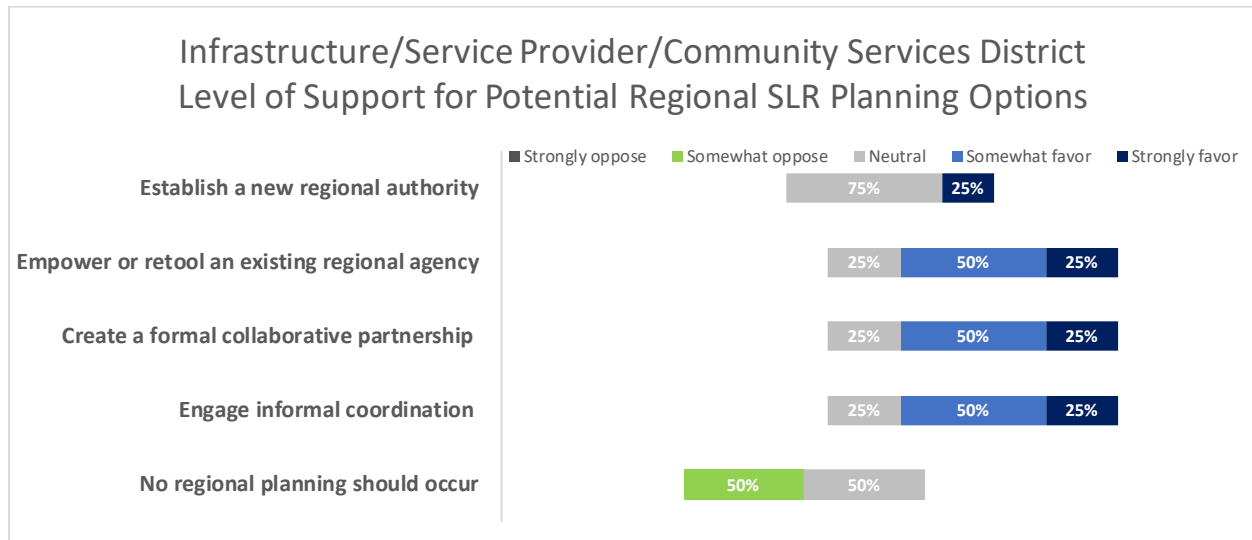


Figure 83. Infrastructure/Service Provider/Community Services District respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

### Reference Links

<http://www.manilacsd.com/>

<http://humboldtlafo.org/wp-content/uploads/Manila-CSD-ADOPTED-MSR-December-2007.pdf>

## Peninsula Community Services District

### Roles & Responsibilities



The reorganization of the Samoa Peninsula Fire District into the Peninsula Community Services District (PCSD) was conditionally approved by LAFCO in 2017 and finalized in 2019. The district includes an area on the Samoa Peninsula between the Highway 255 bridge and the Samoa boat launch. This district was formed to

provide the following services: water; wastewater; fire protection, rescue and emergency response; parks, recreation, trails, and open space; landscape maintenance within public areas, streets and street maintenance; and storm drainage. PCSD together with Humboldt County is spearheading the creation of a community wastewater treatment system to serve the Fairhaven and Finntown communities and various industrial and recreational facilities on the Samoa Peninsula.

*Specific Hydrological Unit Assets and Concerns*

**Eureka Bay**



- **(Future) Samoa Wastewater Treatment System**
  - The communities of Fairhaven and Finntown currently do not have a wastewater treatment system and rely on individual septic systems for wastewater treatment and disposal, resulting in ongoing impacts to water quality. The process of implementing a wastewater treatment system to serve these communities, although complicated by its location within the coastal zone and in areas subject to tsunami and sea level rise impacts, is moving forward.
- **Outfall pipe**
  - An existing pipe owned by Harbor District that will potentially be leased by PCSD as part of the proposed wastewater disposal system for the whole peninsula.

*General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

*Planning Efforts*

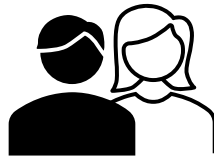
The proposed Samoa Wastewater Treatment System addresses SLR by aiming to alleviate water quality impacts associated with existing leach fields that will be exacerbated due to SLR, and which are the first SLR impacts PCSD is expecting to experience. There is a living shoreline currently protecting PCSD critical assets which is projected to protect the area for the next two decades. They have no interest in hard armoring and anticipate growing the dune structure by removing the invasive species which suppress sand retention in the foredunes and backdunes. When the dune structure is able to function naturally by moving and growing instead of being stabilized by invasive species, the dune will provide a natural buffer for sea level rise.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The PCSD interview contained 9 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to PCSD**

Shared Funding Coordination  
 Regional Coordination in General  
 Restoration and Mitigation  
 Shoreline  
 Transportation Infrastructure  
 Wastewater Concerns  
 Relocation Coordination  
 Fishing Coordination  
 Recreational Coordination



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One section of questions asked survey respondents to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, some of which was identified above in this catalogue section as a PCSD asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Three assets were identified as assets by PCSD, all of which received a moderate priority rating or higher by more than 80% of respondents: “Sewer/wastewater collection and treatment facilities (89%, n=548)”, “Domestic water treatment and conveyance facilities” (87%, n=548), and “Stormwater collection and treatment facilities” (81%, n=543). Results are reported in the graph on the next page.

89%

of the public survey respondents who provided a rating for **"Sewer/wastewater collection and treatment facilities"** rated them a moderate priority or higher for flood protection and future SLR planning.

87%

of the public survey respondents who provided a rating for **"Domestic water treatment and conveyance facilities"** rated them a moderate priority or higher for flood protection and future SLR planning.

81%

of the public survey respondents who provided a rating for **"Stormwater collection and treatment facilities"** rated them a moderate priority or higher for flood protection and future SLR planning.

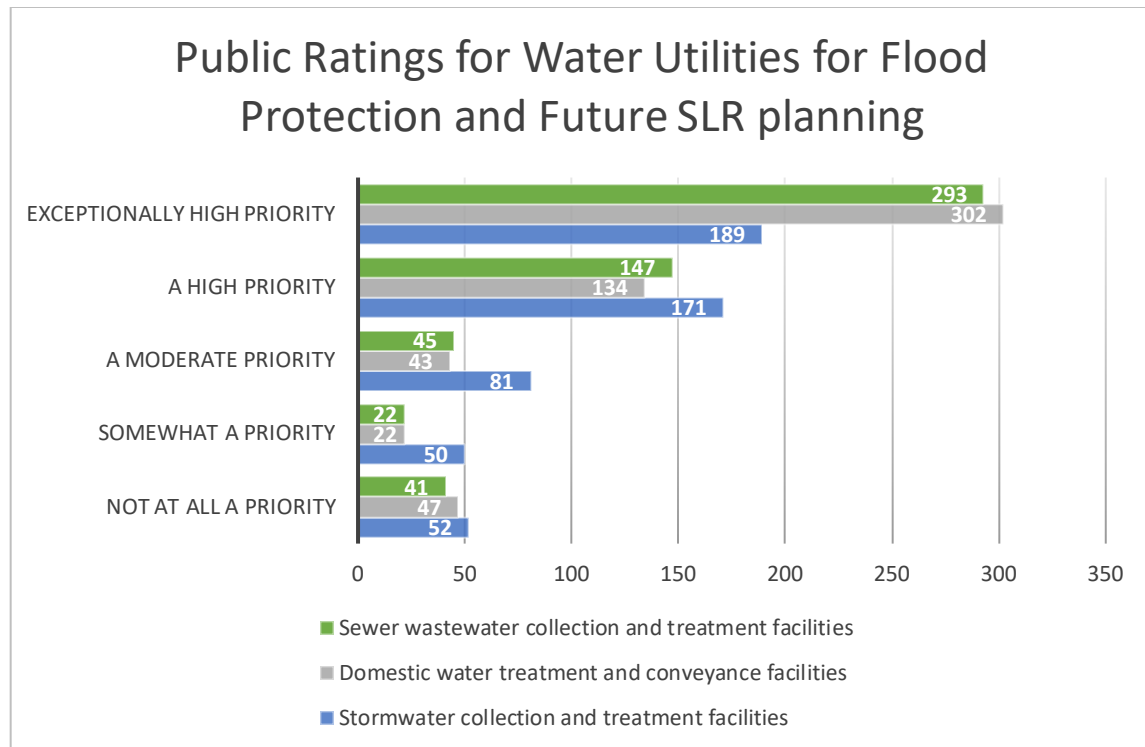


Figure 84. Priority Ratings for Sewer/wastewater collection and treatment facilities (n=548 in green), Domestic water treatment and conveyance facilities (n=548 in grey), and Stormwater collection and treatment facilities (n=543 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

#### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021 there was a total of 9 respondents for the Infrastructure/Service Provider/Community Services District category though participation for individual questions varied. Participants included Humboldt Bay Municipal Water District, Humboldt CSD, Manila CSD, Peninsula CSD, and Vero Networks. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category had low participation (n=4) but ranged from “not involved” to “participate” with a 50% preference for a mix of “not involved” and participation as shown in the graph on the next page.



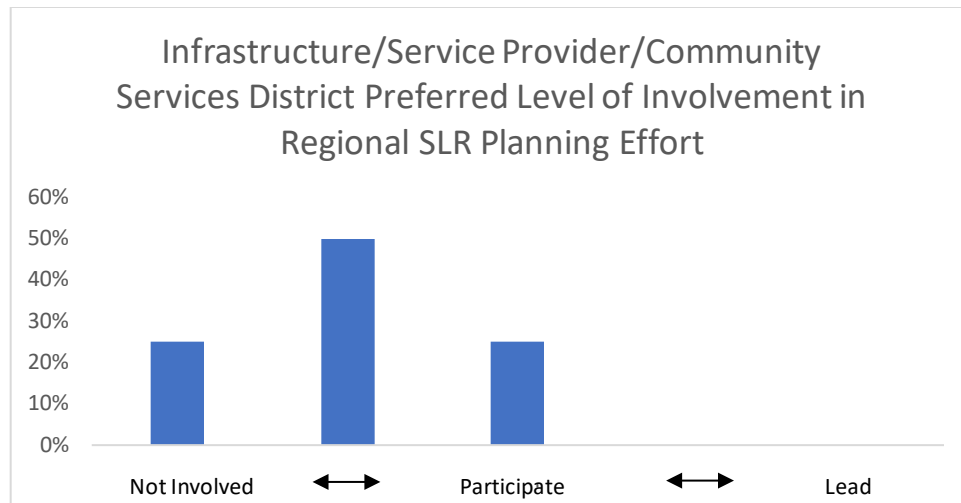


Figure 85. Infrastructure/Service Provider/Community Services District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for this category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph below.

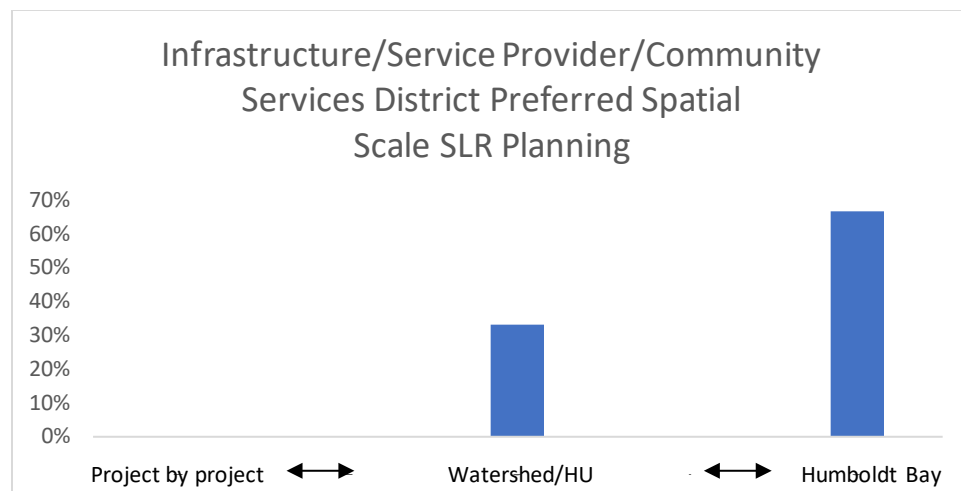


Figure 86. Infrastructure/Service Provider/Community Services District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=3)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Infrastructure/Service Provider/Community Services District category favored empowering or retooling an existing regional agency, creating a formal collaborative partnership, and engaging in informal coordination with 75% of

respondents rating this option somewhat favorable or higher for all three options. Half of respondents were either neutral or somewhat opposed having no regional planning as shown in the graph below.

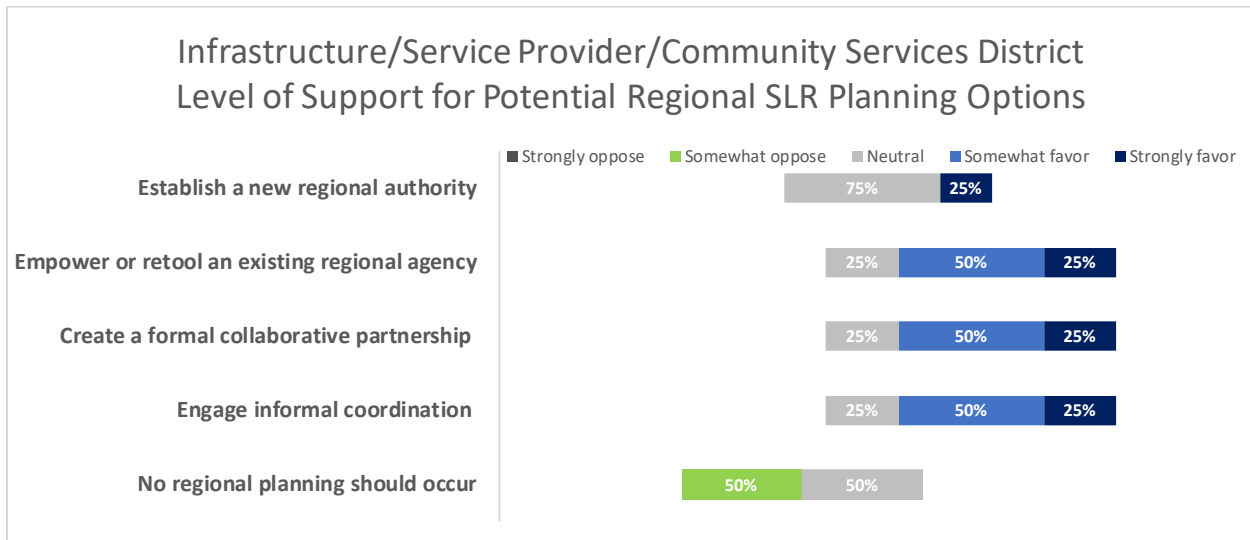


Figure 87. Infrastructure/Service Provider/Community Services District respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

*Reference Links*

<http://humboldtlafo.org/wp-content/uploads/17-08-Samoa-Fire-Reorganization-to-CSD-REVISED.pdf>

<http://humboldtlafo.org/wp-content/uploads/Exhibit-A.pdf>

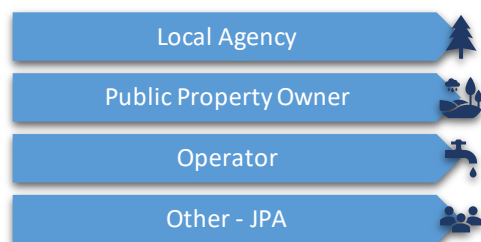
<http://humboldtlafo.org/wp-content/uploads/Peninsula-CSD-Management-Plan-Final-2017-03-31-SHN.pdf>

<https://humboldt.gov/DocumentCenter/View/71162/3-Project-Description-PDF>

[https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1005&context=hsuslri\\_student](https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1005&context=hsuslri_student)

## Redwood Coast Energy Authority

*Roles & Responsibilities*



The Redwood Coast Energy Authority (RCEA) is a local government Joint Powers Agency created in 2003 with the purpose of developing and implementing sustainable energy initiatives for the benefit of the Member agencies and their constituents. Member agencies include the County of Humboldt; the Humboldt Bay Municipal Water District; and the Cities

of Arcata, Eureka, Blue Lake, Ferndale, Fortuna, Rio Dell, and Trinidad.

The purpose of RCEA is to develop and implement sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient, and renewable resources available in the region for the benefit of the Member agencies and their constituents. To further that purpose, the Redwood Coast Energy Authority works toward the following goals:

- To lead, coordinate and integrate regional efforts that advance secure, sustainable, clean and affordable energy resources
- To develop a long-term sustainable energy strategy and implementation plan
- To increase awareness of, and enhance access to, energy conservation, energy efficiency, and renewable energy opportunities available to the region
- To add value to, but not duplicate, energy services offered by utilities and others serving the region
- To keep key decision makers and stakeholders informed of policy, regulatory, and market changes that are likely to impact the region
- To support research, development, demonstration, innovation, and commercialization of sustainable energy technologies by public and private entities operating in Humboldt County
- To develop regional capabilities to respond to energy emergencies and short-term disruptions in energy supply, infrastructure, or markets that could adversely affect Humboldt residents and businesses

RCEA is governed by a board of directors whose members are appointed by the governing bodies of its Member agencies. The Board established a Community Advisory Committee to support RCEA public engagement efforts and to provide decision-making support and input to the RCEA Board.

RCEA administers Humboldt County's Community Choice Energy program. This program is an initiative designed by local city councils and county supervisors to offer benefits such as lower electricity rates to the community while retaining local control by locally sourcing greener electricity and adding it to the grid. RCEA works in partnership with PG&E, who continues to deliver electricity and maintain the lines. This program is available to residents of the County and Member cities.

### *Specific Hydrological Unit Assets and Concerns*

#### **Eureka Bay**

- **DG Fairhaven Biomass Power Plant**
  - The Fairhaven biomass power plant is a state certified renewable energy facility that uses a steam fired turbine powered by the burning of predominantly locally sourced lumber mill waste. The plant is located on the Samoa Peninsula and provides power to PG&E under the Redwood Energy Authority's Community Choice Energy program.

### General Concerns

Shoreline Management	Sea Level Rise Impacts:
Property Ownership and Adaptation Responsibility	
Regulatory Authorization and Compliance	
Feasible Adaptation Strategies	
Funding	
	Erosion
	Tidal Inundation
	Backwater and/or Emerging Groundwater Flooding
	Saltwater Intrusion

### Planning Efforts

There are no known plans by RCEA to address sea level rise although they do cite increasing sea level as an impact of climate change in Northern California in their RePower Humboldt Comprehensive Action Plan for Energy 2019 Update. This plan outlines strategies to increase utilization of renewable energy resources in Humboldt County.

### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, including “Electric service facilities” which was identified above in this catalogue section as a RCEA asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Electric service facilities” received high overall priority ratings with 85% (n=544) of respondents rating this asset as a moderate priority to exceptionally high priority. Results are shown in a graph below.

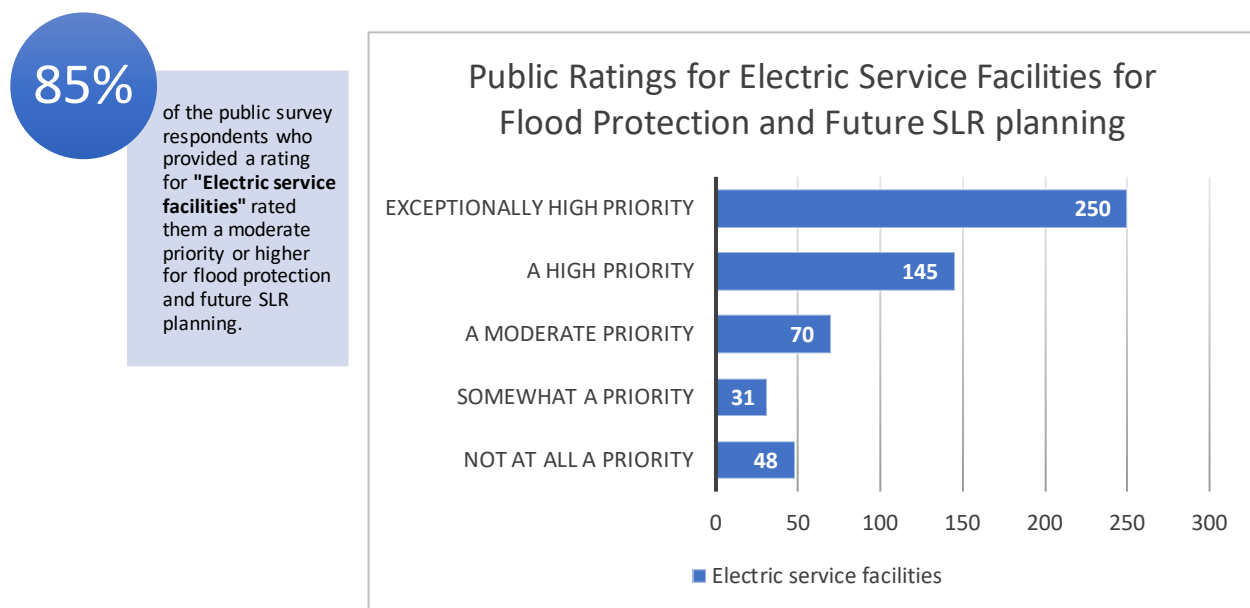
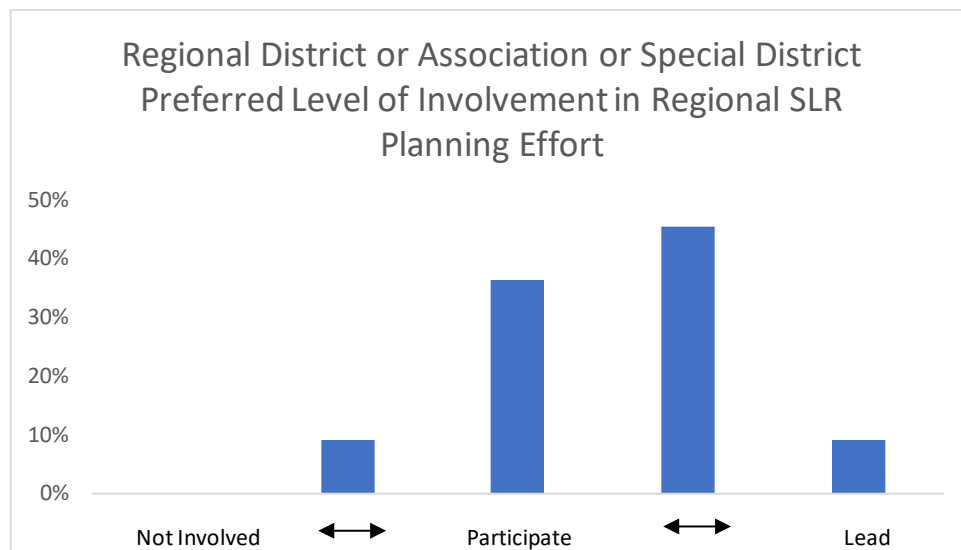


Figure 88. Priority Ratings for Electric service facilities (n=544) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents that were representatives from the Regional District or Association or Special District category which included the Harbor District, Humboldt County Association of Governments, and Redwood Coast Energy Authority, though participation for individual questions varied. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. They were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for this category ranged from just above “not involved” to “lead” with a 45% preference for a mix of participation and leading as shown in the graph below.



*Figure 89. Regional District or Association or Special District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11).*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Regional District or Association or Special District category ranged from Watershed/HU to Humboldt Bay in scale with a 64% preference for a Humboldt Bay approach as shown in the graph on the next page.

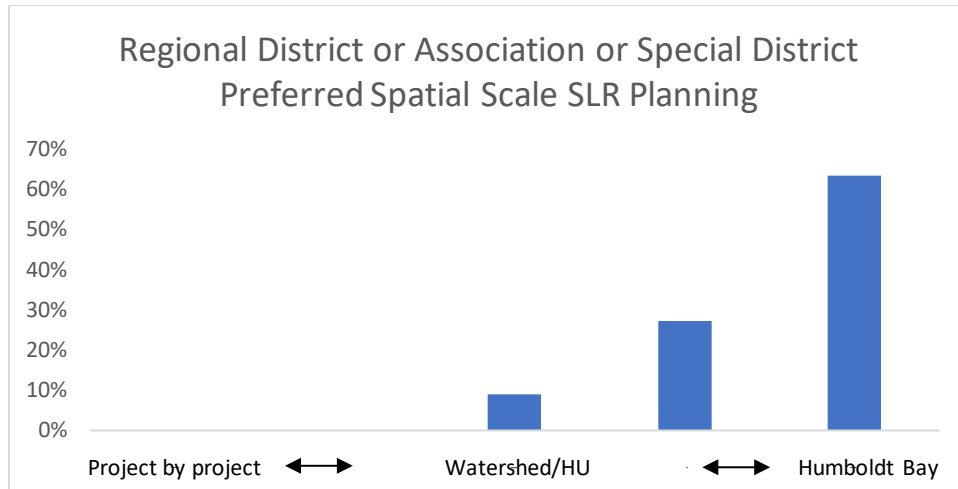


Figure 90. Regional District or Association or Special District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Regional District or Association or Special District category favored creating a formal collaborative partnership with 75% of respondents rating this option somewhat favorable or higher. Similarly, 83% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

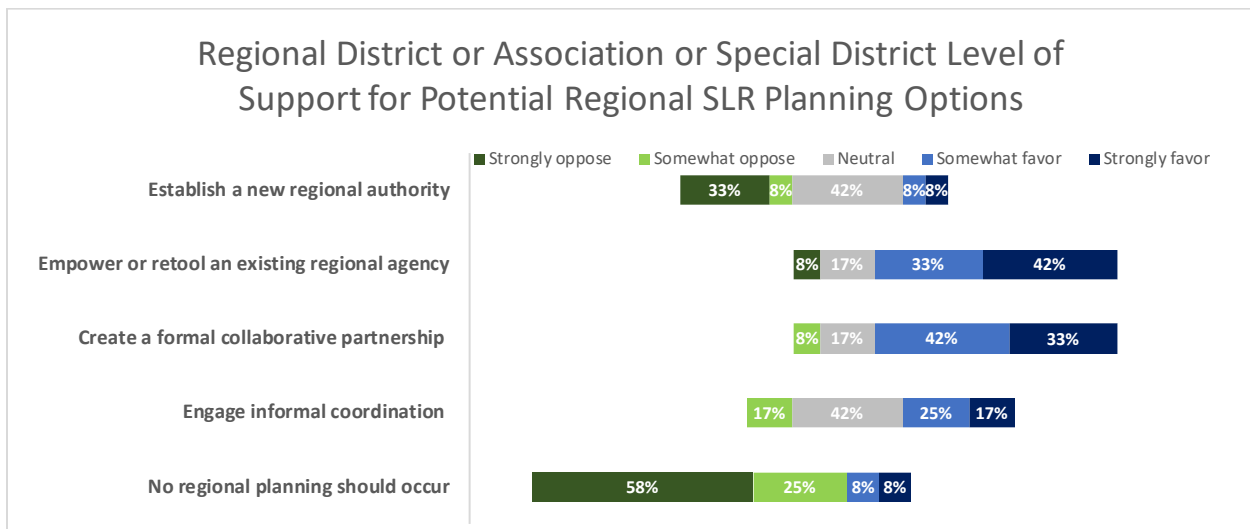


Figure 91. Regional District or Association or Special District respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 12)

*Reference Links*

<https://redwoodenergy.org/>

<https://redwoodenergy.org/wp-content/uploads/2020/06/RePower-2019-Update-FINAL-.pdf>

## American Telephone and Telegraph Company (AT&T)

### *Roles & Responsibilities*

#### Operator



American Telephone and Telegraph Company (AT&T) is the world's largest telecommunications company and the world's second largest provider of mobile phone

services. In Humboldt County, AT&T owns and maintains two fiber-optic lines including the County's oldest runs between Humboldt County and the San Francisco Bay area. The second line runs between Old Town Eureka and Red Bluff, following a route adjacent to Highway 36 and sharing an easement with PG&E. When built in 2011, this line could have provided redundancy for AT&T customers to address frequent outages on the north-south line. However, as late as 2017, AT&T had not leased space to their customers, but instead has leased space to Suddenlink and other local telecommunications companies.

### *Specific Hydrological Unit Assets and Concerns*

#### Eureka Slough

#### Utilities

- **Fiber optic line**
  - AT&T owns and maintains one optical fiber line that runs from San Francisco to Eureka following U.S. Highway 101 along the perimeter of Humboldt, and may share a joint utility easement with PG&E.
  - This fiber optic line could potentially be tidally inundated by dike failure but needs confirmation about exact location from AT&T

#### Eureka Bay

- **Fiber optic line**
  - AT&T owns and maintains one fiber optic line that runs from San Francisco to Eureka following U.S. Highway 101 along the perimeter of Humboldt.

#### Elk River Slough

- **Fiberoptic line**
  - AT&T owns and maintains one optical fiber line that runs from San Francisco to Eureka following U.S. Highway 101 along the perimeter of Humboldt.
  - This easement could potentially be tidally inundated by dike failure but needs confirmation about exact location from AT&T

#### South Bay

- **Fiberoptic line**
  - AT&T owns and maintains one optical fiber line that runs from San Francisco to Eureka following U.S. Highway 101 along the perimeter of Humboldt.

### General Concerns

	Shoreline Management		Sea Level Rise Impacts:
	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, including “Communication Facilities” which was identified above in this catalogue section as a AT&T asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Communication Facilities” received high overall priority ratings with 86% (n=541) of respondents rating this asset as a moderate priority to exceptionally high priority. Results are shown in a graph below.

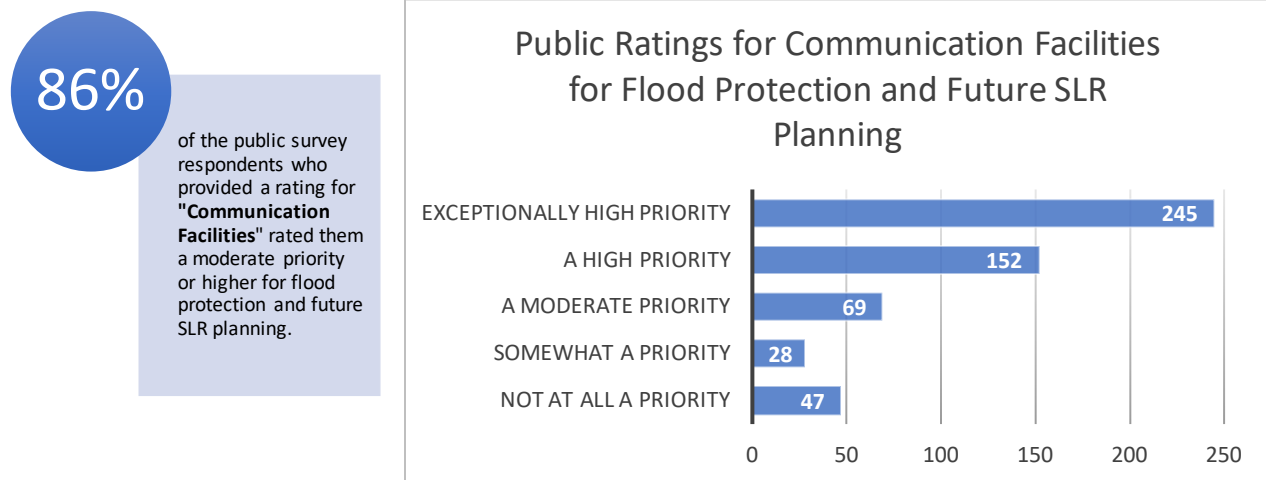


Figure 92. Priority Ratings for Communications Facilities regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=541)

### Planning Efforts

No known planning has or is occurring.

### Reference Links

<https://lostcoastoutpost.com/2017/oct/10/two-years-ago-t-promised-end-mass-telecommunicatio/>



<http://www.eureka2040gpu.com/Links/pdfs/COE%20SLR%20Assets%20Vulnerability-Risk%20Assessment%20Report-Appendix%2006302016.pdf>

## Inyo Networks

### *Roles & Responsibilities*

Operator 

Inyo Networks is a certified telecommunications service provider based in Rancho Cucamonga. They are implementing the “Digital 299 Broadband Project”

which is being constructed under a grant from the California Advanced Service Grant Program, as funded by the California Public Utilities Commission (CPUC). The project involves installation of a fiber optic cable extending from Eureka to Cottonwood and will generally follow California State Route 299, and will connect to large network that will reach to the East Coast.

### *Specific Hydrological Unit Assets and Concerns*

#### **Arcata Bay**

- **Fiber optic cable**

Utilities 

#### **Eureka Bay**

- **Fiber optic conduit connection to other cables**

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

No known planning has or is occurring.

### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, including “Communication Facilities” which was identified above in this catalogue section as a Inyo Networks asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Communication Facilities” received high overall priority ratings

with 86% (n=541) of respondents rating this asset as a moderate priority to exceptionally high priority. Results are shown in a graph below.

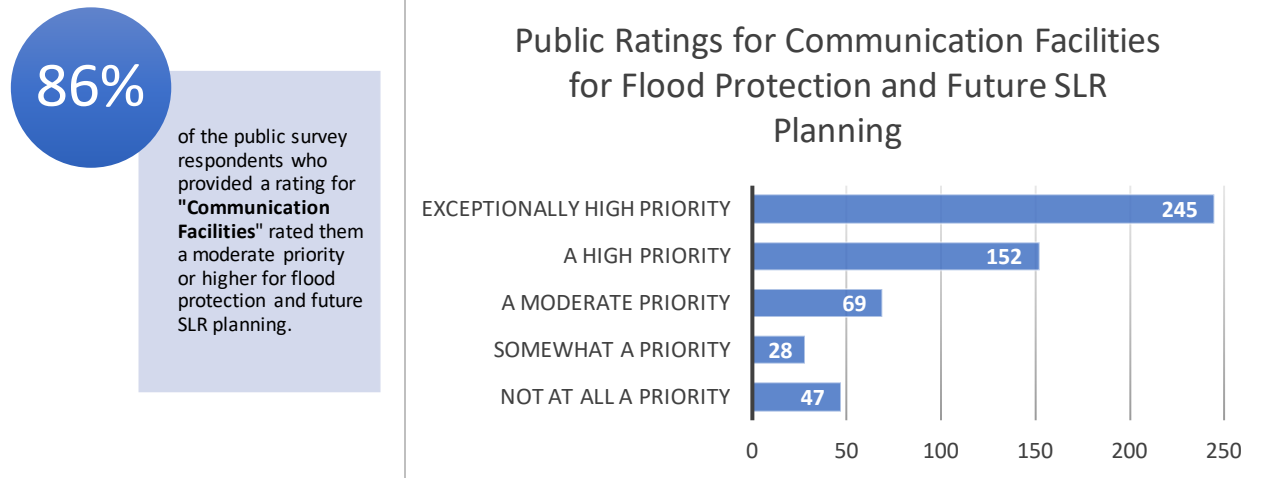


Figure 93. Priority Ratings for Communications Facilities regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=541)

### Reference Links

[https://www.cpuc.ca.gov/environment/info/transcon/digital\\_299\\_project/](https://www.cpuc.ca.gov/environment/info/transcon/digital_299_project/)

[https://www.cpuc.ca.gov/environment/info/transcon/digital\\_299\\_project/D299%20Project%20Newsletter%202019%200709.pdf](https://www.cpuc.ca.gov/environment/info/transcon/digital_299_project/D299%20Project%20Newsletter%202019%200709.pdf)

<https://lostcoastoutpost.com/2020/nov/25/arcata-datacenter-fiber-optic-line/>

<https://www.times-standard.com/2020/11/20/humboldt-bay-harbor-district-approves-1-2m-plus-lease-agreement-to-land-fiber-optic-cables/>

<https://lostcoastoutpost.com/2017/jan/25/fiber-optic-deal-harbor-district/>

## Pacific Gas & Electric Company (PG&E)

### Roles & Responsibilities

Private Property Owner



Operator



Pacific Gas and Electric Company (PG&E), incorporated in California in 1905, is one of the largest combined natural gas and electric energy companies in the United States. Based in San Francisco, the company is a subsidiary of PG&E Corporation and is an investor-

owned utility regulated by the California Public Utilities Commission. PG&E serves most of the northern two-thirds of California. They provide electricity and natural gas within Humboldt County.

Energy infrastructure assets in the Humboldt Bay region include the Humboldt Bay Generating Station (HBGS) which is a local natural gas-fired power plant in King Salmon and DG Fairhaven Biomass Power Plant located on the Samoa Peninsula, both of which are located in the County’s jurisdiction, specifically in the HBAP area. In mid-2020, the reconfiguration of the HBGS was completed to allow the plant to provide power directly to customers, if needed, during emergencies such as Public Safety Power Shutoff events and other events outside the County that would impact the County. The reconfiguration allows portions of Humboldt County to be separated from the larger grid and energized exclusively from the HBGS when transmission sources that import, export, and stabilize power to nearby areas are impacted. Areas that can be powered by the HBGS include 20 cities and towns such as Eureka, Arcata, McKinleyville, and Fortuna as well as some tribal communities.

PG&E have power lines, transmission towers, transmission poles and gas lines that would potentially be affected by 1 meter of SLR in all HUs.<sup>4</sup>

### *Specific Hydrological Unit Assets and Concerns*

#### **Mad River Slough**

- **Electrical transmission lines, towers, and poles**



Utilities



Shoreline Protection

#### **Arcata Bay**

- **Electrical transmission lines, towers, and poles**
- **Gas lines**

#### **Eureka Slough**

- **Electrical transmission lines, and poles**
- **Gas lines**
- **Humboldt substation**
  - Substation on Mitchell Heights Drive is above 4.6 m

#### **Eureka Bay**

- **Electrical transmission lines**
- **Gas lines**
- **DG Fairhaven Biomass Power Plant**
  - The Fairhaven biomass power plant is a state certified renewable energy facility that uses a steam fired turbine powered by the burning of predominantly locally sourced lumber mill waste. The plant is located on the Samoa Peninsula and provides power to PG&E under the Redwood Energy Authority’s Community Choice Energy program.

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<sup>4</sup> PG&E has approximately 26 miles of power lines, 32 transmission towers, 195 transmission poles and 24 miles of gas lines that would potentially be affected by 2 meters of SLR around the Humboldt Bay region.

### Elk River Slough

- **Electrical transmission lines, towers, and poles**
- **Gas lines**

### South Bay

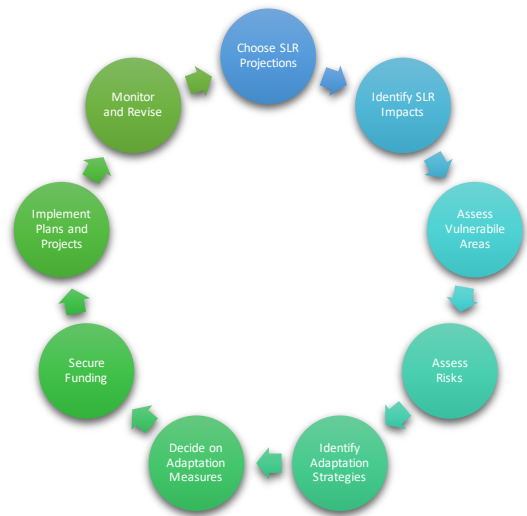
- **Electrical transmission lines, towers, and poles**
- **Gas lines**
- **King Salmon and Fields Landing Residents**
  - These particularly vulnerable communities receive their natural gas and electricity from PG&E. PG&E also maintains a rock fortified shoreline along the north shore of King Salmon that is additionally used as a coastal trail.
- **Humboldt Bay substation**
  - This substation in King Salmon has a range of elevations from 2.9 m to 3.3 m
- **Humboldt Bay Generating Station (HBGS)**
  - Humboldt Bay Generation Station located in King Salmon has a range of elevations from 2.9 m to 3.3 m. It is supplied with natural gas via an onsite natural gas pipeline located underground which is also owned and operated by PG&E, with diesel fuel as a backup. In June 2020, the power system was reconfigured to provide power directly to customers during emergencies such as Public Safety Power Shutoff (PSPS) events if needed. Areas that can be powered by the HBGS now include more than 20 cities and towns such as Eureka, Arcata, McKinleyville and Fortuna as well as some tribal communities. During winter king tides (highest annual tides) large waves from storms erode the shoreline near this station.
- **Decommissioned Humboldt Bay (Nuclear) Power Plant (HBPP)**
  - The Humboldt Bay Power Plant (HBPP), located on Buhne Hill in King Salmon, is a now defunct nuclear facility that is nearing the end of the decommissioning process as of 2019. The spent nuclear fuel from this plant is stored at the nearby Independent Spent Fuel Storage Installation (ISFSI). There is significant erosion in this area due to its proximity to the entrance of Humboldt Bay. In the winter during highest annual tides, storm waves cause erosion at the adjacent railroad, HBGS, and ISFSI. Emergency repairs to the protective rock slope at this plant was performed in 2005 and 2018.
- **Independent Spent Fuel Storage Installation (ISFSI)**
  - The Independent Spent Fuel Storage Installation (ISFSI) site, along with HBPP, is located on Buhne Hill in King Salmon 115 feet behind the shoreline facing the entrance to Humboldt Bay. There are currently six multi-ton casks of spent nuclear material located at this site, 44 feet above the shoreline in a cement vault. PG&E first abated the erosion of Buhne Hill in the 1950s with the installation of a rock riprap sea wall. In the winter during king tides also known as highest annual tides, large waves cause erosion at the adjacent railroad, HBGS, and HBPP. Following these storm damage during king tides in 2005 and 2018, there were emergency repairs to the nearby protective rock slope.

*General Concerns*

	Shoreline Management		Sea Level Rise Impacts:	
✓	Property Ownership and Adaptation Responsibility			Erosion
✓	Regulatory Authorization and Compliance		✓	Tidal Inundation
✓	Feasible Adaptation Strategies		✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding		✓	Saltwater Intrusion

*Planning Efforts*

PG&E is taking steps to address climate change and SLR. In 2015, PG&E was a participant in a climate change adaptation workshop co-hosted by the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC), during which they shared how PG&E are working to address climate change and their commitment to building a more modern and resilient gas and electric system that can better withstand extreme weather and natural disasters. Following this event, PG&E also provided input to California’s Sea Level Rise Planning Database, as required under AB 2516. PG&E was also one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015.



In 2016 PG&E released a Climate Change Vulnerability Assessment which includes a Natural Hazard Asset Performance Initiative - Preliminary Assessment for: Flooding, SLR, Subsidence, and Heat Storms and Change in Temperature Extremes. ([https://www.pge.com/en\\_US/about-pge/environment/what-we-are-doing/fighting-climate-change/fighting-climate-change.page](https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/fighting-climate-change/fighting-climate-change.page).) This website has a link to their broad climate change vulnerability assessment in which they identify the following threats from sea level rise: 1) higher inundation and flooding potential at coastal and low elevation facilities due to sea level rise combined with high tides, storm runoff and storm surges; 2) levee erosion or failure, putting assets at risk; and 3) risk of damage to substations and other gas and electric infrastructure.

In 2016 PG&E also participated in a technical Advisory Committee for Cal-Adapt, working to visualize local and regional climate change-related risks whilst highlighting adaptation needs and possibilities.

PG&E awarded the Wiyot tribe \$100,000 through PG&E’s Better Together Resilient Communities Program. This funding was awarded in support of Phase 1 the tribe’s Climate Change Adaptation Planning project.

Beginning in 2020, PG&E committed to regionalize its operational approach and implemented a regional planning campaign for their Climate Vulnerability Assessment Project (2020-2023). The Climate Vulnerability Assessment Project is a pre-adaptation step meant to inform implementation projects and find funding for these projects. The formal planning process will be conducted on a region-by-region basis, beginning with the Bay Area. The Humboldt Bay region is slated to start in late 2022. The project will look at regional exposure and sensitivity through internal technical studies and then focus on community

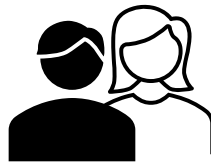
engagement with particular attention to CPUC-defined disadvantaged communities to understand utility customer needs.

### *Key Stakeholder Coordination Themes*

During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The PG&E interview contained 9 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

#### **Interview Themes Important to PG&E**

- Shared Funding Coordination
- Regional Coordination in General
- Increased Landowner Participation
- Increased Communication between Stakeholders
- Personnel Constraints
- Dedicated Time Constraints
- Interest in County leading
- Regional Prioritization of projects
- Utilities Concerns



### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, two of which were identified above in this catalogue section as PG&E assets that could be subject to sea level rise impacts, confirmed as such during the SLR Stakeholder Interview 2021: “Electric service facilities” and “Natural Gas distribution facilities”. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. Both assets received high overall priority ratings with over 80% of respondents rating these assets as a moderate priority to exceptionally high priority with “Electric service facilities” getting 85% (n=544) and “Natural Gas distribution facilities” getting 83% (n=546). Results are shown in a graph on the next page.

**85%** of the public survey respondents who provided a rating for "Electric service facilities" rated them a moderate priority or higher for flood protection and future SLR planning.

**83%** of the public survey respondents who provided a rating for "Natural Gas distribution facilities" rated them a moderate priority or higher for flood protection and future SLR planning.

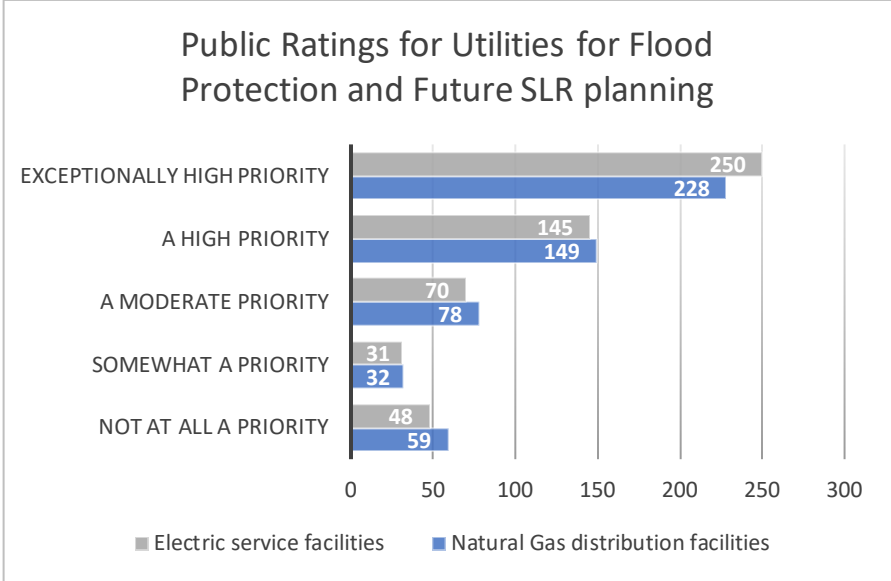


Figure 94. Priority Ratings for Electric service facilities (n=544 in grey) and Natural Gas distribution facilities (n=546 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

*Reference Links*

- <https://www.pgecurrents.com/2020/06/12/humboldt-bay-generating-station-ready-to-serve-as-a-direct-local-power-source-during-emergencies-reducing-impact-of-psps-events/>
- [https://www.pge.com/en\\_US/about-pge/environment/what-we-are-doing/fighting-climate-change/fighting-climate-change.page](https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/fighting-climate-change/fighting-climate-change.page)
- [https://www.pgecurrents.com/wp-content/uploads/2016/02/PGE\\_climate\\_resilience.pdf](https://www.pgecurrents.com/wp-content/uploads/2016/02/PGE_climate_resilience.pdf)
- [https://www.pgecorp.com/corp\\_responsibility/reports/2021/pl02\\_climate\\_change.html](https://www.pgecorp.com/corp_responsibility/reports/2021/pl02_climate_change.html)
- [https://www.pgecorp.com/corp\\_responsibility/reports/2021/assets/PGE\\_CRSR\\_2021.pdf](https://www.pgecorp.com/corp_responsibility/reports/2021/assets/PGE_CRSR_2021.pdf)

**RTI Infrastructure Inc**

*Roles & Responsibilities*

**Operator** 

RTI Infrastructure is a San Francisco based telecommunications and software framework company. They plan to land up to four underground trans-Pacific fiber optic cables extending from Singapore to just off the coast of Humboldt County. The cables will link to the Inyo Network’s Digital 299 project at the data center planned to be constructed in Arcata in 2021.

### *Specific Hydrological Unit Assets and Concerns*

#### **Eureka Bay**

#### Utilities

- **Fiber optic conduit**
  - In November 2020, the Harbor District entered into a lease agreement with RTI Infrastructure to land up to four undersea fiber optic cables at the former Evergreen pulp mill site on the Samoa Peninsula, Marine Terminal II. The cable will run through the outfall of the pulp mill.

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

No known planning has or is occurring.

### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, including “Communication Facilities” which was identified above in this catalogue section as a RTI Infrastructure asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Communication Facilities” received high overall priority ratings with 86% (n=541) of respondents rating this asset as a moderate priority to exceptionally high priority. Results are shown in a graph on the next page.



**86%** of the public survey respondents who provided a rating for "Communication Facilities" rated them a moderate priority or higher for flood protection and future SLR planning.

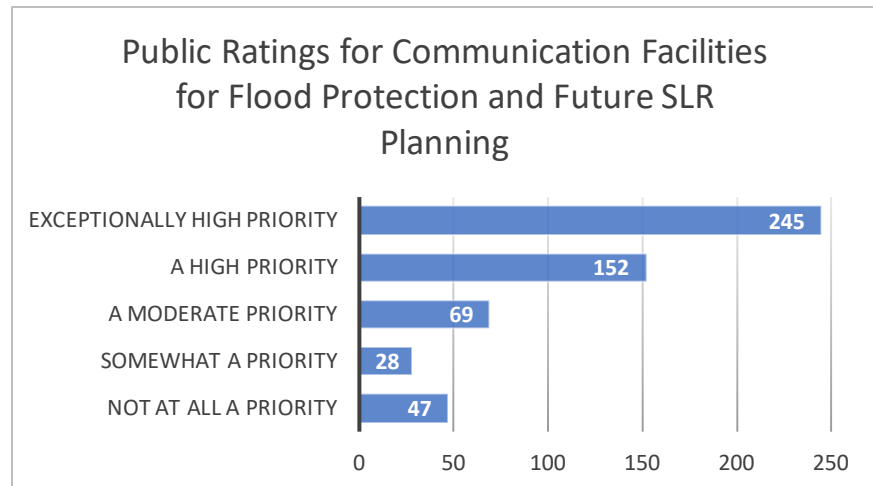


Figure 95. Priority Ratings for Communications Facilities regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=541)

### Reference Links

<http://www.rticables.com/>

[https://www.cpuc.ca.gov/environment/info/transcon/digital\\_299\\_project/](https://www.cpuc.ca.gov/environment/info/transcon/digital_299_project/)

[https://www.northcoastjournal.com/media/pdf/agenda\\_11-19-2020\\_packet.pdf](https://www.northcoastjournal.com/media/pdf/agenda_11-19-2020_packet.pdf)

<https://www.times-standard.com/2020/11/20/humboldt-bay-harbor-district-approves-1-2m-plus-lease-agreement-to-land-fiber-optic-cables/>

<https://lostcoastoutpost.com/2020/aug/21/remember-fat-internet-pipe-was-going-rise-out-sea/>

## Suddenlink

### Roles & Responsibilities

Operator



Suddenlink Communications is a national telecommunications company that operates in eleven states including California. It is a subsidiary of Altice USA that offer services for cable television, broadband, IP telephony, home security, and advertising. They lease space on an AT&T fiberoptic line connected to the Central Valley and have their own fiber optic cable that follow US 101, but the exact location is not available. They offer fiber optic services from Ferndale to Trinidad.

### *Specific Hydrological Unit Assets and Concerns*

#### **Arcata Bay**

- **Fiber optic cable**


 Utilities

#### **Eureka Slough**

- **Fiber optic cable**

#### **Eureka Bay**

- **Fiber optic cable**

#### **Elk River Slough**

- **Fiber optic cable**

#### **South Bay**

- **Fiber optic cable**

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

No known planning has or is occurring.

### *Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, including “Communication Facilities” which was identified above in this catalogue section as a Suddenlink asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Communication Facilities” received high overall priority ratings with 86% (n=541) of respondents rating this asset as a moderate priority to exceptionally high priority. Results are shown in a graph on the next page.

**86%** of the public survey respondents who provided a rating for "Communication Facilities" rated them a moderate priority or higher for flood protection and future SLR planning.

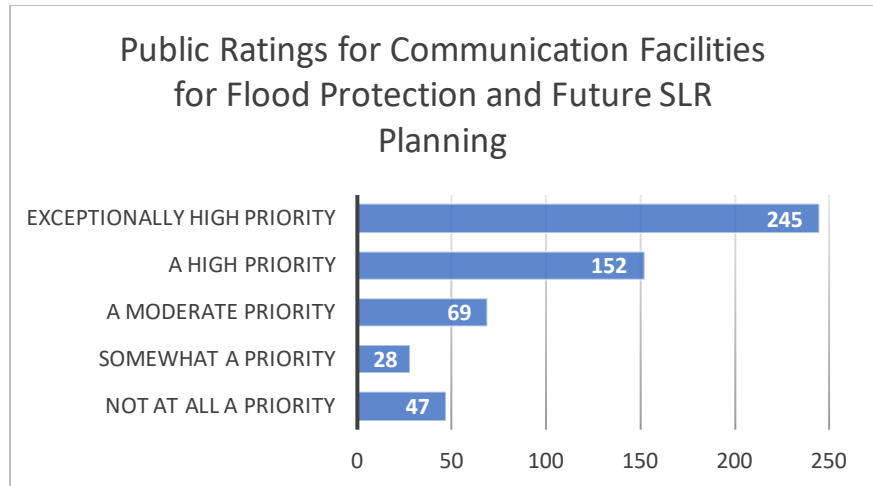


Figure 96. Priority Ratings for Communications Facilities regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=541)

*Reference Links*

<https://lostcoastoutpost.com/2017/oct/10/two-years-ago-t-promised-end-mass-telecommunicatio/>

<https://www.times-standard.com/2013/03/09/suddenlink-customers-disconnected-after-vandals-cut-fiber-optic-line-thousands-off-line-friday-damage-estimated-at-10000/>

## Verizon

*Roles & Responsibilities*

Operator 

Verizon is an international telecommunications company that offers mobile and landline communications services, including broadband

internet and phone service. They have nationwide 5G mobile service and are expanding their fiber optic services nationwide although they do not have fiber optic services available in Humboldt County yet.

*Specific Hydrological Unit Assets and Concerns*

**All hydrological units**

- **Telecommunication lines**

 Utilities

### General Concerns

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### Planning Efforts

No known planning has or is occurring.

### Relevant SLR Public Survey Findings

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. Survey respondents were asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, including “Communication Facilities” which was identified above in this catalogue section as a Verizon asset that could be subject to sea level rise impacts. Responses for priority ratings ranged from “not at all a priority” to “exceptionally high priority”. “Communication Facilities” received high overall priority ratings with 86% (n=541) of respondents rating this asset as a moderate priority to exceptionally high priority. Results are shown in a graph below.

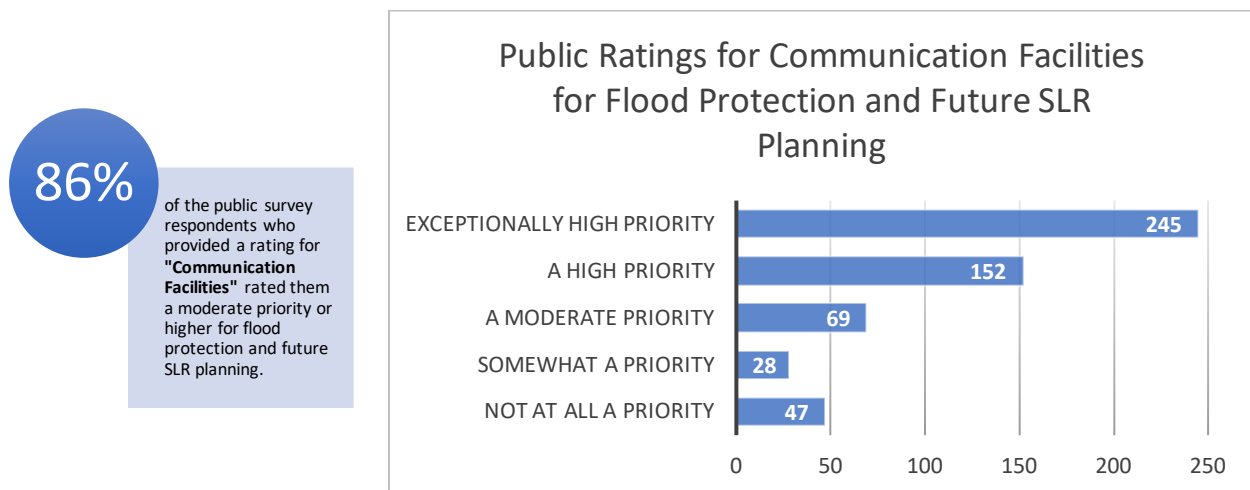


Figure 97. Priority Ratings for Communications Facilities regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=541)

### Reference Links

<https://www.verizon.com/about>

## Vero Fiber Networks

### *Roles & Responsibilities*

Operator

Vero Fiber Networks is a Colorado based telecommunications company that plans to run fiber optic conduits along Route 255 into Arcata.

### *Specific Hydrological Unit Assets and Concerns*

#### **Arcata Bay**

Utilities

- **Fiber optic conduits**
  - EdgeConnex recently announced plans to establish a datacenter in Arcata that will serve as the terminal for two underground fiber optic lines to be installed by Vero Fiber Networks. Vero plans to run two fiber optic conduits that will both be roughly ten miles long and include at least a portion of each running under streets in Arcata. One conduit line will be installed from Samoa along Route 255 into Arcata and will connect to the datacenter. A second conduit that will run from the data center and will follow Old Arcata Road that will connect to another line just east of Eureka.

### *General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility		Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
✓	Funding	✓	Saltwater Intrusion

### *Planning Efforts*

No known planning has or is occurring.

### *Relevant SLR Public Survey Findings*

During the SLR Public Survey 2021, respondents were asked to rate the priority of Communication Facilities located within the Humboldt Bay region for consideration in flood protection and future SLR planning. Of the 577 participants, 541 assigned a rating to “Places of Cultural Importance”. For those that did participate, 86% of these respondents rated these cultural sites as a moderate or higher priority. Results are reported in the graph on the next page.

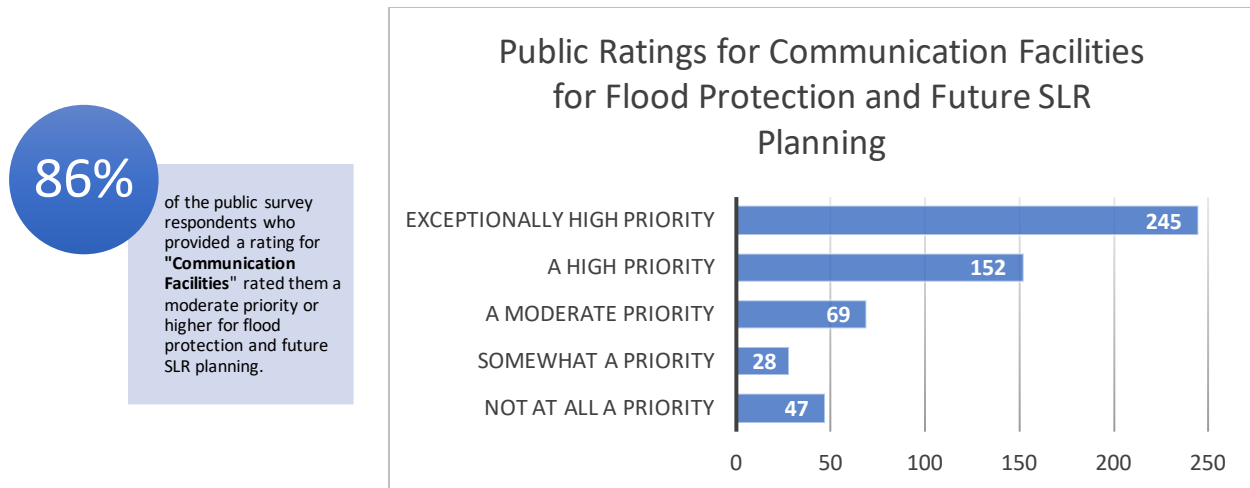


Figure 98. Priority Ratings for Communications Facilities regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021 (n=541)

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents that were representatives from the Regional District or Association or Special District category which included the Harbor District, Humboldt County Association of Governments, and Redwood Coast Energy Authority, though participation for individual questions varied. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. They were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results for this category ranged from just above "not involved" to "lead" with a 45% preference for a mix of participation and leading as shown in the graph on the next page.

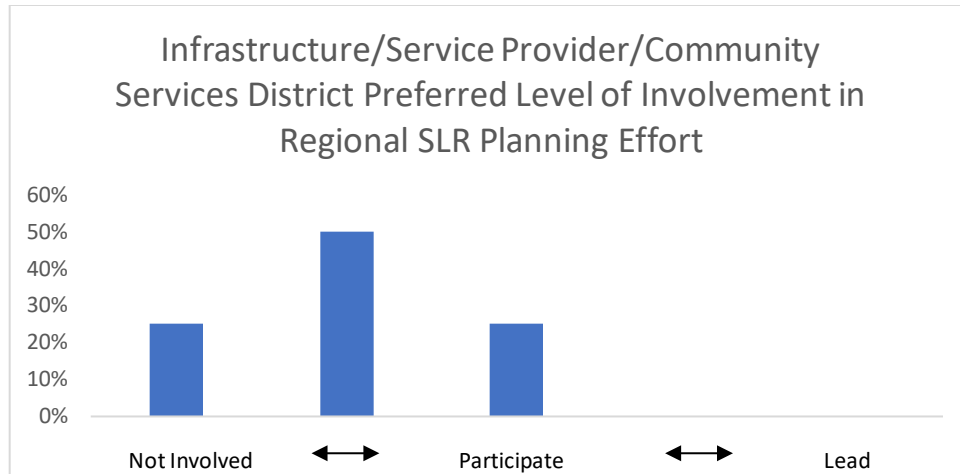


Figure 99. Infrastructure/Service Provider/Community Services District respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=4)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for this category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph below.

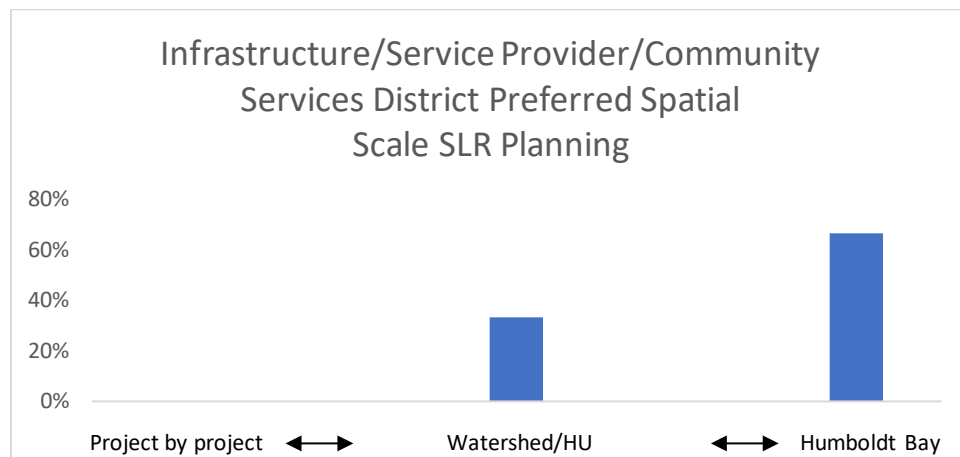


Figure 100. Infrastructure/Service Provider/Community Services District respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=3)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Infrastructure/Service Provider/Community Services District category favored empowering or retooling an existing regional agency, creating a formal collaborative partnership, and engaging in informal coordination with 75% of

respondents rating this option somewhat favorable or higher for all three options. Half of respondents were either neutral or somewhat opposed having no regional planning as shown in the graph below.

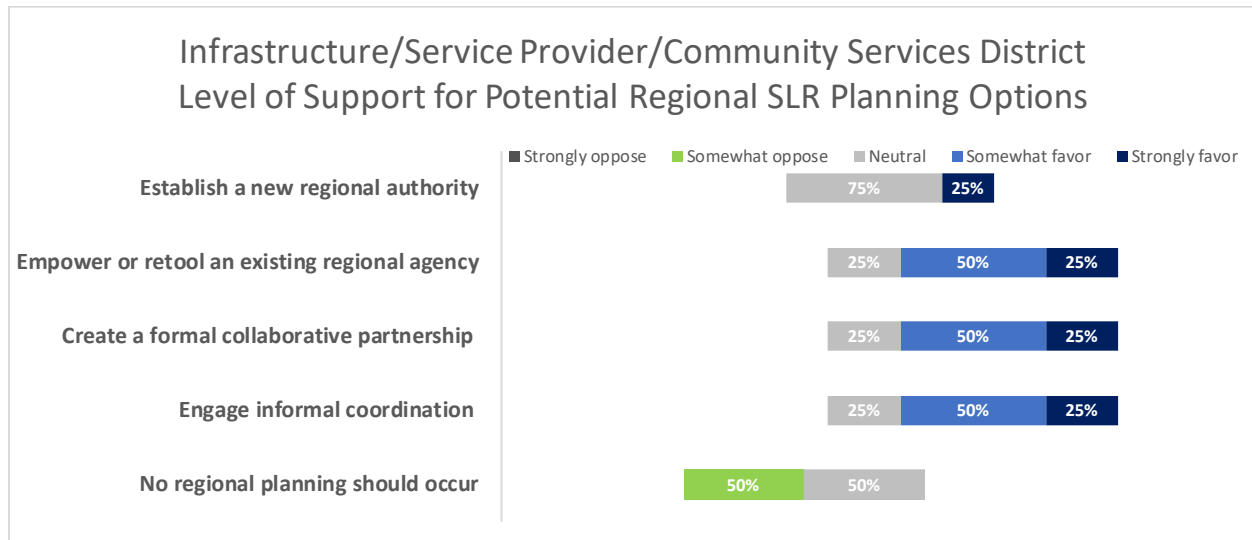


Figure 101. Infrastructure/Service Provider/Community Services District respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 4)

#### Reference Links

<https://www.veronetworks.com/>

<https://ceqanet.opr.ca.gov/2021030437>

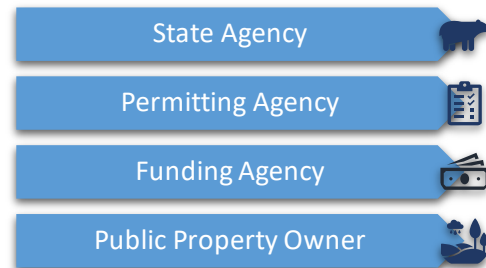
<https://lostcoastoutpost.com/2020/nov/25/arcata-datacenter-fiber-optic-line/>



## Transportation Infrastructure Owner

### California Department of Transportation

#### *Roles & Responsibilities*



The California Department of Transportation (Caltrans) manages a state highway system (SHS) of more than 50,000 miles of the state's highways and freeways, including U.S. Route or Highway (US) 101 and California State Route (SR) 255 in the Humboldt Bay area. US 101 forms a critical transportation corridor that traverses approximately 18 miles of the eastern shoreline of Humboldt Bay. Humboldt

County's SLR Vulnerability Assessment identifies three low-lying segments of these 18 miles of US 101: a north segment along the shoreline of Arcata Bay (5.8 miles), a middle segment between King Salmon and South Eureka (2.3 miles), and a south segment on South Bay (2.7 miles). These segments are primarily protected from SLR by dikes or the railroad grade, both of which are not owned by Caltrans.

Caltrans District 1 has identified where SR 255 and US 101 surround and traverse the bay as one of their most vulnerable sections of the SHS due to SLR and land subsidence. Erosion, tidal inundation, and groundwater changes are Caltrans concerns in the Eureka to Arcata US 101 corridor area.

There are many divisions within Caltrans but the two that would be most involved in SLR planning in the Humboldt Bay region are:

#### Capital Outlay Support (COS) Program

The COS Program is the funding mechanism for construction contracts and right-of-way acquisition for projects that preserve and improve the SHS. In managing construction capital budgets, Caltrans balances risk in project budgeting with the need to ensure that an appropriate mix of projects is brought forward in sufficient quantities to use their annual federal obligation authority. Complete and reasonable estimates are necessary to avoid undesired consequences, including loss of federal or local funds. The COS Program is responsible for developing capital projects on the SHS and preparing the construction contract documents for these projects. COS functions include the activities necessary to deliver construction projects such as engineering and design work; environmental analysis and studies; right-of-way acquisition support; and construction administration and inspection activities.

#### Division of Transportation Planning (DOTP)

Caltrans' DOTP articulates a long-term vision for California's transportation system and implements statewide transportation policy through partnerships with state, regional, and local agencies. The Division provides quality planning products, services, and information to support and guide transportation investment decisions.

## *Specific Hydrological Unit Assets and Concerns*

### **Arcata Bay**



- **Eureka to Arcata US 101 Corridor**
  - Caltrans, in cooperation with the Humboldt County Association of Governments (HCAOG) and the Federal Highway Administration (FHWA), proposes to make improvements to this corridor. The corridor improvement project will also assess and respond to sea level rise by incremental raising of structures (such as medians, curbs and ramps) and Caltrans will remain flexible about future on-alignment adaptation projects. The current proposal will:
    - Improve safety and reduce delays at intersections.
    - Reduce operational conflicts.
    - Resurface, restore, and rehabilitate the existing Route 101.
    - Extend or construct right-turn acceleration and deceleration lanes.
  - Areas of proposed improvements for sea level rise and adaptability in this hydrologic unit includes raising Jacoby Creek Bridge and improving three tide gates. This area has documented existing vulnerabilities, most notably the highest recorded tidal elevation in Humboldt Bay at 9.5 ft in 2005. The dikes protecting most of the area are predominantly over 100 years old and are susceptible to overtopping in extreme tide events. These dikes are controlled by multiple private landowners which include North Coast Rail Authority (NCRA) and the California Department of Fish and Wildlife (CDFW)
    - Jacoby Creek Bridge does not have a dike protecting it
- **SR 255 runs through SLR vulnerable area**

### **Eureka Slough**

- **Eureka to Arcata Route 101 Corridor**
  - Caltrans, in cooperation with HCAOG and FHWA, proposes to make improvements to this corridor. Areas of proposed improvements for sea level rise and adaptability in this hydrologic unit includes raising the Indianola Road/Highway 101 Intersection, beginning a project on Airport Road, and improving one tide gate.
  - Indianola interchange currently has moderate protection

### **Eureka Bay**

- **Broadway Corridor**
  - The 101-Broadway corridor is the most highly traveled corridor and is undergoing planning to fix safety issues within this SLR vulnerable location.
  - There is a project to construct improvements on U.S. Highway 101 for compliance with the Americans with Disabilities Act (ADA) from just north of the Herrick Interchange to just north of Cedar Street in the City of Eureka. Work would include replacing or installing curb ramps, sidewalks, driveways, and splitter islands. The project would also improve drainage and the install audible pedestrian systems at all existing signalized intersections.
- **SR 255 runs through SLR vulnerable area**

**Elk River Slough**

- US 101 runs through SLR vulnerable area

**South Bay**

- US 101 runs through SLR vulnerable area

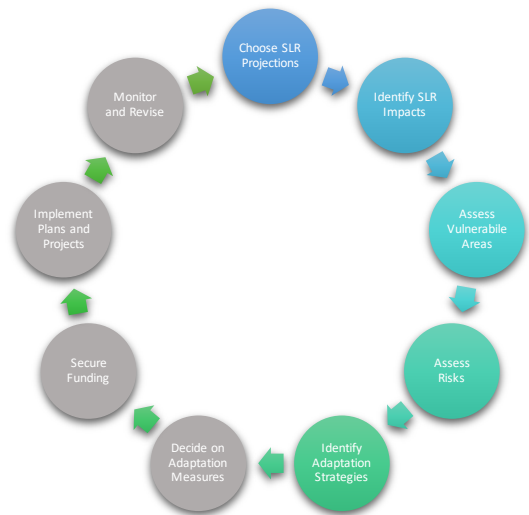
*General Concerns*

	Shoreline Management		Sea Level Rise Impacts:
✓	Property Ownership and Adaptation Responsibility	✓	Erosion
✓	Regulatory Authorization and Compliance	✓	Tidal Inundation
✓	Feasible Adaptation Strategies	✓	Backwater and/or Emerging Groundwater Flooding
	Funding	✓	Saltwater Intrusion

*Planning Efforts*

In 2014 Caltrans District 1 and Humboldt County Association of Governments completed a Climate Change Vulnerability Assessment Pilot Study. This agency was one of 22 partners in the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) which ended in 2015. Caltrans conducted multiple studies and a SLR Vulnerability and Adaptation Solutions study (2019) on the Eureka-Arcata HWY 101 Corridor. District 1 concluded a Climate Change Vulnerability Assessment in 2019.

A Coastal Development Permit was issued for the Eureka-Arcata U.S. Highway 101 Corridor Improvement Project in September 2019 that included conditions to annually monitor and report SLR and flooding impacts and to develop a Long-Term SLR Comprehensive Adaptation and Implementation Plan (CAIP) by 2025. The CAIP must include a feasibility of potential project alternatives such as accommodation, protection, relocation, and no action. As of January 2021, baseline monitoring had occurred, a technical working group was developed, stakeholder outreach scoping was started by Humboldt State University students, and hazard mitigation was ongoing.



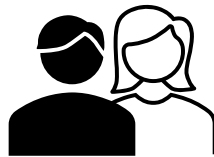
Caltrans staff participates in the technical advisory group for Humboldt County’s Natural Shoreline Infrastructure in Humboldt Bay for Intertidal Coastal Marsh Restoration and Transportation Corridor Protection Project (2020-2021). They also participate in the technical advisory group for the Sea Level Rise Adaptation Plan for Humboldt Bay/Eureka Slough Area (2018-2022) Project that was funded by the Caltrans Adaptation Planning Grant program. Additionally, Caltrans staff participates with the Humboldt

State University Sea Level Rise Initiative, which is a subcommittee of the Humboldt Marine & Coastal Science Institute at Cal Poly Humboldt.

*Key Stakeholder Coordination Themes*

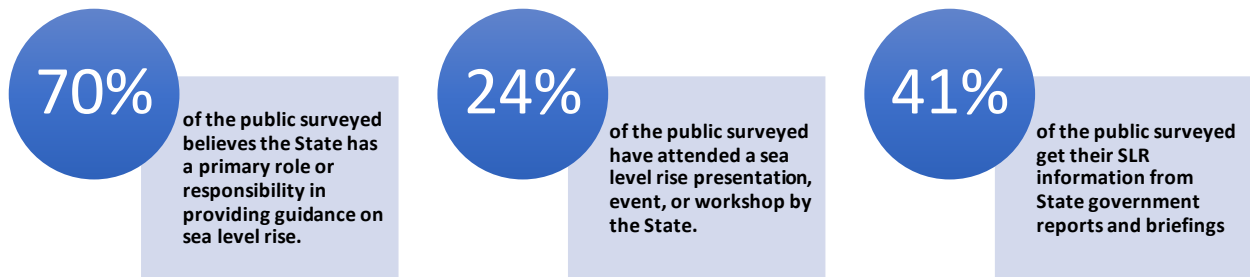
During the SLR Stakeholder Interview 2021, 22 shared themes about SLR regional planning and adaptation were identified to have been explicitly mentioned by two or more stakeholder groups. The Caltrans interview contained 6 of these shared themes as shown in the table to the right, reported from highest to lowest percent of stakeholder groups interviewed that shared each interview theme. For more description of themes, reference the Key Stakeholder Themes section of the Introduction on page 12.

**Interview Themes Important to Caltrans**  
 Shared Funding Coordination  
 Increased Landowner Participation  
 Increased Communication between Stakeholders  
 Restoration and Mitigation  
 Interest in County leading  
 Include more NGOs



*Relevant SLR Public Survey Findings*

There were 577 total participants during the SLR Public Survey 2021, though participation varied by individual question. One question asked respondents to identify one or more entities that had a primary role or responsibility in providing guidance on SLR and had the option of “City Government”, “County Government”, “State Government”, “Federal Government”, and “Other”. There were 403 respondents who identified the State Government (70%) as having a primary role or responsibility. Participants were also asked to estimate how many sea level rise presentations, events, or workshops they had attended in the last five years. Out of 308 respondents who had attended events, 24% (n=75) had attended SLR outreach events hosted by a City Government. When asked where survey participants got their information about sea level rise, 41% (n=236) said State agency reports and briefings.



Survey respondents were also asked to rate the priority of assets located within the Humboldt Bay region for consideration in flood protection and future SLR planning, two of which was identified above in this catalogue section as assets to Caltrans that could be subject to sea level rise impacts: "Highway 101" and "local roads and highways". Responses for priority ratings ranged from "not at all a priority" to "exceptionally high priority". Both assets received high overall priority ratings with over 80% of respondents rating these assets as a moderate priority to exceptionally high priority with "Highway 101" getting 89% (n=553) and "Local roads and highways" getting 88% (n=546). Results are shown in a graph below.

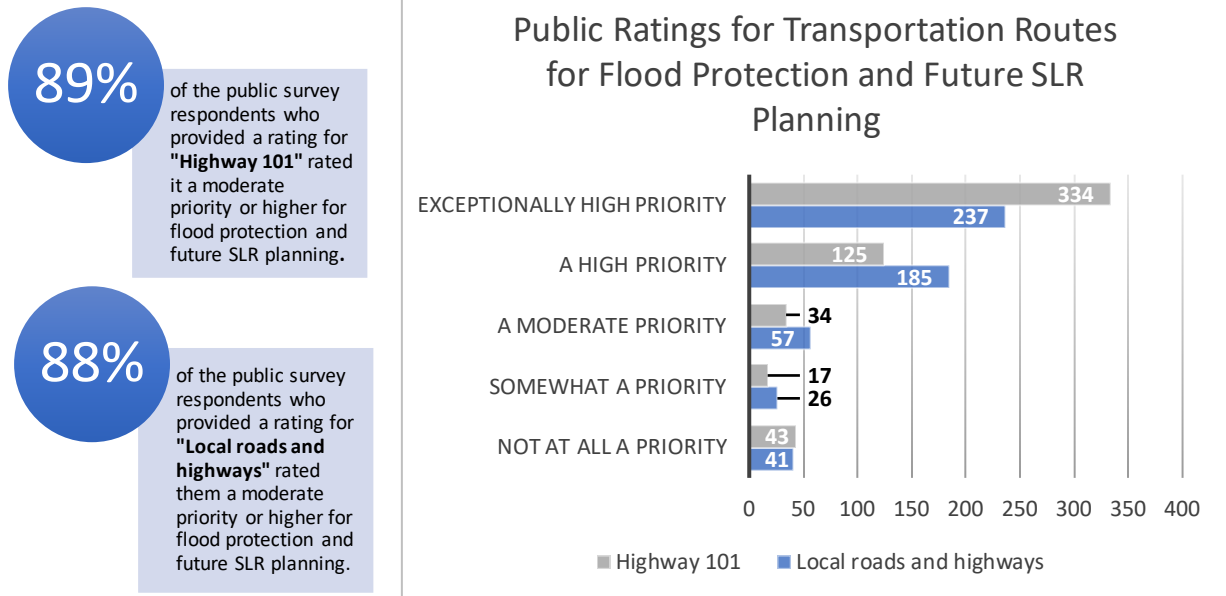


Figure 102. Priority Ratings for Highway 101 (n=553 in grey) and Local roads and highways (n=546 in blue) regarding Flood Protection and Future SLR Planning by participants of the SLR Public Survey 2021

### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, survey participants were given a sliding scale ranging from "Local" to "State" to "Federal" to show what level of government they thought should hold the majority of the planning control and authority for SLR. A total of 80 individuals provided responses, a majority of which preferred the planning authority to include a mix of local-and-state control at 64% as shown in the graph on the next page.

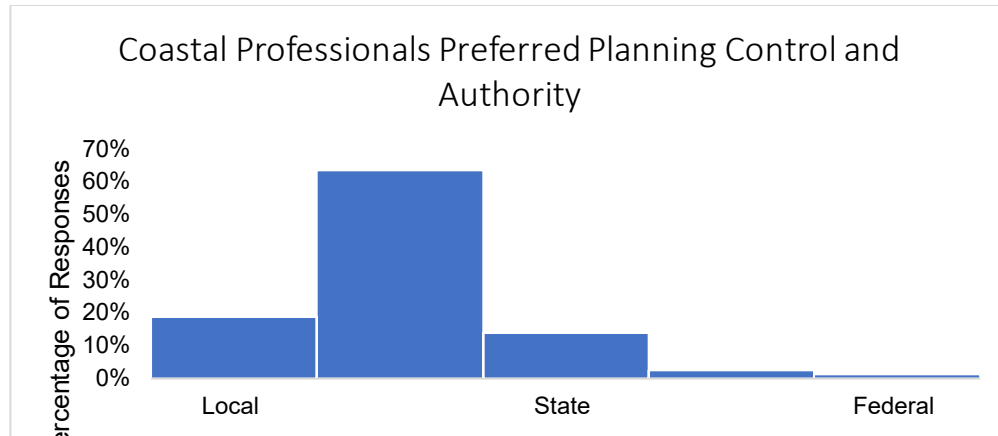


Figure 103: Survey respondents' preference for what level of government should hold the majority of the planning control and authority from the SLR Coastal Professionals Survey 2021 (n=80).

For the State Government category of participants, there was a total of 25 respondents though participation for individual questions varied. Participants included the California Coastal Commission, California Department of Fish & Wildlife, California Geological Survey, California State Coastal Conservancy, Caltrans, Humboldt County Resource Conservation District, North Coast Regional Water Quality Control Board, Governors' Office of Planning and Research, and State Lands Commission. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results for the State Government category ranged from "participate" to "lead" with a 65% preference for participation as shown in the graph below.

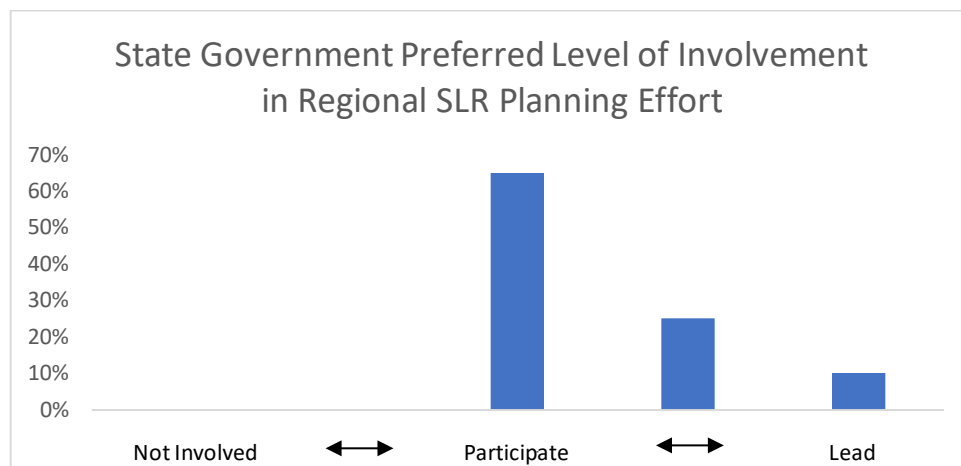


Figure 104. State Government respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=20)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a "project by project" basis to planning on a larger scale of "Watershed/HU" and "Humboldt Bay". The results for the State Government category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 68% preference for a Humboldt Bay approach as shown in the graph on the next page.

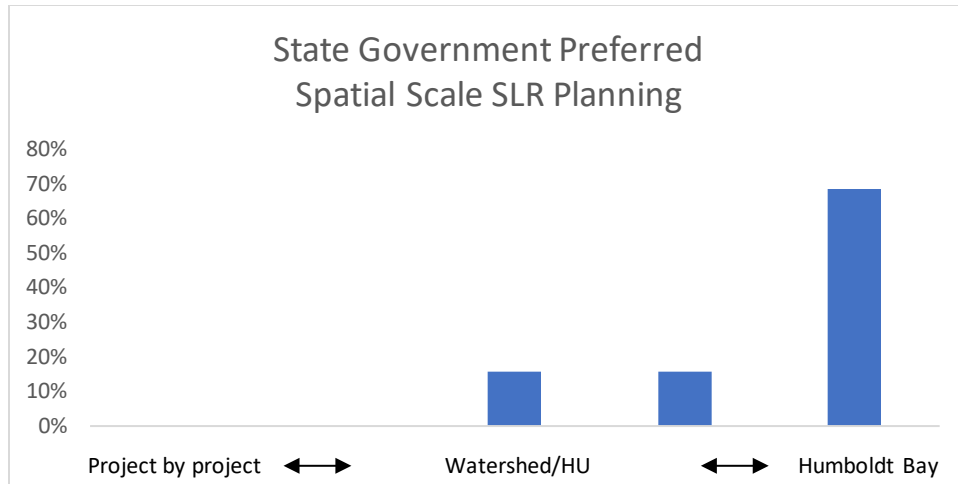


Figure 105. State Government respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=19)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the State Government favored creating a formal collaborative partnership with 72% of respondents rating this option somewhat favorable or higher. Similarly, 95% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

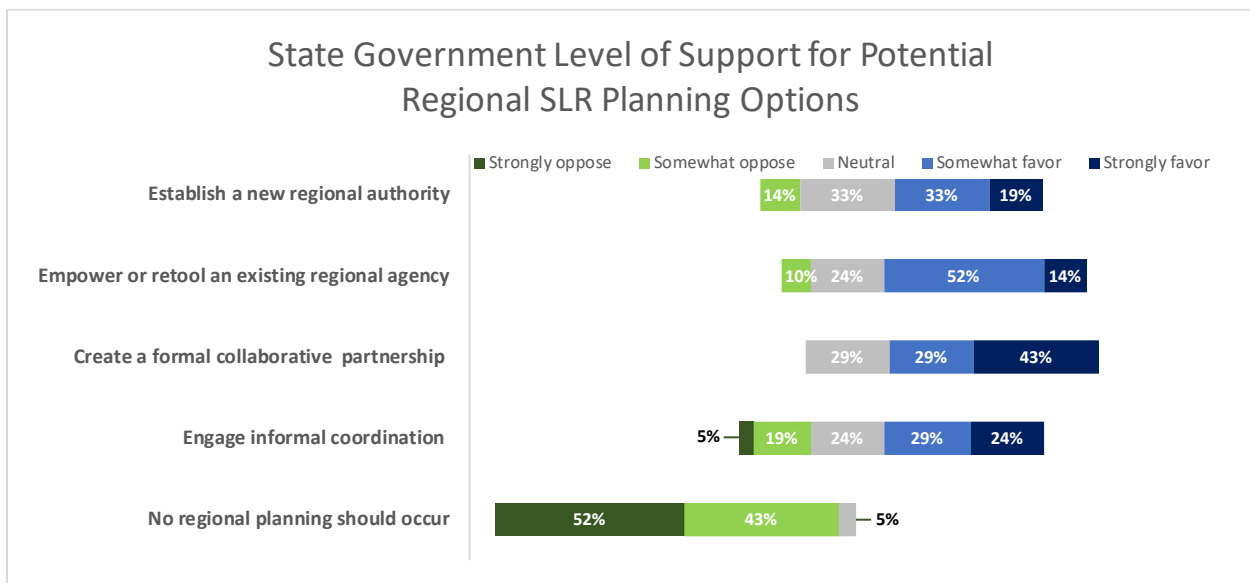


Figure 106. State Government respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 21)

*Reference Links*

<https://dot.ca.gov/caltrans-near-me/district-1/d1-projects>

[https://www.eurekabroadwaycorridorplan.com/uploads/5/4/7/5/54754127/broadway\\_feasibility\\_study\\_final.pdf](https://www.eurekabroadwaycorridorplan.com/uploads/5/4/7/5/54754127/broadway_feasibility_study_final.pdf)

<https://www.arcgis.com/apps/webappviewer/index.html?id=517eecf1b5a542e5b0e25f337f87f5bb>

Climate Change VA Summary Report (2019): <https://dot.ca.gov/-/media/dot-media/district-1/documents/d1-summary-report-a11y.pdf>

<https://dot.ca.gov/caltrans-near-me/district-1/d1-projects>

Caltrans Eureka-Arcata Corridor: Sea Level Rise Vulnerabilities and Adaptation Solutions (2019): [https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1007&context=hsuslri\\_state](https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1007&context=hsuslri_state)

Climate Change Vulnerability Assessment and Pilot Studies Federal Highway Administration Climate Resilience Pilot Project: <https://humboldt.gov/DocumentCenter/View/70095/Caltrans-District-1-Climate-Change-Vulnerability-Assessment---Main-Document>

Appendices: <https://humboldt.gov/DocumentCenter/View/70094/Caltrans-District-1-Climate-Change-Vulnerability-Assessment---Appendices>

## City of Arcata

*See page 23.*

## City of Eureka

*See page 31.*

## Humboldt Bay Harbor, Recreation, and Conservation District

*See page 52.*

## Humboldt County

*See page 41.*



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## North Coast Railroad Authority (Great Redwood Trail Agency)

*See page 130.*

## Academic/Public Interest Organizations

### Buckeye Conservancy

#### *Description*

The Buckeye Conservancy is a non-profit organization dedicated to the protection of open space and family ranch land values on California's North Coast. They have over 150 family, individual and commercial memberships, representing over 300,000 acres of forests and rangeland in the county.

#### *Reference Links*

<https://www.thebuckeye.org/>

### California Coastal Resilience Network

#### *Description*

Coastal Resilience is a program led by The Nature Conservancy to examine nature's role in reducing coastal flood risk. The program consists of an approach (assess hazard risk and community vulnerability, identify nature-based solutions, take conservation and restoration action, and measure the effectiveness of our actions to reduce flood risk), a web mapping tool, and a network of practitioners around the world supporting hazard mitigation and climate adaptation planning.

The stated mission of the California Coastal Resilience Network, a Coastal Resilience project under the umbrella of the Nature Conservancy's Coastal Resilience program, is to promote knowledge exchange to support adaptation solutions that strategically and comprehensively prepare California's coastal habitats and communities for climate induced impacts. The Network provides a space for informal dialogue between local and state managers to improve coastal management efficiency and communication and aims to provide local managers with the tools they need to implement nature-based multi-benefit coastal adaptation solutions.

#### *Reference Links*

<https://coastalresilience.org/>

<https://coastalresilience.org/project/california-coastal-resilience-network/>

## California Trout

### *Description*

California Trout (CalTrout) is a nonprofit organization focused on protecting and restoring wild fish in the waters of California. They accomplish this by advocating for fish and water policy, leveraging existing laws, and restoring fish habitat. CalTrout is comprised of six regions, one of which is the North Coast Region which includes the Humboldt Bay area. The North Coast regional goal is to recover and protect threatened salmon and steelhead populations and their habitats through the implementation of species recovery plans and proof-of-concept projects, and by advocating for science-based approaches and policy reform.

### *Reference Links*

<https://caltrout.org/>

<https://caltrout.org/projects/aquatic-species-assessment-tool-asat>

<https://caltrout.org/article/recovering-the-elk-river-and-community>

<https://caltrout.org/article/restoring-and-reconnecting-the-mad-river-estuary>

## Coastal Ecosystems Institute of Northern California

### *Description*

The Coastal Ecosystems Institute of Northern California (CEINC) is a nonprofit organization formed in 2011. CEINC is dedicated to promoting and interpreting coastal ecosystem science along California's north coast to ensure vibrant and resilient coastal ecosystems and communities. It provides nonprofit administration for collaborative projects throughout the north coast to advance communication, collaboration, and conservation through applied science and promoting ecosystem-based management. CEINC coordinates the Humboldt Bay Initiative (HBI), which is described below.

CEINC was one of 22 regional stakeholders that comprised the Humboldt Bay Sea Level Rise Adaptation Planning Working Group (APWG) that was formed during Phase II of the Humboldt Bay Sea Level Rise Adaptation Planning Project funded by the State Coastal Conservancy. The goals of the project were to identify SLR vulnerabilities and support informed decision-making and encourage a unified, consistent regional adaptation approach among the jurisdictions around the bay. The project which was completed in 2015, at which time the APWG disbanded.

### *Reference Links*

<http://www.coastalecosystemsinstitute.org/>

<http://www.coastalecosystemsinstitute.org/about-hbi/>

<http://www.coastalecosystemsinstitute.org/humboldt-bay-slr-vulnerability-and-adaptation-planning/>

## Environmental Protection Information Center

### *Description*

The Environmental Protection Information Center (EPIC) is a community based, non-profit organization advocating for science-based protection and restoration in the forests of Northern California with a specialty in resource policy at the local and national level. They protect imperiled species and their habitats by filing lawsuits and establishing legal precedents with cases that have gone before the U.S. Supreme Court and California Supreme Court.

### *Reference Links*

<https://wildcalifornia.org/>

## Friends of Arcata Marsh

### *Description*

Friends of the Arcata Marsh (FOAM) is a nonprofit organization that supports the Arcata Marsh and Wildlife Sanctuary and Arcata Marsh Interpretive Center by educating the public about how wetlands can be used to treat wastewater. They provide volunteers and funding for community and educational programs in the marsh.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the Non-Government Organization category ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph on the next page.

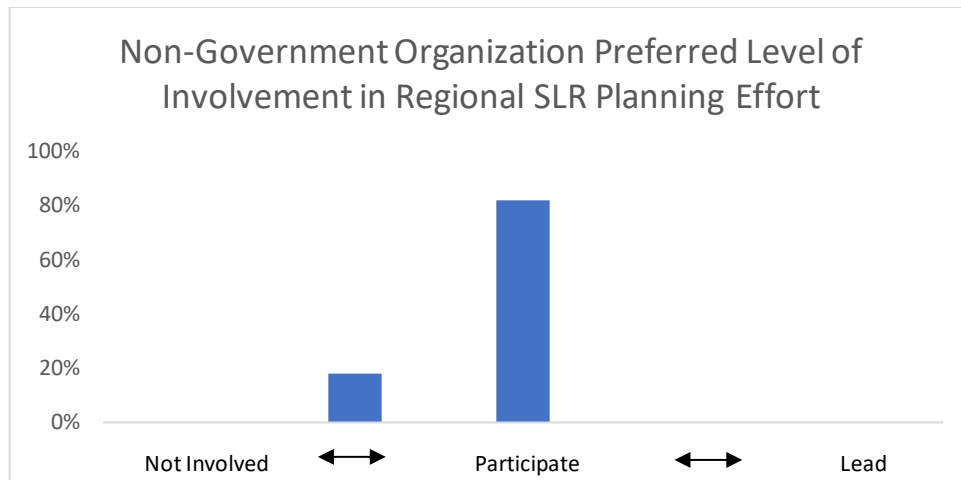


Figure 107. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph below.

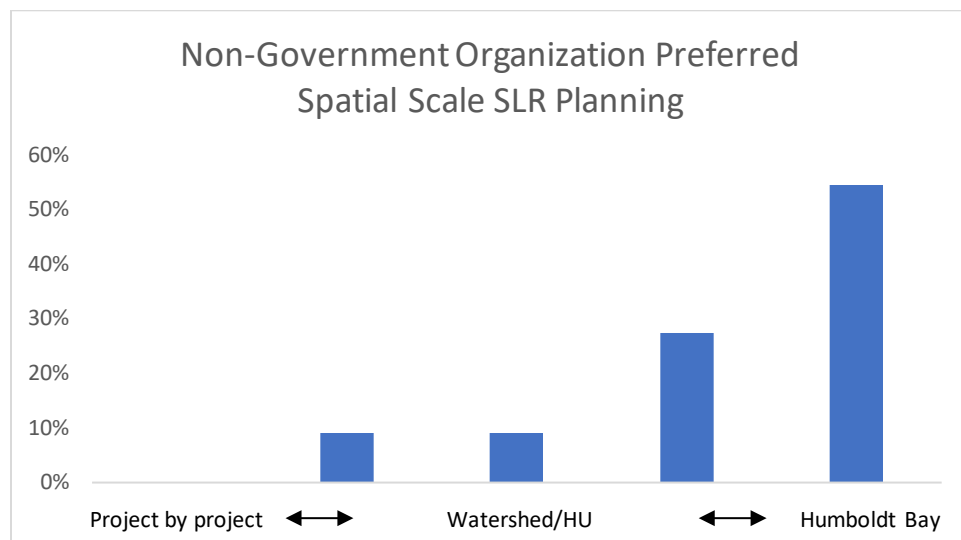


Figure 108. Non-Government Organization respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning

coordination and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

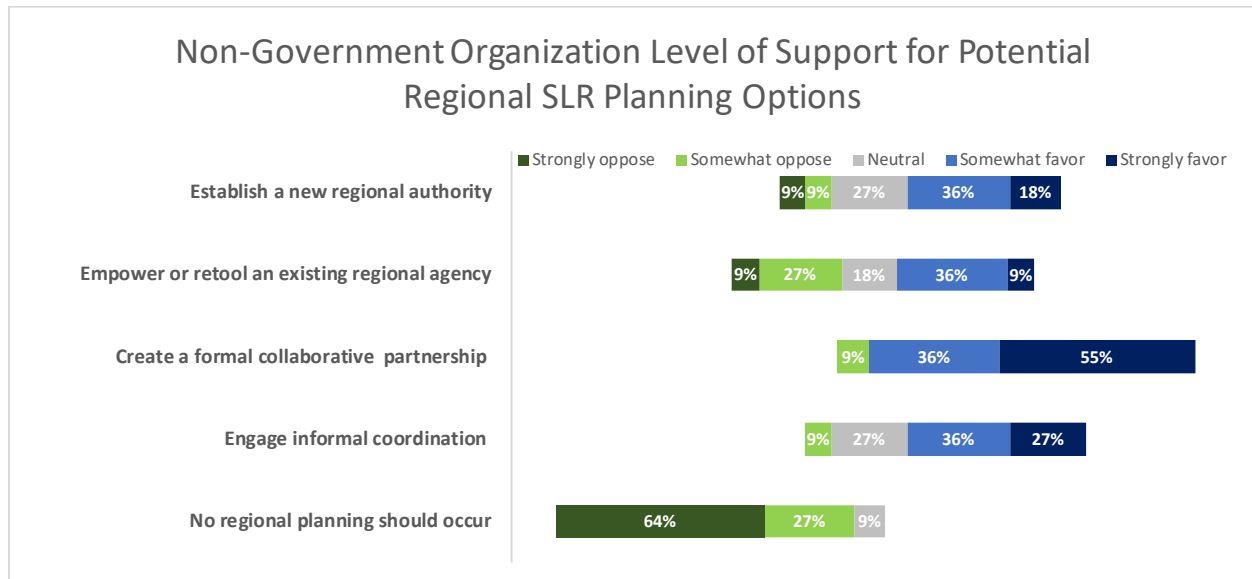


Figure 109. Non- Government Organization respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)

#### Reference Links

<https://www.arcatamarshfriends.org/>

## Friends of the Dunes

*See page 117.*

## Friends of the Elk River

#### Description

Friends of the Elk River is an advocacy group focused on creating lasting bonds between healthy forests and clean water within the Elk River watershed and the local community. They seek to restore the river for the benefit of people and fish and participated in a NCRWQCB forum with the RCAA for discussion of sediment load in the Elk River.

#### Reference Links

<https://www.facebook.com/friendsofelkriver>

[https://www.waterboards.ca.gov/northcoast/water\\_issues/programs/watershed\\_info/eureka\\_plain/elk/](https://www.waterboards.ca.gov/northcoast/water_issues/programs/watershed_info/eureka_plain/elk/)

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the Non-Government Organization category ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph below.

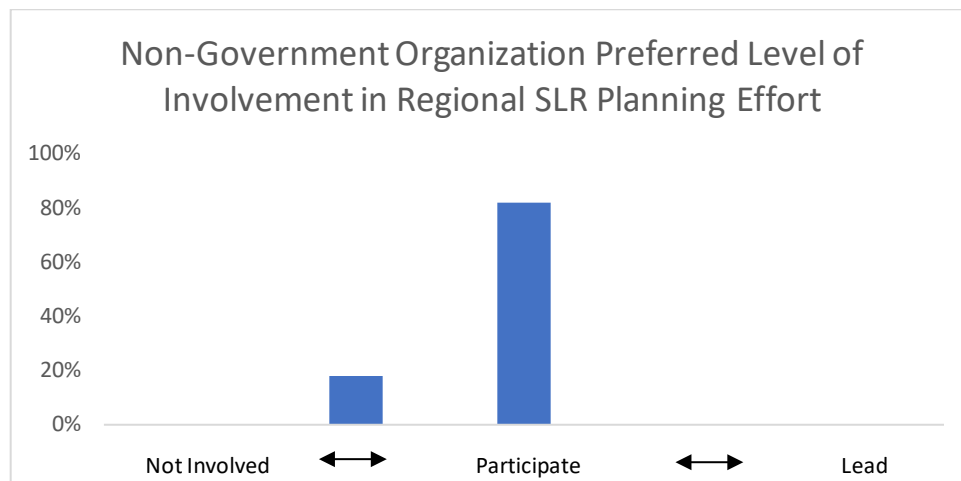


Figure 110. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph on the next page.

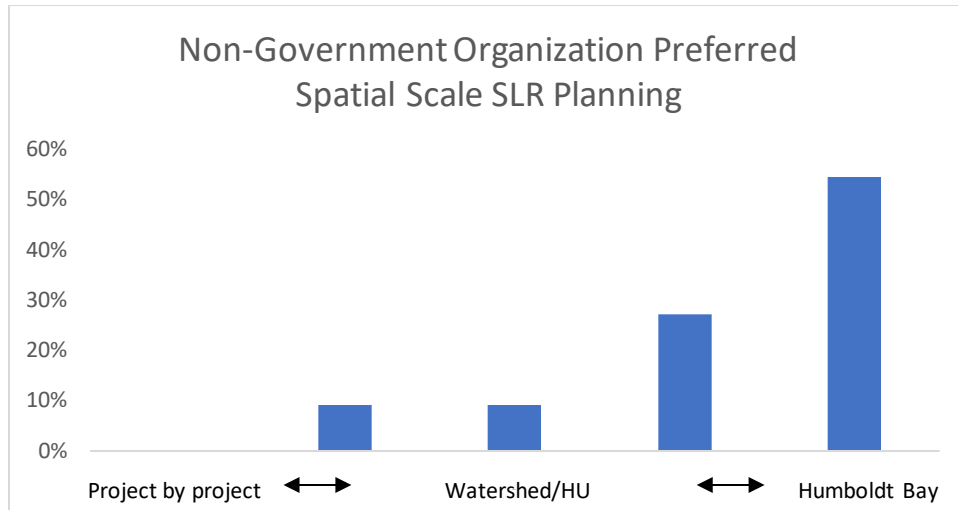


Figure 111. Non-Government Organization respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

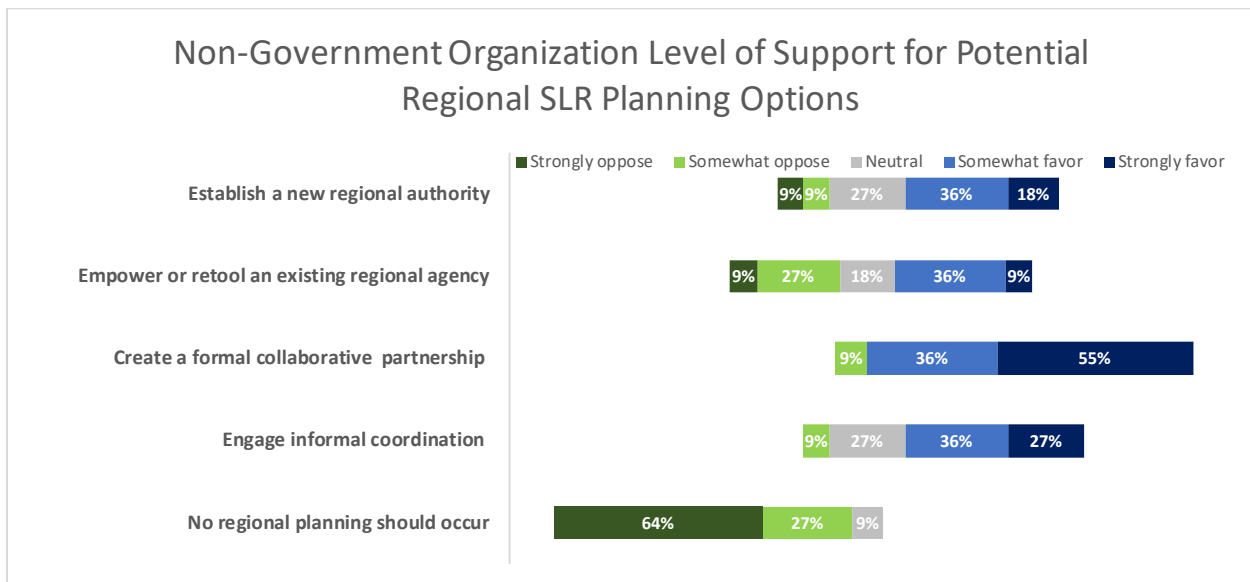


Figure 112. Non-Government Organization respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)



## Humboldt Baykeeper

### *Description*

Humboldt Baykeeper monitors regional environmental issues in Humboldt Bay and surrounding areas to protect natural resources. Their mission is to involve a wide variety of concerned citizens from scientists and students to boaters, fishermen, and birdwatchers in local environmental protection initiatives. Their scope is not just the Bay itself, but also the tributaries and near-shore waters between Trinidad Harbor to the north and the Eel River estuary to the south. Humboldt Baykeeper began the Humboldt Bay King Tides Photo Initiative in 2011 which they use to track SLR issues in the area and reference in their campaigns concerning SLR local plans and policies.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the Non-Government Organization category ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph on the next page.

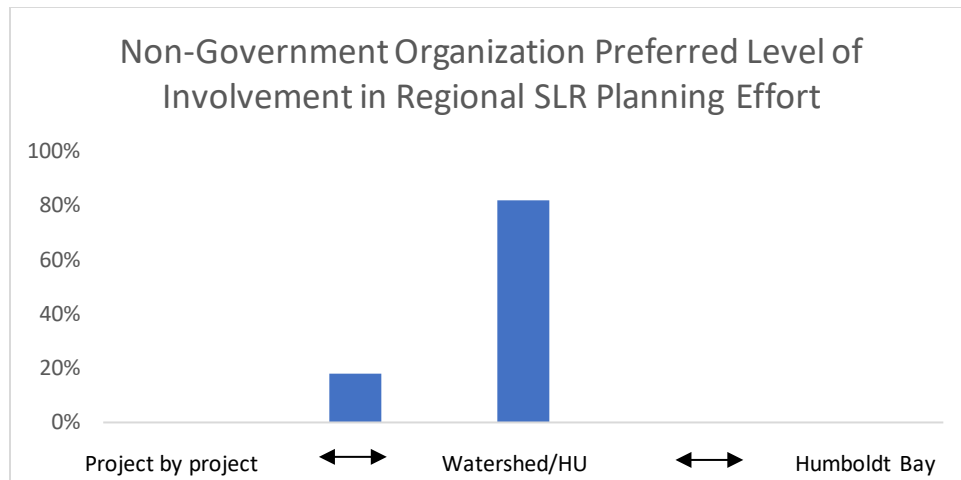


Figure 113. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph below.

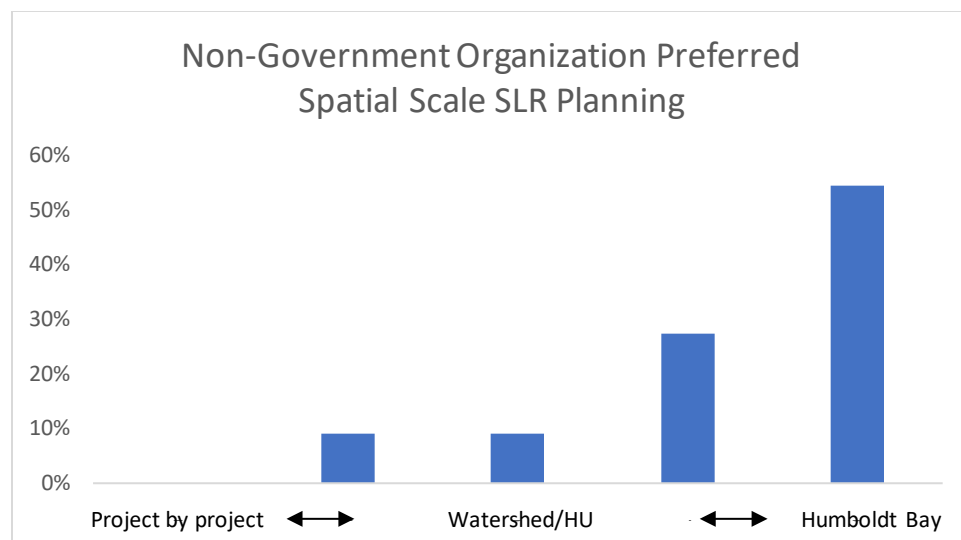


Figure 114. Non-Government Organization respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning

coordination and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

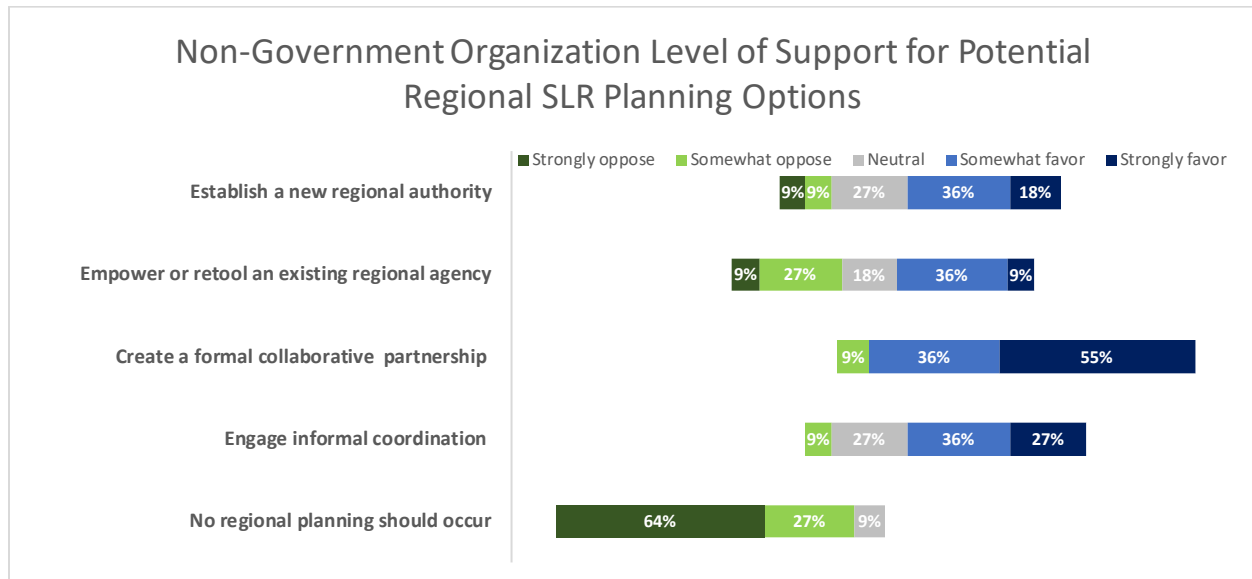


Figure 115. Non- Government Organization respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)

### Reference Links

<https://www.humboldtbykeeper.org>

## Humboldt County Farm Bureau

Humboldt County Farm Bureau is a member-based, grass roots non-profit organization and Humboldt County's largest general agricultural organization. The organization consists of a 5-member Board, an Executive Director and office manager, and a Board of Directors. They are dedicated to promoting and preserving agriculture and represent the interests of the dairy, timber, livestock, produce, oysters, wineries, and floral industry in Humboldt County. As a member of the larger California Farm Bureau Federation, their members are part of a support network both on and off the farm.

The stated purposes of the Humboldt County Farm Bureau are as follows:

- To work for the solution of the problems of the farm, the farm home and rural community, by use of the recognized advantages of organized action, to the end that those engaged in the various branches of agriculture may have opportunity of happiness and prosperity in their chosen work.
- To represent, protect and advance the social, economic and educational interests of the farmers of Humboldt County.

- To work in conjunction with the Cooperative Extension Service in the development of better methods and practices in farming and management; to work for the improvement of conditions surrounding rural life and for the cultivation of such sentiments and ideals as may promote the highest type of neighborliness and citizenship.
- To unite the farmers of the county in a farm organization for the promotion and protection of their common interest without regard to political or religious affiliation.
- To encourage and foster the development of commodity marketing and
- purchase of farm supplies on a cooperative nonprofit basis and the development of such other activities as will best serve the economic needs of our members.
- To cooperate with the American Farm Bureau Federation, the California Farm Bureau Federation and other county Farm Bureau members of the California Farm Bureau Federation for mutual assistance in the achievement of common aims and purposes.

A workshop on sea level rise and the Humboldt Bay Area Plan was sponsored by the Farm Bureau in August of 2018. The workshop included presentations and input from local ranchers, Humboldt County, HCRCD, and the Harbor District, and included a field trip to look at degraded agricultural dikes on McNulty Slough.

This organization was one of 22 partners in the Humboldt Working Group (APWG) which ended in 2015.

#### *Reference Links*

<https://www.humboldtcountyfarmbureau.com/>

## Humboldt State University Sea Level Rise Initiative

#### *Description*

The Humboldt State University (HSU) (now Cal Poly Humboldt) Sea Level Rise Initiative is a subcommittee of the Humboldt Marine & Coastal Science Institute at HSU. The Initiative will provide regional leadership on sea level rise research and outreach by developing a home for interdisciplinary scholarship related to sea level rise; creating a depository of research, databases, and assessments; informing local, regional, and national decision making through collaborative frameworks; and providing a centralized program through which regional sea level rise science and planning efforts can be coordinated.

#### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection,

refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 7 respondents that were representatives from the Academia/Research category though participation for individual questions varied. Participants included California Sea Grant Extension, Humboldt State University (now Cal Poly Humboldt), and San Francisco State University These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” to “lead”. The results for this category ranged from “participate” to “lead” with a 60% preference for participation as shown in the graph on the below.

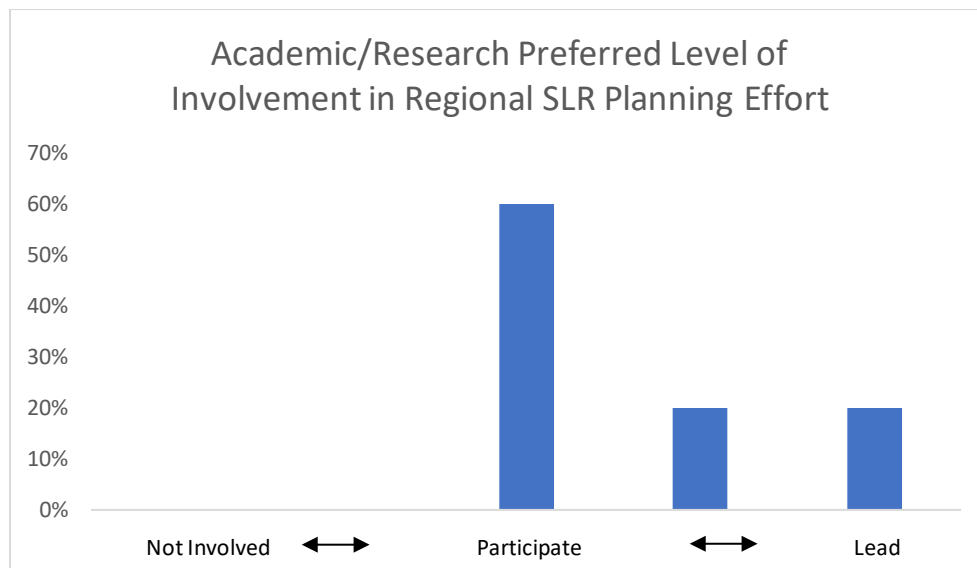


Figure 116. Academic/Research respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=5).

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Academia/Research category ranged from a mix of “Watershed/HU” and “Humboldt Bay” in scale to just a “Humboldt Bay” spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph on the next page.

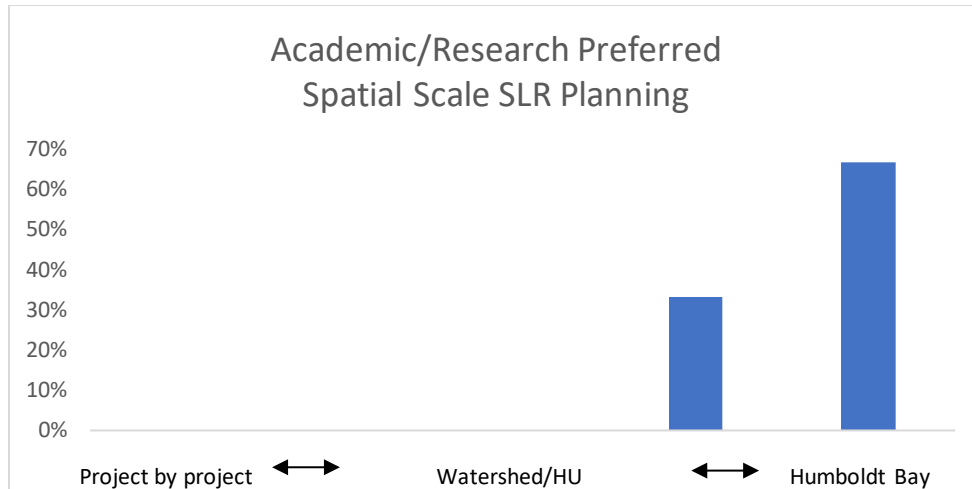


Figure 117. Academia/Research respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=6)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Academia/Research category favored creating a formal collaborative partnership with 83% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination and 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

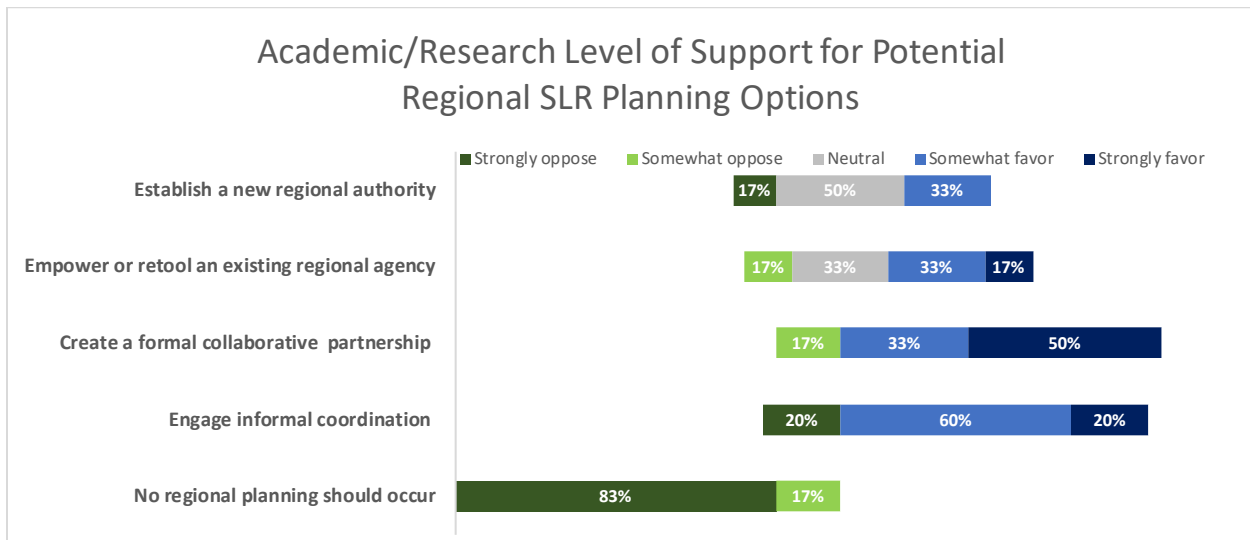


Figure 118. Academia/Research respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 5-6)

*Reference Links*

<https://humboldtslri.org/>

## Northcoast Environmental Center

### *Description*

The stated mission of the Northcoast Environmental Center (NEC), a non-profit organization, is to promote understanding of the relations between people and the biosphere and to conserve, protect, and celebrate terrestrial, aquatic, and marine ecosystems of northern California and southern Oregon. NEC is a collaborative organization in that the Board of Directors is comprised of representatives of member groups as well as at-large members. Member groups represented on the Board include: California Native Plant Society, North Coast Chapter; Environmental Protection Information Center; Friends of the Eel River; Humboldt Baykeeper; North Group, Redwood Chapter of the Sierra Club; Redwood Region Audubon Society; and Safe Alternatives for our Forest Environment.

### *Reference Links*

<https://www.yournec.org/>

## Redwood Community Action Agency

### *Description*

Redwood Community Action Agency (RCAA) is one of 52 Community Action Agencies in California and approximately 1,100 nationwide. It is a locally based private non-profit organization working to provide a wide range of services to low- and moderate-income residents of Humboldt County. RCAA's long-term goal is to develop programs through which people can become self-sufficient and empowered to improve their own lives. RCAA has divisions focused on Property Management, Energy Services, Natural Resources Services, Youth Services, and Community Services.

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from

“not involved” to “participate” and “lead”. The results for the Non-Government Organization category ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph below.

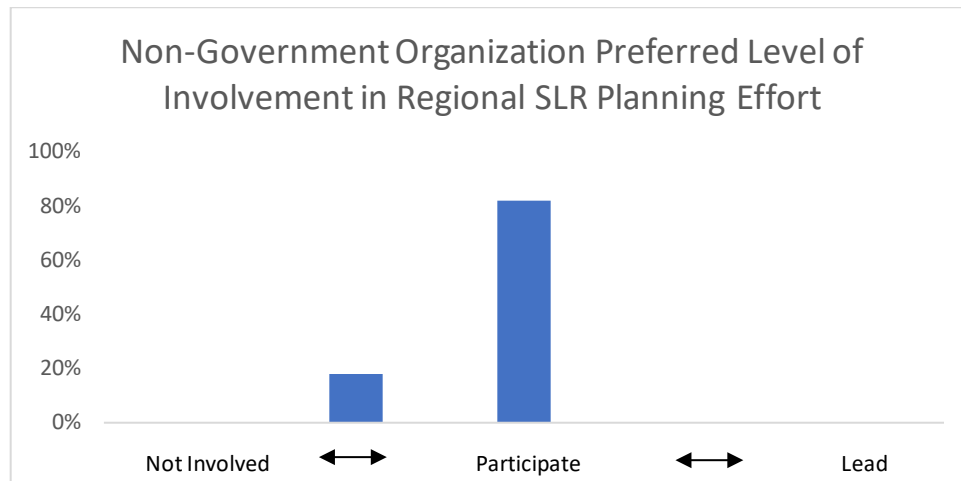


Figure 119. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph below.

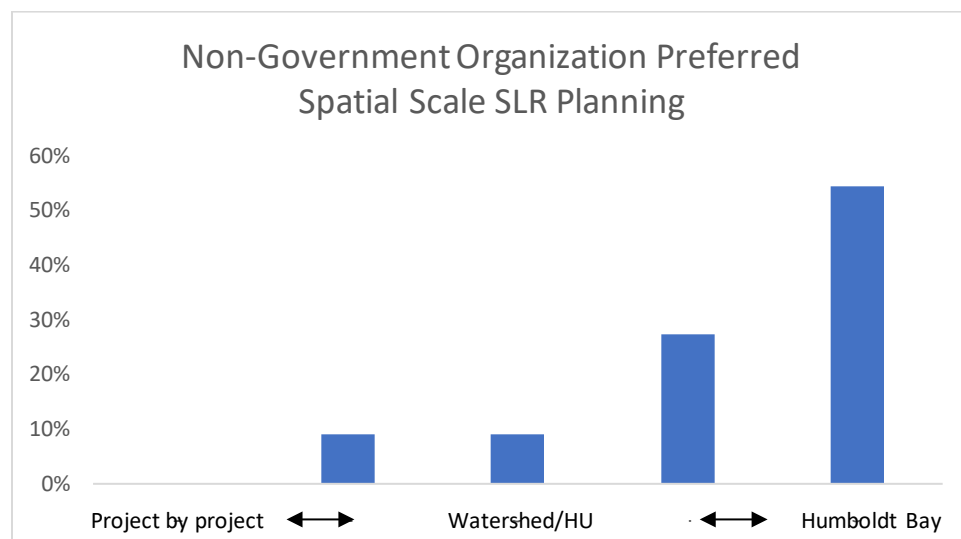


Figure 120. Non-Government Organization respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Non-Government Organization



category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

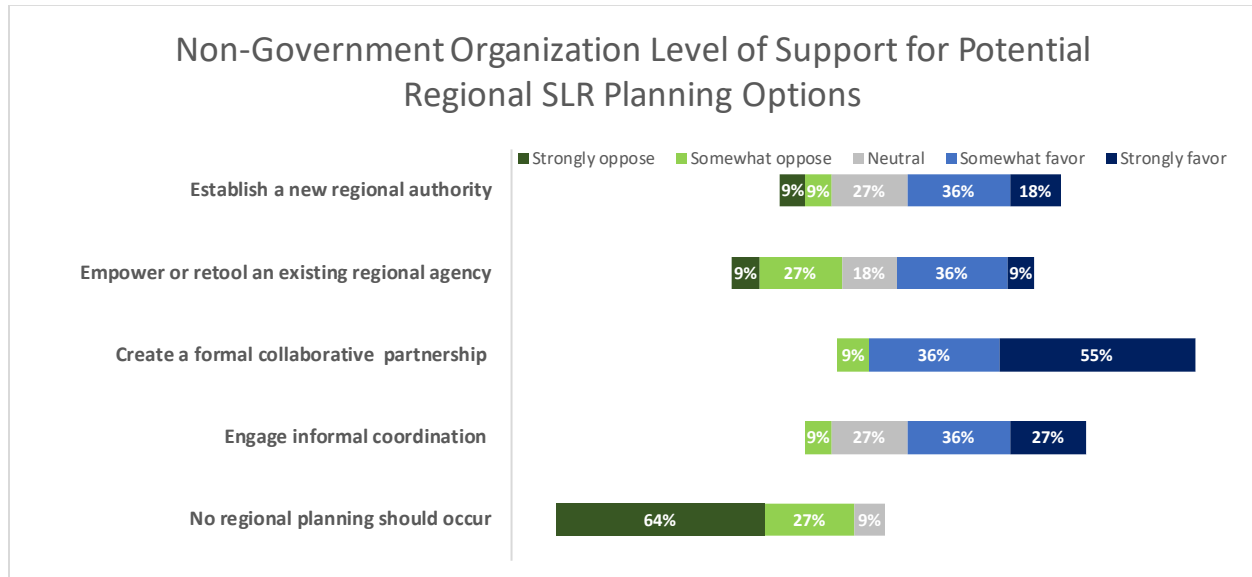


Figure 121. Non-Government Organization respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)

### Reference Links

<https://rcaa.org/>

## Redwood Region Audubon

### Description

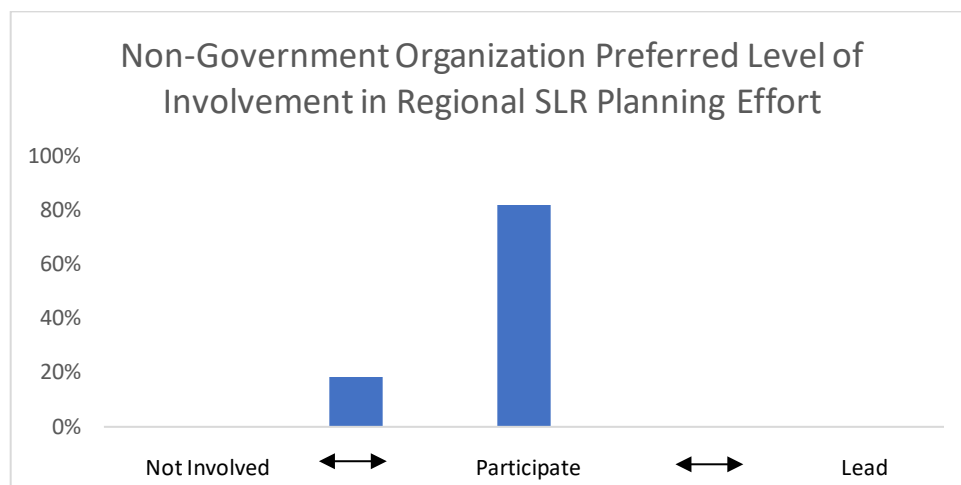
The Redwood Region Audubon Society (RRAS) is a local chapter of the National Audubon Society and encompasses Humboldt, Del Norte, and western Trinity Counties. This volunteer nonprofit organization has roughly 500 members that support local conservation efforts and advocate for protection of birds and other wildlife.

### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection,

refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the Non-Government Organization category ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph below.



*Figure 122. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph on the next page.

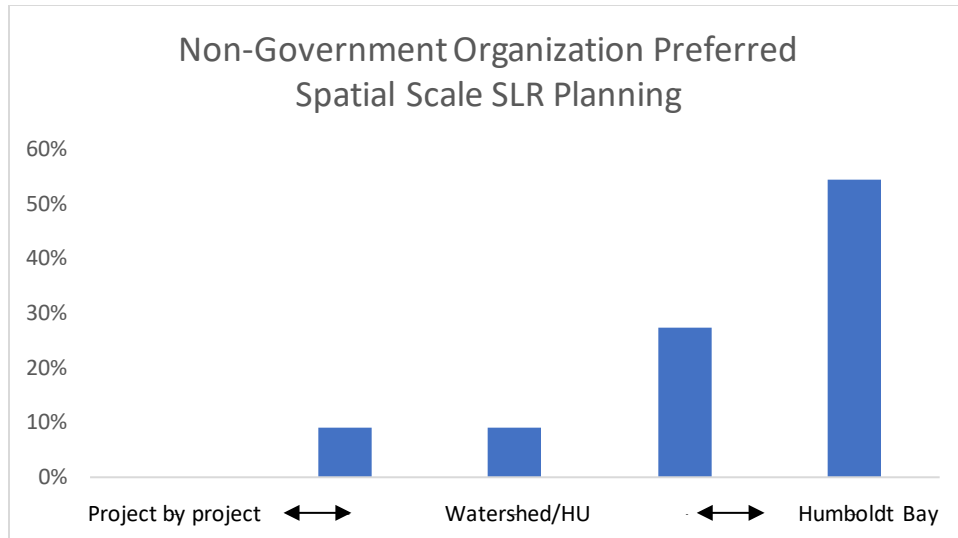


Figure 123. Non-Government Organization respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

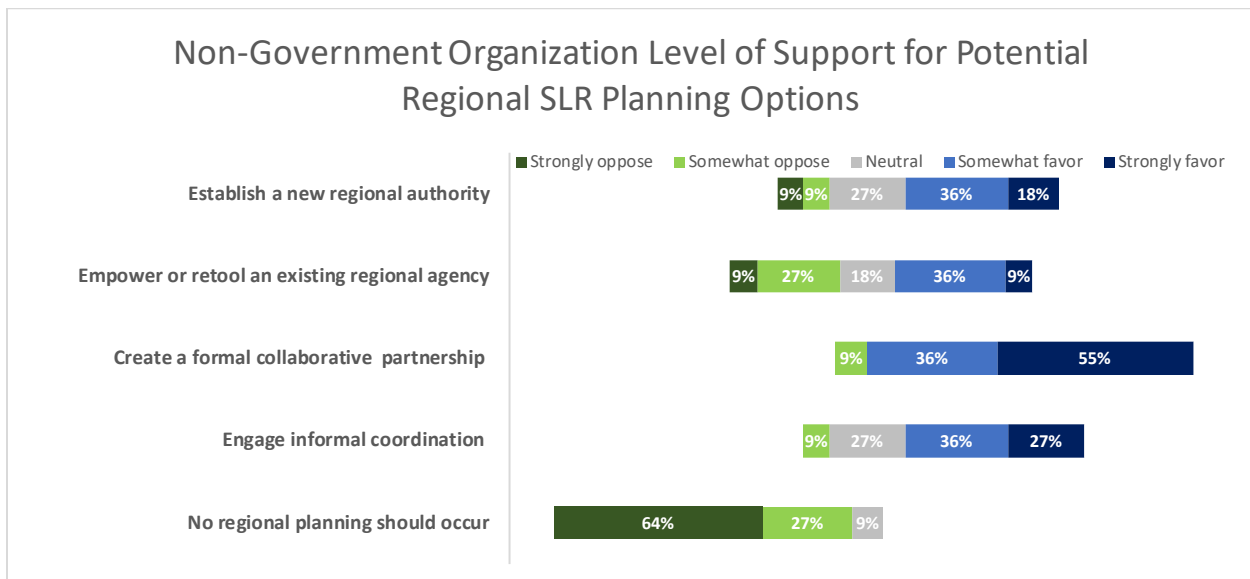


Figure 124. Non-Government Organization respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)

### *Reference Links*

<http://www.rras.org/home.aspx>

## Surfrider Foundation - Humboldt Chapter

### *Description*

The Surfrider Foundation is a nonprofit organization whose stated mission is the protection and enjoyment of the world's ocean, waves and beaches through a powerful activist network. The Humboldt Chapter of Surfrider has programs including Ocean Friendly Gardens (incorporating stormwater into the landscape); Rise Above Plastics (to reduce impacts of plastics in the marine environment); Samoa Trash Bash (keeping Samoa beach clean); and involvement in the Marine Protected Areas (established in 2012).

### *Relevant SLR Coastal Professionals Survey Findings*

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from "not involved" to "participate" and "lead". The results for the Non-Government Organization category ranged from a mix of "not involved" and "participate" to just "participate". A vast majority (82%) preferred participation as shown in the graph on the next page.

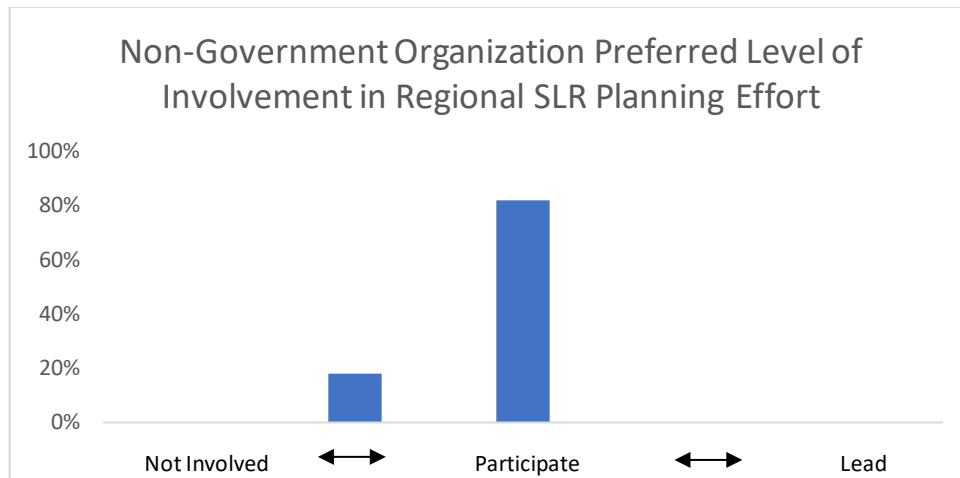


Figure 125. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from Watershed/HU to Humboldt Bay in scale with an 55% preference for a Humboldt Bay approach as shown in the graph below.

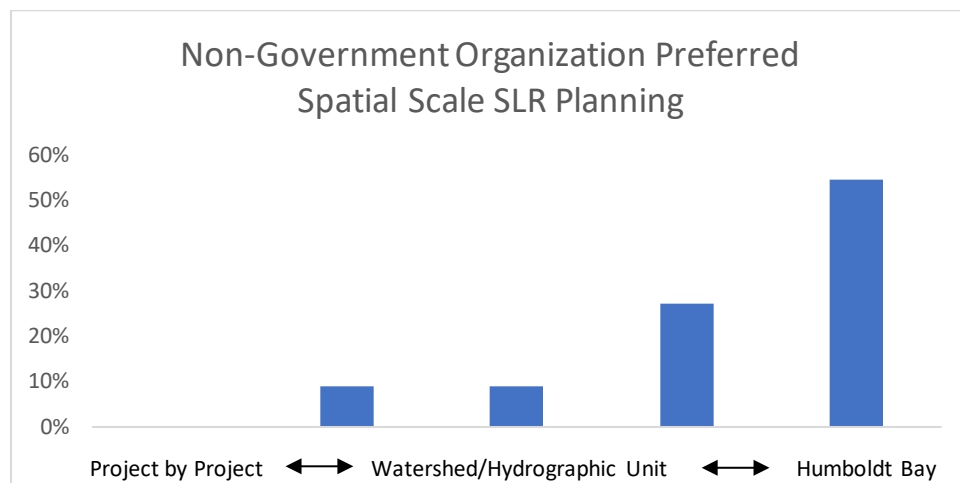


Figure 126. Non-Government Organization respondents' preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination

and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

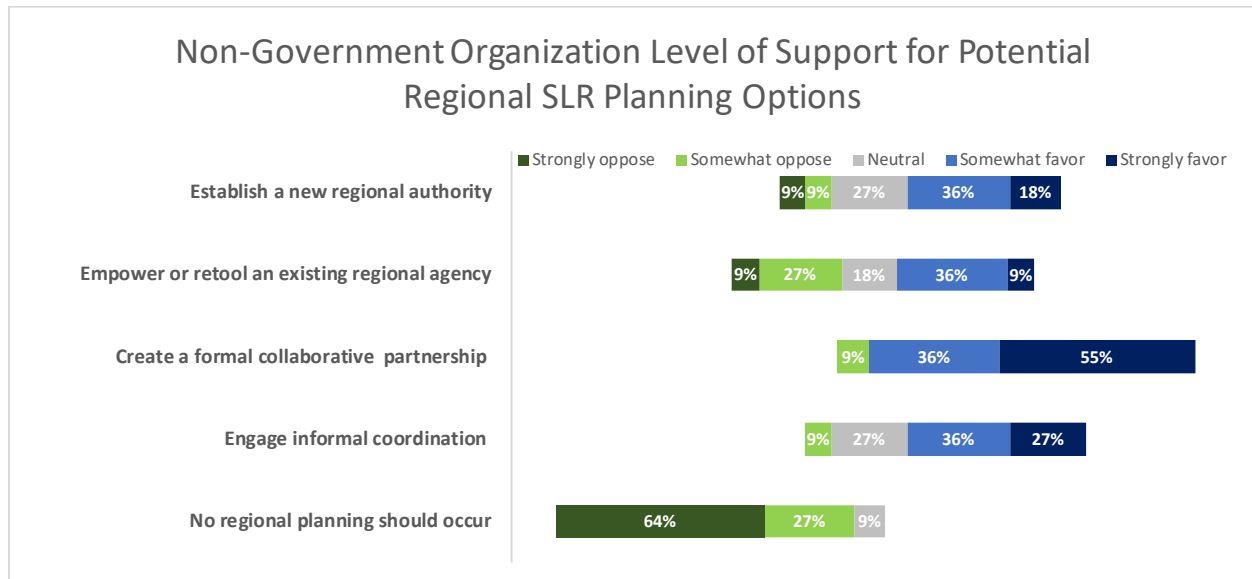


Figure 127. Non- Government Organization respondents' level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)

### Reference Links

<https://humboldt.surfrider.org/>

## Timber Heritage Association

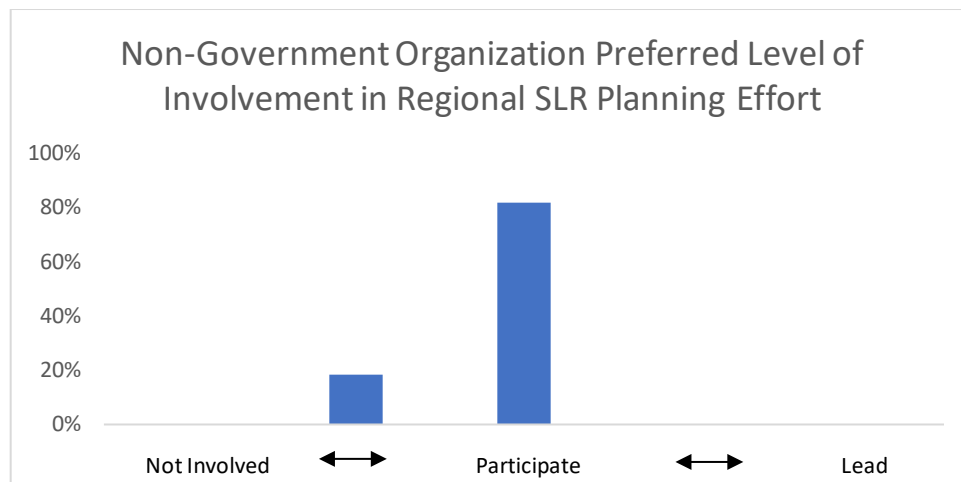
The Timber Heritage Association is a volunteer-based group interested in preserving timber industry history, and dedicated to generating awareness and appreciation for the historical impact of timber, logging, and railroads on the settlement and development of Humboldt County. They aim to create the Timber Heritage Museum as well as develop a Humboldt Bay Excursion Train. The joint benefit of these projects is to create a tourist draw to the region, and to provide an educational facility and source of pride for the community. THA offers crew speeder car rides in various Humboldt County locations, including rides in the Humboldt Bay area in Samoa/Manila and in Eureka. The THA has expressed concerns about removal of rails to allow for a trail between Samoa and Scotia, and supports trails with rails, thereby preserving rails for future use.

### Relevant SLR Coastal Professionals Survey Findings

Results presented in this section for the SLR Coastal Professionals Survey 2021 do not necessarily represent an official view of the agency/organization or categories with which respondents identified, as explained in the introduction. Results presented below are intended only to provide general guidance in

future planning and collaboration efforts. For more information on sampling methods and data collection, refer to the section on Community Input within the Introduction on page 2 and Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results within the Appendices beginning on page 229.

During the SLR Coastal Professionals Survey 2021, there was a total of 12 respondents for the Non-Government Organization category though participation for individual questions varied. Participants included the Coalition for Responsible Transportation Priorities, Friends of the Arcata Marsh, Friends of the Dunes, Friends of Elk River, Humboldt Baykeeper, Redwood Community Action Agency, Redwood Region Audubon, Surfrider Foundation, and Timber Heritage Association. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” and “lead”. The results for the Non-Government Organization category ranged from a mix of “not involved” and “participate” to just “participate”. A vast majority (82%) preferred participation as shown in the graph below.



*Figure 128. Non-Government Organization respondents' preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=11)*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Non-Government Organization category ranged from a Watershed/HU to a Humboldt Bay spatial scale with a 55% preference for a Humboldt Bay approach as shown in the graph on the next page.

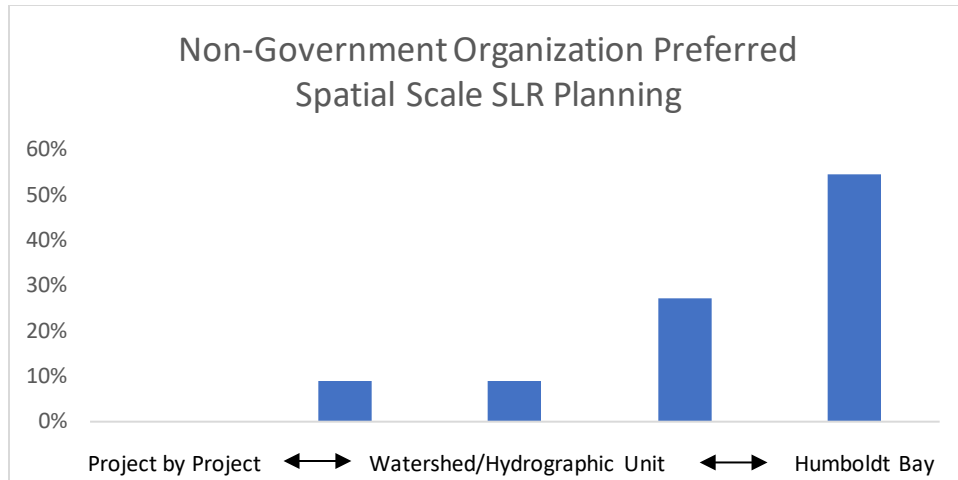


Figure 129. Non-Government Organization respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=11)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from "strongly oppose" to "strongly favor". The results for the Non-Government Organization category favored creating a formal collaborative partnership with 91% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination and 91% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

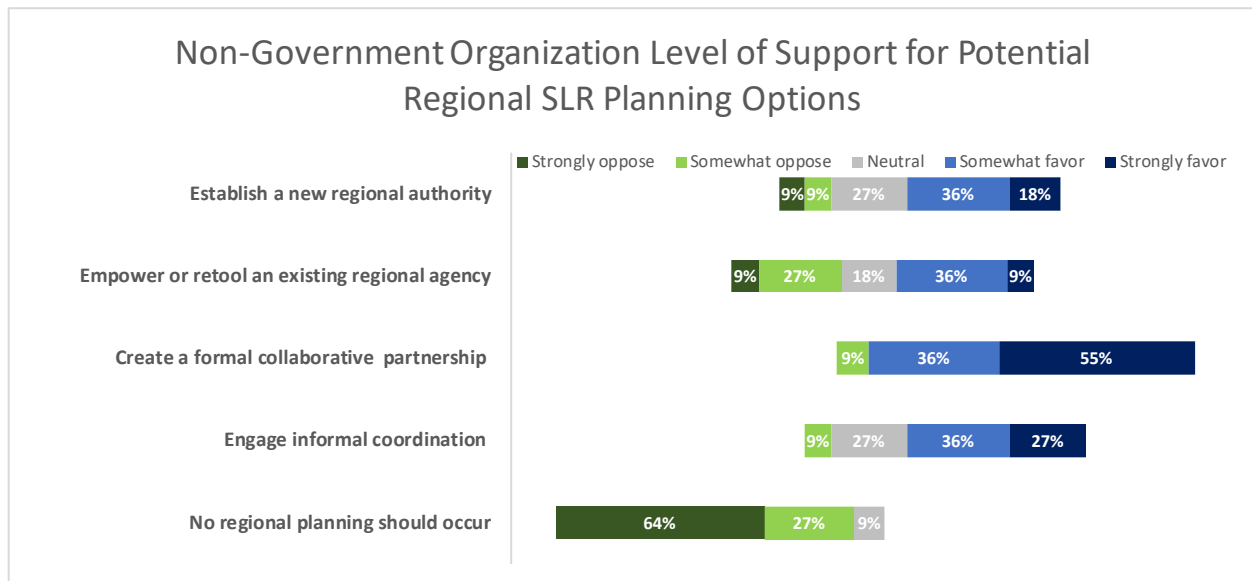


Figure 130. Non-Government Organization respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n=11)



*Reference Links*

<https://timberheritage.org/>

## University of California Cooperative Extension - Humboldt

The University of California Cooperative Extension (UCCE) is a program dedicated to improving the quality of life for Californians by developing and delivering research-based information in agriculture and natural resources, and by supporting healthy families and communities. Humboldt County was home to the first UC Cooperative Extension program, established in 1913. This innovative partnership between federal, state, and county entities started out as programs to serve farmers and rural families throughout the country and now have expanded to include the following community programs, with Agriculture and Livestock being the most germane when considering the potential SLR impacts to agricultural land.

- 4-H
- Agriculture
- Fire
- Forestry & Forest Health
- Livestock
- Master Food Preserver
- Master Gardener Program
- Nutrition

*Reference Links*

<http://cehumboldt.ucdavis.edu/>

<https://humboldt.gov/614/UC-Cooperative-Extension>

<https://us3.campaign-archive.com/home/?u=ec84b345fa9c9d123c30fa9dd&id=fe76dc6a68>

<https://calfish.ucdavis.edu/News/?routeName=newsstory&postnum=10546>

<https://escholarship.org/content/qt6qm2x1zt/qt6qm2x1zt.pdf?t=n3pm18>

## University of California Sea Grant Extension - Humboldt Bay Initiative

*Description*

California Sea Grant is a collaboration of the National Oceanic and Atmospheric Administration (NOAA), the State of California and universities across the state to create knowledge, products and services that benefit the economy, the environment, and the citizens of California. These services are offered for coastal and marine science and policy issues.

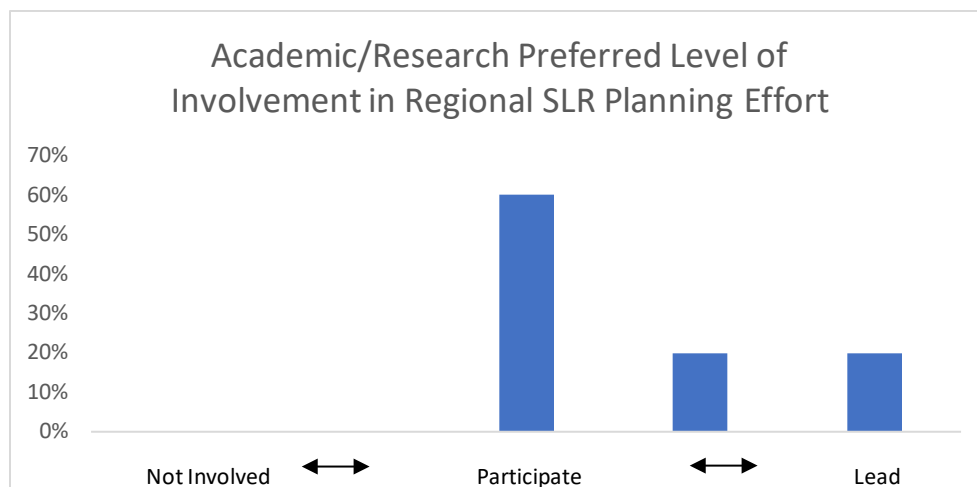
The Humboldt Bay Initiative. (HBI), coordinated by the Coastal Ecosystems Institute of Northern California, brings together resource managers, scientists, and community members to address management issues that cross disciplines and to link science and management for the Humboldt Bay ecosystem. HBI facilitates ongoing coordination and collaboration among local agencies, resource managers and local constituencies and develops, integrates, and disseminates key ecosystem information.

HBI completed its formal strategic planning process in 2009 and identified the following six priority EBM strategies in order to address priority threats to the local ecosystem and communities including climate change, invasive species, and human activities:

- Establish the Humboldt Bay Initiative
- Coordinated Response to Climate and Coastal Change
- Coordinated Response to Invasive Species
- Study and Control of Sediment Sources
- Promote Sustainable Development
- Support Integrated Forest Management

#### *Relevant SLR Coastal Professionals Survey Findings*

During the SLR Coastal Professionals Survey 2021, there was a total of 7 respondents that were representatives from the Academia/Research category though participation for individual questions varied. Participants included California Sea Grant Extension, Humboldt State University (now Cal Poly Humboldt), and San Francisco State University. These Coastal Professionals were asked a variety of questions including what the preferred level of involvement in SLR planning was for the entity they represented. Respondents were given a sliding scale to rate their role ranging from “not involved” to “participate” to “lead”. The results for this category ranged from “participate” to “lead” with a 60% preference for participation as shown in the graph on the below.



*Figure 131. Academic/Research respondents’ preferred level of involvement in SLR planning effort from the SLR Coastal Professionals Survey 2021 (n=5).*

These Coastal Professionals were also asked about their preferred spatial scale for SLR planning. Respondents were given a sliding scale ranging from planning on a “project by project” basis to planning

on a larger scale of “Watershed/HU” and “Humboldt Bay”. The results for the Academia/Research category ranged from a mix of “Watershed/HU” and “Humboldt Bay” in scale to just a “Humboldt Bay” spatial scale with a 67% preference for a Humboldt Bay approach as shown in the graph below.

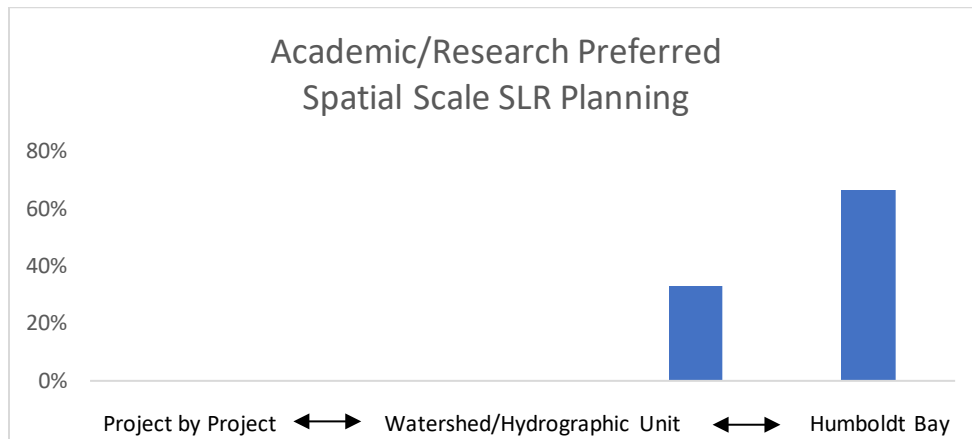


Figure 132. Academia/Research respondents’ preferred spatial scale to focus regional SLR coordination efforts in the SLR Coastal Professionals Survey 2021 (n=6)

To better understand the preferred style of future regional SLR coordination, Coastal Professionals were asked their level of support for several potential regional SLR planning options on a five-point Likert scale ranging from “strongly oppose” to “strongly favor”. The results for the Academia/Research category favored creating a formal collaborative partnership with 83% of respondents rating this option somewhat favorable or higher. Overall, this category favored having some form of regional planning coordination and 100% of respondents answered they somewhat or strongly oppose having no regional planning as shown in the graph below.

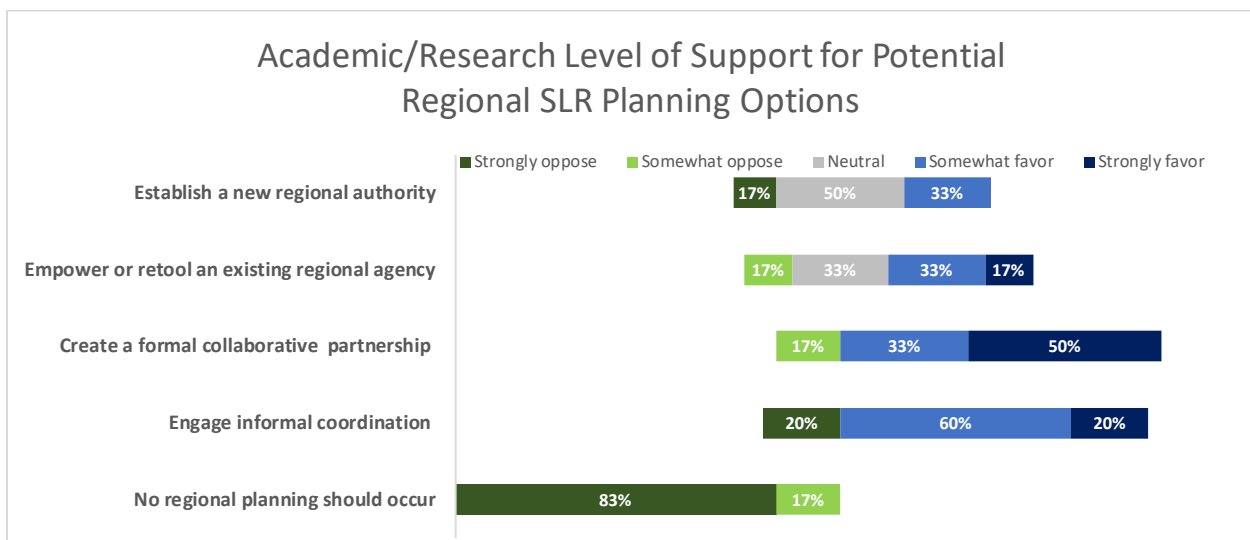


Figure 133. Academia/Research respondents’ level of support or opposition for various strategies for regional coordination of SLR planning from the SLR Coastal Professionals Survey 2021 (n= 5-6)

*Reference Links*

<https://caseagrant.ucsd.edu/about-us>

<https://caseagrant.ucsd.edu/project/humboldt-bay-ebm/humboldt-bay-initiative>

<http://www.coastalecosystemsinstitute.org/about-hbi/>

## Appendices

# Appendix i - SLR Public Survey 2021: Results and Survey Instrument

The Humboldt Bay Sea Level Rise Regional Planning Feasibility study is part of California Climate Investments, a statewide program that puts billions of Cap and Trade Dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment particularly in disadvantaged communities. The Cap and Trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investments projects include affordable housing, renewable energy, public transportation, zero emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low income communities, and low income households across California. For more information, visit the California Climate Investments website at: [www.caclimateinvestments.ca.gov](http://www.caclimateinvestments.ca.gov).

# SLR Public Survey 2021: Results and Survey Instrument

LCP Local Assistance Grant: LCP-19-01  
Task 1. Outreach  
March 2022

Orth-Gordinier, Kristen  
Richardson, Michael  
Shikany, Lisa  
Wickman, Sarah



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## Overview

The Humboldt Bay Sea Level Rise (SLR) Regional Planning Feasibility Study is an effort by Humboldt County to explore if and how regional collaboration for managing sea level rise might be implemented in the Humboldt Bay region. As a part of this effort, a Stakeholder Catalogue was created to identify asset owners, managers, and other parties that will or could be implicated in regional SLR planning. To support the creation and accuracy of this stakeholder catalogue, an outreach campaign consisting of two surveys for different target audiences and a set of stakeholder group interviews were conducted. Humboldt State University (now known as Cal Poly Humboldt) researchers and Humboldt County Long Range Planning staff partnered to develop and implement a survey of the general public and a separate survey for Coastal Professionals connected with the Humboldt Bay region in order to gain insights into their knowledge, attitudes, and perceptions of sea level rise (SLR) and their preferences for various coordination strategies. A key goal of the study was to use this information to inform the development of options for SLR adaptation planning in the Humboldt Bay region that will foster a cooperative and coordinated regional approach.

Outreach began in May 2021 with the release of one survey prepared for property owners that could be impacted by 1 meter of sea level rise, as well as for the general public (i.e., anyone who wished to take the survey). The survey was published online and announced via a press release to local news outlets. In addition, all property owners in the 1-meter sea level rise inundation area (984 property owners) were also sent physical copies of the survey in the mail. Of the 984 surveys mailed to property owners, 159 completed surveys were returned, resulting in a 16% completion rate. The online survey received 645 views, and there were 418 completed online survey entries resulting in a 64% completion rate. A total of 577 online and mail-in responses were received by the cut off collection date. The closing date for the online surveys and return date for mail-in surveys was June 21, 2021, although all mail-in surveys returned prior to August 1, 2021, with 30% or more of the survey filled out, were included in our calculations. For simplification, all results reported within the descriptions are aggregated responses from both modes of online and mail-in collection unless otherwise mentioned in the description. In order to understand participation for each question, total number of survey respondents will be reported (as n=) in each description.

# Results

## Respondent Demographics

Questions 30 and 31 of the survey asked for the age and household income of respondents in order to understand how representative this sample of survey respondents was of the County population, and to get a general understanding of the demographics for the SLR Public Survey 2021. These results are shown in comparison with 5-year estimates by the U.S. Census Bureau in 2020 for Humboldt County.

Results for survey respondents age represented 14% fewer 18-34 year old's and 4% fewer 35-44 year old's than shown by Census Bureau County demographics. On the other hand, there were 12% more 45-64 year old's and 20% more 64 years or older than shown by Census Bureau County demographics. There was also a small percentage of respondents who preferred not to say their age (4%). This discrepancy in age demographics is possibly due to the combined methodology of collection techniques. Mail-in surveys did target land and property owners within the inundation area of the Humboldt Bay region, which would skew results for an older age demographic. Results are shown below (Figure 1).

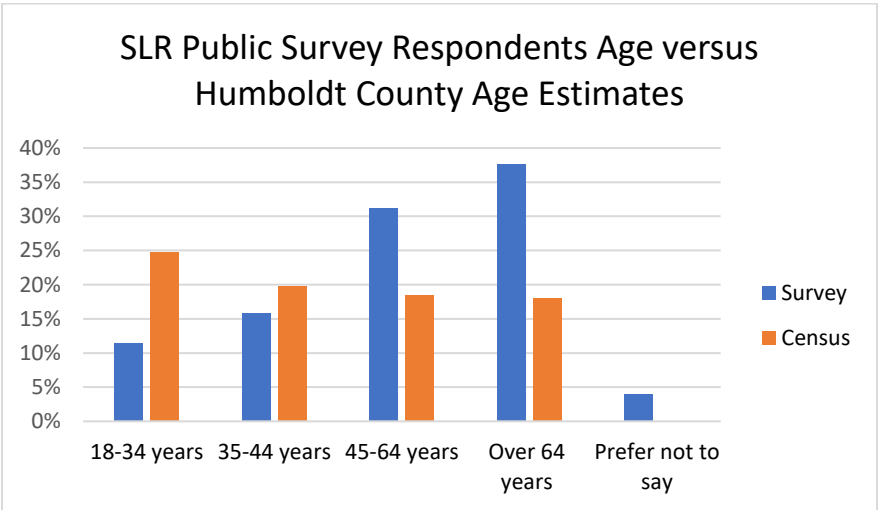


Figure 1. SLR Public Survey respondents' reported Age (n= 561) versus Humboldt County 5-year estimates for Age. Source: Census data 2020<sup>1</sup>

Similarly, the number of survey respondents with a household income of less than \$50,000 annually were 31% fewer than Census 2020 estimates for that income bracket for Humboldt County, while the other income brackets were all under 10% difference from U.S. Census Bureau estimates. However, 22% of respondents preferred not to provide their income level, and it should be noted that the mail-in survey target audience of land and property owners would skew results towards more financially established individuals. Results are shown on the next page (Figure 2).

<sup>1</sup> U.S. Census Bureau (2016-2020). Household Income Level American Community Survey 5-year estimates. Retrieved from <<https://censusreporter.org>>

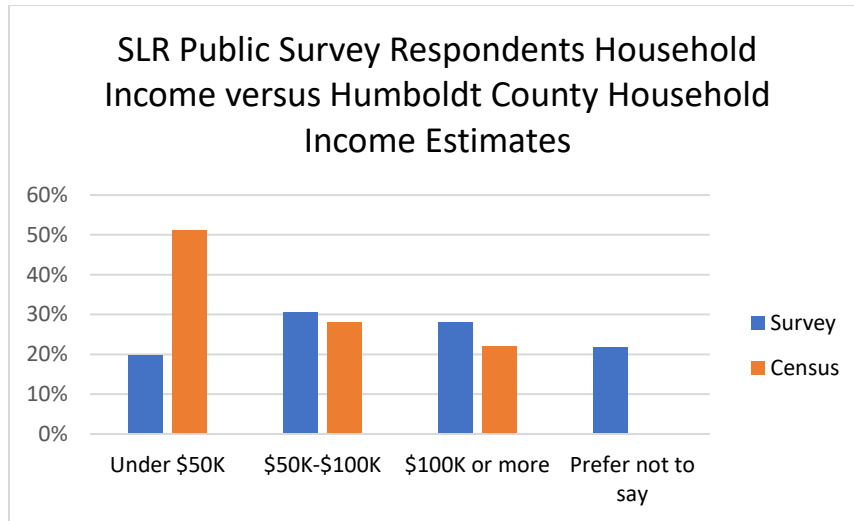


Figure 2. SLR Public Survey respondents' reported Household Income (n= 549) versus Humboldt County 5-year estimates for Household Income. Source: Census data 2020<sup>2</sup>

Question 2 of the survey asked how long the survey respondent had lived in Humboldt County, which gives context on how familiar the respondent was with regional SLR issues and gave a frame of reference for respondent's answers. Overall, the average respondent had lived in Humboldt County 35.9 years. Results are shown below (Figure 3).

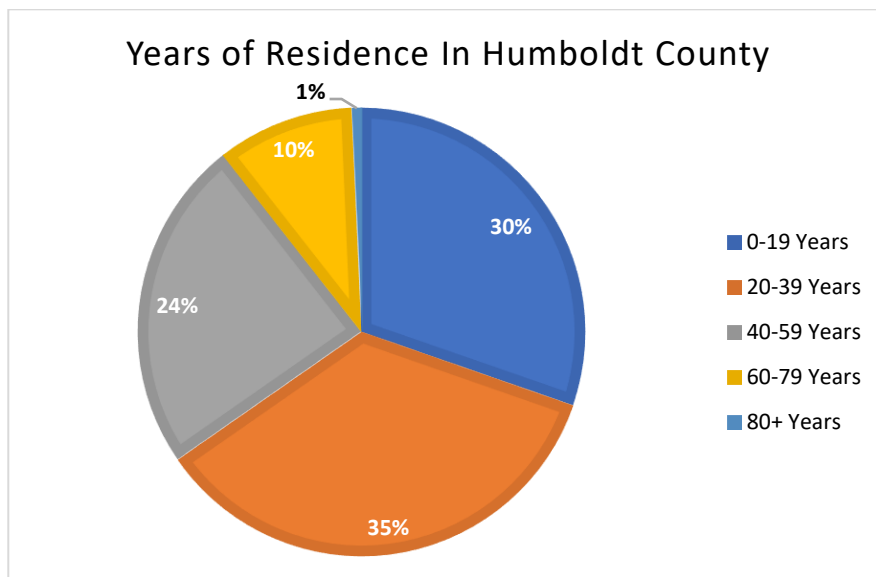


Figure 3. SLR Public Survey respondents' reported years of residence in Humboldt County (n= 539)

<sup>2</sup> U.S. Census Bureau (2016-2020). Age American Community Survey 5-year estimates. Retrieved from <<https://censusreporter.org>>

## Respondent Hydrologic Unit Association

Question 1 of the survey gave respondents a map of the six hydrologic units (HUs) in the Humboldt Bay region, with the 1-meter SLR inundation area shown in different colors corresponding with each HU, and the 2-meter SLR inundation area outlined in black. Respondents were asked to use this map to identify within which HU they (1) lived, (2) worked, (3) owned property, and (4) visited/recreated. This question allowed for multiple answers per HU and per category for an individual HU. The purpose of this question was to create a better understanding of how each HU is utilized by the public and identify roughly the location of a respondent's homes/properties while maintaining the respondent's confidentiality. Later questions ask for specific information about homeowner/property owner concerns and experiences, so understanding their frame of reference for responses provided valuable information on future planning frameworks and priorities.

Most respondents had answers associated with Arcata Bay HU, Eureka Bay HU, or Eureka Slough HU which contain to some extent the cities of Eureka and Arcata. South Bay HU had a sizable number of respondents as well, but with a higher concentration of property owners versus the other categories: live, work, or recreate. Eureka Bay HU had a higher concentration of property owners as well, although the number of respondents who actually lived in this HU was lower than average for all HU and it was the location of more respondent workplaces than the other HUs. Respondents used all six HUs extensively for visiting and recreating, with Eureka Bay HU and Arcata Bay HU having the highest concentration of visitors/recreators. Results are shown on the next page with the map used in the survey (Figure 4). HU results are arranged around the map in rough proximity to the location of their corresponding HU from North to South. Due to the multi-use nature of each HU, total number of responses and not percent of total respondents or percent of respondents for each HU was used to create the treemap charts on the next page.

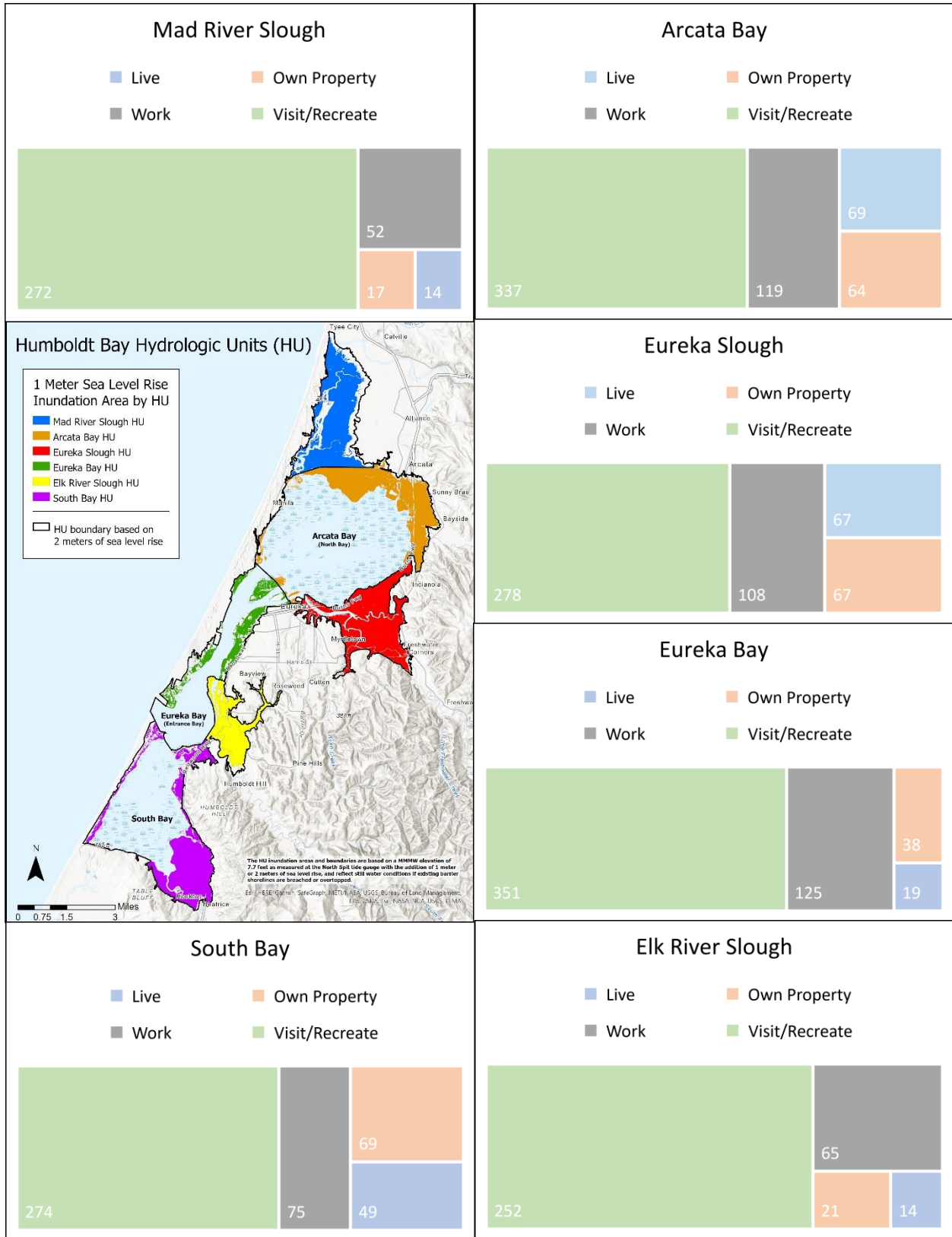


Figure 4. SLR Public Survey respondents' reported utilization of HU for Mad River Slough HU (n=355), Arcata Bay HU (n=589), Eureka Slough HU (n=520), Eureka Bay HU (n=533), Elk River Slough HU (n=352), and South Bay HU (n=467) by total respondents per category.



Question 3 of the survey asked respondents to identify their housing or property status within the HU inundation areas shown in Question 1. They were given the option of answering “Renter”, “Homeowner”, “Property owner – no residence”, “Seasonal residence”, and “None of the above” and had the ability to check all that applied. Some respondents had multiple housing and property situations, such as owning a home and a seasonal residence. The purpose of this question was to understand what level of investment and involvement the respondent had in decision-making for the land or property they are giving data for in the next series of questions regarding concerns and experiences. Homeowners were the most highly represented housing situation among respondents (54%), likely due to the targeted mail-in survey effort (Table 1).

Table 1. SLR Public Survey respondents’ reported housing situation or property status within the six HUs in reference to the Humboldt Bay HU map from SLR Public Survey 2021.

	<b>Total Responses</b>	<b>Percent of Total Participants (n=577)</b>
<b>Homeowner</b>	314	54.4%
<b>Property Owner – No Residence</b>	95	16.5%
<b>Renter</b>	83	14.4%
<b>Seasonal Residence</b>	8	1.4%

Following this question, survey respondents were given the option to skip the subsequent housing/property related questions if they had responded “None of the above”. This was done to reduce respondent burn out and filter responses to only those immediately affected by potential SLR inundation at 1-2 meters. Subsequently, the number of respondents dropped following this question until Question 15 when questions shift to general knowledge and attitudes about SLR.

Question 4 of the survey asked respondents to identify if the housing and property situations identified in the Question 3 were located along the shoreline. They were given the option to identify if it was a “Residence”, “Property”, or “None of the above” with the ability to check all that applied. The purpose of this question was to determine how immediate the impact of SLR would be on respondents and their question responses. The results showed a fairly even distribution of residences (21%) and properties (19%) that were located on shorelines, represented in this survey (Table 2).

Table 2. SLR Public Survey Respondents reported shoreline proximity for their housing situation or property status within the six HUs in reference to the Humboldt Bay HU map from SLR Public Survey 2021.

	<b>Total Responses</b>	<b>Percent of Total Participants (n=577)</b>
<b>Shoreline Residences</b>	122	21.1%
<b>Shoreline Properties</b>	109	18.9%

Question 5 of the survey asked respondents to identify if they lived in one of three communities identified by Humboldt County as “at-risk” from sea level rise of 3.3 feet/1.0 meter (King Salmon, Fields Landing, and Fairhaven which includes the area referred to as Finntown) or “None of the above”. The purpose of this question was to determine how immediate the impact of SLR would be on respondents as well as gather more valuable information on these communities for future SLR planning and collaboration. The results showed a strong turnout for respondents from King Salmon and poor representation from Fairhaven/Finntown (Table 3).

Table 3. SLR Public Survey respondents’ reported shoreline proximity for their housing situation or property status within the six HUs in reference to the Humboldt Bay HU map from SLR Public Survey 2021.

	<b>Total Responses</b>	<b>Percent of Total Participants (n=577)</b>
<b>King Salmon</b>	40	7.0%
<b>Fields Landing</b>	18	3.1%
<b>Fairhaven/Finntown</b>	1	0.2%

Question 6 of the survey asked respondents to identify their level of concern for SLR hazards such as flooding, erosion, etc. for the residence or property they identified in Question 3 as being within an HU SLR inundation area. If they had selected more than one housing or property status in Question 3, they were asked to respond on behalf of the housing or property situation at highest risk from SLR hazards. Respondents were given the option of “Does not apply”, “Not concerned”, “Somewhat concerned”, “Moderately concerned”, and “Very concerned”. The purpose of this question was to ascertain the base level of concern home and property owners had regarding SLR hazards and better understand the general sense of urgency for regional SLR planning and collaboration. The results show that 44% of respondents (n= 177) had moderate or higher level of concern (Figure 5).

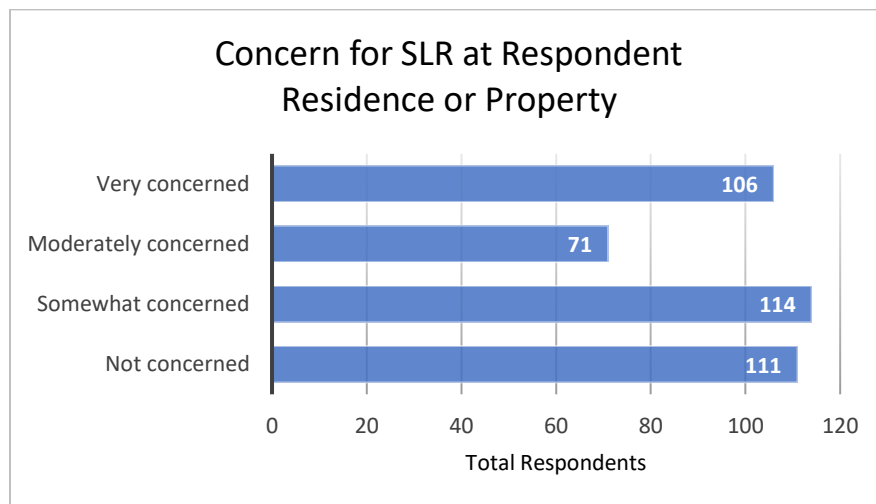


Figure 5. SLR Public Survey respondents’ reported level of concern for their residence or property at highest risk from SLR hazards such as flooding, erosion, etc. (n= 402).

Question 7 of the survey asked respondents to identify how often they have experienced flooding and/or damage at their residence or property within the last five years. If they had selected more than one housing or property status in Question 3, they were asked to respond on behalf of the housing or property situation at highest risk from SLR hazards. The purpose of this question was to understand the base level of flooding impacts and property damage already being experienced by home and property owners within the Humboldt Bay region. The results show that 21.1% of respondents who reported having a residence and/or property for Question 3 had experienced flooding damage and 8.2% had experienced flood damage (Table 4). The number of flooding experiences themselves ranged from 0 to 60 estimated incidents per respondent within the past five years so it is important to look at the reported average of 1.85 incidents flooding and .38 incidents of damage.

Table 4. SLR Public Survey respondents’ reported incidence of flooding and/or damage to residence or property in reference to the Humboldt Bay HU map from SLR Public Survey 2021.

	<b>Experienced Flooding</b>	<b>Experienced Damage</b>
<b>Total SLR Survey Respondent Count</b>	445	437
<b>Respondents who were unaffected in the last 5 years</b>	351	401
<b>Respondents who were affected in the last 5 years</b>	94	36
<b>Percent Respondents Affected</b>	21.1%	8.2%
<b>Average Number of Incidents Across all Respondents</b>	1.85	0.38

Questions 8 and 10 of the survey asked respondents if they had relocated, sold property, or at least considered these options due to SLR hazards. The purpose of this question is to understand the extent SLR hazards were already impacting home and property owners within the Humboldt Bay region and to understand the general perception of SLR hazards by these respondents. The results show that the percent of respondents who reported being affected by flooding (21.1%) and damage (8.2%) are not consistent with the percent of respondents who had relocated/considered relocation (12.9%) or sold property/considered selling property (14.6%) as shown in Table 5 on the next page.

Table 5. SLR Public Survey respondents’ reported incidence of relocating/considering relocation and selling property/considering selling property due to SLR hazards within the Humboldt Bay HU map from SLR Public Survey 2021.

	<b>Relocated /Considered Relocating</b>	<b>Sold Property/ Considered Selling</b>
<b>Total SLR Survey Respondent Count</b>	426	405
<b>Respondents who answered “No”</b>	371	346
<b>Respondents who answered “Yes”</b>	55	59
<b>Percent who answered “Yes”</b>	12.9%	14.6%

Question 12 of the survey asked respondents how informed/educated they felt regarding SLR hazards at their residence or property. Respondents were given a five-point Likert scale ranging from “Not informed” to “Extremely informed”. The purpose of this question was to understand the level of understanding these home and property owners had regarding SLR and to help determine general attitudes on SLR outreach in the Humboldt Bay region. The results show that 72% of respondents (n=353) felt moderately informed or higher on SLR hazards at their Residence/Property (Figure 6).

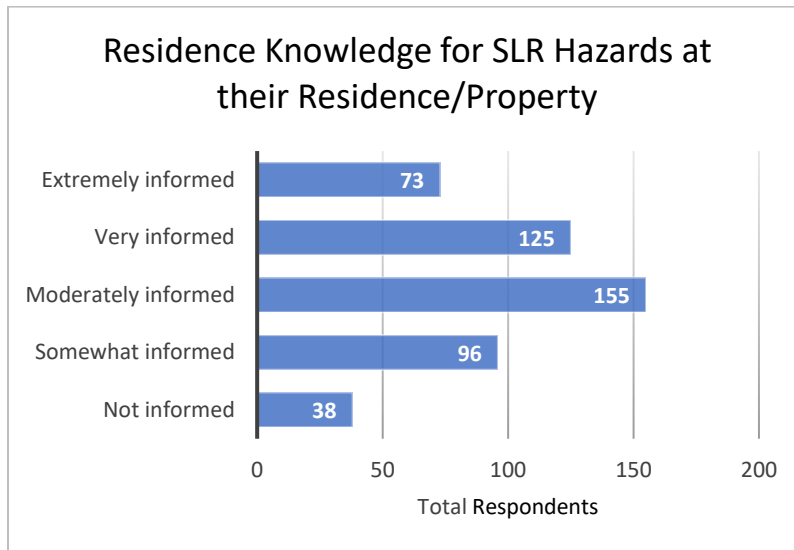


Figure 6. SLR Public Survey respondents’ reported level of information/education regarding SLR hazards for their residence or property at highest risk from SLR hazards within the Humboldt Bay HU map from SLR Public Survey 2021 (n= 487).

Question 13 of the survey asked respondents how vulnerable they thought the area immediately surrounding their residence or property is to damage from various SLR hazards. Respondents were given a five-point Likert scale ranging from “Exceptionally Vulnerable” to “Not at all Vulnerable” and “I don’t know”. The purpose of this question is to determine how vulnerable home and property owners feel about their residence or properties to SLR hazards and to identify immediate concerns for these stakeholders. The results show that respondents felt the most vulnerable to damage from “Increased flooding or erosion if sea level rises in the future” with 36% of respondents (n=166) rating their immediate area as “Vulnerable” to “Exceptionally Vulnerable” (Figure 7).

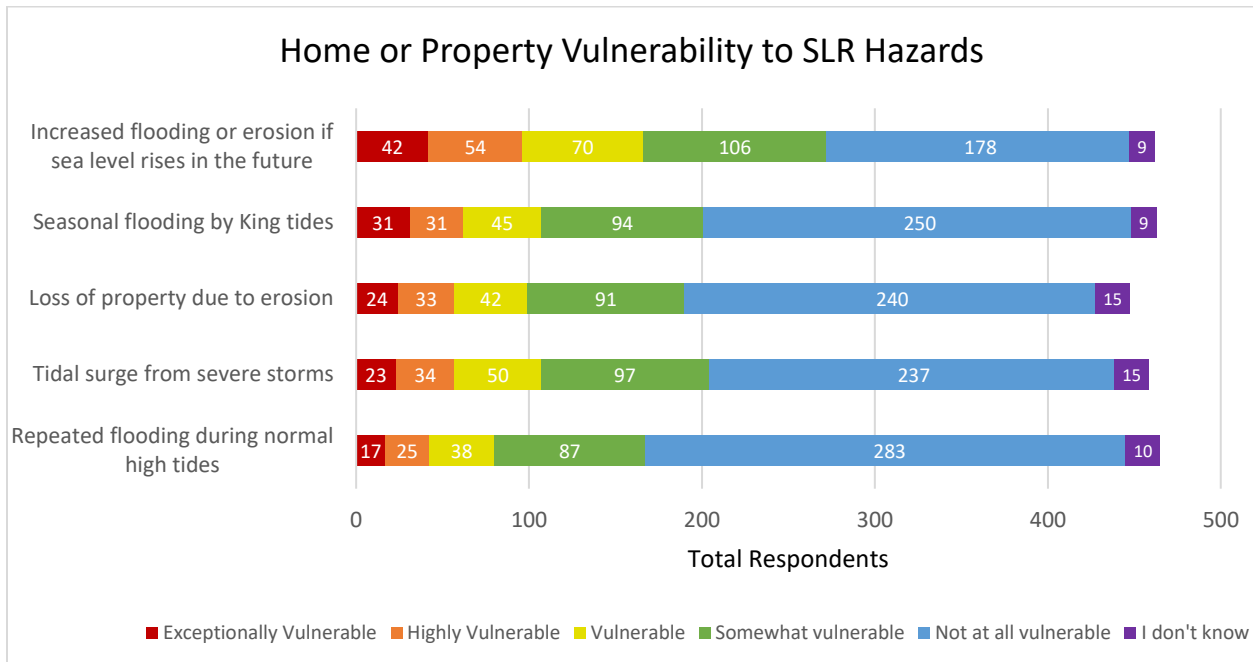


Figure 7. SLR Public Survey respondents’ reported vulnerability rating for various SLR hazards in the immediate area around the respondents residence or property at highest risk from SLR hazards within the Humboldt Bay HU map from SLR Public Survey 2021 (n= 440-460).

## General Knowledge and Attitudes on SLR

Beginning with question 15 of the survey, questions switch from home and property owner focused questions to general SLR knowledge and attitude questions. Question 15 asked respondents when, if ever, they thought the Humboldt Bay region will start to be impacted by sea level rise. Respondents were given a range of answers ranging from “It is already being impacted” and different ranges of years, to “Never” and “I don’t know”. The purpose of this question is to understand the general perception of SLR impacts by the public, and it also provided the opportunity to compare how public sentiment aligns with results from the Coastal Professional’s survey. Comparison of both target audiences are detailed in Appendix ii - SLR Regional Coordination: coastal professional survey results on page 11. The results for the SLR Public Survey 2021 alone show that 42% of respondents think the Humboldt Bay region is already being impacted by SLR (Figure 8).

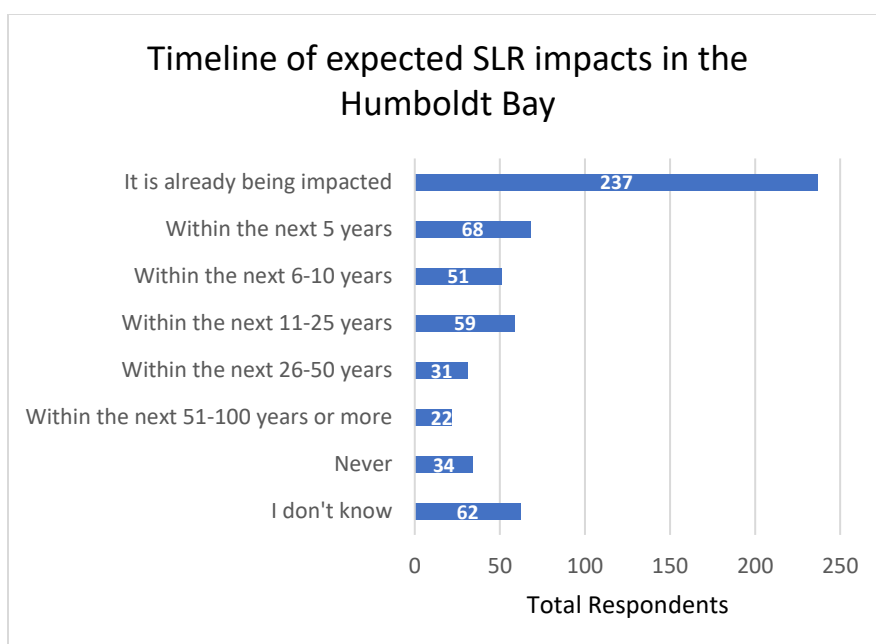


Figure 8. SLR Public Survey respondents’ reported expected timeline for SLR impacts in the Humboldt Bay region (n= 564).

Question 16 of the survey asked all respondents (as opposed to just home or property owners) how informed/educated they were about SLR in the Humboldt Bay region (as opposed to SLR hazards at their personal residence or property). Respondents were given a five-point Likert scale ranging from “Not informed” to “Extremely informed”. The purpose of this question was to understand the general level of understanding the public had regarding SLR and to help determine general attitudes on SLR outreach. The results show that 61% of respondents felt moderately to extremely informed about SLR in the Humboldt Bay region as shown on the next page in Figure 9.

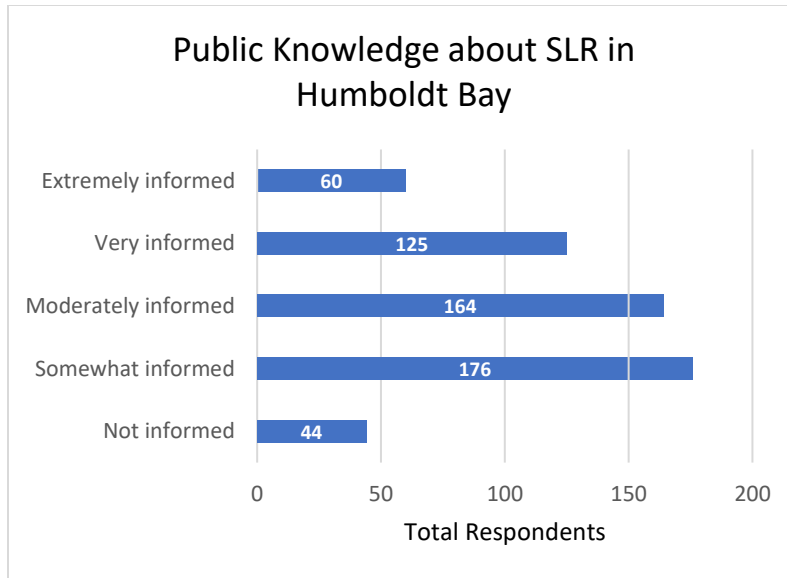


Figure 9. SLR Public Survey respondents' reported level of information/education regarding SLR in the Humboldt Bay region (n= 564).

Question 17 of the survey asked all respondents (as opposed to just home or property owners) how concerned they were about SLR in the Humboldt Bay region (as opposed to SLR hazards at their personal residence or property). Respondents were given a five-point Likert scale ranging from “Not concerned” to “Extremely concerned”. The purpose of this question is to understand the general perception of SLR in the Humboldt Bay region by the public. The results show that 69% of respondents (n= 394) felt moderately or more concerned about SLR in the Humboldt Bay region (Figure 10).

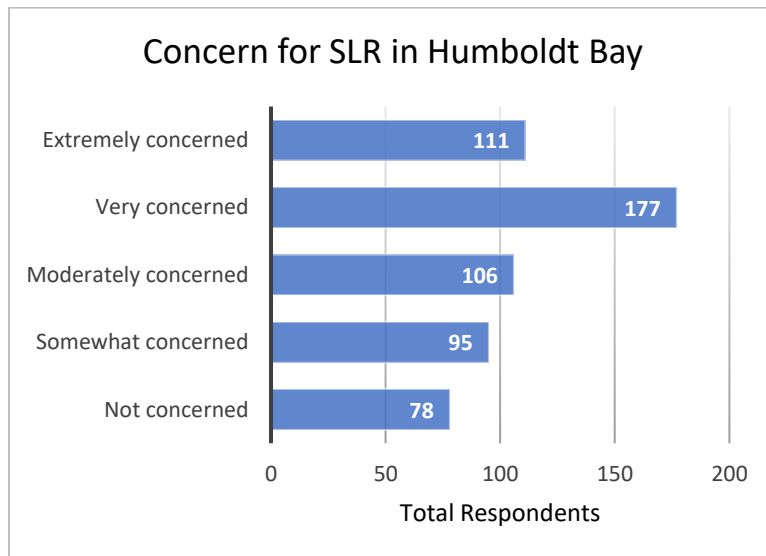


Figure 10. SLR Public Survey respondents' reported level of information/education regarding SLR in the Humboldt Bay region (n= 567).

Question 18 of the survey asked respondents to identify their sources of information about SLR from a list of 14 options with an additional option to write in a response. The purpose of this question was to provide insight into how the public accesses information that would be useful for future SLR outreach campaigns or regional collaboration. The top three sources for information cited by the public was “Digital media” (66%), “Local news” (54%), and “Local government reports and briefings” (51%) as shown in Figure 11. Preference for information source varied by age demographic, with respondents in the “Over 64 years old” bracket writing in “phone call” or “mail” under the “other” option. Some participants in this age bracket also noted they did not have access to all of these sources of information such as digital media, TV, and social media.

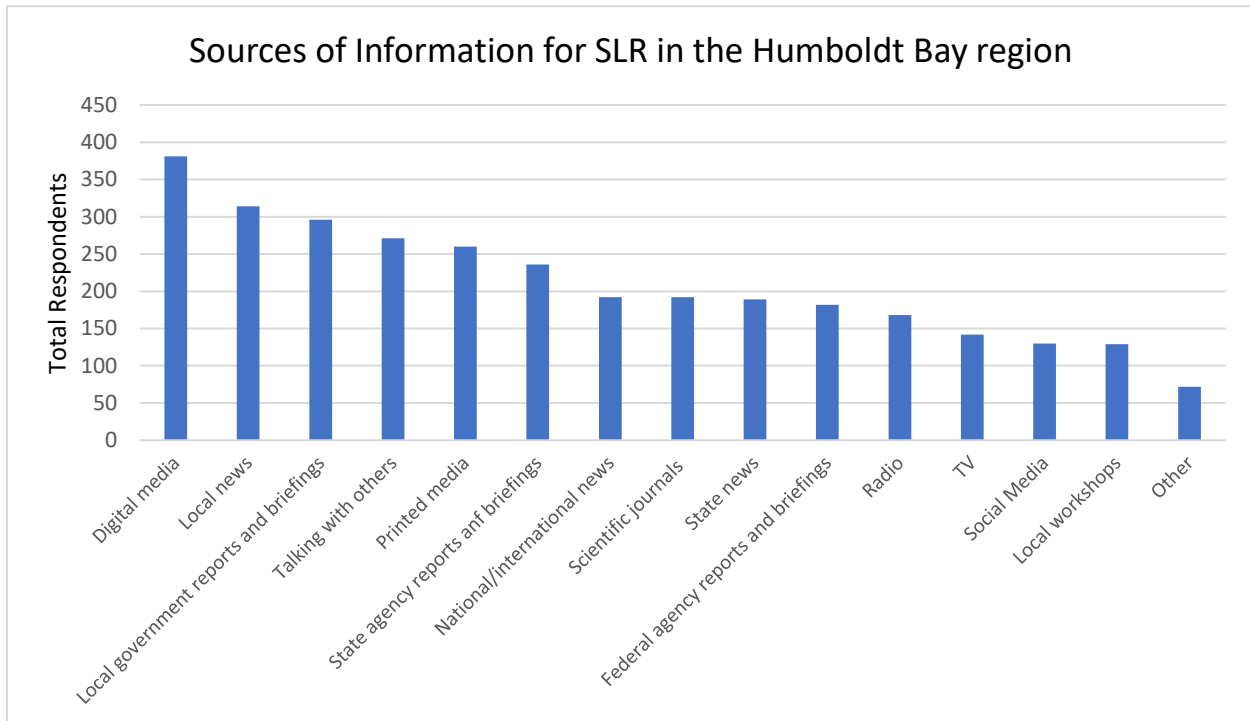


Figure 11. SLR Public Survey respondents’ reported sources of information for SLR in the Humboldt Bay region (n= 72-381).

Question 19 of the survey asked respondents to rate the priority of various assets within the Humboldt Bay region that would need consideration for SLR adaptation and future sea level rise planning. Respondents were given a five-point Likert scale ranging from “Not at all a Priority” to “Exceptionally High Priority”. The purpose of this question was to understand the public’s level of support for assets that could be potentially addressed via regional SLR collaboration and adaptation. The results for this question show that the top three assets given a priority rating of moderate priority or higher were “Highway 101” (89%), “Sewer/Wastewater collection and treatment facilities” (89%), and “Domestic water treatment and conveyance facilities” (88%). In contrast, “Individual Residences” (36%) and “Individual Businesses” (37%) were given the lowest number of ratings for moderate priority or higher. All results are shown in the graph on the next page (Figure 12).



## Public Priority Ratings for Local Assets in Flood Protection and Future SLR Planning

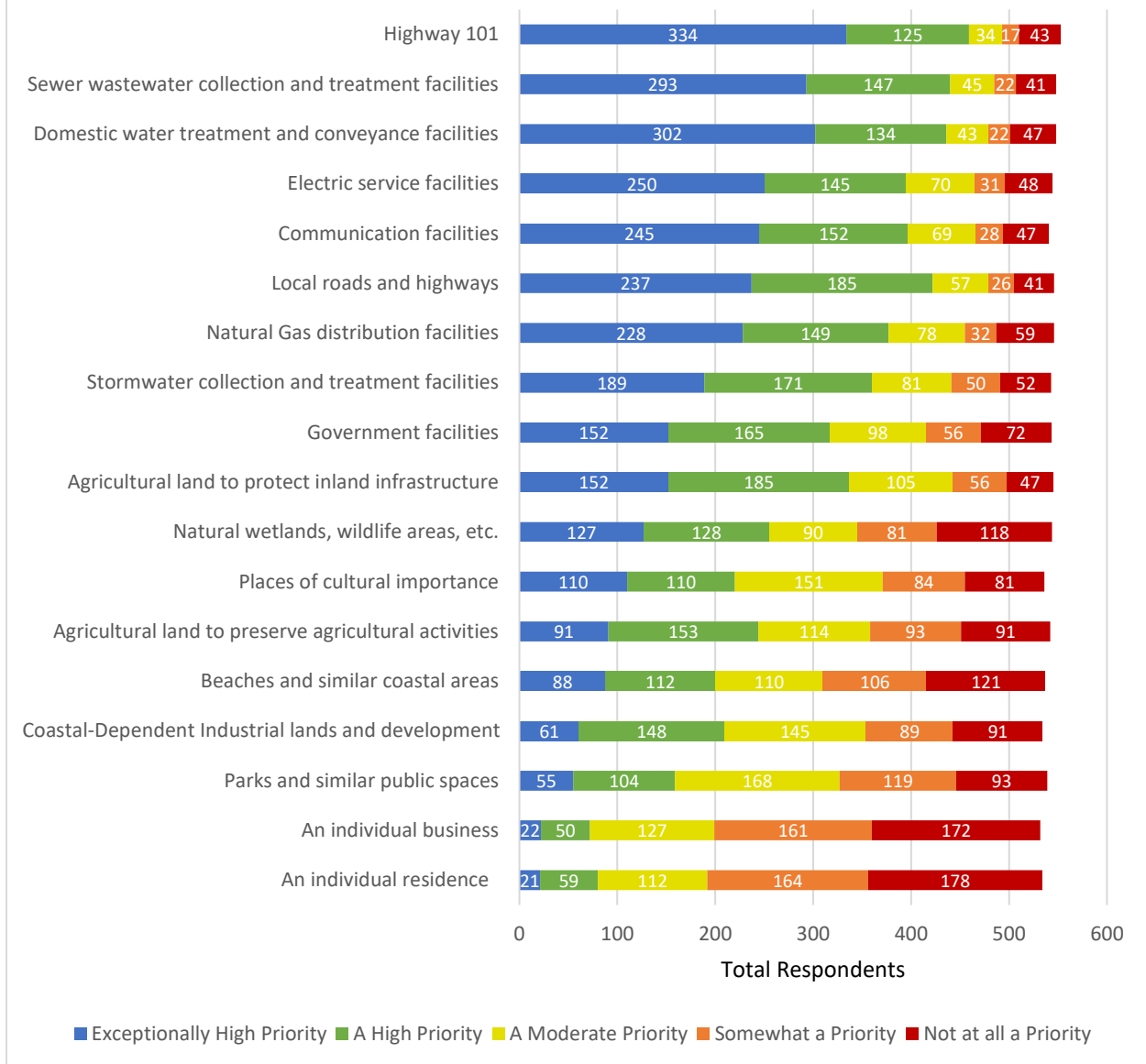


Figure 12. SLR Public Survey respondents’ reported priority ratings for Humboldt County assets that would need consideration for SLR adaptation and future SLR planning (n=532-553).

Question 20 of the survey asked respondents to rate the importance of a variety of components that could be involved in preparing for SLR and associated hazards. Respondents were given a five-point Likert scale ranging from “Not at all Important” to “Neutral” and “Very Important”. The purpose of this question was to understand the public’s level of support for components that could be potentially utilized in regional SLR collaboration and adaptation. The results for this question show that the top three assets given a rating of important or very important were “Installing hard shoreline stabilization” (80%), “Finding ways to postpone SLR policy changes until more research is done” (77%), and “Educating the community about

SLR” (75%). In contrast, “Regulating land use, such as development restrictions, to avoid SLR impacts” (23%) were given the lowest number of ratings for important or higher (Figure 13).

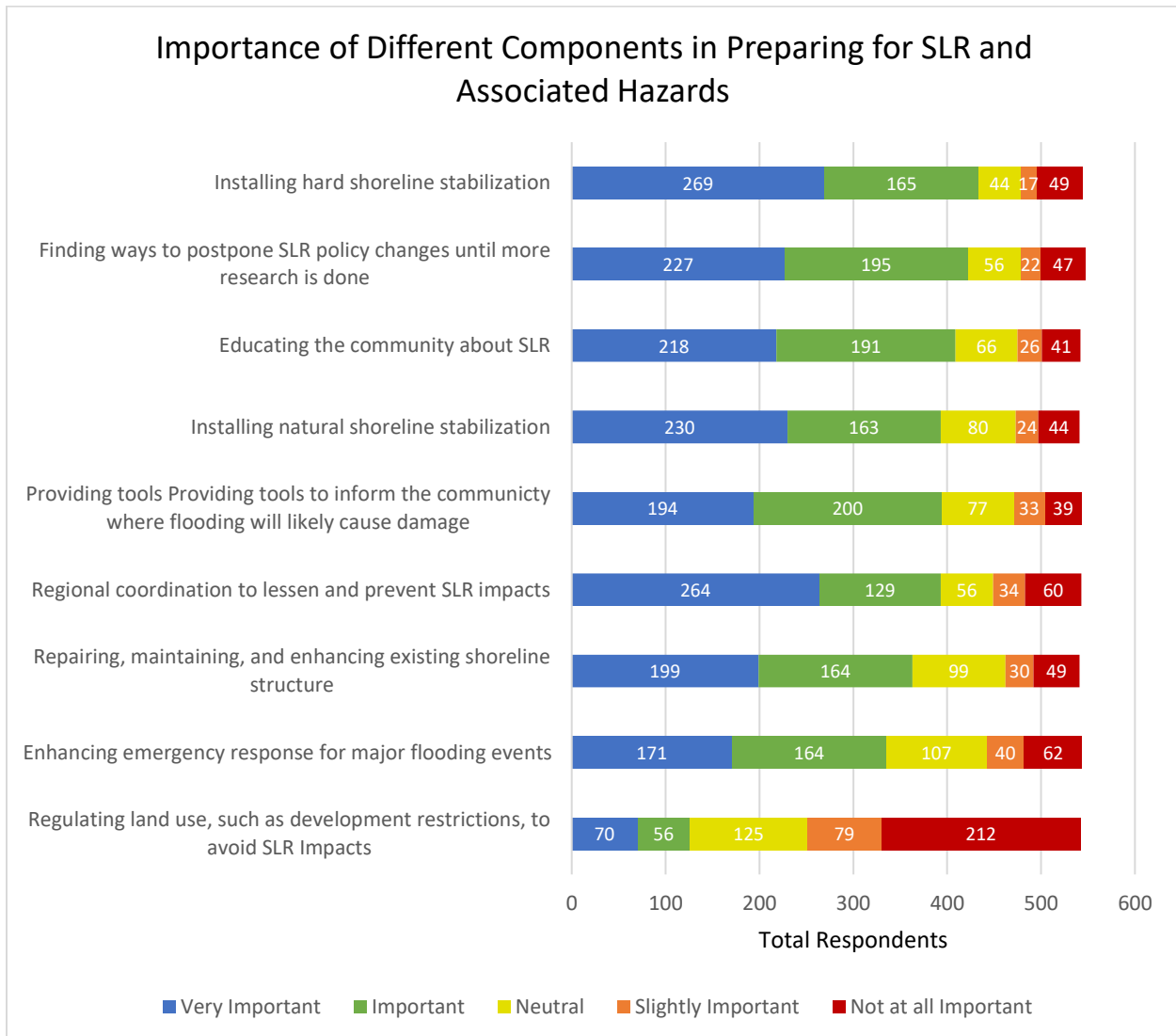


Figure 13. SLR Public Survey respondents’ reported importance ratings for potential components involved in preparing for SLR and associated hazards (n= 541-547).

Question 21 of the survey asked respondents their level of support for different SLR planning and adaptation funding options. Respondents were given a five-point Likert scale ranging from “Strongly oppose” to “Neutral”, and “Strongly favor”. The purpose of this question was to understand the public’s level of support for funding options that could be potentially utilized in regional SLR collaboration and adaptation, and it also provided the opportunity to compare how public sentiment aligns with results from the Coastal Professional’s survey. A comparison of both target audiences is detailed in Appendix ii - SLR Regional Coordination: coastal professional survey results on page 45. The results for this question show that the top three funding options given a rating of somewhat favor or strongly favor were “Utilize external grant funds when available” (84%), “Pass federal laws or programs with mechanisms to fund SLR work” (69%), and “Pass state laws, programs, or bond measures with mechanisms to fund SLR adaptation

work” (67%). In contrast, “Funding should not be spent on SLR planning and adaptation work” (10%) was given the lowest number of ratings for somewhat favor or higher (Figure 14).

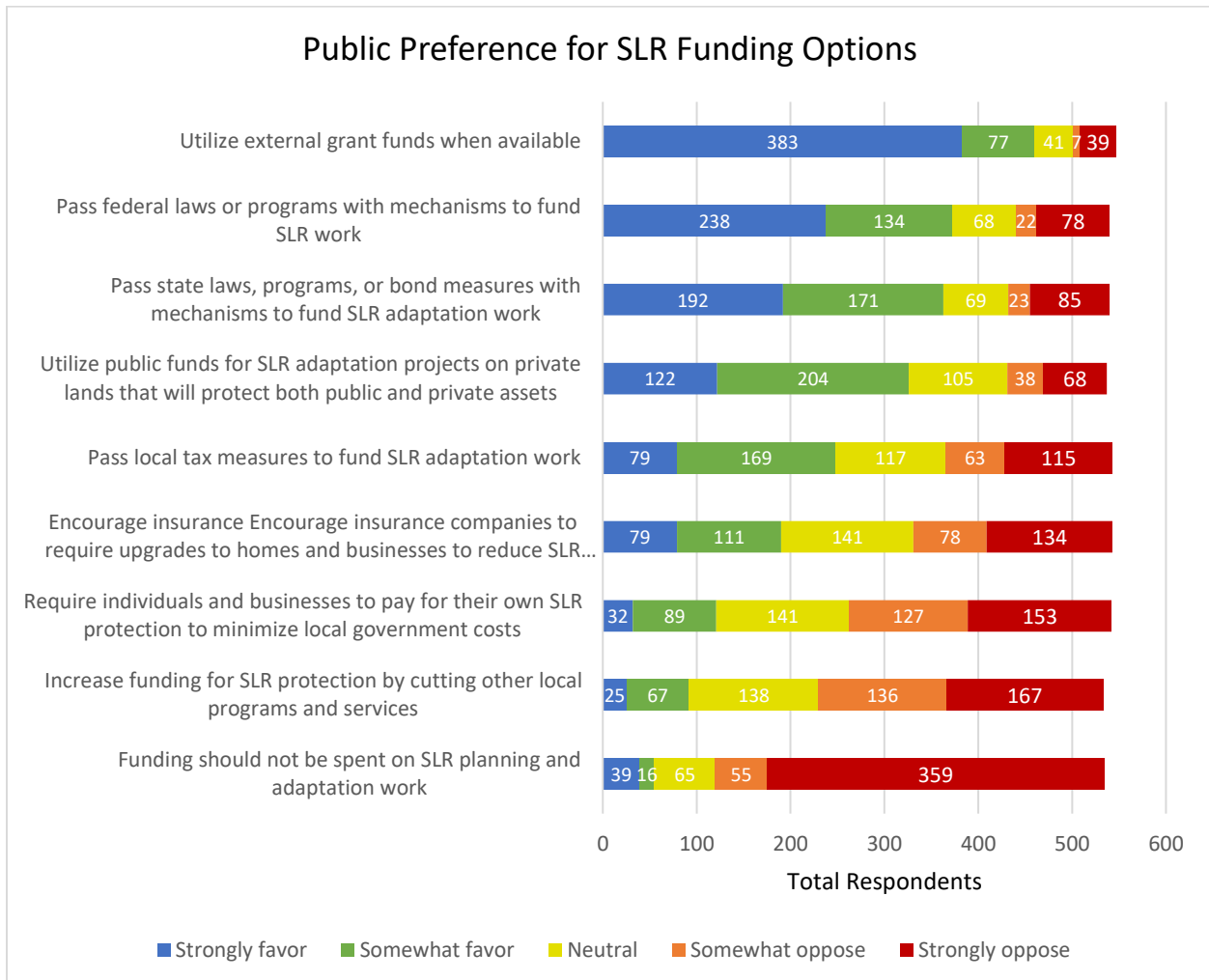


Figure 14. SLR Public Survey respondents’ reported support for different potential SLR planning and adaptation funding options (n= 533-547).

Question 22 of the survey asked respondents what agency/organization they thought should have a primary role or responsibility in providing information and general guidance on SLR adaptation in the Humboldt Bay region. Respondents were given the option to choose more than one organization ranging from City government to Federal government and given the additional opportunity to write in their own answer. The purpose of this question was to determine public support for potential SLR regional collaboration frameworks and who ultimately the public thinks should be leading this effort. The results show that respondents did not overwhelmingly rate one organization should lead over another. The top two chosen organizations were State Government (27%) and County Government (26%). All results are shown in the graph on the next page (Figure 15).

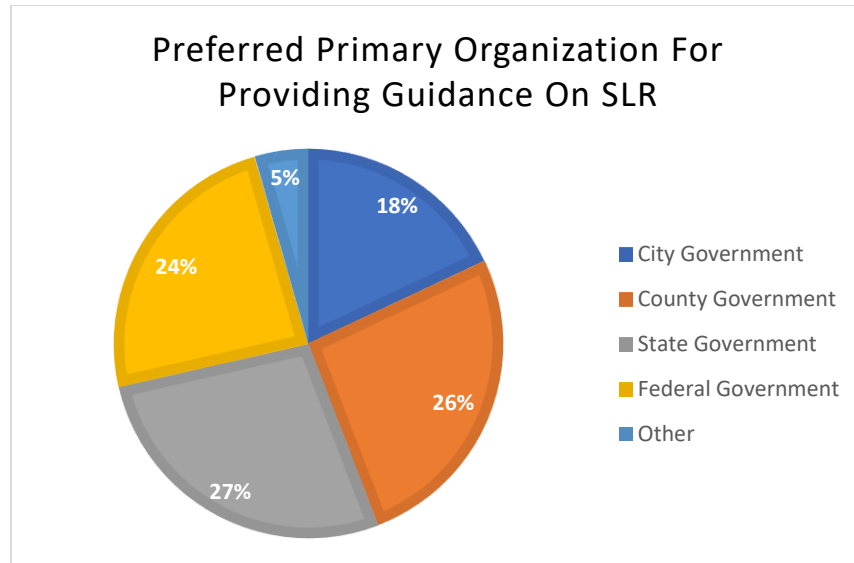


Figure 15. SLR Public Survey respondents' reported organization with primary role or responsibility for providing information and general guidance on SLR adaptation in the Humboldt Bay region (n= 66-403).

Question 23 of the survey asked respondents how many SLR presentations, events, or workshops they had attended in the last five years. Respondents were given the option of “None”, different ranges of numbers, and “10+”. The purpose of this question was to determine how effective public outreach has been and how involved the public is in SLR outreach. The results show that 45% of respondents (n= 247) had not attended any presentations, events, or workshops. There were 308 respondents who attended some sort of event in the last five years, with 54% of those respondents (n= 160) having attended 1-2 events (Figure 16).

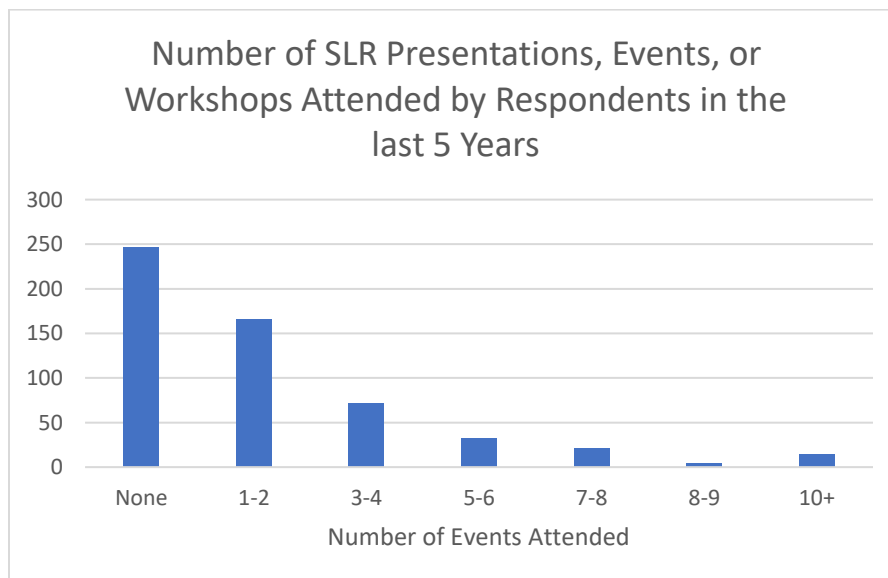


Figure 16. SLR Public Survey respondents' reported number of SLR Presentations, Events, or Workshops (n= 555)

Question 24 of the survey asked respondents what organizations had hosted the presentations, events, or workshops that they had attended in the last five years. Respondents were given the option of “City”, “County”, “State”, “Nonprofit”, and “School”, with the additional option of writing in their own answer. The purpose of this question was to determine who was effectively involving the public in SLR outreach and who might be targeted as an outreach partner for future regional SLR planning and collaboration. The results show that respondents did not overwhelmingly attend outreach from one organization over another. The top category for SLR outreach those respondents had attended was “Nonprofit” (n= 145) at 28% of respondents (Figure 17).

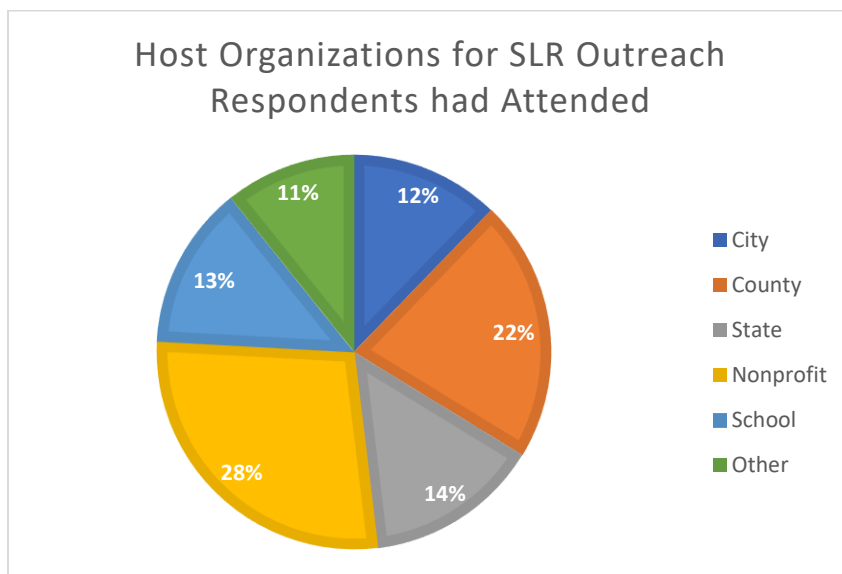


Figure 17. SLR Public Survey respondents’ reported organizations that had hosted presentations, events, or workshops that they had attended in the last five years (n= 308)

Question 25 of the survey asked respondents why they had not attended any SLR presentations, events, or workshops in the last five years. Respondents were given the opportunity to choose all statements that applied from the options of “Does not apply”, “I am not interested in this topic”, “I have not heard of one”, “I had other things to do”, “I felt other people attending the event represented my interests”, “I do not think the topic is relevant to me”, and “I am discouraged from attending because of the lack of action after meetings”, with the additional option of writing in their own answer. The purpose of this question was to determine how to increase the effectiveness of public SLR outreach and assess the general attitude towards participation in SLR outreach. The results show that respondents predominantly have not heard of any SLR outreach events to attend. Out of the 247 respondents who had not attended an event as indicated by Question 23, 55% cited they did not attend due to not hearing of an event. The second most popular option was “Other” which cited reasons such as “Work”, “Inconvenient times for meetings”, and “Need gas money”. All results are shown in the graph on the next page (Figure 18).

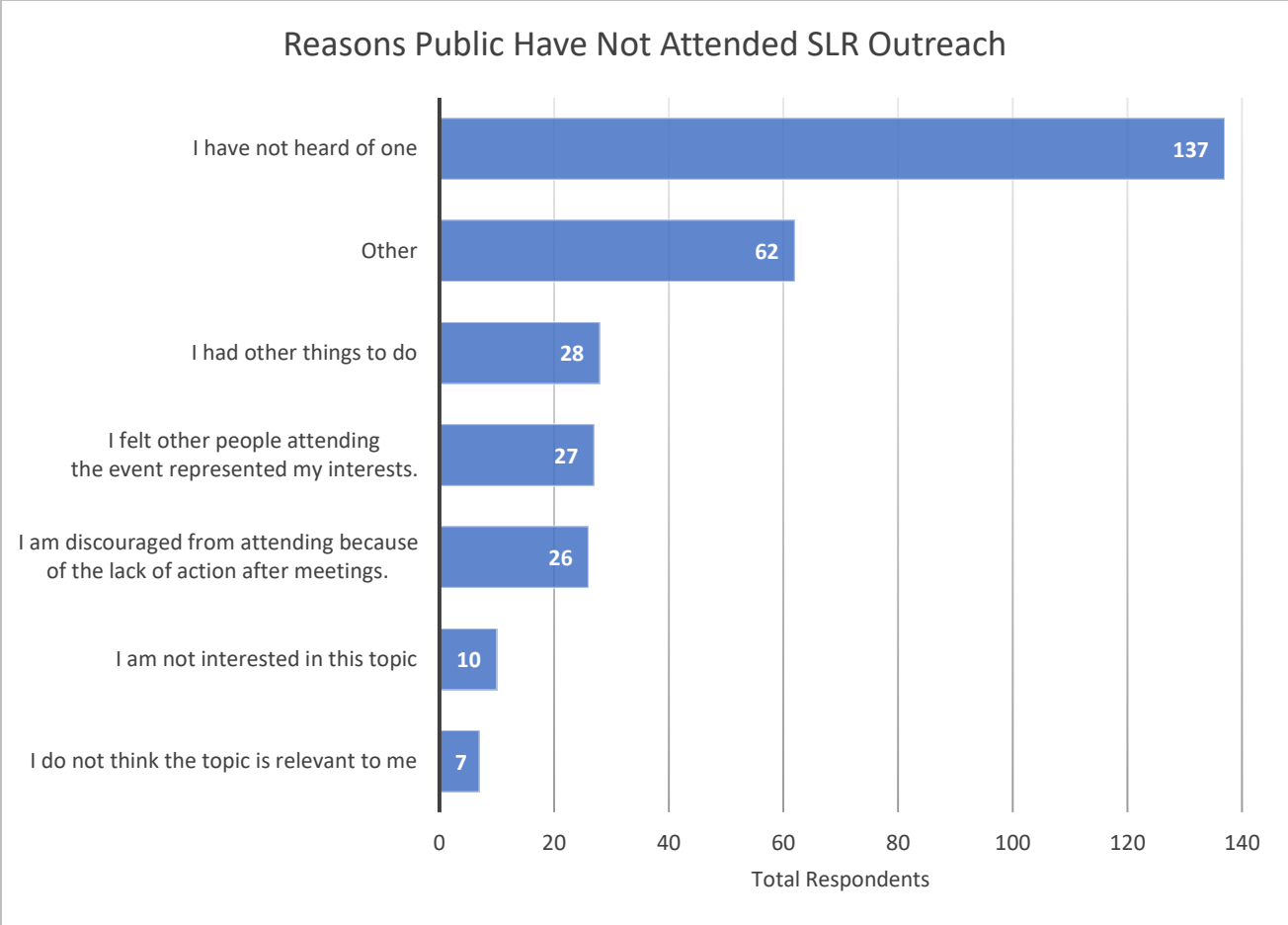


Figure 18. SLR Public Survey respondents’ reported reasons for not attending SLR outreach presentations, events, or workshops in the last five years (n= 297).

Question 29 of the survey asked respondents how they would like to be updated on SLR planning efforts. They were given a variety of options, including “I do not want to be updated”, “Email”, “Dedicated webpage”, “Facebook event”, “Phone call”, “Radio Announcement”, and “Workshops”, with the additional option of writing in their own answer. The purpose of this question was to determine how to increase the effectiveness of public SLR outreach. The results show that the top two options respondents would prefer are Email (37%, n= 214) and Webpage (34%, n= 195). All results are shown in the graph on the next page (Figure 19).

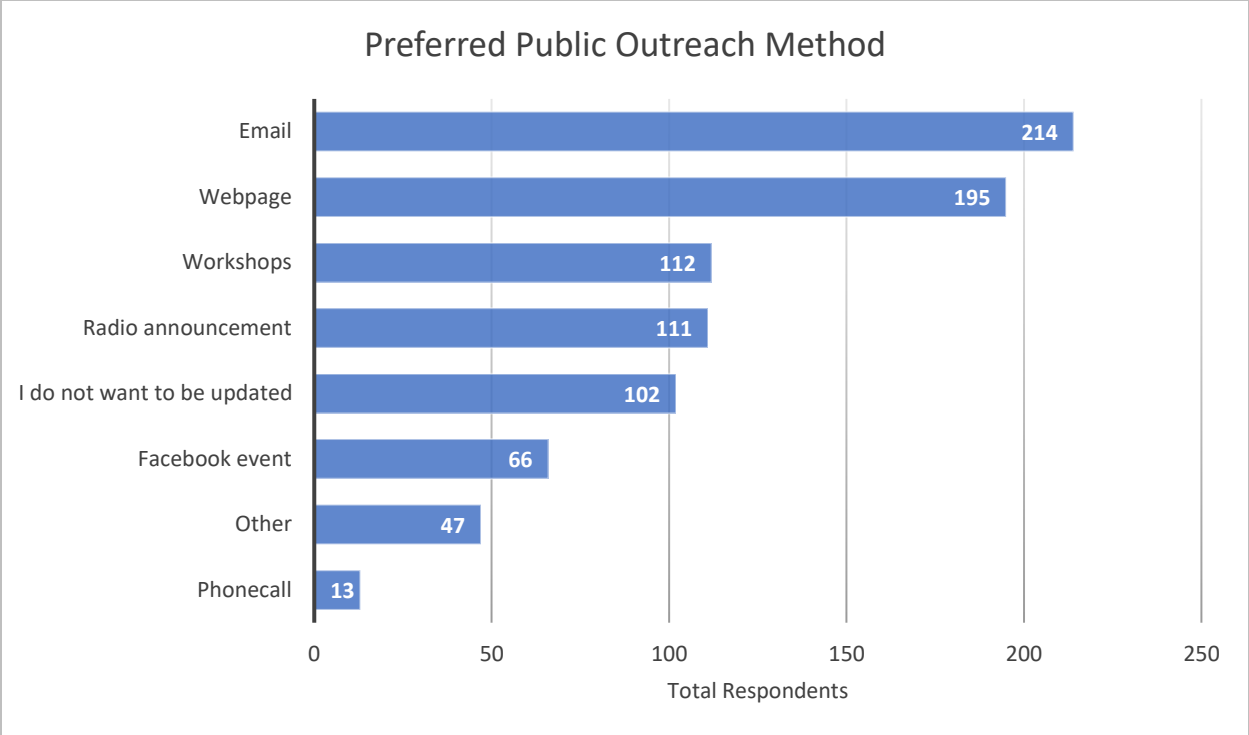


Figure 19. SLR Public Survey respondents’ reported preferred mode of outreach to be updated on SLR planning efforts (n= 13-214).

Question 29 of the survey asked participants to answer how they heard about the SLR Public Survey 2021. They were given a variety of options, including “Radio and television”, “Conversations with family/friends/others”, “Humboldt County website”, “email”, “social media”, “Received survey in the mail”, and “other”. The purpose of this question was to determine how effective different modes of outreach for the survey had been. The results show that the outreach method most chosen was “Other” (30%, n= 179). Many answers included specific digital media outlets or otherwise overlapped with other outreach methods provided as options. Due to the targeted mail-in survey effort, the “Received the survey in the mail” had the second highest number of respondents (29%, n= 171). All results are shown in the graph on the next page (Figure 21).

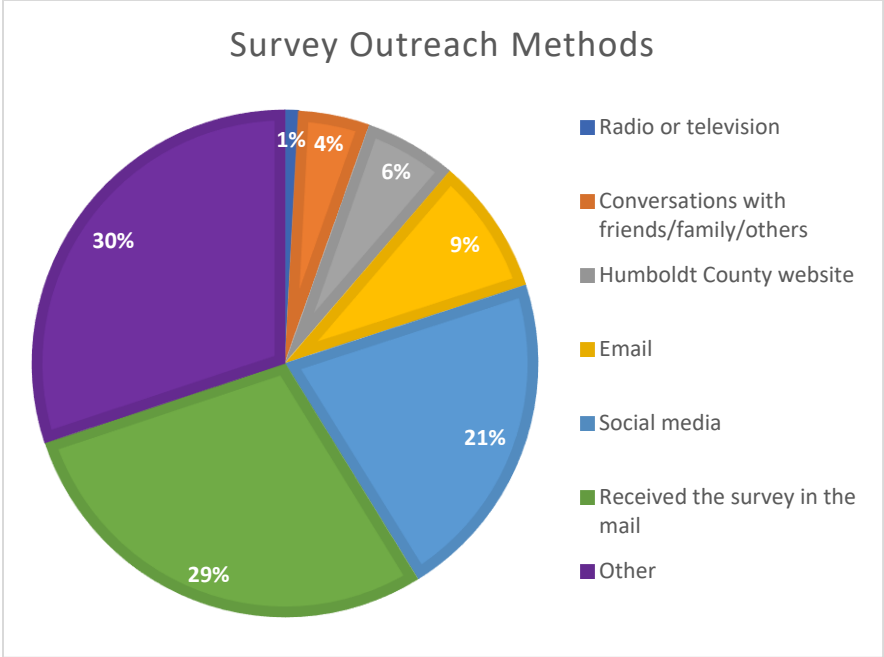


Figure 20. SLR Public Survey respondents' reported method of receiving the SLR Public Survey 2021 (n= 5-179).



## Public Comment

Survey Respondents were given several opportunities to expand on answers previously given, ask questions, or otherwise provide public comment on the Humboldt Bay Sea Level Rise Regional Planning Feasibility Study and the survey itself. In order to protect identifying information such as home or work location, the County will keep these specific comments in private records and consider them moving forward with the Feasibility Study.

Online survey participants were given the additional opportunity for public facing comment due to requirements of the website the survey was hosted on. Specifically, respondents were asked: “ Any public comment you would like to add to be posted on this survey?” Question 27 of the survey asking respondents "Do you have any questions or comments regarding how coordinated, cross-jurisdictional, regional sea level rise planning could be accomplished for the Humboldt Bay region?" was also offered in both versions of the survey. These comments have been shared below in their entirety, aside from comments that simply said a variation of the answer “no” or those that would identify the respondent. Spelling and grammar have been minimally corrected for readability. Comments are arranged in alphabetical order.

- Action needs to begin now if there is any hope for success. The human tendency to wait until the shit is hitting the fan isn't going to cut it.
- Already did them going through the Survey
- As I stated previously the impacts of sea level rise occur gradually and are essentially amortized into the use and value of low value (farms, parks) property. To panic over a 1 meter rise in the distant future is to encourage hysteria.
- As shocking as it may be to think about much of our familiar landscape being underwater, the future flooding threat to low lying parts of Humboldt Bay is significantly greater than this map and survey suggests. We're likely to see as much as twice that much sea level rise by 2100. And any other flooding, whether from a tsunami or an atmospheric river, will come atop that new level. Climate models strongly suggest we will get even larger floods in the future.
- Be prepared for the worst case scenario. The loss of old town will ruin Eureka's tourist economy. The loss of the marsh will lead to pollution and the loss of the 101 safety corridor will cripple this community. And then think about the domestic refugee situation with the loss of all housing in flood zones.
- Build the bear river ridge wind farm. None of the opposition to it was nearly enough to outweigh its climate benefits by reducing co2 production. Also, build offshore wind, re-open the blue lake biomass plant, let pg&e try their tidal power experiment, and generally stop putting up regulatory hurdles for planet-saving clean energy. Every time you say no to a renewable energy project, you are why we're not reducing our co2 output.
- Building sea walls or natural barriers is absolutely necessary. The ecological damage from allowing the SLR to overtake would-be abandoned structures far outweighs the cost of building barriers. Should the SLR get too extreme then my opinion could change but a few feet is preventable
- Concern for the PG&E site
- Consider that in some locations the perceived rise in sea level may actually be the sinking of land mass.

- Developing local understanding of the opportunities and constraints for migrating coastlines and adaptation planning, and coastal mitigation, is critical knowledge for a our small coastal community to thrive. I look forward to collaborating in this process and learning as the county learns.
- Eel river carries more sediment than any river west of the Mississippi. And it is not properly cared for, dredged, or maintained. That heavy sediment load is deposited within humboldt bay. When you take a fixed volume container, then add sediment to the bottom, the liquid will raise. The localized ""sea level rise"" humboldt bay is experiencing is a result of the excessive sediment loading, and not from an actual rise in sea level. If the sea level were rising, it would be observed throughout the Pacific, not specific to our little bay.
- Emphasize a policy of retreat and full bay restoration. Remove all the levees.
- for warned is for armed
- get ready!
- Great job on trying to get information on sea level rise in the Humboldt Bay area out to residents and businesses.
- Humboldt is stuck in past. It needs to invest in clean energy, electric transport, and find better ways to integrate game changing technologies into helping people. Entire economic sectors are at risk of being disrupted--and we need to give our people a chance to compete!
- I am ashamed of Humboldt County's approach to SLR, it's as if you encouraged Salt-Water Intrusion by doing nothing but ripping-out the vegetation that create coastal wetlands, stability and habitat.
- I better not!
- I found a problem with this survey. The questions only focused on how I feel about protecting or not protecting EXISTING property, infrastructure, and utilities from sea level rise. While I feel it's important to adapt some existing infrastructure (i.e. raising up Highway 101), I don't feel like we should try and save it all. Anywhere where I checked "not important" I am not saying the infrastructure, be it electrical, government buildings, residences, is not important what I am saying is that much of it needs to be moved to higher ground and out of future impact areas. This is not a time for short-term thinking. The sea is going to continue to rise higher and higher over the next couple of centuries even if as a species we actually are able to slow down global warming. Trying to save some the infrastructure around the bay is going to be insanely expensive and for how long will the mitigations really last? To spend money wisely we should be looking at moving as much infrastructure as possible to higher ground, and in some cases changing the kind of infrastructure we have (i.e. local micro-grids for electricity)
- I prefer local decisions on sea level rise. What works on an unincorporated shoreline is likely different than an industrial waterfront. Communication and coordination among agencies and jurisdictions are positive but no jurisdiction should be making decisions for others.
- I think much more consideration should be given to redrawing the maps for flood zones locally and restricting development in those areas. I also think there should be more consideration of relocating critical infrastructure.
- I think the 101 needs to be relocated. I think much of the industrial buildings at the lower elevations need to be removed. I think more pressure should be put on the government to create a permanent storage location for the radioactive waste being stored right off the shore of Humboldt bay. I think we should stop allowing new development in the lower elevations. New

structures should only be built at 260ft+ elevation because sea level rise could eventually reach 230ft and extra elevation needs to be considered for the Cascadia subduction zone tsunami risk as well. Additionally coastal areas in southern California came up with an idea for organizations and counties to buy residential homes in flood risk areas at market value, and that the county or organizations recoup those funds over time by renting them out as vacation rentals while the slow rise of the seas approaches.

- I think there needs to be an alternative road going along the back side of Humboldt Hill ridge. Humboldt hill road is the only way in or out and it will be flooded eventually. Also i think the county should stop allowing new construction in the lower elevations. Sea level rise will eventually reach 230ft, and it's best not to leave our infrastructural problems for future generations to deal with.
- I urge Humboldt County to do more to prepare for Sea Level Rise (SLR). Highway 101 will be underwater unless we take immediate action. We can not continue to push the planning for, and mitigation of, SLR-induced flooding impacts to the next generation of public officials and annual budgets. We need to apply for (or otherwise generate) funding and start to include SLR planning and preventative treatments in our budgets immediately, not in 5 years from now. Please do not wait!
- If an idea is noble enough, people will support it voluntarily. If people choose not to support it, the issue may be with the most vocal proponents of the cause, not the cause itself. If extremist ideologues vilify the skeptical or indifferent, you will lose more support than you could ever gain. Reign in the alarmists and you will probably get more support.
- If Humboldt County gets this right, we should be fine. If we don't, we could be in a world of hurt.
- I'm worried about subterranean conveyance being flooded like storm drains and water/sewer pipe chambers - and that sea water reaching further inland via those channels
- Is climate change real for everyone yet?
- It is coming. Prepare. Do not buy any wooden nickels!
- Just get the word out. Make it easier to find this survey Door to door if necessary
- Keep up the good work! This topic is important and critical to the future success of this area.
- Let's get busy!
- Making intelligent informed decisions (as opposed to reactionary and not well thought out responses) needs to be centered in the planning process. Using a natural approach should also be centered. Sea walls should never be built along the North Coast. We also need to examine dredging of the Humboldt Bay and the effect it's having on beach erosion. We are decreasing the sand budget that keeps our first line of defense against SLR strong, beaches and native dunes.
- Many studies have been done, but little appears to be acted upon. Time is of the essence.
- Nice work! Planning, prioritizing and funding sea level rise adaptations is a complex issue that spans jurisdictions and affects many people. The results from this survey can help guide next steps.
- No sea walls!
- one subduction earthquake can equal 3 feet of SLR in a single event.
- Only if anonymous. I am terrified of how unprepared we are on the local, state, national and global level.
- Please measure sea level rise in various locations in Humboldt to verify the models. I have owned property in King Salmon for over 20 years and to date, there has been no effect. I do believe it is

happening but would like scientific data rather than a model. Year over year records to verify the models being offered. Please see my comments offered above. The earth is no longer warming. The earth began cooling in 2007 when the sun entered a state of lower solar activity. I took geography and other planning type courses during my civil engineering education at UC Davis. I am educated in the use of ESRI ArcGIS software. Go look up a query: "what percentage of the earth's surface area is urbanized?" You should find a link from Columbia University: <https://www.earth.columbia.edu/news/2005/story03-07-05.html> That indicates 3 percent of the earth's landmass is now urbanized. Urbanized regions are where the majority of fossil fuel exhaust is generated. So the earth's landmass constitutes just 25 percent of the total earth's surface area. Therefore by simply multiplying 0.03 by 0.25, you arrive at the fraction of the earth's total surface area that is urbanized. The fraction digitally is just 0.0075, or 0.75 percent of the earth's total surface, or seventy-five one hundredths of one percent. We are INSIGNIFICANT compared to the sun's activity. I hope my capitalizing "INSIGNIFICANT" is not a violation of your "guidelines for civility". I merely typed the word in capital letters for emphasis. Furthermore and foremost, the County of Humboldt, by pursuing the myth of sea level rise, with the possibility of limiting or eliminating development of private parcels in coastal areas are effectively engaging in the slander of title that could and would lead to decreased property values. Such a scenario is a "take" and private land owners have a right to be justly financially compensated for the loss of their fair market value of their properties."

- Remind the public often.
- Save our coastal lands! Save California!
- Sea level protections have been made for 30 years and have been consistently wrong. Sea level rise has not increased beyond historical rates going back two thousand years. 1/8 of an inch per year
- SEA LEVEL RISE (SLR) is not drastically accelerating, and is not an imminent threat. Most of the current alarm over SLR derives from climate model projections, which predict a large increase that will accelerate in the future. These models DO NOT find any confirmation in the real world, where ocean tide gauge data shows that SLR has been slow and relatively constant since at least as far back as 1856. All of the perceived acceleration comes from satellite measurements, and multiple peer-reviewed studies of those data sets have shown that the data being interpreted as SLR acceleration fall within the range of satellite measurement error, and furthermore do not match well with tide gauge data on the ground, and thus can not be taken as proven, or even real. To summarize, even though some researchers claim evidence that can be interpreted as showing recent acceleration, the long-term record shows that sea level has always varied naturally on multi-decadal time scales, and it is dangerous to extrapolate any short-term trends that do not significantly exceed that normal variance into the far future.
- Sea level rise is inevitable. Focus on incremental steps in planning moves to higher ground.
- Sea Level Rise is not some esoteric thing that doesn't apply to you and me. It is critical to our society and economy. It takes a long time to effectively plan for the inevitable catastrophe. Denial is no longer an option. It's a 'all hands on deck' survival event.
- Sea level rise is one of the most serious issues that Humboldt county is going to face over the next 20 to 50 years. If we do not get a system in place to handle this upcoming rise and sea level, we will be forced to respond haphazardly and incrementally to a pervasive problem. I hope that the county creates a set of guidelines, especially in regards to infrastructure development and

property vulnerability that makes it clearer to ordinary citizens about the impacts of sea level rise. The sooner that we can get ahead of this phenomenon, the more that the county, our economy, and the ordinary citizen will benefit.

- Sea level rise is real and needs to be taken seriously. Municipalities and agencies need to work together -- and speed up the pace. Funding sources should be sought NOW while we have environmentally aware state and federal leaders in office.
- Sea levels have change throughout history. There is far more hype than real effect from sea level changes. If people choose to build and live in an intertidal location then the consequences should be born by those who make the choice.
- Show the photograph of the measuring stick in the ocean with the notation the sea level was here, now its here.
- Sixty years is not even the lifespan of your children. Look further ahead.
- SLR is real, inevitable, and will eventually impact the area.
- SLR is real. Take action now
- SLR regional planning should address equity & inclusion issues to address any undue impacts on certain vulnerable populations and on non-motorized transit users of roads and public buses.
- Stop pushing fear.
- Survey was too long, I didnt know it would take 30 minutes. Maybe post a warning next time. Thanks!
- Thank you
- Thank you for all your hard work! The time is now, to start preparing for next Ice Age. Today decides tomorrow, except at last chance grade.
- Thank you for doing this! I hope you get overwhelming support for SLR adaptation planning! It's so important!
- Thank you for doing this. It is of fundamental importance.
- Thank you for focusing on an inevitable and hopefully manageable future.
- Thank you!
- Thank you!
- Thank you.
- Thanks for asking us.
- Thanks...very important to be proactive about SLR. Surprised so much money was spent on upgrading Eureka/Arcata causeway with no concern for sea level rise...
- The climate change deniers will loudly oppose any and all policies. Some people (NIMBYs) will whine about their "property value" or "the view", and those people should be ignored.
- The County needs to start thinking seriously about the cumulative impacts of water-intensive projects as it pertains to the environment, our water resources, and climate change impacts, such as sea level rise. We are in a period of sustained ""moderate to severe"" drought, which is only likely to get worse. Please impose a moratorium on permits for water-intensive projects, like the mega cannabis grows and larger factories. At the very least, require an EIR for new projects. Start thinking about sustainability. We do not have endless resources to be exploited for individual profit or corporate greed. Think ahead -whether seven generations or several - preserve the water and the environment for future generations and think about them in everything you do. The flooding map "1 meter" makes me very concerned for the (additional) much greater effects on the region from a catastrophic earthquake off the coast (Mendocino Triple Junction, Cascadia

Subduction Zone), especially with the potential for concurrent earthquake-caused Humboldt Bay area subsidence. Meaning: A Tohoku-type flooding event. We need to spend some money on MUCH better directional signage (for everyone, including visitors unfamiliar with the area) and awareness (for residents) of all the potential escape routes to higher ground, especially from the Eureka 101 business corridor, including side streets inland from the 101. There are only so many roads in and out of that area, and the most commonly known and used ones would quickly be overwhelmed with traffic, and could become a parking lot/death trap as people abandon their vehicles trying to get to higher ground. PLUS more and louder tsunami warning sirens! I barely heard the sirens outside during the test this spring, 2021, (and didn't hear them at all in a quiet indoor location) and I never heard the aircraft-broadcast tsunami warning."

- The idea that sea level rise isn't already affecting us and isn't being required to address in every proposed project is of huge concern. For example, thinking sea level rise won't affect the proposed aquafarm in Humboldt Bay is so insane I can't believe it will get approved but a proper EIR hasn't been done. Then there are the "improvements" that widened 101 safety corridor. And then there is the issue of the care of spent fuel rods from the decommissioned nuclear power plant, with PG&E oversight of their ending in 2025 (not sure of all the details but a public meeting was held & covered by media in 2019 or so, so records can probably be located). These things are being done with an "as if" mentality, with no thought to integrate the fact that Humboldt Bay has been identified as "ground zero" for sea level rise. We ignore this at our own peril!
- The most important thing that you could do is restrict building permanent structures in low lying areas, at least areas colored in your map and beyond also. Just pick a height above sea level 30 feet or whatever is decided to be the minimum height to build permanent structures on, just like you did with areas too low and close to the rivers after the 1964 flood. Study how they deal with things in Holland. If possible, build locks at a raised Jetty and keep the barrier of dunes. Once the rising water gets into the bay and river mouths, the only thing to do is relocate from low lying areas.
- The same exact one I wrote on the previous page which I now cannot go back to. Thank you for providing this survey.
- The spent nuclear fuel rods stored at the PG&E power plant need to be removed. The plant location is highly vulnerable to both sea-level rise and tsunami's due to climate change, as well as earthquakes. Assistance from the federal and state government, coordination with local government agencies, along with guidance and instruction from top-level scientists is needed. PG&E is highly unlikely to take appropriate action on its own. Pressure needs to be applied to governments agencies and those in public office to move forward to rectify this situation.
- This area has struggled for decades to provide a good living, stability. If we work together and cross-jurisdictionally, we should be able to make this work for us and attract tourism (& Hollywood), preserve our way of life (meeting everyone's needs), create jobs, protect our environment. Also, we feel the tribes should be given first say in how this goes down, with wisdom from the ages. Please think of the whales and animals first - this area is critically important to migration & diversity.
- THIS IS A TOTAL WASTE OF MONEY
- This is a waste of time and resources. The sea level is not going to rise, mark my words, time will prove.
- Time is running out

- To address SLR, we must in our planning include the option that we cannot stop SLR (I do not see that tone in this survey). Thus we must come up with solutions to move residents/businesses/etc. that are in the flood zones.
- We are too late!
- We have owned our property since 1975. We are experiencing the same type of flooding which occurs when it rains hard for a week with a king tide. Our biggest flooding events happens approximately 8 to 9 years ago.
- We need a road that can be accessed by anywhere that is 50' above sea level for times when 101 which has many places where it is below that and has overpasses and bridges susceptible to failure. 101 is not a reliable emergency road and is too close to sea level.
- We need to responsibly retreat and get out of historical coastal floodplains.
- We're all in this together! What affects your neighbor affects you.
- We're not King Kanute here. The focus should be on moving to higher ground. Other efforts will be temporary and ultimately a waste of resources.
- Within TEN years, Highway 101 near Jacobs Avenue will be flooding on a regular basis during very high tides (see Aldaron Laird's SLR in Humboldt Bay study). The time to act to prevent this problem was 40-50 years ago. But the time to act to deal with this as best as we can is NOW! We can't keep our heads in the sand any longer.
- Yes get a life you ought to be more worried about radiation from Japan's nuclear disaster than the land being pulled down which mother earth will take care of one day
- Your survey is simply too danged long. I burned out. Learn to write concise surveys, deal with the most important issues. Don't dump your inbox, outbox, and trash can into the form.

# Paper Copy of Survey Instrument





COUNTY OF HUMBOLDT  
PLANNING AND BUILDING DEPARTMENT  
LONG RANGE PLANNING DIVISION

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3015 H Street Eureka CA 95501  
Phone: (707) 445-7541 Fax: (707) 268-3792

## Research Survey on Regional Coordination of Sea Level Rise Adaptation Planning in the Humboldt Bay Region

Hello! You are receiving this public survey because you have been identified by the County of Humboldt as the owner of property that could be affected by 1 meter of sea level rise. **Please fill out this survey and mail it back in the stamped return envelope supplied by June 21, 2021.** If you would like to take the online version of this survey instead, please go to:

<https://www.opentownhall.com/10786>

This public survey by the County of Humboldt will inform their Humboldt Bay Sea Level Rise Regional Planning Feasibility Study, a project funded by a California Coastal Commission local coastal program grant (LCP-19-01). The goal of this project is to develop options for sea level rise adaptation planning in the Humboldt Bay region that will foster a cooperative and coordinated regional approach to the identification, funding, and implementation of various sea level rise adaptation policies and strategies and measures. This region contains many critical assets owned and/or operated by various public and private entities, located in multiple hydrologic units (an area of land that drains into a specific hydrologic feature such as a stream), and in multiple federal, state, and local governmental jurisdictions with regulatory authority over development or public trust responsibility.

This survey will help the County identify and understand the roles, responsibilities, needs and concerns of those that could be involved in sea level rise planning efforts within the Humboldt Bay region. The County hopes to identify ways collaborative adaptation efforts could be advanced. Results of this survey will be reported in future informative community workshops and presentations. Data collected will also be incorporated into the Humboldt Bay Sea Level Rise Regional Planning Feasibility Study.

### Confidentiality

This is an anonymous survey with no foreseeable risks associated with your participation. If you agree to participate, you will be asked to answer questions about your opinions on sea level rise impacts and planning in the Humboldt Bay region. No identifiable personal information will be collected unless you would like to share your email in order to be contacted for future updates on the County's sea level rise project. There are also a few voluntary general location and non-identifiable demographic information questions.

### Contact

This information is being collected by the County of Humboldt Planning and Building Department - Long Range Planning. If you have questions or concerns, please contact Sarah Wickman at [swickman@co.humboldt.ca.us](mailto:swickman@co.humboldt.ca.us) or 707-445-7245.

Sea level rise information is available on the County's webpage:  
<https://humboldt.gov/1678/Local-Coastal-Plan-Update>

## Acknowledgements

*The Humboldt Bay Sea Level Rise Regional Planning Feasibility study is part of California Climate Investments, a statewide program that puts billions of Cap-and-Trade Dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment—particularly in disadvantaged communities. The Cap-and-Trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution.*

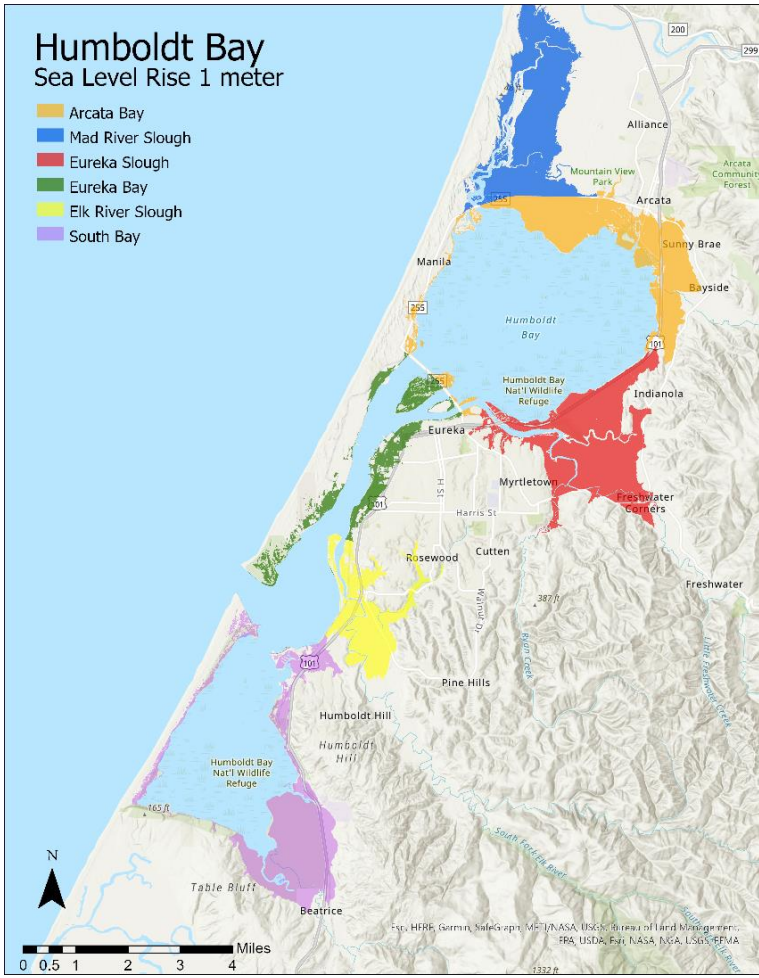
*California Climate Investments projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low-income communities, and low-income households across California. For more information, visit the California Climate Investments website at: [www.caclimateinvestments.ca.gov](http://www.caclimateinvestments.ca.gov).*



CALIFORNIA  
**COASTAL**  
COMMISSION



1. According to the California Ocean Protection Council, Humboldt Bay could experience approximately 1-3 feet of sea level rise by the year 2060. The color-coded shaded areas of this map represent locations within the six **hydrologic units** on Humboldt Bay (tidally influenced drainage areas that include Arcata Bay, Mad River Slough, Eureka Slough, Eureka Bay, Elk River Slough, and South Bay) that could potentially be flooded with 3 feet of sea level rise under current Humboldt Bay shoreline conditions.



Using this map, do you:

**(1.1) live,**  
**(1.2) own property,**  
**(1.3) work, or**  
**(1.4) visit/recreate**  
 in any of the shaded areas?

*Check all that apply in the table below*

	Arcata Bay	Mad River Slough	Eureka Slough	Eureka Bay	Elk River Slough	South Bay	N/A
<i>(1.1) live</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>(1.2) own property</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>(1.3) work or conduct work-related projects/activities</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>(1.4) visit and/or recreate</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How many years have you lived in Humboldt County?  
Enter number of years \_\_\_\_\_
3. Please select the statement that best describes your housing or property status within the areas mapped in Question #1. Please check all that apply.  
**If you checked “None of the above” for this question, skip to Question #15.**
- Renter
  - Homeowner
  - Property owner – no residence
  - Seasonal residence
  - None of the above
4. Is your residence/residences or property/properties that you identified in Question #3 above, located on the shoreline? Please check all that apply.
- Residence
  - Property
  - None of the above
5. Do you live in one of the following communities?
- King Salmon
  - Fairhaven/Finntown
  - Fields Landing
  - None of the above
6. How concerned are you about sea level rise hazards such as flooding, erosion, etc., at your residence or property? If you selected more than one housing or property status in Question #3, please respond for the one that is at highest risk from sea level rise hazards.
- Does not apply
  - Not concerned
  - Somewhat concerned
  - Moderately concerned
  - Very concerned
7. Please indicate how often you have experienced flooding and/or damage at your residence or property within the last five years. If you selected more than one housing or property status in Question #3, please respond for the one that is at highest flooding risk.

	<i>Enter # of incidents</i>
Experienced flooding	
Experienced property damage due to flooding	

8. Have you relocated in the past or considered relocating due to sea level rise hazards such as flooding, erosion, etc., at your residence or property?

- No
- Yes

9. If you answered “yes” to Question #8, please briefly explain the type of hazards you experienced and how they impacted you:

10. Have you sold your property or considered selling your property due to sea level rise hazards such as flooding, erosion, etc., at your residence or property?

- No
- Yes

11. If you answered “yes” to Question #10, please briefly explain the type of hazards you experienced and how they impacted you:

12. How informed/educated do you feel you are regarding sea level rise hazards at your residence or property?

- Not informed
- Somewhat informed
- Moderately informed
- Very informed
- Extremely informed

13. How vulnerable do you think the area immediately surrounding your residence or property is to damage from the sea level rise hazards in the table below? If you selected more than one housing or property status in Question #3, please respond for the one that is at highest risk.

*Check the box to indicate the level of vulnerability for each hazard.*

	<i>Not at all vulnerable</i>	<i>Somewhat Vulnerable</i>	<i>Vulnerable</i>	<i>Highly Vulnerable</i>	<i>Exceptionally Vulnerable</i>	<i>I don't know</i>
Repeated flooding during normal high tides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seasonal flooding by King tides (highest high tide of the year)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tidal surge from severe storms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased flooding or erosion if sea level rises in the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss of property due to erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Do you have any other comments regarding sea level rise hazards at your residence or property you would like to share?

15. When, if ever, do you think the Humboldt Bay region will start to be impacted by sea level rise? (choose one answer below)
- It is already being impacted
  - Within the next 5 years
  - Within the next 6-10 years
  - Within the next 11-25 years
  - Within the next 26-50 years
  - Within the next 51-100 years or more
  - Never
  - I don't know
16. How informed/educated are you about sea level rise in the Humboldt Bay region?
- Not informed
  - Somewhat informed
  - Moderately informed
  - Very informed
  - Extremely informed
17. How concerned are you about sea level rise in the Humboldt Bay region?
- Not concerned
  - Somewhat concerned
  - Moderately concerned
  - Very concerned
  - Extremely concerned
18. Where do you get your information about sea level rise? Choose all that apply.
- Digital media (newspaper, magazine)
  - Printed media (newspaper, magazine)
  - Radio
  - Television
  - Social Media
  - Talking with others
  - Local workshops
  - Local news
  - State news
  - National/international news
  - Local government reports and briefings
  - State agency reports and briefings
  - Federal agency reports and briefings
  - Scientific journals
  - Other: \_\_\_\_\_

19. Please rate the priority of the following Humboldt County assets when considering the need for sea level rise adaptation (flooding or erosion protection, asset modification or relocation, etc.) and future sea level rise planning.

*Check the box to indicate the priority rating for each item.*

	<i>Not at all a Priority (1)</i>	<i>Somewhat a Priority (2)</i>	<i>A Moderate Priority (3)</i>	<i>A High Priority (4)</i>	<i>Exceptionally High Priority (5)</i>
An individual residence where surrounding residences would not also require protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
An individual business, office, shop, etc. where the surrounding establishments would not also require protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Highway 101	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local roads and highways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural wetlands, wildlife areas, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beaches and similar coastal access areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural land to protect inland infrastructure (roads, sewer lines, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural land to preserve agricultural activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal-Dependent Industrial lands and development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parks and similar public spaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electric service facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sewer/Wastewater collection and treatment facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



19. (Cont'd) - Please rate the priority of the following items in Humboldt County for protection from flooding associated with sea level rise and for consideration in future sea level rise planning.

*Check the box to indicate the priority rating for each item.*

	<i>Not at all a Priority (1)</i>	<i>Somewhat a Priority (2)</i>	<i>A Moderate Priority (3)</i>	<i>A High Priority (4)</i>	<i>Exceptionally High Priority (5)</i>
Domestic water treatment and conveyance facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stormwater collection and treatment facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural Gas distribution facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communication facilities (e.g., phone lines, internet cables, fiber optic lines, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government facilities excluding water and wastewater facilities (includes police and fire departments, city halls, public works corporation yards, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Places of cultural importance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. In the Humboldt Bay region, how important are the following components in preparing for sea level rise (SLR) and associated hazards?

*Check the box to indicate the level of importance for each.*

	<i>Not at all Important (1)</i>	<i>Slightly Important (2)</i>	<i>Neutral (3)</i>	<i>Important (4)</i>	<i>Very Important (5)</i>
Educating the community about SLR impacts and solutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installing <u>natural</u> shoreline stabilization such as living shorelines, dunes, etc., to protect against SLR impacts such as tidal flooding and shoreline erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installing <u>hard</u> shoreline stabilization or barriers such as dikes, sea walls, rip rap, etc., to protect against SLR impacts such as tidal flooding and shoreline erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Repairing, maintaining, and enhancing existing shoreline structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enhancing emergency response for major flooding events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Providing tools to inform the community where flooding will likely cause damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regulating land use, such as development restrictions, to avoid SLR impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finding ways to postpone SLR policy changes until more research is done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional coordination to lessen and prevent SLR impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. How should sea level rise (SLR) planning and adaptation be funded? Indicate your level of support for the various potential funding mechanisms listed below:

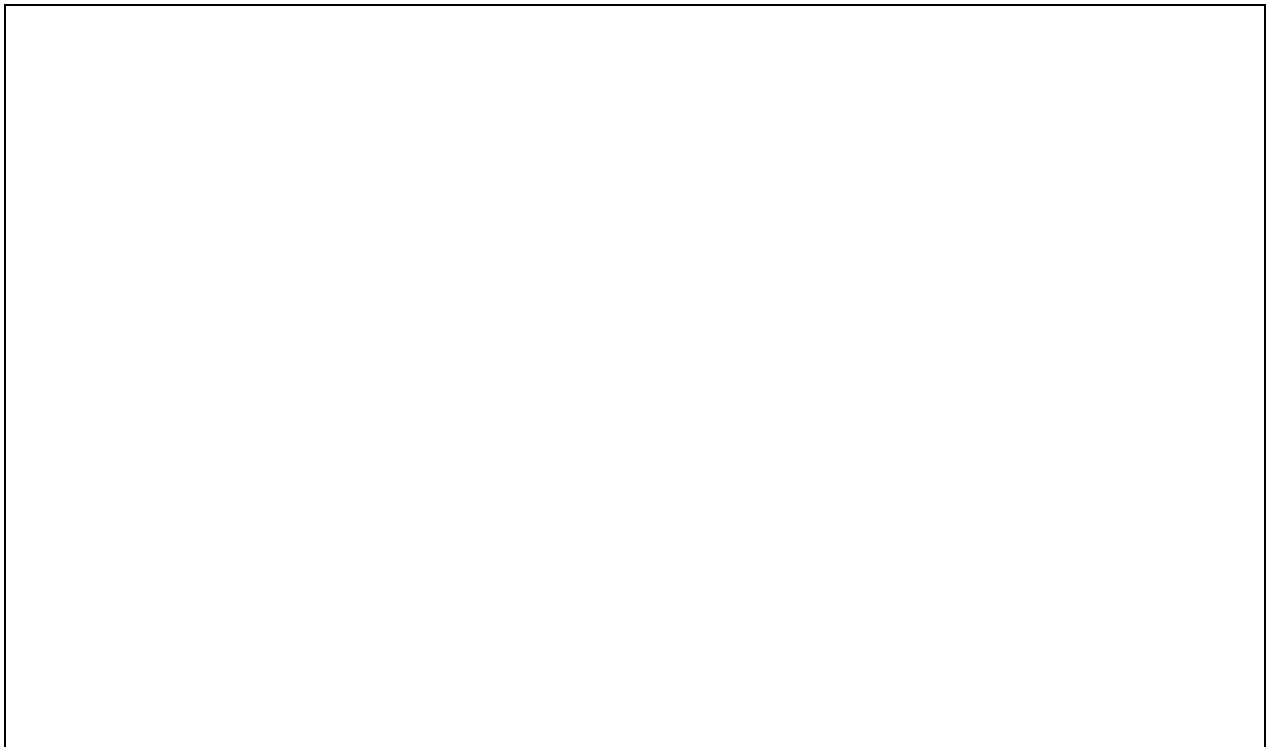
	<i>Strongly oppose</i>	<i>Somewhat oppose</i>	<i>Neutral</i>	<i>Somewhat favor</i>	<i>Strongly favor</i>
Increase funding for SLR protection by cutting other local programs and services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilize external grant funds when available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage insurance companies to require upgrades to homes and businesses to reduce SLR risks as a condition of insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require individuals and businesses to pay for their own SLR protection to minimize local government costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pass local tax measures to fund SLR adaptation work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pass state laws, programs, or bond measures with mechanisms to fund SLR adaptation work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pass federal laws or programs with mechanisms to fund SLR work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilize public funds for SLR adaptation projects on private lands that will protect both public and private assets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Funding should not be spent on SLR planning and adaptation work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. What organization do you think should have a primary role or responsibility in providing information and general guidance on sea level rise adaptation in the Humboldt Bay region? Choose all that apply.
- City government
  - County government
  - State government (e.g., Ocean Protection Council, California Coastal Commission, etc.)
  - Federal government (e.g., Federal Emergency Management Agency, National Oceanic and Atmospheric Administration, etc.)
  - Other: \_\_\_\_\_
23. How many sea level rise presentations, events, or workshops have you attended in the last five years?
- None
  - 1-2
  - 3-4
  - 5-6
  - 7-8
  - 8-9
  - 10+
24. If you have attended a sea level rise presentation, event, or workshop, who hosted it? If you have attended multiple, please mark all that apply.
- City
  - County
  - State
  - Nonprofit
  - School
  - Other (Please specify): \_\_\_\_\_
25. If you have not attended a sea level rise presentation, event, or workshop, why not?
- Does not apply
  - I am not interested in this topic.
  - I have not heard of one.
  - I had other things to do.
  - I felt other people attending the event represented my interests.
  - I do not think the topic is relevant to me.
  - I am discouraged from attending because of the lack of action after meetings.
  - Other: \_\_\_\_\_

26. If you attended or would like to attend a SLR public outreach event, is there anything else you would like to share about these events? (Overall impression, ways to improve events, presentations you would like to see, favorite events, etc.)



27. Do you have any questions or comments regarding how coordinated, cross-jurisdictional, regional sea level rise planning could be accomplished for the Humboldt Bay region?



28. If you would like to be updated on sea level rise planning efforts, how would you prefer to be communicated with? Check all that apply.

- Email (provide email address) \_\_\_\_\_
- Dedicated webpage
- Facebook event
- Phone call
- Radio Announcement
- Workshops
- Other: \_\_\_\_\_
- I do not want to be updated

29. How did you hear about this survey?

- Humboldt County website
- Email
- Social media: Please list \_\_\_\_\_
- Radio or television
- Conversations with friends/family/others
- Received the survey in the mail
- Other \_\_\_\_\_

30. What is your age?

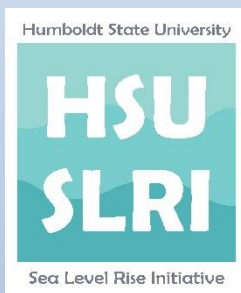
- 18-34 years
- 35-44 years
- 45-64 years
- Over 64 years
- Prefer not to answer

31. What is your total household income?

- Less than \$10,000
- \$10,000 to \$19,999
- \$20,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$59,999
- \$60,000 to \$69,999
- \$70,000 to \$79,999
- \$80,000 to \$89,999
- \$90,000 to \$99,999
- \$100,000 to \$149,999
- \$150,000 or more
- Prefer not to say

# Appendix ii - SLR Regional Coordination: Coastal Professional Survey Results

# Regional Coordination of Sea Level Rise Adaptation Planning on Humboldt Bay: results from a survey of coastal professionals



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# Executive Summary

Humboldt State University researchers and Humboldt County Long Range Planning staff partnered to develop and implement a survey of coastal professionals connected to Humboldt Bay in order to gain insights into their knowledge, attitudes, and perceptions of sea level rise (SLR) and their preferences for various coordination strategies. A key goal of the study was to use this information to inform the development of options for SLR adaptation planning in the Humboldt Bay region that will foster a cooperative and coordinated regional approach.

This report outlines the methods and results of an online survey conducted from May to June 2021 which obtained responses from 107 coastal professionals on topics related to their current SLR planning experiences, perceived barriers to coordination, and ideas for future regional-level planning and adaptation. Each question asked in the survey is presented with a figure of the results based on percentage of responses as well as a descriptive text interpretation. Additional detail from the figures can be found in accompanying tables.

Overall, respondents perceived SLR as an issue that is already impacting the Humboldt Bay region. A vast majority of respondents generally agreed that coordination of SLR planning and adaptation was needed. Generally, less than 55% of respondents indicated that their agency or organization has collaborated and engaged in SLR activities with other agencies/organizations on Humboldt Bay within the last four years. The most agreed upon barriers to regional SLR planning and adaptation were a lack of funding and a lack of staff availability. Other potential barriers to regional coordination included the perception that stakeholders disagree on actions needed to address SLR and the perception that differences in stakeholder values will inhibit agreement in choosing adaptation options. Generally, respondents indicated that both public outreach and incorporation of environmental justice considerations had not been efficient or sufficient and needed improvement. Most of the potential future SLR projects and programs identified in the survey were prioritized as high or essential by the majority of survey respondents; the only effort prioritized as low or not a priority was the development of regional projects aimed at the development or enhancement of man-made physical barriers.

# Introduction

Humboldt Bay is experiencing the fastest rate of relative sea level rise in California and is likely to experience severe SLR flooding within the next two decades (Laird, 2015; Patton, Williams, Anderson, & Leroy, 2017). The Humboldt Bay shoreline is governed by a patchwork of entities with different missions and jurisdictions and coordination of sea level rise (SLR) planning will be critical because hydrologic areas and flooding from tidal waters can cross political boundaries. Developing an effective coordination strategy will require an understanding of the social dynamics among coastal professionals and planners connected to the Humboldt Bay system.

Researchers from Humboldt State University partnered with staff from the County of Humboldt Planning and Building Department - Long Range Planning to develop and implement a survey of coastal professionals connected to Humboldt Bay in order to gain insights into their knowledge, attitudes, and perceptions of sea level rise and their preferences for various coordination strategies.

Findings from this survey have informed two different efforts. First, the findings have been incorporated into an HSU Master's Thesis by Kristen Orth-Gordinier titled: "Social science research to help advance regional coordination and collaboration of sea level rise adaptation and planning on Humboldt Bay." This thesis combines findings from the survey with information from semi-structured interviews with coastal professionals and a review of sea level rise documents to produce findings and recommendations related to sea level rise coordination on Humboldt Bay.

Second, the survey data will also inform Humboldt County's Humboldt Bay Sea Level Rise Planning Feasibility Study. The goal of this project is to develop options for sea level rise adaptation planning in the Humboldt Bay region that will foster a cooperative and coordinated regional approach to the identification, funding, and implementation of various sea level rise adaptation policies, strategies, and measures with resulting regulatory and financial benefits.

This joint survey effort highlights the possibilities for collaborations between local government and academic institutions to develop rigorous, applied research that can inform effective planning and adaptation. Through this partnership, local government and academia were each able to bring their strengths to the table to design a survey approach that was sound, relevant, and spoke to community needs.

## Methodology

Surveys are often used to measure stakeholder's values or "mental models," and are especially helpful in understanding their past experiences with and perceptions of SLR (Thomas, Pidgeon, Whitmarsh, & Ballinger, 2015). The standardization of questions can provide researchers with specific quantifiable information that can be compared across participants (Newing, 2011). This method was chosen by the project team in order to collect input from a large number of people in a short timeframe. It also provided a means to capture a representative sample of views among coastal professionals operating in the Humboldt Bay region.

## Target Population

Survey participants generally met the definition of “Coastal Professionals” used in the 2016 California Coastal Adaptation Needs Assessment: “...individuals involved in California coastal resource management, conservation, and protection from coastal hazards.” This includes “...planners, resource managers, public works engineers, transportation managers, emergency response managers, public health officials, harbor managers, port commissioners, and elected officials, as well as representatives of environmental organizations working on coastal issues, private-sector consultancies, and officials at farm bureaus. Public sector respondents were drawn from the local, regional, state, and federal levels (Moser, Finzi Hart, Newton Mann, Sadrpour, & Grifman, 2018).” Randomization was not used because participants needed to have a moderate-high relative level of knowledge in SLR planning and conditions on Humboldt Bay. Participants were recruited through email, asked to voluntarily participate in this study, and no incentives were provided. Nonrandom sampling and self-selection could introduce areas of bias. We sought to reduce this bias by developing broad and inclusive lists of potential participants and by sending several follow-up emails reminding and encouraging participation.

## Survey Design

This survey was designed in coordination with the County of Humboldt’s Regional SLR Coordination & Regulatory Framework Feasibility Study which started in late 2020 in order to directly inform their study. Survey questions were drawn from relevant literature, other climate change related surveys conducted in California, and interviews conducted with Humboldt Bay coastal professionals by Kristen Orth-Gordinier for her graduate thesis research at HSU. Draft surveys were reviewed by multiple local professionals for relevance and clarity. Once the survey instrument was developed, the research team obtained HSU Institutional Review Board approval for this project (Protocol #20-148). All participants were provided a consent form at the beginning of the survey and could only participate if they consented to the terms described (see Appendix A for consent form and survey).

In mid-May invitations were sent to request participation in the study via a SurveyMonkey email collector. If an email bounced or was blocked, followed up occurred via email with a survey link. After two weeks another email was sent with the survey link to invitees who had not responded, to account for SurveyMonkey emails potentially being directed to spam/quarantine folders. To increase participation, reminder emails were sent each week either via SurveyMonkey or email and a research team member attended public meetings to introduce the survey during public comment periods. Some participants emailed the team with recommendations on additional participants and in most cases, the team would send a survey link to those individuals within a couple days of the recommendation. The survey was closed after approximately one month when the stakeholder representation and response rate was acceptable.

## Survey Response & Completion Rate

Email invitations were sent to 297 potential survey participants and 140 people responded to the survey. Upon closure of the survey, 33 sets of responses were deemed “incomplete” and removed from the data set because the respondents completed less than 30% of the questions. Therefore, responses from 107 respondents were utilized for this report. The response rate was then calculated by the number of complete and partial responses. The revised survey response rate was 36%.

$$\text{response rate} = \frac{\text{total responses} - \text{responses less than 30\% complete}}{\text{total contacted}}$$

The average completion time according to Survey Monkey was 23 minutes and 35 seconds. On average, respondents answered approximately 81% of the questions. Only about 12% of respondents answered less than 60% of the questions. Of those respondents who answered less than 60% of the questions, 50% either “never or rarely” professionally work with SLR topics, while 30% “occasionally” work with SLR topics and 20% “moderately or worked a great deal” with SLR topics. One respondent commented in a short answer box, “I’m probably not a great selection to contact.”

## Analysis & Reporting

Survey data was downloaded from SurveyMonkey as an excel file. After incomplete responses were removed from the dataset, response affiliations were updated by stakeholder category. Stakeholder categories were developed by the project team, however a second question asked respondents to self-identify their agency or organization. If needed, the project team updated responses by re-categorizing them into consistent stakeholder groups based on the self-identified agency/organization. This would also allow for additional analysis to be conducted based on specific agencies if the sample size was large enough ( $n > 3$ ). Analysis done at the specific agency level may not represent an official view of the agency/organization respondents work for and therefore should not be treated as such. Results for each survey question are presented by a figure based on percentage of responses as well as a descriptive text interpretation. Figures were made in Microsoft excel (version 2107) and R Core Team (version 2019). Statistics were run in Microsoft excel (version 2107) and R Core Team (version 2019).

## Respondents

Survey participants were asked a series of questions about themselves and their involvement and general thoughts about SLR-related work in order to collect demographic and topic-experience information.

### Respondent Demographics

The average respondent was a white college-educated male, 45 years of age or older. The vast majority of respondents were Caucasian, European American, or White (78%) while 4% of respondents were American Indian, Alaskan Native, or Native American which was the next most represented race/ethnicity (Figure 1). Fifty-one percent of respondents were 45 years old or older and 80% had either a Bachelor’s or Post-graduate (Master/PhD) degree (Figure 2 and Figure 3). Of the demographic questions, approximately 12-14% of participants chose “prefer not to answer” or did not answer the questions.



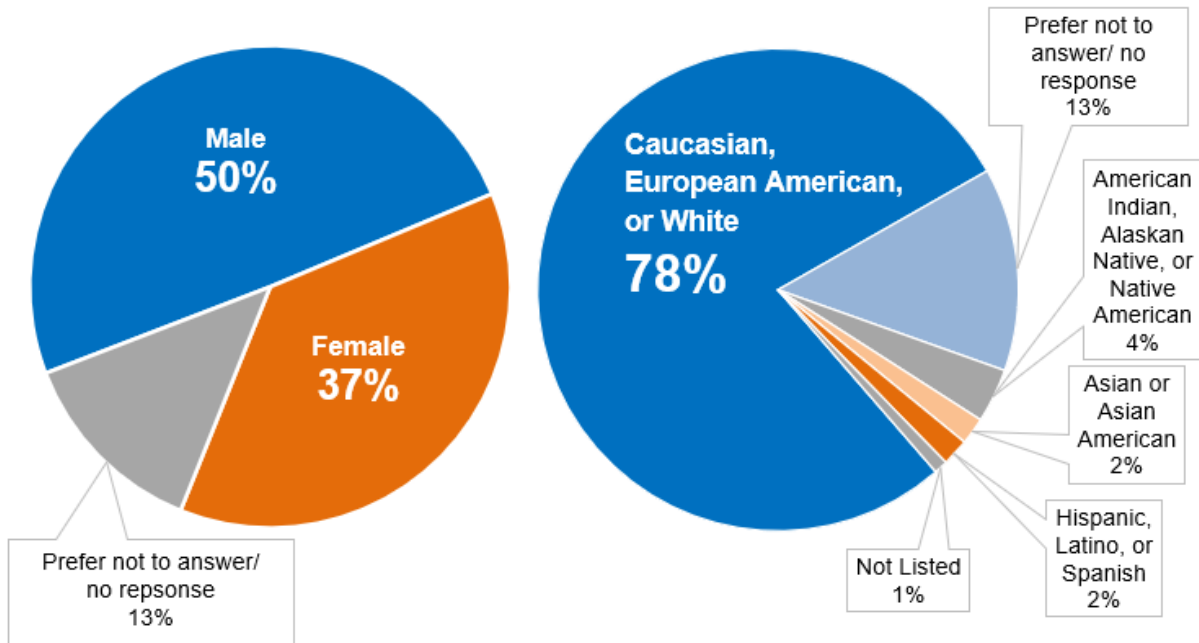


Figure 1: Respondent gender (left) and race/ethnicity (right). No respondents identified as genderqueer or non-binary. No respondents identified as genderqueer or non-binary. No respondents identified as African American or Black, Middle Eastern or North African, and Native Hawaiian or Other Pacific islander. Gender identities or race/ethnicities with no responses are not presented on these figures. For the race/ethnicity question n=110, this is higher than the total number of respondents due to the option to choose multiple answers for this question.

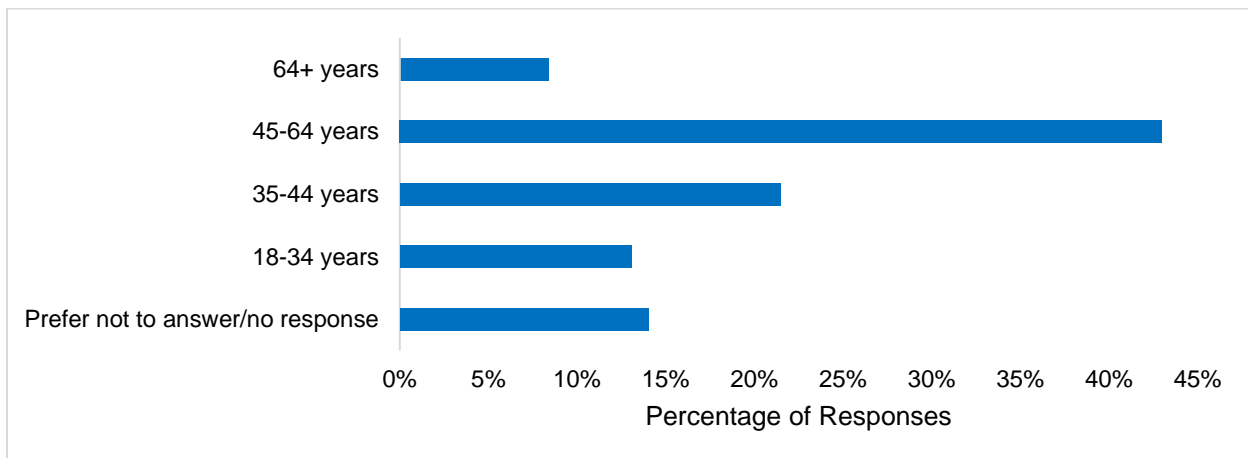


Figure 2: Respondent age (n=107).

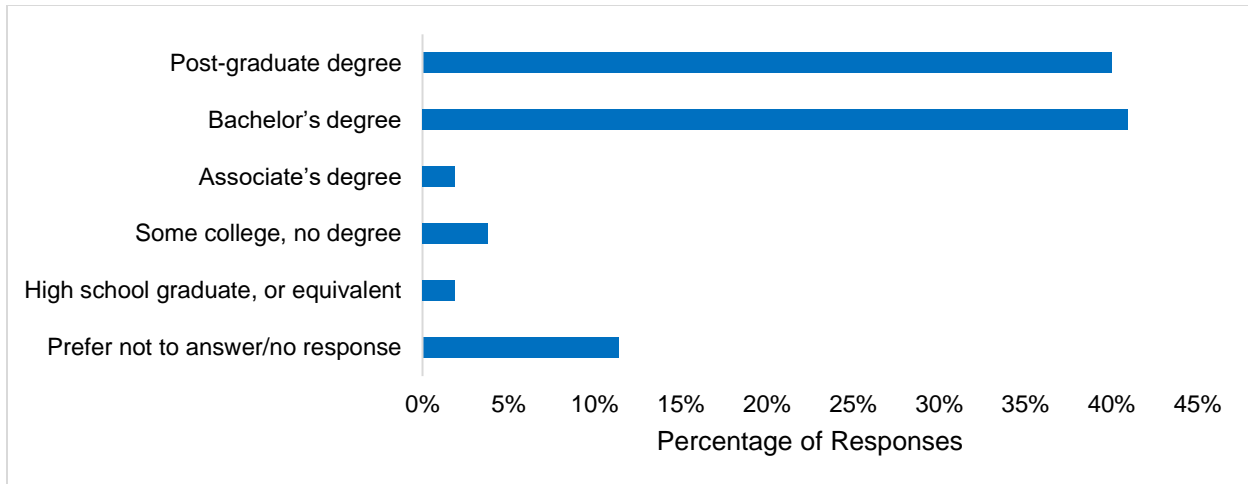


Figure 3: Respondent level of education (n=107).

## Respondent Characteristics

Respondents represented 11 stakeholder categories and 47 agencies/organizations (Table 1). State government was the most represented (25 respondents), followed by city, non-government organizations (NGO) and private sector consultants (12 respondents each). The only stakeholder category not chosen by a respondent was “Agricultural Industry,” however some respondents who are affiliated with government entities that represent agricultural stakeholders and interests did participate in this survey and were categorized by their state or local affiliation. Some respondents have multiple roles within the community and self-identified two affiliated agencies/organizations (i.e., a specific state government and a specific local government). Their responses are reported with the Stakeholder Group they chose when responding to the survey, even if it did not match both self-identified entities.

Table 1: Number of respondents per stakeholder category and self-identified agency/organization that respondents work for or are associated with.

Stakeholder Group	Specific Agency/Organization	Number of Respondents
Academia/Research		7
	California Sea Grant Extension	
	Humboldt State University	
	San Francisco State University	
City Government		12
	City of Arcata	
	City of Eureka	
County Government		5
	Humboldt County	
Federal Government		4
	Bureau of Land Management	
	US Fish & Wildlife Service	

US Department of Agriculture-Natural Resources Conservation Service	
Infrastructure/Service Provider/Community Services District (CSD) (e.g., roads, water, sewer, gas, electric)	9
Humboldt Bay Municipal Water District	
Humboldt CSD	
Manila CSD	
Peninsula CSD	
Vero Networks	
Non-Government Organization	12
Coalition for Responsible Transportation Priorities	
Friends of the Arcata Marsh	
Friends of the Dunes	
Friends of Elk River	
Humboldt Baykeeper	
Redwood Community Action Agency	
Redwood Region Audubon	
Surfrider Foundation	
Timber Heritage Association	
Private Sector Consultant	12
GHD	
Greenway Partners	
H. T. Harvey & Associates	
ICF	
Michael Love & Associates, Inc.	
Northern Hydrology & Engineering	
Stillwater Sciences	
Regional District or Association or Special District (e.g., Harbor District, etc.)	9
Humboldt Bay Harbor, Recreation and Conservation District	
Humboldt County Association of Governments	
Redwood Coast Energy Authority	
State Government	25
California Coastal Commission	
California Department of Fish & Wildlife	
California Geological Survey	
California State Coastal Conservancy	
Caltrans	
Humboldt County Resource Conservation District	
North Coast Regional Water Quality Control Board	
Office of Planning and Research	
State Lands Commission	
Trade/Business/Industry Group	4
Coldwell Banker Sellers Realty	
Hog Island Oyster Co.	
Humboldt Association of Realtors	

Tribal Government	7
Blue Lake Rancheria	
Wiyot Tribe	
Other	1

Elected officials made up a small amount of respondents (16%); however, represented most local Stakeholder Groups that have elected officials including City Government, County Government, Tribal Government, Regional/Special Districts, and Infrastructure Service Provider/CSDs.

Respondents had varying degrees of professional experience and involvement with SLR-related work (Figure 4). Approximately 8% of respondents had never done related work and had no years of professional experience. Alternatively, almost 50% were involved with SLR-related work moderately (monthly) to a great deal (weekly, daily) and 60% had more than 5 years of experience. Overall, survey respondents were likely fairly knowledgeable on this topic, as suggested by these levels of involvement and experience.

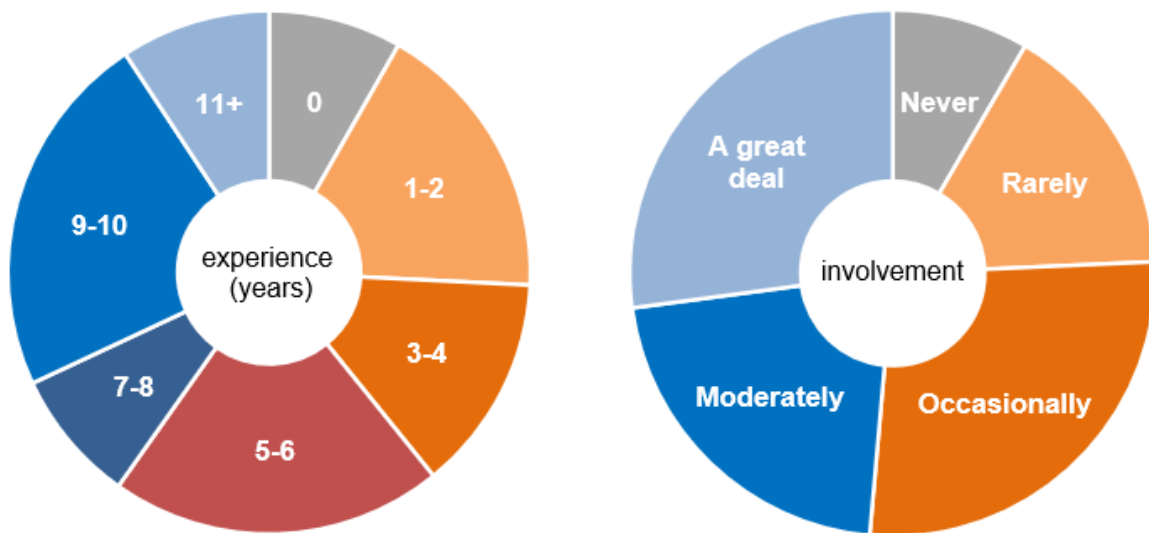


Figure 4: Respondents' years of professional experience (left, n=97) and frequency of involvement (right, n=107) with SLR-related work. Frequencies were quantified as: never (no involvement), rarely (1 time or less per year), occasionally (2-11 times per year), moderately (monthly), a great deal (daily, weekly).

## Feelings About Performing SLR-Related Work

The survey of coastal professionals also contained a series of questions related to their “feelings about performing SLR-related work.” Figure 5 and Table 2, shows the results from those questions. The two most agreed with statements were regarding feeling worried about future impacts of planning decisions and feeling personally worried about SLR. The majority of respondents found SLR work engaging and fulfilling. Fifty-four percent of respondents were discouraged by a lack of forward movement of SLR adaptation actions, while 41% were inspired by the amount of work the Humboldt Bay region has already accomplished. Almost the same number of respondents agreed as disagreed that addressing SLR adds significantly to their workload. Less than 25% of respondents agreed with statements about their work being overwhelming due to technical complexity, uncomfortable due to the uncertainty associated with SLR, or feeling unprepared and therefore less confident.

Table 2: Respondents’ level of agreement regarding various statements about performing SLR-related work.

	Percentage of Respondents				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I am worried about how our SLR planning decisions will impact future generations.	1%	6%	12%	49%	31%
I am personally quite worried about SLR.	0%	10%	14%	38%	38%
I find SLR work engaging and fulfilling.	1%	4%	28%	45%	22%
I am discouraged by our lack of forward movement of SLR adaptation actions.	3%	17%	26%	35%	19%
I am inspired by how much work the Humboldt Bay region has accomplished.	2%	14%	43%	30%	12%
Having to address SLR in what I do means a big additional workload.	2%	30%	36%	25%	7%
The technical complexity of SLR science is overwhelming.	6%	37%	32%	20%	4%
The uncertainty associated with SLR makes me uncomfortable.	14%	40%	24%	17%	4%
I don’t know what to do to prepare for SLR, so I feel less confident in my work.	17%	44%	24%	13%	2%

### Feelings about performing SLR-related work

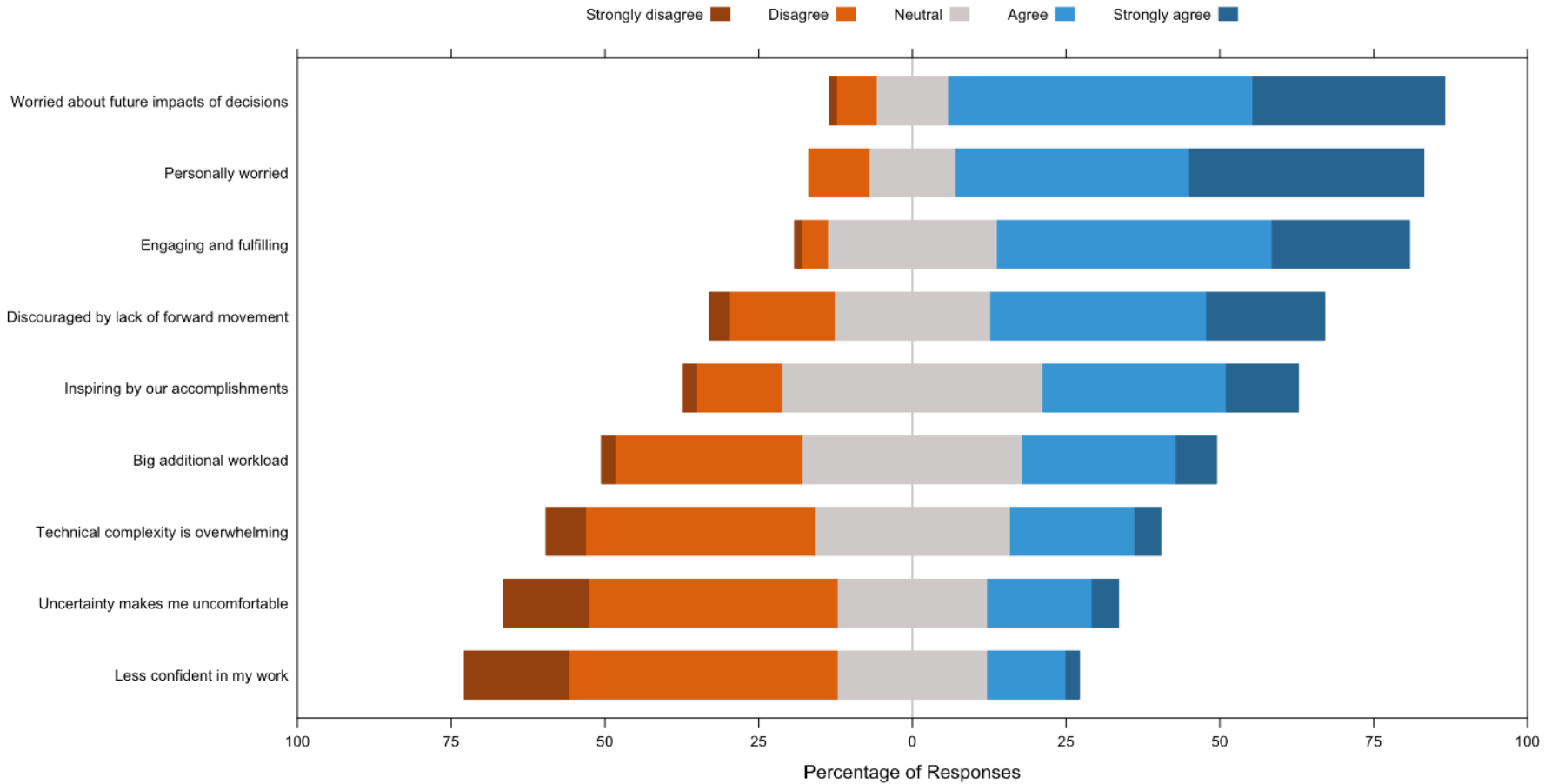


Figure 5: Respondents' level of agreement regarding various statements about performing SLR-related work (n=92-94).

## Perceptions of SLR

The coastal professional survey included a question about expectations of when SLR will impact the region. This question was replicated in a public survey about SLR released by Humboldt County in the summer of 2021. The public survey was developed by Humboldt County Long Range Planning staff, with input from this HSU team, with the intention of gathering baseline information on public perceptions of SLR risks and expectations of planning for SLR around Humboldt Bay. Results from both surveys are compared in Figure 6. The majority of both groups of respondents thought that SLR was already impacting the Humboldt Bay region (public 46%; professional 71%). This generally suggests that people in the Humboldt Bay region believe that SLR could be an immediate issue. Compared to the public, coastal professionals are slightly more likely to view it as an immediate risk.

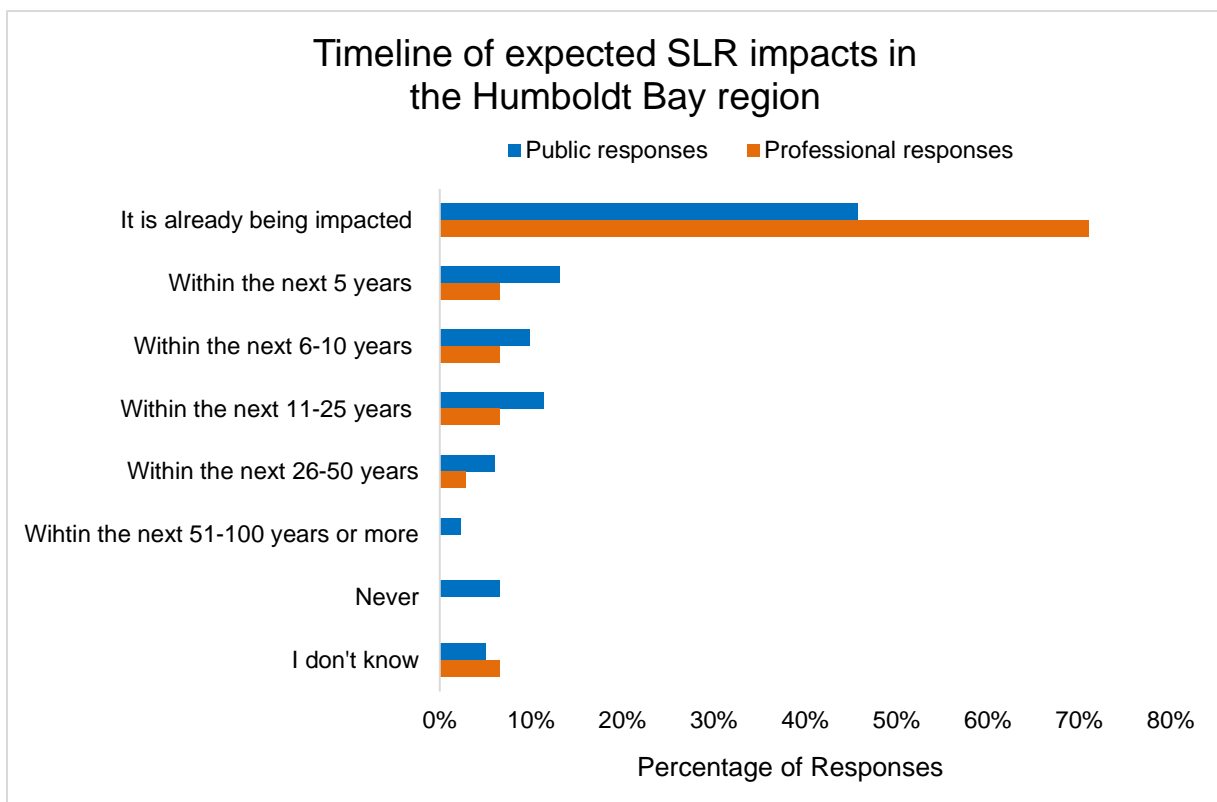


Figure 6: Comparison of expectations from public (n=577) and coastal professional (n=107) respondents of when SLR might impact the Humboldt Bay region. (Public survey data from 2021 Humboldt County Planning and Building Department Public Survey).

## Current SLR Planning Efforts

Respondents were asked if their agency/organization is using a specific timeline and/or projection for their SLR planning or advocacy work. If they were, two follow up questions were asked about specifically what those timelines and/or projections were as well as what sources their projection guidance came from. If their agency/organization was not using specific timelines and/or projections, participants were asked why.

Almost 60% of respondents were not using specific timelines/projections (Figure 7). Respondents who answered a short open-ended question about why they were not using specific guidelines (n=60) included that guidance wasn't relevant to their organization (either due to a different mission/role or they rely on other partners for that information such as state government or permit agencies), their organization was complacent and therefore not planning for SLR, it was something they would "deal with in the future," or there was limited data availability to make those decisions. Some respondents reported that a change in leadership or organizational structure hindered their SLR planning processes or that they were dealing with a lack of resources, including being "beyond our collective bandwidth" as volunteers. Some respondents noted that they chose "no" because they were unsure if they had specific guidance or because they were currently in the process of planning or just started those discussions. In addition to those reasons, some respondents noted that their agency/organization was using a strategy different than planning with timelines and/or projections. Some strategies included focusing on risk tolerances, using elevation/inundation levels rather than timelines, considering different scenarios or ranges of projections/timelines, or using the best available science depending on the project/location/goals.

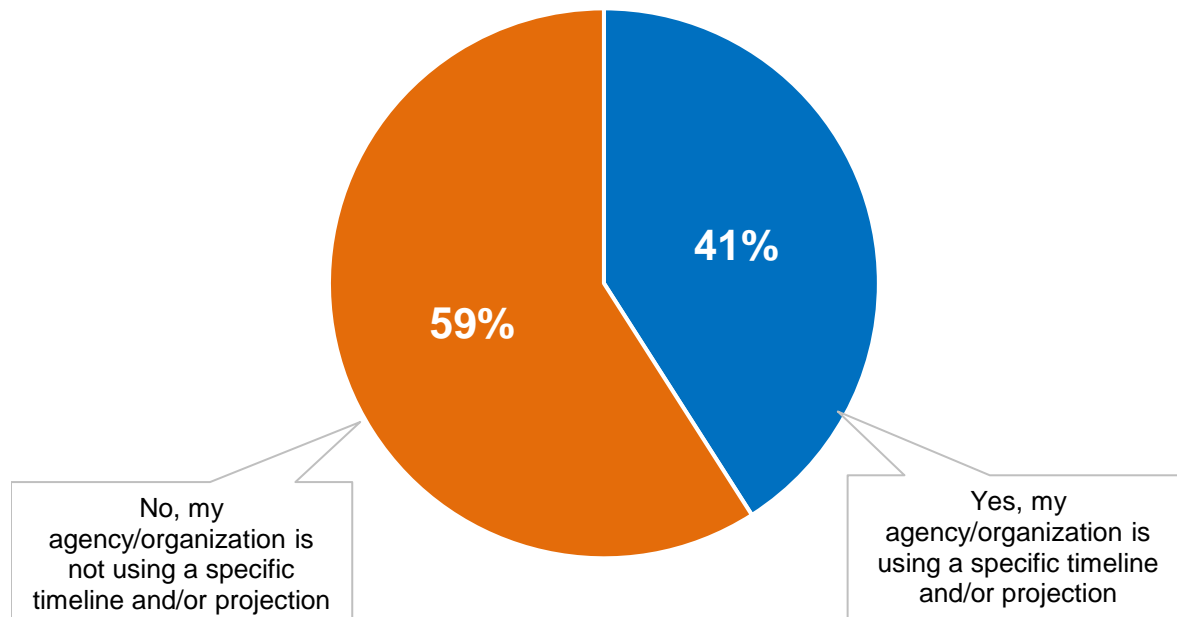


Figure 7: Percentage of respondents whose agency/organization is or is not using specific timelines and/or projections for SLR planning or advocacy (n=105).



Approximately 40% of respondents noted that their agency/organization was using specific timelines/projections (Figure 7). Answers ranged from 1.6 feet by 2040, 1.9-3.5 feet by 2050, 3.3 feet by 2057, 3-3.3 feet by 2016, 4-12 feet by 2070, 2.7-10.9 feet by 2120, and 20 feet by 2120. Respondents were given the option via a fill in the blank to provide additional details about the source of their SLR projections and the most common responses were: (1) projections came from local planning documents and vulnerability assessments (n=16); (2) their organization used OPC SLR guidance (n=16); (3) they used other state-level documents (n=3); and (4) and some were not sure specifically where their timelines/projections came from (n=3).

Figure 8 below shows the breakdown of responses about organizational use of SLR projections based on broad stakeholder categories. The data show variation within each stakeholder category, and even within each agency/organization. In other words, respondents associated the same organization sometimes had differing responses about whether their organization used a specific SLR projection or timeline. While this could illustrate inconsistencies within a group, it is possible this reflects normal differences between departments (i.e., Long-term Planning and Engineering) or that stakeholder groups consist of agencies that require difference focuses (i.e., State Government: CA Department of Fish & Wildlife or Caltrans). Although sample sizes were small, there seemed to be some differences within stakeholder groups and specific agencies. For example, in County Government three respondents chose no and two chose yes, in City Government (with minimal difference between the two cities) three respondents chose no and eight chose yes, and of respondents who were affiliated with Caltrans, four responded no and seven responded yes. The stakeholder groups of Federal Government (n=4), Infrastructure/Service Provider/CSDs (n=5), and Business/Industry Groups (n=4) were the only respondents to all respond that their entity is not using a specific timeline or projection.

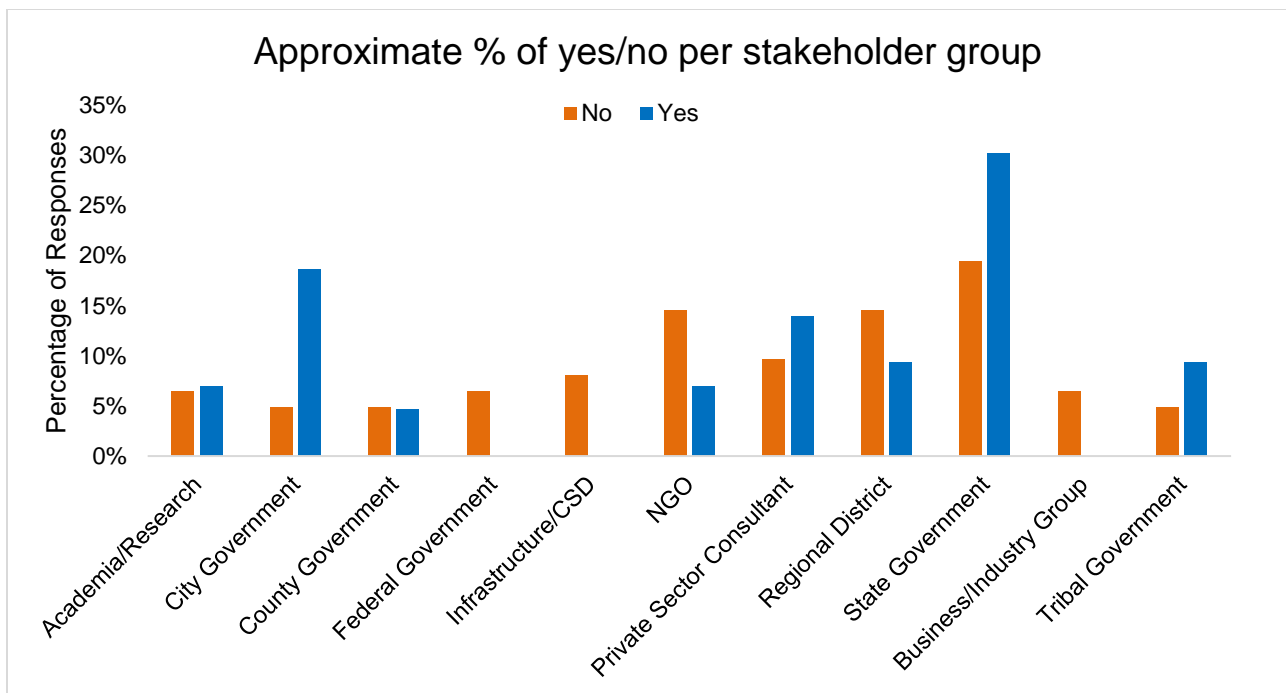


Figure 8: Breakdown of number of respondents who reported that their agency did (yes) or did not (no) use a specific projection or timeline for their SLR planning (n=105).

## Level of engagement and interest in collaborative activities

Stakeholders were asked to indicate which activities their agency/organization collaborated and engaged in with other agencies/organizations in reference to sea level rise (SLR) on Humboldt Bay within the last four years (Figure 9 and Table 3). "SLR-related" activities could include projects, studies, or work where SLR is not the only focus, such as multi-benefit projects that consider SLR as well as infrastructure protection, habitat enhancement, flood control, public access, education, etc.

When asked about what collaborative activities their agency or organization is currently involved in, the mostly commonly reported activities included: sharing information about your organization's SLR activities with other agencies and organizations (55% engaged; 30% not engaged); attending regular SLR planning or technical meetings hosted by another entity (51% engaged; 38% not engaged); and carrying out joint SLR studies with other entities or organizations (44% engaged; 42% not engaged). The least commonly reported collaborative activities were coordinating with other entities regarding environmental justice and equity considerations related to SLR (19% engaged; 65% not engaged); hosting regular SLR planning or technical meetings (25% engaged; 55% not engaged); and coordinating with other entities to streamline permitting processes related to SLR adaptation (28% engaged; 54% not engaged).

If respondents indicated their agency/organization was not engaged in one or more of the listed collaborative activities, they were asked to rank their agency's/organization's potential level of interest in future engagement (Figure 10 and Table 4). The most interest (92%) was indicated for implementing joint projects. Additionally, 87% were interested in coordinating equity and environmental justice considerations, which is the effort that currently has the least engagement. Respondents were the least interested (28%) in contributing funding.

### Level of engagement in collaborative SLR-related activities

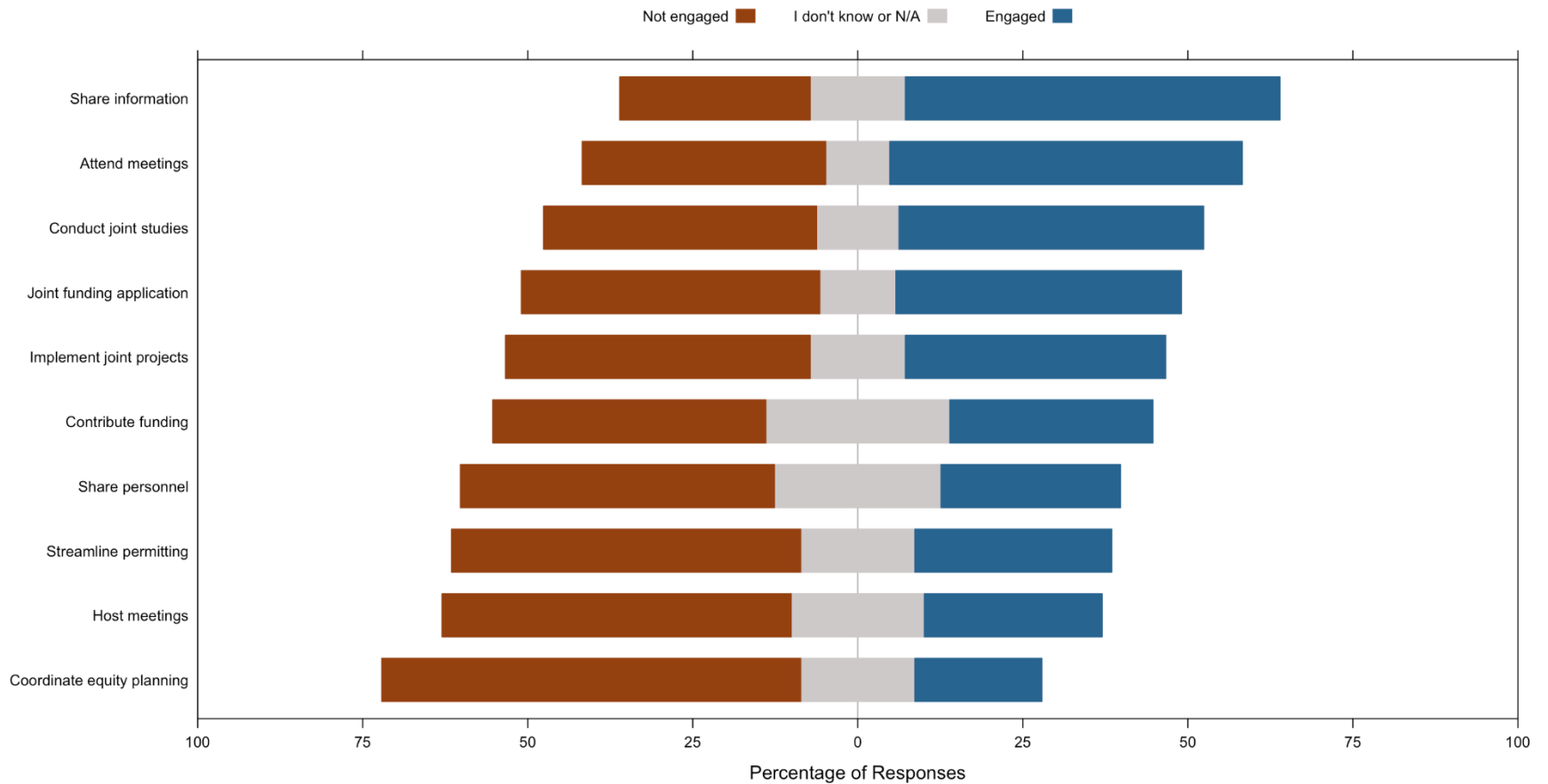


Figure 9: Level of engagement in collaborative SLR-related activities (n=105-106).

**Interest in collaborative SLR-related activities that agencies/organizations are currently not engaged in**

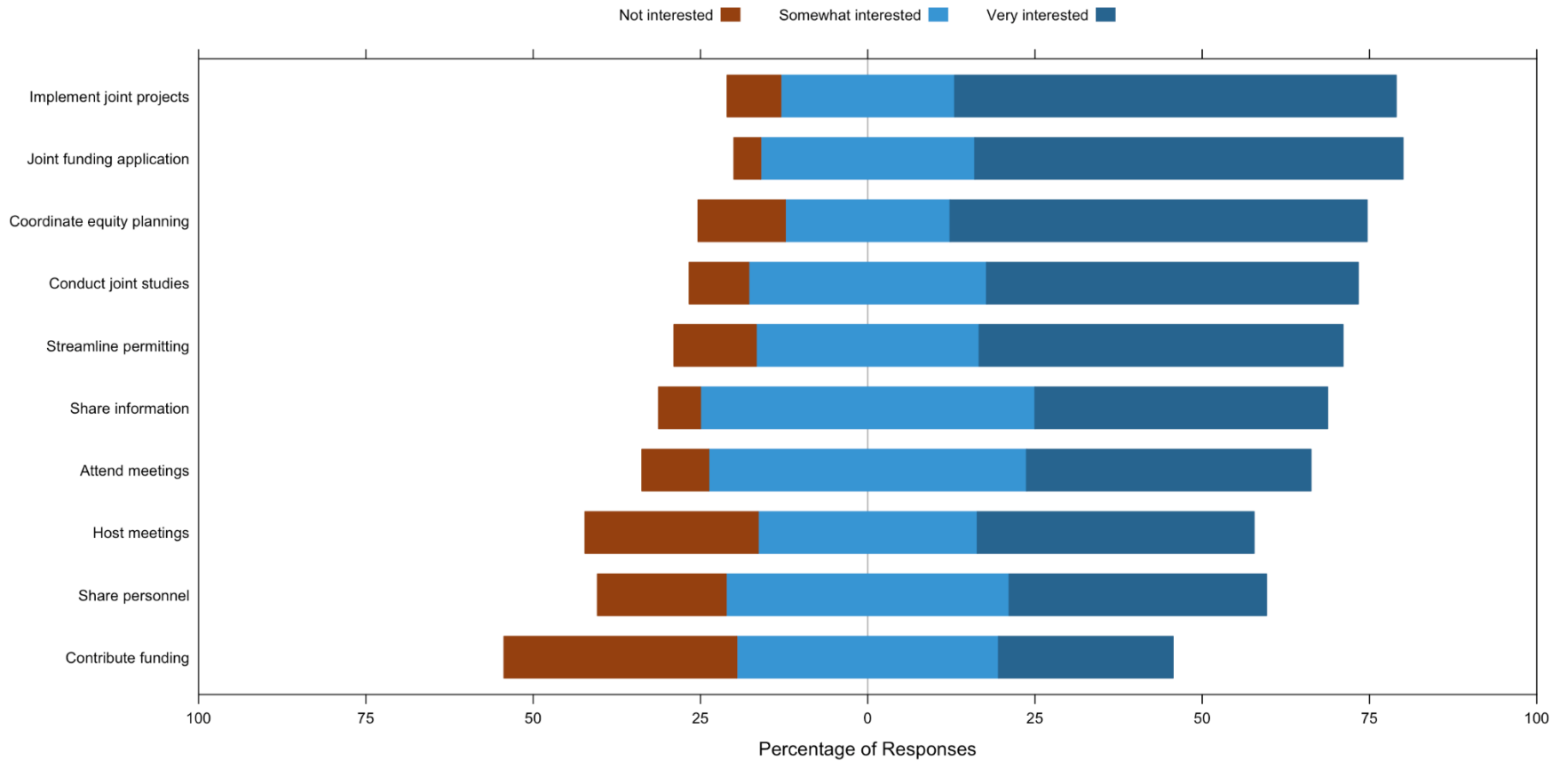


Figure 10: Level of interest in activities not currently engaged in (n=105-106).

Table 3: Level of engagement in collaborative SLR-related activities.

	Percentage of Responses		
	Engaged	Not Engaged	I don't know or N/A
Sharing information about your organization's SLR policies, projects, and/or research with other agencies/organizations	55%	30%	15%
Attending regular SLR planning or technical meetings hosted by another agency/organization	51%	38%	10%
Carrying out SLR studies that inform multiple agencies/organizations	44%	42%	13%
Collaborating with other agencies/organizations to apply for and/or secure SLR-related project funding through grants or other sources	42%	47%	11%
Implementing SLR-related projects with other agencies/organizations	38%	47%	15%
Contributing funding towards SLR-related projects that benefit multiple agencies/organizations	29%	43%	27%
Coordinating with other agencies/organization to help streamline permitting processes related to SLR adaptation (e.g., programmatic permit, joint permit application)	28%	54%	18%
Sharing personnel with other agencies/organizations for SLR-related work	26%	50%	25%
Hosting regular SLR planning or technical meetings and inviting other agency/organization to attend	25%	55%	20%
Coordinating with agencies/organizations regarding equity and environmental justice considerations into SLR planning	19%	65%	16%

Table 4: Interest in collaborative SLR-related activities that respondents' agencies/organizations were currently not engaged in.

	Percentage of Responses		
	Very Interested	Somewhat Interested	Not Interested
Implementing SLR-related projects with other agencies/organizations	66%	26%	8%
Collaborating with other agencies/organizations to apply for and/or secure SLR-related project funding through grants or other sources	64%	32%	4%
Coordinating with agencies/organizations regarding equity and environmental justice considerations into SLR planning	62%	25%	13%
Carrying out SLR studies that inform multiple agencies/organizations	56%	36%	9%
Coordinating with other agencies/organization to help streamline permitting processes related to SLR adaptation (e.g., programmatic permit, joint permit application)	54%	33%	12%
Sharing information about your organization's SLR policies, projects, and/or research with other agencies/organizations	44%	50%	6%

Attending regular SLR planning or technical meetings hosted by another agency/organization	43%	48%	10%
Hosting regular SLR planning or technical meetings and inviting other agency/organization to attend	41%	33%	26%
Sharing personnel with other agencies/organizations for SLR-related work	38%	42%	19%
Contributing funding towards SLR-related projects that benefit multiple agencies/organizations	26%	39%	35%

Respondents were provided a space in the survey to type any other thoughts about types of coordination their agency/organization is involved with or interested in. The following are typed responses from respondents:

Additional engagement in coordination activities reported by respondents included:

- Currently, County Environmental Services is leading an effort and technical working group to identify possible natural shoreline infrastructure projects to address rising sea levels.
- Creating a mitigation bank dedicated to offset impacts from SLR adaptation and renewable energy/carbon neutrality type projects.
- Our agency is involved in multi-modal project development that highlights key pieces of our infrastructure that could require retrofits for sea level rise concerns. Where applicable costs/scope are added to the projects developed to address sea level rise concerns.
- Our main involvement with sea-level rise planning in the area (and statewide) has been through AB 691 (2013), legislation that requires local trustees of granted state lands to submit sea level rise assessments to the State Lands Commission, detailing vulnerability and adaptation plans for public trust lands and assets. The Humboldt Bay Harbor District and the City of Eureka are both AB 691 trustees. We are also a part of a unique partnership with the CA Coastal Commission to enhance coordination surrounding the public trust and sea-level rise and we have developed a case study on Humboldt Bay to identify how we can work in the region to improve coordination around these issues.
- Community outreach
- Land use planning and regulation, providing grants, but not project implementation
- Work cooperatively with landowners
- We run the Integrated Climate Adaptation and Resiliency Program, which serves as a hub for state agency work in this space. Through our Technical Advisory Council, we also try to ensure that state resources are useful for helping advance local climate adaptation implementation.
- [consolidation of infrastructure] working towards consolidated sewer system to replace on-site systems, as an adaptation to sea level rise.
- Coordination through NSF proposal with other entities, institutions, and community and tribal partners.
- HSU SLR Initiative
- HSU SLR Special Interest Group
- Humboldt County SLR Technical Advisory Team
- Caltrans CAIP
- Local energy infrastructure relocation / reorganization due to SLR and groundwater inundation of anchor electric power plant site; SLR and other threats to nuclear waste repository at Humboldt Bay; general SLR issues, including zoning and

building/infrastructure decision-making that centers SLR and groundwater table increases.

Other comments about interests included:

- SLR activities have taken somewhat of a back seat to other projects in the last couple years but are very interested in partnering with the County, State, and local landowners to develop programmatic planning and permitting in an effort to address plans and permitted projects in the Humboldt Bay Region.
- We are interested in and researching the coordination of a regional approach to SLR planning and adaptation in the Humboldt Bay region. Regarding permitting streamlining, we believe that is important, but are not yet at a point in our planning process to implement this approach. Cooperation from the Coastal Commission to implement a consistent and unified approach to addressing the impacts of SLR is critical.
- We want to expand our engagement with neighboring coastal tribes.
- While we are aware of sea level rise and the danger to the levees, we have not evaluated its impact on access to our transmission system and other facilities are above the rise predicted.
- Adequate funding for projects addressing SLR-vulnerable infrastructure has yet to materialize so providing funds to other agencies would be secondary to addressing our own most at-risk locations that could result in isolation of already disadvantaged communities.
- A region-wide approach to this issue would be appropriate from the local, county, state and federal and private levels.

Two respondents noted some uncertainty with their answers:

- New to the entity therefore not sure of SLR activities
- It is also possible that I am not involved with or aware of what all functions of my department are doing.

# Regional Coordination

The County’s Feasibility Study is evaluating the feasibility of multiple sea level rise (SLR) regional coordination options. Respondents were asked what their initial support was for five potential strategies for regional coordination of SLR planning (Table 5 and Figure 11). Options ranged from those that would maintain the status quo to those that would take a lot of change and effort to implement:

- No regional planning should occur, local jurisdictions should individually respond to SLR as they see fit.
- Engage in the sharing of information and coordinated planning with other organizations through working groups with no formal agreement or commitment (e.g., an initiative).
- Create a formal collaborative partnership between existing agencies and stakeholders to address SLR (e.g., Memorandum of Understanding, Memorandum of Agreement, Joint Powers Authority).
- Empower or retool an existing regional agency (e.g., Harbor District, Humboldt County Association of Governments, Humboldt County, Humboldt County Flood Control District, etc.) to serve as a lead agency to coordinate and address regional SLR.
- Establish a new regional authority to address SLR (e.g., Joint Powers Association, Special District).

Currently in SLR planning efforts, most Humboldt Bay stakeholders are using “informal coordination” through various meetings and no formal agreements, outside of specific project contracts, are established for regional planning efforts. The last large scale coordination effort, the Adaptation Planning Working Group that ended in 2015 due to a lack of funds, would be considered by this survey to be informal collaboration since there was no formal agreement between participating stakeholders. The creation of a formal collaborative partnership was the most supported, with 79% of respondents favoring this option. A majority of respondents also favored empowering an existing regional authority (65%) and engaging in informal coordination (55%). Respondents had the most neutral responses (35%) for establishing a new regional authority, which may be due to the uncertainty around what such a large change would entail. According to this survey, over 60% of respondents strongly opposed and another 25% somewhat opposed the idea that no regional planning should occur. Additional ideas expressed in the open-ended question included the development of a multi-agency task force to identify action items for areas across jurisdictions and to develop MOUs to outline budgets and timelines for those areas, as well as to consider the political aspects of what agency is up to the job and will not create resentment from other agencies.

Table 5: Level of support for potential SLR coordination planning options.

	Percentage of Respondents				
	Strongly oppose	Somewhat oppose	Neutral	Somewhat favor	Strongly favor
Create a formal collaborative partnership	0%	4%	17%	33%	46%
Empower or retool an existing regional	2%	12%	22%	46%	18%
Engage informal coordination	5%	15%	25%	33%	22%
Establish a new regional authority	9%	11%	35%	28%	18%
No regional planning should occur	62%	26%	9%	2%	2%



### Level of support for potential regional SLR planning options

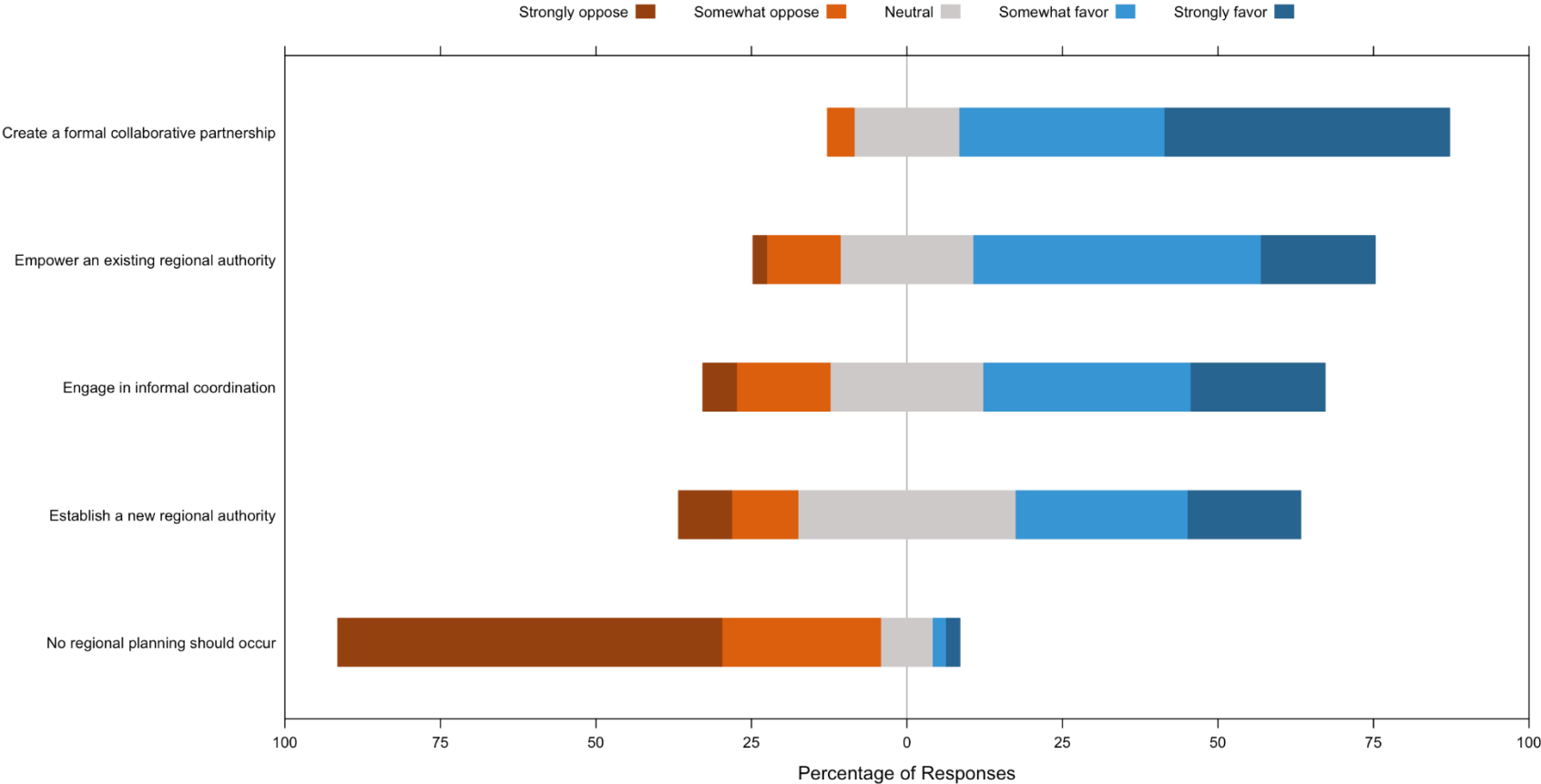


Figure 11: Survey respondents' initial support or opposition for various strategies for regional coordination of SLR planning (n=93-94).

To collect more information of types of potential regional collaboration efforts, respondents were asked four additional questions about planning control, level of involvement of their agency/organization, time of planning, and spatial scale of planning.

The vast majority of respondents (64%) preferred the planning authority to include a mix of local-and-state control, while 19% preferred local-only control and 14% preferred state-only control (Figure 12). Only 4% of respondents thought the planning authority should lie between state-and-federal or federal-only. On average, the stakeholder groups that tended to favor more local control included Tribal Government, County Government, Regional Districts, Consultants, and Academia. The average answer from City Government leaned closer to state control. No stakeholder group's average answer indicated preference for state-only or federal-only control.

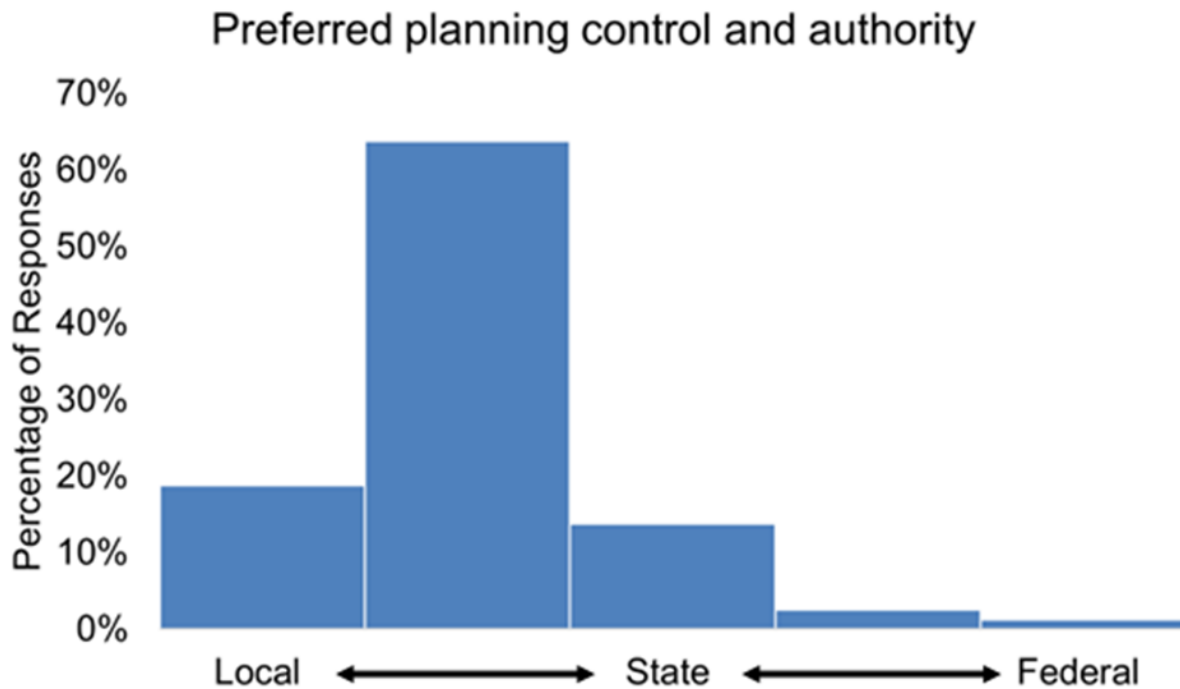


Figure 12: Survey respondents' preference for what level of government should hold the majority of the planning control and authority (n=80).

As indicated in Figure 13, most respondents indicated that their agency/organization should participate (55%) or should be involved in a mix of participation and leading (26%). Only 12% indicated they should either be rarely involved or not involved. Stakeholder groups whose average answers indicated their involvement should lie between participation-and-no involvement included Infrastructure/Service Providers, Business/Industry Groups, NGOs, and Consultants. The average answers of the stakeholder groups of Federal Government, City Government, State Government, Tribal Government, and Academia all indicated a solid preference in participating. County Government and the Harbor District (when separated from other Regional/Special Districts) indicated an average preference between participating and leading. Only 7% of respondents indicated a preference to lead a regional SLR planning effort and on average, no stakeholder group indicated a desire to lead.

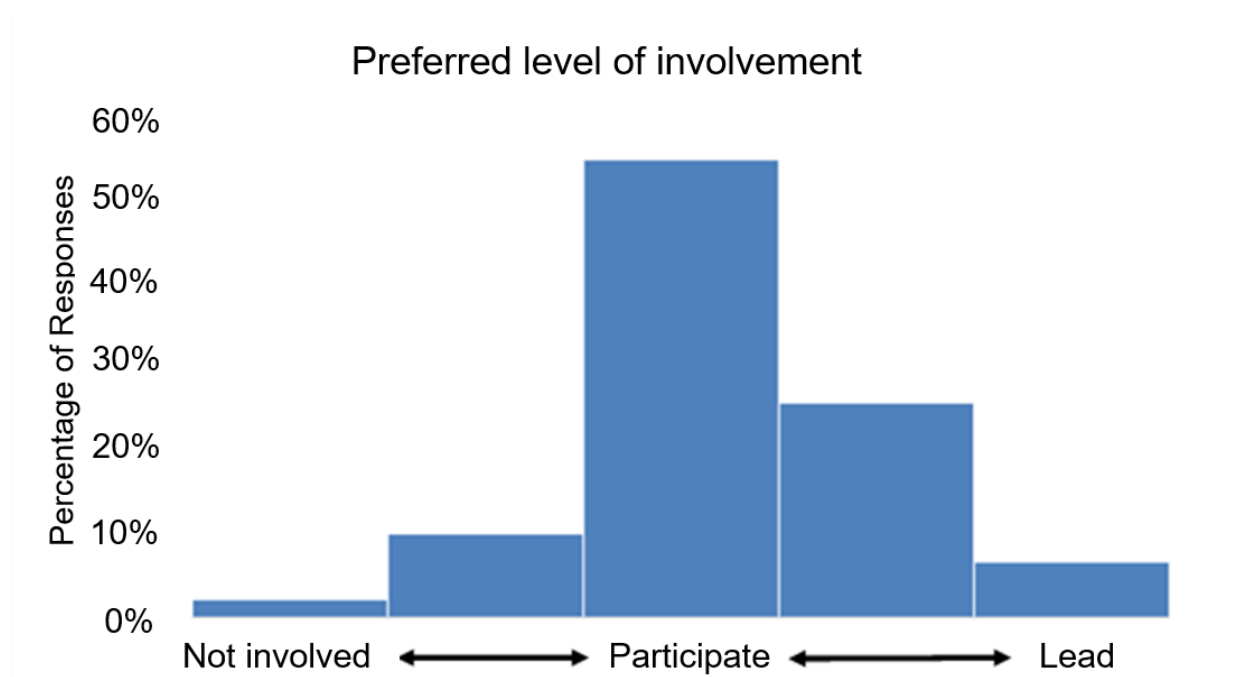


Figure 13: Preferred level of involvement of survey respondent's agency/organization in regional SLR planning effort (n=89).

Respondents were provided a space in the survey to type any other thoughts on how to regionally coordinate SLR planning and adaptation. The following typed responses related to the SLR planning coordination structure, involvement, and leadership.

- Coordination is essential. I don't know enough about the politics to know whether an existing agency is (a) up to the job; (b) will not create resentment from other agencies.
- I think empowering and existing JPA or making a new one would be wise to coordinate SLR planning.
- There needs to be a multi-agency task force to identify action items across jurisdictions and MOU's signed to give each agency in the region tasks to develop budgets and timelines.
- Individual Cities should lead their own planning/adaptation efforts. Humboldt County RCD can lead planning in all other areas.
- Early project planning and local agency involvement.
- We really need planning and coordination at all levels and a view on the long-term future to be effective.

Figure 14 shows the respondent results indicating what spatial scale they think regional coordination should mainly focus. Thirty-seven percent of survey respondents thought it should be either focused on a watershed unit or other unit that is smaller than the entire bay and 62% of respondents thought regional coordination should occur on a bay-wide scale.

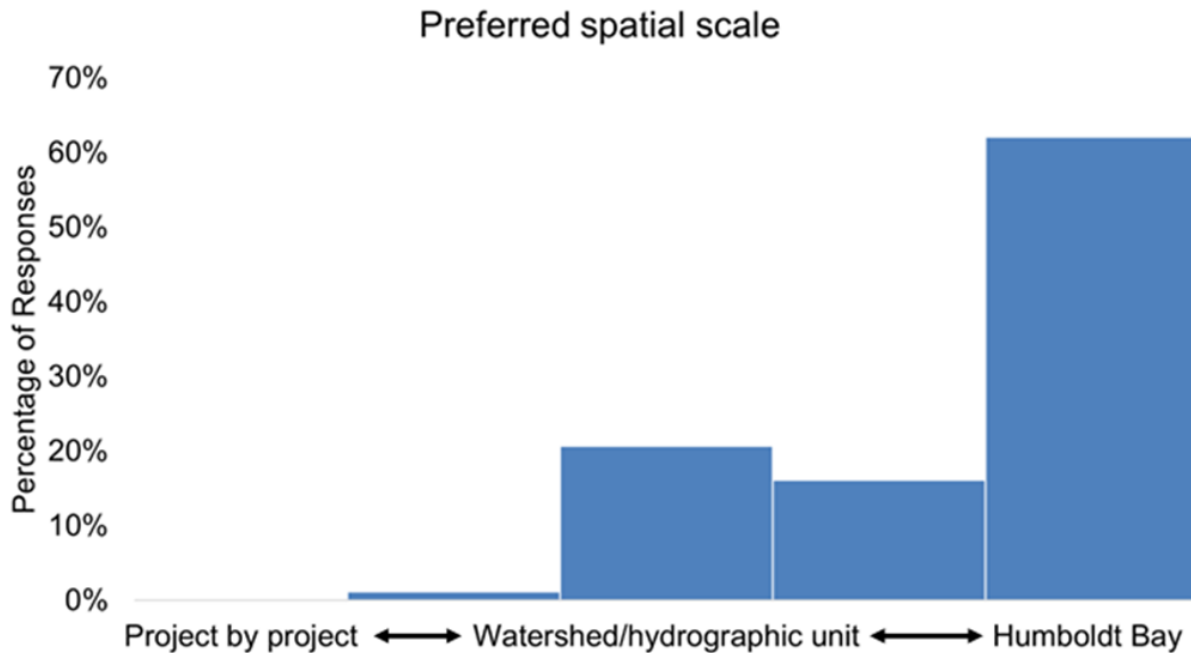


Figure 14: Survey respondents' preferred spatial scale to focus regional SLR coordination efforts (n=87).

Respondents were provided a space in the survey to type any other thoughts on how to regionally coordinate SLR planning and adaptation. The following responses related to the spatial scale of planning.

- Needs to include the Humboldt Bay watersheds, plus all of Humboldt Bay.
- Bioregional and neighborhood forums of organization should be prioritized.
- Engage the public to determine priority areas. Utilized the King Tide initiative Photo Project to rank priority areas with public input.
- A mitigation banks works on hydrologic units to establish service areas of the bank; therefore, the watershed of the entire Humboldt Bay would be included.
- Can't overlook the impact of shoreline activities on how waves propagate around the bay. In the near term, wave induced erosion, that results from poorly thought-out shore protection, will do more damage than chronic sea level rise...and is already happening.

Respondents were also asked about what timescale they thought regional coordination should mainly focus on addressing. As shown in Figure 15, 45% of respondents thought it should focus on the mid-term. Approximately 26% thought coordination efforts should focus on the short- to mid-term and 29% responded efforts should focus on the mid- to long-term.

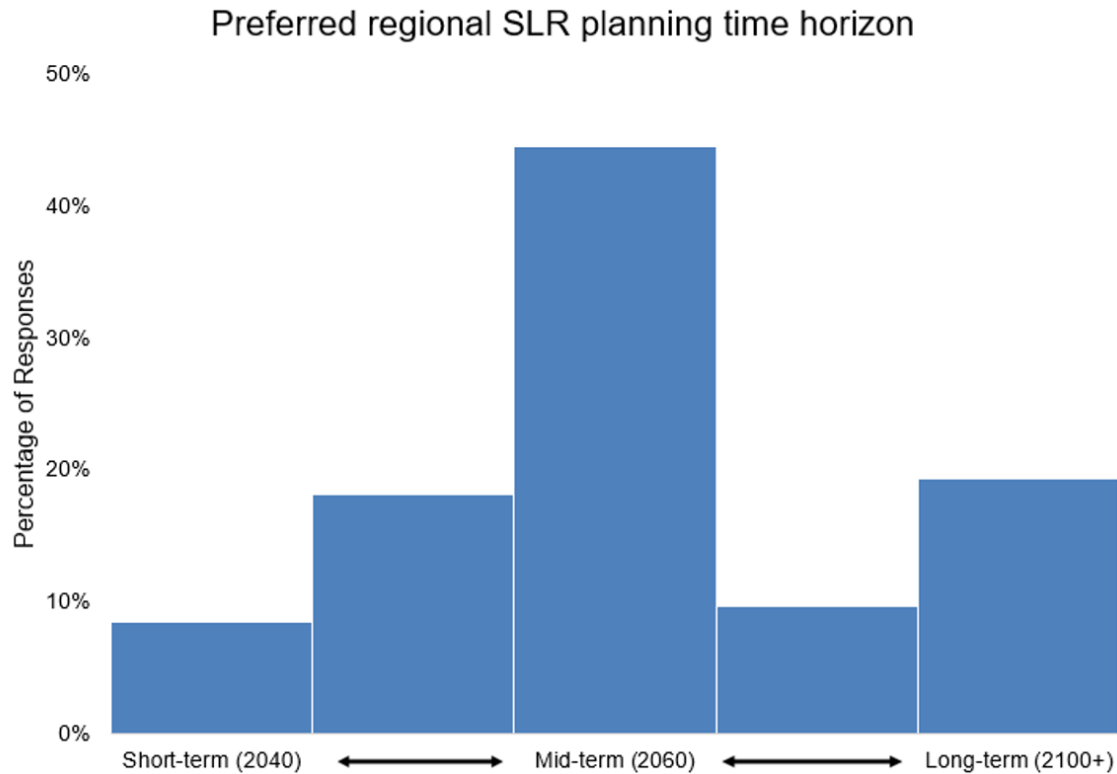


Figure 15: Survey respondents' preferred regional SLR planning time horizon (n=83).

Respondents were provided a space in the survey to type any other thoughts on how to regionally coordinate SLR planning and adaptation. The following typed responses related to the temporal scale of planning

- Consider SLR an emergency.
- We already have some ability to address the short term through project-by-project coordination. To provide a seamless response with little wasted resources/effort, aim for the long-term solution and work to get there on a step-by-step basis.
- I think that regional coordination should have a dual focus on short and long-term planning with a goal of phased adaptation overtime based on SLR triggers.
- While I selected short-term focus for regional coordination, SLR planning needs to also include mid-term and long-term. The idea is to do what we can to protect assets in the short-term while determining what needs to happen in the mid- and long-term.
- I think that any large civil type project undertaken in the next 5 years will likely have a life expectancy of 30-50 years (roads/windfarms/ports) so the planning range need to at least go as far as those projects life service spans... ~2075 min.

## Barriers to regional coordination and SLR adaptation planning

Coastal professionals were asked a series of questions related to potential barriers to SLR adaptation and regional coordination. Survey respondents could rate their level of agreement with each statement about sea level rise (SLR) planning (coordination, funding, public engagement, general stakeholder engagement, and the participant's primary organization) on Humboldt Bay. Respondents were provided with a "not applicable (N/A)" choice if the statement was not applicable to their agency/organization. In an open-ended text space at the end of this series of questions, respondents were provided an opportunity to add any other thoughts. Some respondents used the space to describe why they chose neutral for some statements.

Explanations included:

- We are in the process of outreach and learning more about what the public and stakeholders think.
- I am answering for my agency and feel that response may warrant neutral. I have personal opinions that are not neutral but don't feel that's the nature of this survey response structure.
- Some of these I was more ambivalent than neutral. These are difficult questions to unpack, there's a fair amount of nuance being lost, maybe some listening sessions with key players would be helpful.

As shown in Figure 16 and Table 6, when asked if SLR planning success will require coordination between local governments, Tribes, management agencies, and the public, 95% agreed or strongly agreed. When asked if the current governmental/institutional structure is sufficient for addressing SLR, 50% of respondents disagreed/strongly disagreed. On the topic of whether there is clear communication between regional stakeholders related to SLR planning, 18% agreed/strongly agreed and 40% disagreed/strongly disagreed. Thirty-eight percent of respondents indicated that they trust the stakeholders they need to work with.

When asked if all the right stakeholders are currently involved in SLR planning conversations, only 5% of respondents agreed and 57% were neutral (Figure 16). A follow up fill in the blank question requested that respondents write in any groups, organizations, sectors, or types of people that they think have been missing or not sufficiently included in SLR-related planning and activities on Humboldt Bay. Common responses about who has been missing included: private property owners, residents, taxpayers, and business owners. Slightly less frequently, respondents noted that disadvantaged and environmental justice communities, Tribes, and communities highly vulnerable to SLR should be more included in SLR planning efforts. A few respondents mentioned specific land/asset managers, community services districts, and public interest/user groups such as environmental groups. The most frequent industry noted as needing increased involvement in SLR planning was the agricultural community; however, fishing, cannabis, construction/development, banking, and insurance industries were also mentioned.

Additionally, respondents were asked a series of questions about their perceptions on risks, actions, and values related to SLR (Figure 16). Respondents were fairly evenly split between agreeing (32%), feeling neutral (32%), and disagreeing (34%) that stakeholder agree on risks posed by SLR. Furthermore, very few respondents (11%) agreed that stakeholders agree on the actions needed to address SLR. Most respondents (53%) felt that stakeholders did not agree on the necessary actions. Forty-eight percent of survey respondents also perceived that stakeholders' conflicting values and preferences could hinder agreement in selecting adaptation strategies.

### Level of agreement regarding coordination of SLR planning

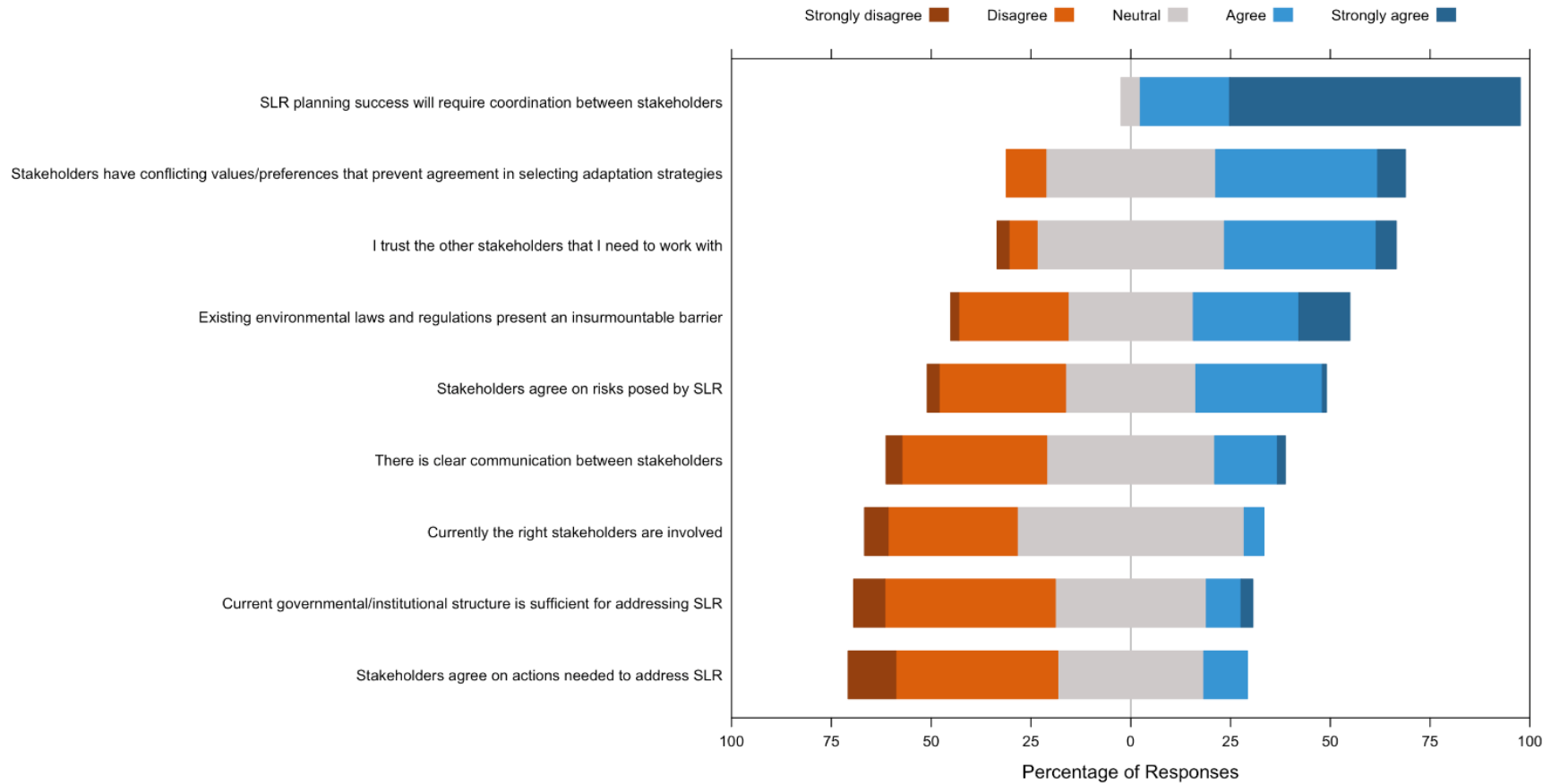


Figure 16: Level of agreement regarding coordination of SLR planning (n=100-103).

Table 6: Level of agreement regarding coordination of SLR planning.

	Percentage of Responses					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
SLR planning will only be successful if local governments, Tribes, management agencies, and the public work together and coordinate on SLR planning activities.	0%	0%	5%	22%	73%	0%
Stakeholders have conflicting values/preferences that do not allow for agreement in selecting adaptation strategies.	0%	10%	43%	41%	7%	0%
I trust the other agencies/ organizations that I need to work with in order to accomplish SLR planning.	3%	7%	47%	38%	5%	0%
Existing environmental laws and regulations present an insurmountable barrier/obstacle to SLR adaptation.	2%	27%	31%	26%	13%	0%
Humboldt Bay stakeholders generally agree on risks posed by SLR.	3%	32%	33%	32%	1%	0%
There is clear communication between agencies/organizations about their SLR planning efforts.	4%	36%	42%	16%	2%	0%
Currently in regional conversations about SLR, all the right stakeholders are in the room.	6%	32%	57%	5%	0%	0%
The current governmental/institutional structure is sufficient for addressing SLR impacts and concerns on Humboldt Bay.	8%	43%	38%	9%	3%	0%
Humboldt Bay stakeholders generally agree on the actions that are needed to address SLR.	12%	41%	37%	11%	0%	0%



Respondents were asked a series of questions related to their perceptions of the agency/organization they work for (Figure 17 and Table 7). Respondents were provided with a “N/A” choice if the statement was not applicable to their agency/organization; between 5-15% of respondents chose “N/A” for all questions in this series. The majority of respondents agreed (56% agreed/strongly agreed; 13% disagreed/strongly disagreed) that their agency or organization’s leadership was prioritizing SLR adaptation planning.

More respondents disagreed than agreed (47% disagreed/strongly disagreed; 25% agreed/strongly agreed) that it was hard for their agency/organization to leave the status quo in order to plan for a different future. Slightly more respondents agreed than disagreed (33% agreed/strongly agreed; 25% neutral; 28% disagreed/strongly disagreed). Forty percent of respondents agreed their agency/organization had enough information to begin implementing SLR adaptation plans, while just 23% disagreed. More respondents disagreed than agreed (31% disagreed/strongly disagreed; 23% agreed/strongly agreed) with the statement that their agency/organization’s planning is held up and contingent on key decisions being made by other agencies/organizations

Table 7: Level of agreement regarding SLR planning within respondents' agencies/organizations.

	Percentage of Responses					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
Leadership within my agency/organization is making SLR adaptation planning a priority.	1%	12%	27%	34%	22%	5%
My agency/organization has enough data/information now to begin implementing sea level rise adaptation plans and activities.	3%	20%	25%	29%	11%	13%
My agency/organization currently has more pressing issues that take priority over SLR planning.	5%	23%	32%	27%	6%	8%
My agency/organization is kept waiting to plan for SLR until key decisions are made by other agencies/organizations.	6%	25%	32%	21%	2%	15%
It has been hard for my agency/organization to leave the status quo in order to plan for a different future (with potentially higher sea levels).	11%	36%	18%	21%	4%	11%

### Level of agreement regarding SLR planning within participants' agencies/organizations

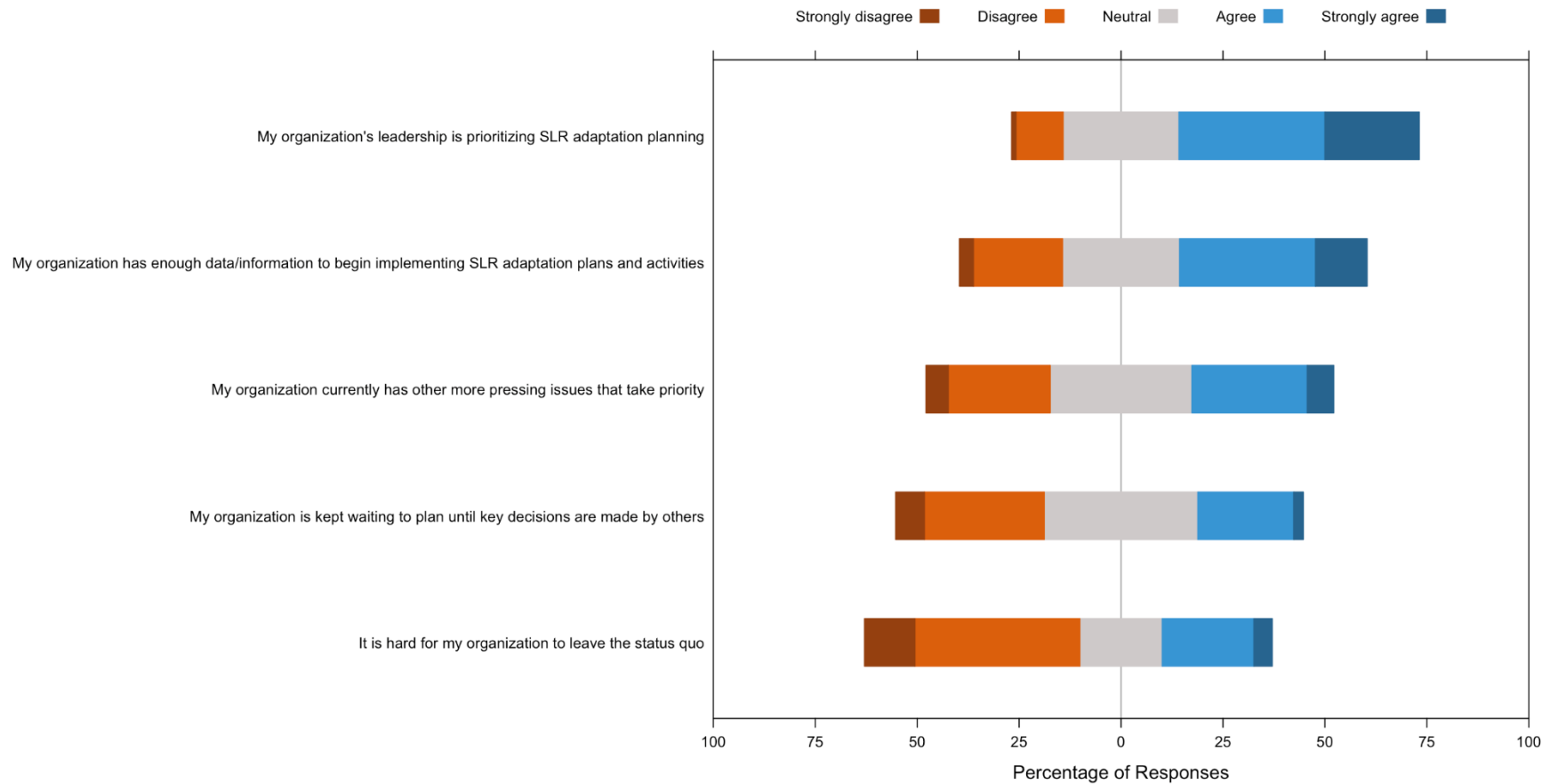


Figure 17: Level of agreement regarding SLR planning within respondents' agencies/organizations (n=101).

In regards to levels of agreement and disagreement about funding SLR planning, most respondents did not agree that the region is getting enough support from State or Federal sources and did not think their agency/organization had enough funding or staff resources for sufficient planning efforts (Figure 18 and Table 8).

Table 8: Level of agreement regarding funding of SLR planning.

	Percentage of Respondents					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
The Humboldt Bay region is getting sufficient support from the State of California to do SLR planning and adaptation work.	10%	33%	50%	6%	1%	0%
The Humboldt Bay region is getting sufficient support from the federal government to do SLR planning and adaptation work.	15%	35%	44%	6%	1%	0%
My agency/organization has sufficient staff resources to dedicate to SLR planning activities.	25%	46%	16%	13%	0%	0%
My agency/organization has enough funding to engage in SLR planning as much as we would like.	32%	36%	27%	4%	1%	0%

### Level of agreement regarding funding of SLR planning

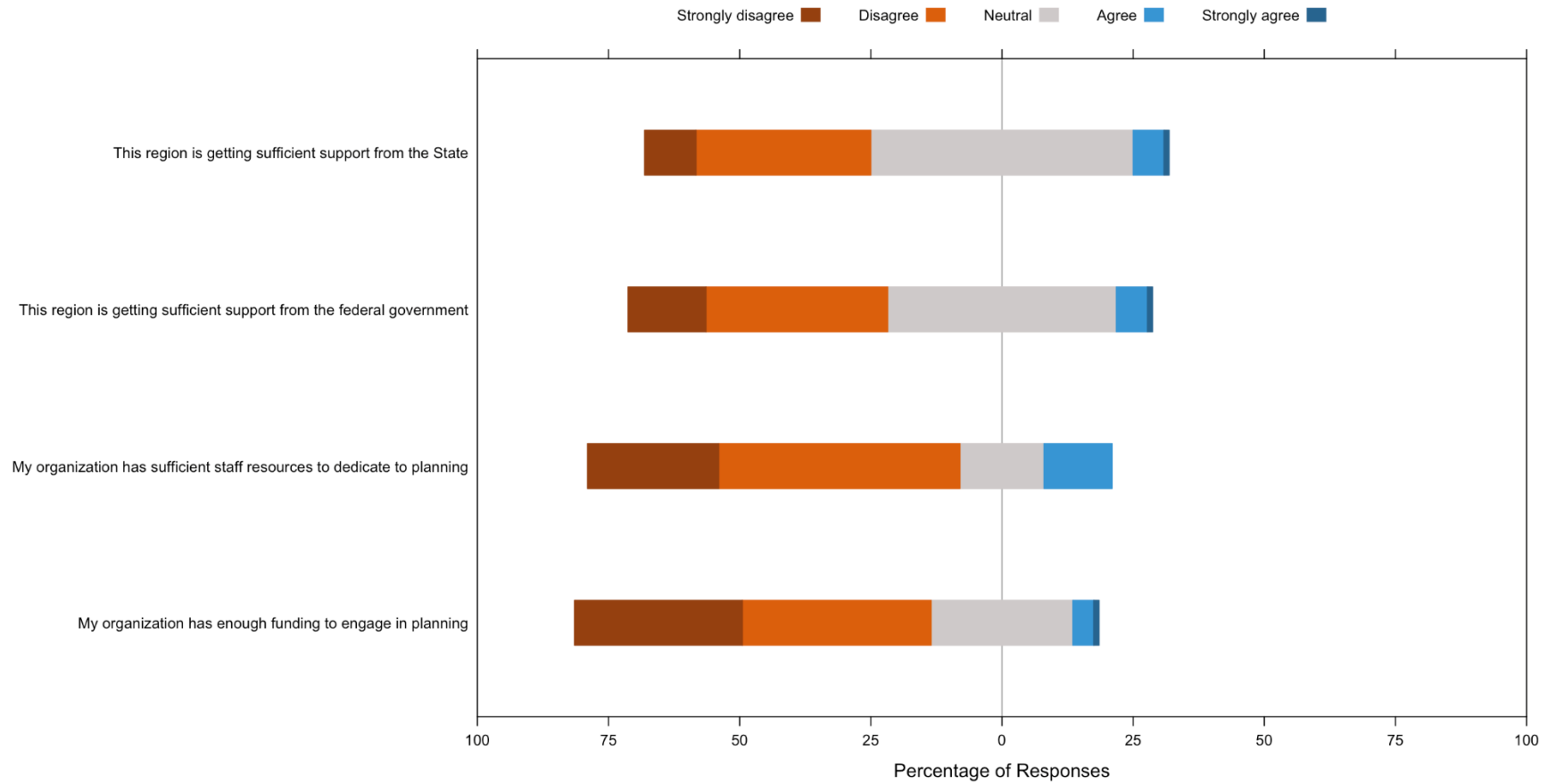


Figure 18: Level of agreement regarding funding of SLR planning (n=100-102).

We asked survey respondents to rate their level of agreement with four statements about public engagement in SLR planning in the Humboldt Bay region (Figure 19 and Table 9). Forty four percent of respondents either agreed or strongly agreed that members of the public are interested in policies and planning to address SLR (compared to 19% who disagreed). However, 45% of survey respondents disagreed or strongly disagreed that public engagement with residents and business owners has been effective in educating them about SLR impacts, 39% of respondents felt neutral, and 19% of respondents agreed public engagement has been effective. Additionally, on average, survey respondents felt neutral-disagreed that there has been sufficient effort to include vulnerable communities and businesses in SLR planning and decision making or that there has been sufficient incorporation of equity and social justice considerations. Only 4% of survey respondents agreed or strongly agreed that equity and social justice considerations have been sufficiently incorporated into SLR planning.

Table 9: Level of agreement regarding public engagement in SLR planning.

	Percentage of Respondents					
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
Members of the public are clearly interested in policies and planning to address SLR in the Humboldt Bay region.	1%	18%	38%	34%	10%	0%
Public engagement with residents and business owners has been effective in educating them about SLR impacts.	10%	35%	36%	19%	0%	0%
There has been sufficient effort to include local communities, businesses, and residents that may be impacted by SLR in local SLR planning and decision making on Humboldt Bay to date.	11%	34%	38%	17%	1%	0%
SLR planning processes on Humboldt Bay to date have sufficiently incorporated equity and social justice considerations.	7%	35%	54%	3%	1%	0%

### Level of agreement regarding public engagement in SLR planning

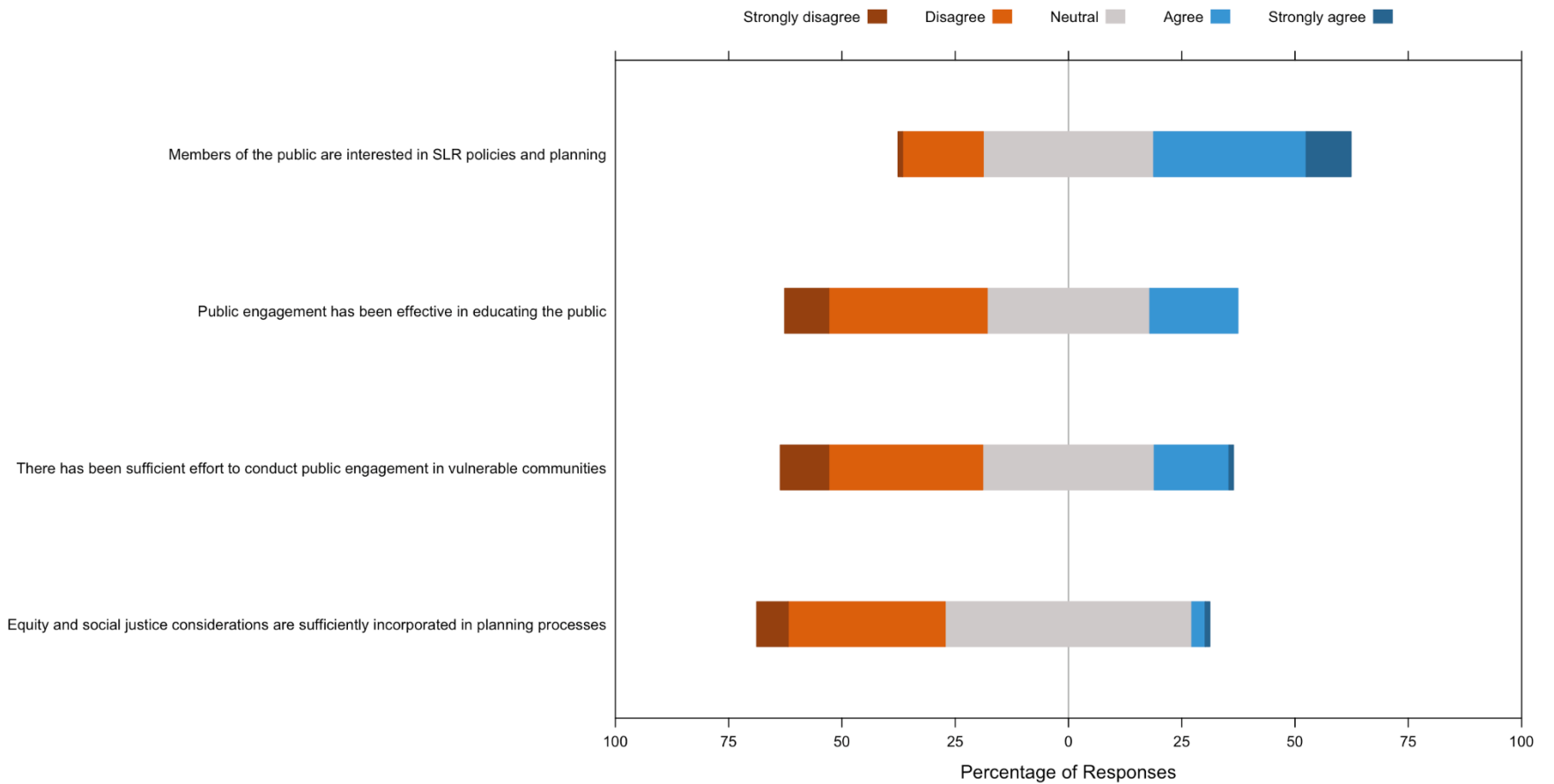


Figure 19: Level of agreement regarding public engagement in SLR planning (n=101-103).

Respondents were provided a space in the survey to type any other thoughts on SLR planning opportunities or challenges. The following are their typed responses:

- Collaboration is the key to overcoming any insurmountable barrier/obstacle to SLR adaptation.
- The dispersed jurisdictions around Humboldt Bay with no bay-wide organizing framework is a big challenge.
- Need to do regional SLR planning for HB.
- We need a list of action items. Everything is conceptual and vague right now. We can't successfully plan to do an unknown project.
- We should do everything that we can now to stop burning fossil fuels.
- Many local planners aren't taking a long enough view of SLR risks. They seem to be waiting until serious impacts occur to being planning to deal with them, but by then it will be too late.
- Current hurdles are preliminary project planning and not being able to fully identify scoping needs for adaptive measures since there is limited data to review and limited funding.
- There are many issues related to SLR and climate change that are still poorly understood, but we can be confident that sea level rise will alter the landscape of Humboldt Bay. I think any planning effort needs to incorporate these uncertainties but hiding from the science is not the answer.
- I think state government could do a lot more to incentivize better SLR planning and the Coastal Commission is trying with limited funding to bolster our Statewide Planning Unit so that they have the capacity to work with other state agencies towards that end. I think the local governments need help making this more of a priority and on regional collaboration.
- Lots of challenges. The Coastal Act has been pointed at as a barrier to SLR type activities. A central organizing entity seems needed, almost like a levee commission or something where wants and needs could be balanced. Harbor commission doesn't seem to have the capacity and not sure about the vision.
- A (non-profit) mitigation bank set-up like a land trust has very efficient regulatory pathways available, as well the ability to deal in "ecological currency" and equate an impact of an offshore open ocean environment with an onshore mitigation. Founding a mitigation bank now also provides a vehicle for advanced monitoring of potential impacts/habitats and assessment of impacts and viable routes of mitigation. A mitigation bank provides a regulatory and funding nexus that I see as essential to keep pace with the state and fed goals.
- Staffing and base supported funding will continue to be a challenge.
- It is hard to understand how much funding might be available/where to plan for retreat/where to plan for protection...seems like it would be good to get more engagement with Huffman, McGuire, Wood.
- Funding for periodic and sustained community engagement (meetings, education campaigns) in addition to government planning processes is key to help make difficult decisions in short timeframes.
- One of the main challenges to education and planning, in my opinion, is the disbelief in science that a large portion of our population seems to share.
- To be perfectly honest, when I read through the existing SLR planning documents for the region, I find them incredible dense and inaccessible. They contain an abundance of thorough and region-specific information, and I can tell lots of care and effort were put into them, but they are not super clear and helpful resources in my opinion. I would

suggest that future plans focus on communicating opportunities, challenges, needs more succinctly and with a broader, more general audience of stakeholders in mind so that decision-making could be based on a more collective understanding of the baseline science and options available.

- There is heavy mistrust between state agencies and private landowners when it comes to SLR. There is a very real fear that any SLR “adaptation” measures will lead to condemnation of land, or unconstitutional take of private property.
- This questionnaire assumes that government agencies and institutions will be the leading force in adapting to SLR. They will actually resist adaptation and will cling to their spheres of power. Only an informed and passionate citizenry will demand coordinated and effective action. Institutions that are controlled by real estate and moneyed interests will resist. They will hire people to conduct surveys.
- The lack of funding for public engagement has left these discussions in private meetings of experts and agency staff.
- I have not heard of any meetings to inform public about coordinated efforts to plan for impacts related to SLR or climate change.
- Include outreach and education in the planning so key messages can get shared with our next generation of critical thinkers, planners, economists and scientists.
- Private Landowners are key to assist in SLR. Most of these landowners are agricultural producers who have issues with governmental agencies. It is difficult to engage them in something like SLR where they distrust government, don't really believe in climate change, and are so busy they can't take time to come to a stakeholder meeting. Nonetheless, they are key to helping mitigate SLR.
- Many landowners would like to prevent inundation using the tools they have used in the past, such as dikes and levees. Many of these areas could be protected for a period of time if permits were regulatorily attainable and financially within reach. One solution suggested is some sort of programmatic plan and permitting that included mitigation. An agency or government, probably the county would need to hold and administer the process and programmatic permit.
- Funding and environmental prohibitions on filling coastal wetlands remain the biggest hurdles to addressing SLR. Plans, collaboration and agreements are great but without funding or env. clearances, there will be no forward progress.
- We need an expedited permitting process to implement SLR projects. We can't wait two years to obtain permits!
- We have to assume that the coastal act will not look the same in 30 years and begin to plan for solutions that will likely be permissible in the coastal act of the future, even though they are not permissible right now. For example, moving Fairhaven into the high dunes in 30 - 50 years. Not possible now, but I bet it will be when 2-3 feet of sea level has occurred statewide.
- Working within the CA Coastal Act, which needs updated, will be problematic



## Prioritizations and Future Actions

Coastal professionals were asked to rate their level of prioritization for various sea level rise (SLR) planning efforts, public outreach efforts, and regional projects and programs on Humboldt Bay. Respondents could choose 'I don't know' (IDK) as a response; figures do not depict those responses, but they are captured in the tables. Two type-in answers addressed reasons for choosing IDK: "I don't know means I need more information to answer" and "While I have opinions on several of these I have responded 'I don't know' given that I'm responding for an agency."

All statements in Figure 20 and Table 10, except one, were identified as a high or essential priority by around 60% or more of respondents. The creation of an overarching regional SLR adaptation plan was a high or essential priority according to 80% of respondents. Incorporate equity and environmental justice considerations into planning was a high or essential priority according to 71% of respondents. Between 60-65% of respondents indicated activities that were a high or essential priority were developing a SLR hazard zone for consideration in development projects, developing regulatory solutions to allow for reuse of dredge spoils, addressing planning conflicts from state retained coastal development permitting authority, and completing updated SLR vulnerability assessments. For the development of a formal regional management or governing structure, 57% of respondents noted it was a high or essential priority and 23% of respondents noted it as a medium priority. Almost 50% of respondents identified the development of regulatory solutions to allow for wetland fill for SLR adaptation as a high or essential priority, while 8% thought it was not a priority, 5% indicated it was a low priority, and 18% responded that it was a medium priority.

Table 10: Prioritization of regional SLR planning efforts.

	Percentage of Respondents					
	Not a priority	Low priority	Medium priority	High priority	Essential priority	IDK
Create an overarching regional SLR adaptation plan	0%	4%	10%	39%	40%	6%
Incorporate equity and environmental justice considerations into planning	1%	11%	13%	37%	34%	4%
Complete updated SLR vulnerability assessments	4%	5%	24%	32%	29%	5%
Develop a SLR hazard zone for consideration in development projects	4%	4%	17%	35%	29%	10%
Develop regulatory solutions to allow for reuse of dredge spoils for SLR adaptation	2%	1%	16%	31%	34%	16%
Address planning conflicts from the Coastal Commission's retained coastal development permitting authority	3%	3%	12%	23%	41%	18%
Develop a formal regional management or governing structure	3%	6%	23%	29%	27%	11%
Develop regulatory solutions to allow for wetland fill for SLR adaptation	8%	5%	18%	25%	24%	19%

### Prioritization of potential regional SLR planning efforts

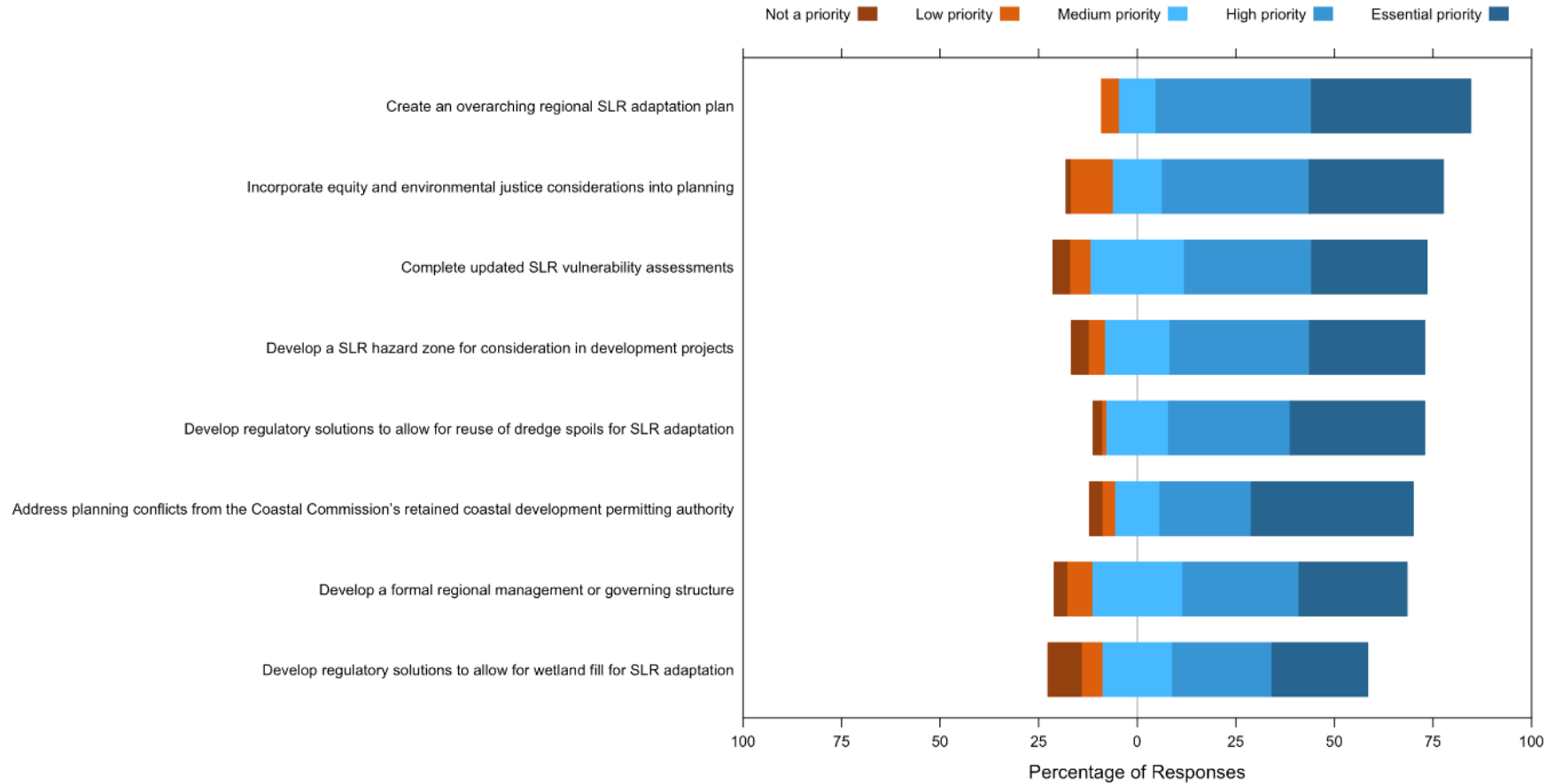


Figure 20: Prioritization of regional SLR planning efforts (n=94-96).

Figure 21 and Table 11 show results for five potential regional projects and programs. Ninety-seven percent of respondents indicated that the development of regional projects with natural physical barriers was a medium, high, or essential priority; no respondents indicated it was a low priority or not a priority. Over 40% of respondents indicated essential priorities included the development of a regional program for habitat restoration/enhancement and mitigation projects in vulnerable areas, development of projects aimed at remediating contaminated sites, and development of a plan for measured retreat and/or relocation. The statement with the most varied responses was regarding the development of projects aimed at the development/enhancement of man-made physical barriers.

Table 11: Prioritization of potential regional SLR projects and programs.

	Percentage of Respondents					
	Not a priority	Low priority	Medium priority	High priority	Essential priority	IDK
Develop regional projects aimed at the development/enhancement of natural physical barriers	0%	0%	6%	35%	55%	3%
Develop a regional program for habitat restoration/enhancement and mitigation projects in vulnerable areas	0%	4%	15%	37%	40%	3%
Develop projects aimed at remediating contaminated sites and pollutant sources that are vulnerable	0%	1%	23%	29%	43%	4%
Collaborate regionally to develop a plan for measured retreat and/or relocation	2%	4%	21%	21%	45%	6%
Develop regional projects aimed at the development/enhancement of man-made physical barriers	5%	27%	23%	24%	17%	3%

### Prioritization of potential regional SLR projects and programs

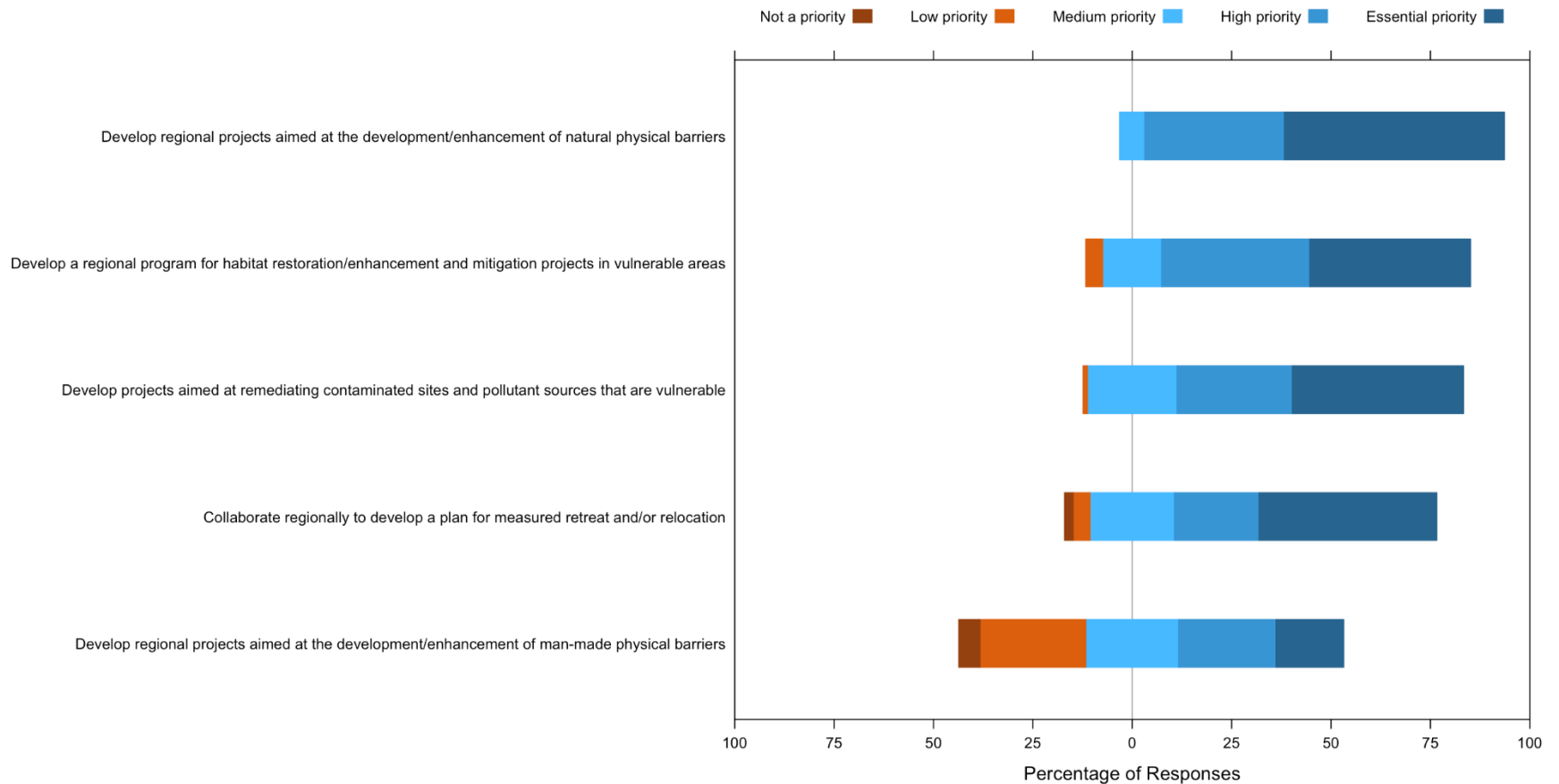


Figure 21: Prioritization of potential regional SLR projects and programs (n=93-94).

Respondents were provided a space in the survey to type any other thoughts on priorities for SLR planning approaches, programs, or projects. The following are responses from the survey:

- We should not be working on resilience projects that will only last a decade or two before they are over-topped.
- All these projects and programs need to be done at a regional scale.
- It's difficult to prioritize the above relative to one another, as the shoreline management needs of Humboldt Bay vary so broadly, not one single approach on the Bay scale is appropriate.
- Consider SLR an opportunity to build an ecologically based society
- Not sure what is meant by wetland fill, but the Humboldt County shoreline largely cannot be adapted to keep the ocean out, due to inundation from groundwater everywhere. Likely less expensive is to conduct managed retreat and use wetlands, estuaries, and other sea-front nature-based systems to buffer the impacts.
- I think that offshore wind/carbon neutrality and SLR are intrinsically bound. and I think that any SLR planning will/must assume/incorporate the presence and function of offshore wind in the adaptation.
- As I understand it, man-made physical barriers will not work in this region because SLR will cause groundwater table elevations to rise which are not feasible economically or operationally to mitigate with man-made physical barriers.
- Develop combined barrier/restoration/enhancement projects on agricultural land that was former tidal wetland areas
- Some nature-based methods will require pilot tests and/or demonstration projects
- I think we have some really great vulnerability assessments, and we need to focus now on addressing those vulnerabilities. There are regulatory pathways to reusing dredged spoils and filling for SLR adaptation.
- Use vulnerability assessments to prioritize essential infrastructure which are first to be at risk.
- The SLR inundation flood mapping completed for the Bay in 2015 needs to be updated with contemporary flood risk mapping methods. This should be top priority before any additional planning/policy making is advanced there are too many limitations with the current mapping.
- I generally don't support regulations. This is why I answered "not a priority" to develop a SLR hazard zone. However, I have advocated in my agency to do just this.
- Don't call it a hazard zone.
- I disagree with the concept of a hazard zone. We can discuss this, but the survey is not the place to go into it.
- Establish funding sources for SLR standalone projects.
- Fund regional planning efforts
- I would like to use the mitigation bank as a means of designing the measured retreat. We combine/prioritize elements of the topics/resources above and use the bank to develop the regions where the highest ecological gain (that is needed to offset impacts) is required/feasible/attainable. I think the mitigation banks allows for the cross jurisdictional targeted planning/design needed.

We asked survey respondents how they would prioritize various SLR public outreach efforts in the Humboldt Bay region, see Figure 22 and Table 12 for results. No respondent chose “not a priority” for the three public outreach strategies provided in the survey. On average, the highest priority strategy, with 81% of respondents saying it was a high or essential priority, was to create a public engagement process to identify community goals and actions for addressing SLR. Respondents also thought coordinating public outreach strategies to educate residents and business owners regarding SLR impacts and planning efforts was a high priority, with 76% saying it was a high or essential priority. The third strategy, to create a single regional information platform concerning the status of projects and research related to SLR was, on average, a medium-high priority, with 68% saying it was a high or essential priority.

Table 12: Respondent prioritization of public engagement strategies.

	Percentage of Respondents					
	Not a priority	Low priority	Medium priority	High priority	Essential priority	IDK
Create a single regional information sharing platform	0%	9%	23%	47%	16%	5%
Coordinate public outreach/education strategies	0%	2%	18%	48%	27%	4%
Create a public engagement process to identify community goals and actions	0%	3%	13%	42%	39%	3%

When provided with space to type additional comments, respondents commented on groups that should be engaged and other ideas to focus or improve public engagement. One respondent shared that they chose “low priority” for activities they felt have already been done. Additional responses included:

- Hire experienced organizers. Go beyond surveys and questionnaires.
- A regional approach will be difficult given diverse land use/management. Suggest planning/outreach occur at the sub-watershed level in areas hydrologically connected.
- Hold realtors to ethical disclosure standard.
- More public information on impacts of sea level rise over the next 100 years.
- There are already many online tools and regional information. Public outreach and engagement are critical priorities.
- One on one engagement with landowners so their input is directly captured into any future planning.
- Groups to engage
  - Specifically target potentially affected businesses; clarify that armoring is an option.
  - Include k12 admin/education and higher education demographics
  - Engage agricultural community

### Prioritization of potential public outreach strategies

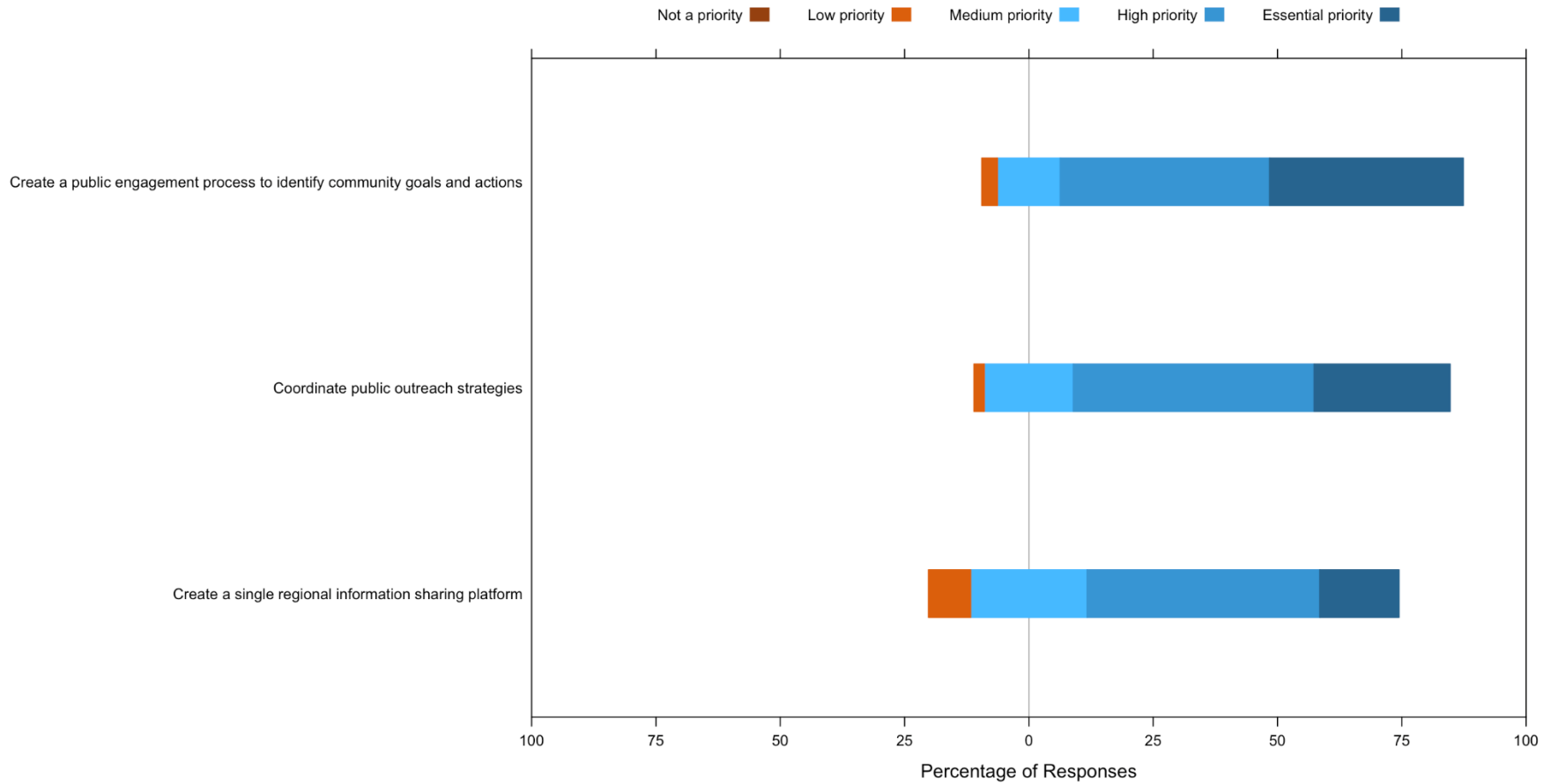


Figure 22: Respondent prioritization of public engagement strategies (n=94-95).

## Funding

Coastal professionals and the public were asked to rate their level of support for various potential SLR funding strategies in their respective surveys. Strategies presented in both surveys were identical. In general, as shown in Figure 23/Table 13 and Figure 24, responses suggest that the vast majority of public and professional respondents support spending funds on SLR planning and adaptation (either a stand-alone project or within other projects). The most support was shown for the use of external grant funds when available, to pass state or federal laws or programs with mechanisms to fund SLR work, and to use of public funds for SLR adaptation projects on private lands that will protect both public and private assets. A slight majority supported passing a local tax measure to address SLR (public survey: 44% support and 31% oppose; coastal professional survey: 47% support and 18% oppose). Less support was shown for encouraging insurance companies to require upgrades on homes/businesses to reduce SLR risks as a condition of insurance. The least desirable options were to require individuals/businesses to pay for their own SLR protection to minimize local government costs or to increase funding for SLR protection by cutting other local programs and services.

Respondents provided additional ideas including modifying federal budgets to accommodate coastal adaptation funding, multi-benefit funding opportunities such as creating a regional mitigation bank or adding SLR considerations to proposed projects like road or trail improvements, and encouraging considerations of equity and the unequal funding burdens that certain taxes impose on poorer communities or individuals.

Table 13: Coastal Professional level of support for various funding strategies.

	Percentage of Respondents				
	Strongly oppose	Somewhat oppose	Neutral	Somewhat favor	Strongly favor
Utilize external grant funds when available	0%	1%	1%	31%	67%
Pass federal laws or programs with mechanisms to fund SLR work	1%	1%	15%	34%	49%
Pass state laws, programs, or bond measures with mechanisms to fund SLR work	1%	2%	15%	40%	41%
Utilize public funds for SLR adaptation projects on private lands that will protect both public and private assets	0%	7%	25%	47%	22%
Pass local tax measures to address SLR	8%	10%	35%	42%	5%
Encourage insurance companies to require upgrades on homes/businesses to reduce SLR risks as a condition of insurance	7%	20%	36%	28%	10%
Require individuals/businesses to pay for their own SLR protection to minimize local government costs	16%	29%	40%	14%	1%
Increase funding for SLR protection by cutting other local programs and services	36%	34%	27%	2%	1%
Funding should not be spent on SLR planning and adaptation work	86%	7%	5%	2%	0%



### Level of support for potential funding strategies

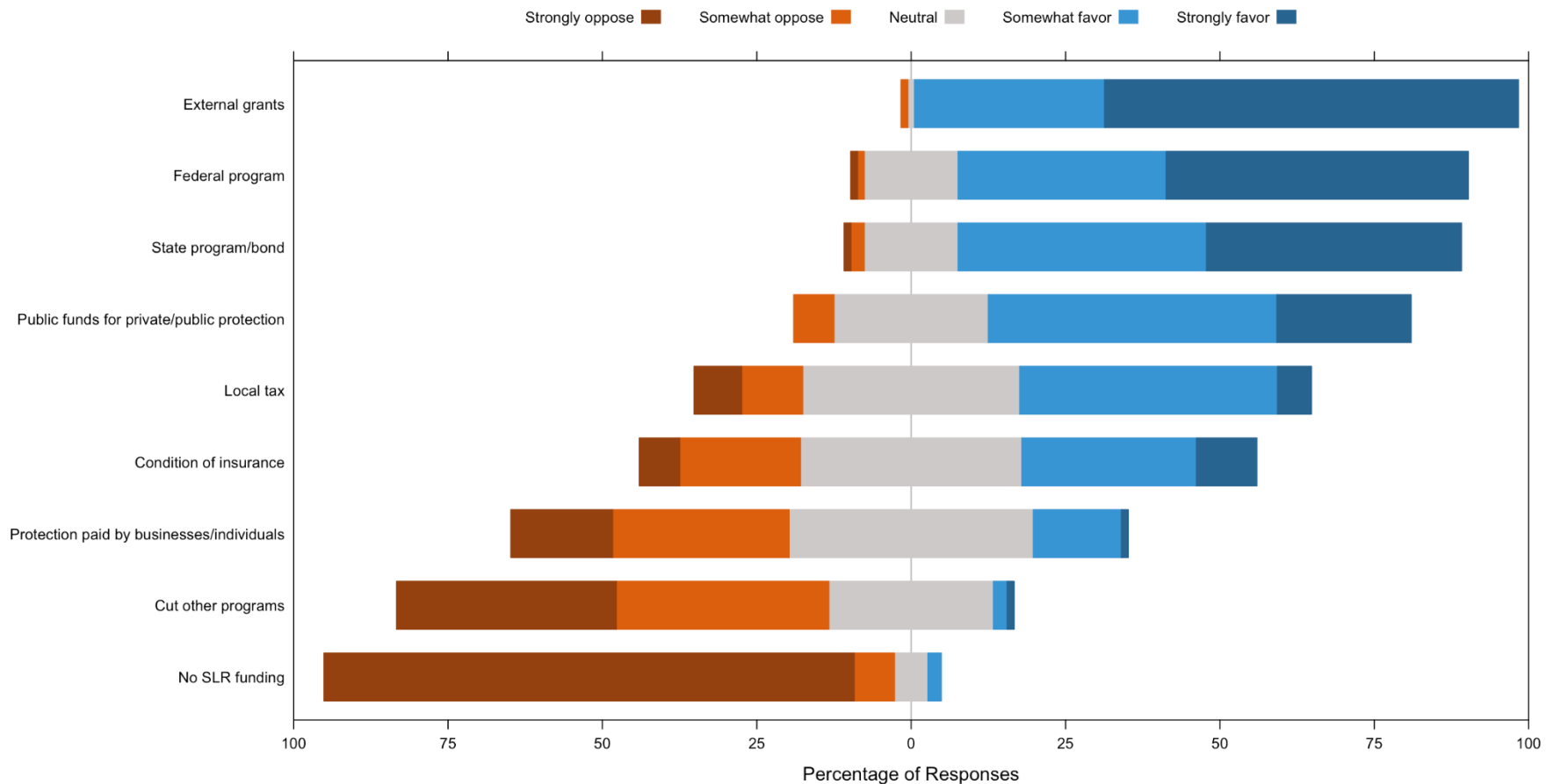


Figure 23: Coastal Professionals' level of support for various funding strategies (n=90-92).

### Public Survey: Level of support for potential funding strategies

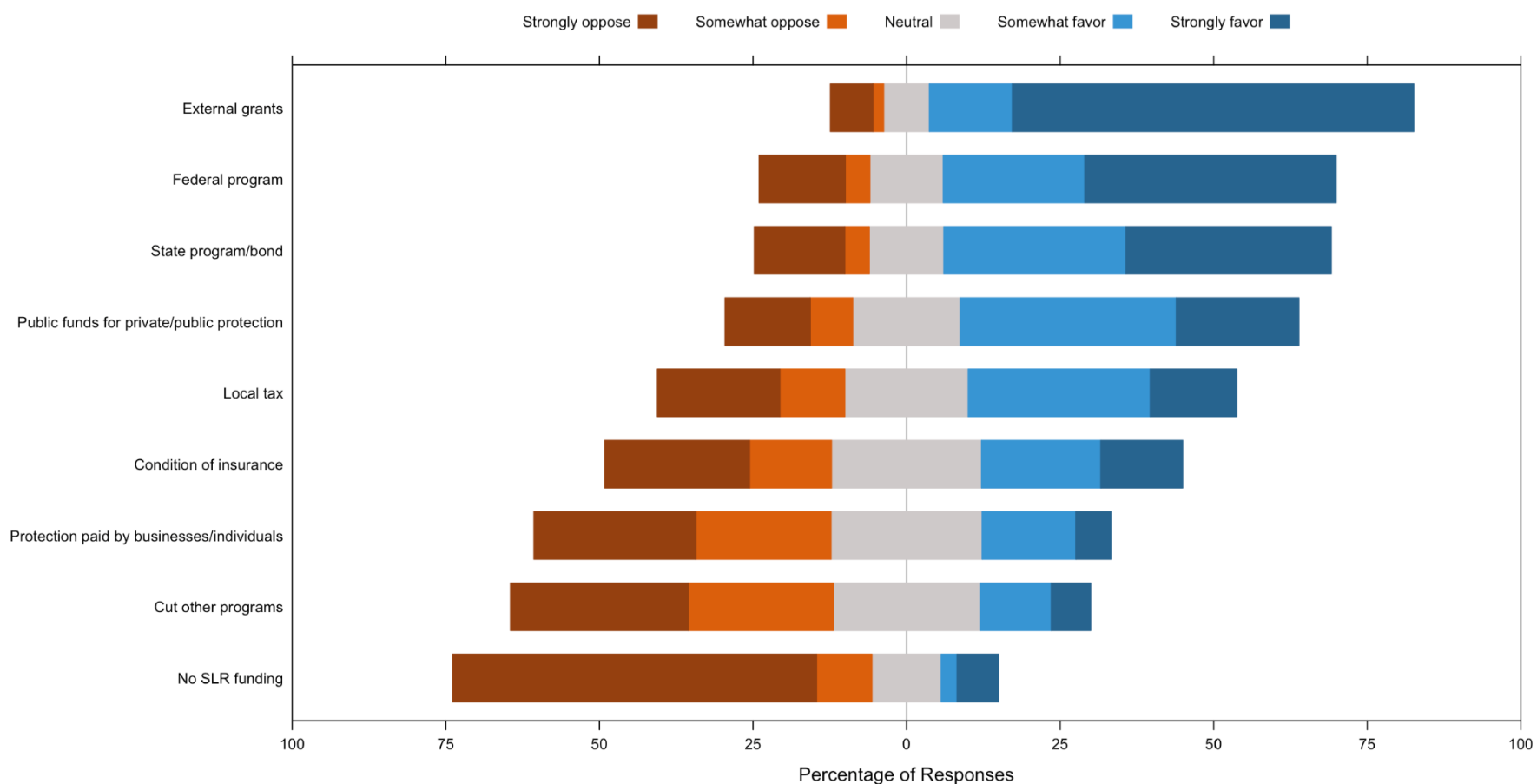


Figure 24: General public respondents' level of support for various funding strategies (n=533-547) (Public survey data from 2021 Humboldt County Planning and Building Department Public Survey).

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# Appendix A: Survey Instrument



# Regional Coordination of Sea Level Rise Adaptation Planning on Humboldt Bay

Project Research Survey

## **PURPOSE OF THE PROJECT**

Data is being collected by HSU Environmental Science & Management researchers and the County of Humboldt Planning and Building Department - Long Range Planning with the goal of exploring regional sea level rise planning in the Humboldt Bay region.

This survey data will inform Humboldt County's Humboldt Bay Sea Level Rise Planning Feasibility Study. The goal of this project is to develop options for sea level rise adaptation planning in the Humboldt Bay region that will foster a cooperative and coordinated regional approach to the identification, funding, and implementation of various sea level rise adaptation policies, strategies, and measures with resulting regulatory and financial benefits.

The data collected will also inform an HSU graduate student research project titled "Social science research to help advance regional coordination and collaboration of sea level rise adaptation and planning on Humboldt Bay." This study aims to understand people's knowledge, attitudes, perceptions, and expectations of sea level rise planning on Humboldt Bay.

Project Funders:

California Sea Grant College Program Grant and California Coastal Commission Local Coastal Program Grant

## **Informed Consent**

What We Will Ask You To Do:

If you volunteer to participate, you will be asked to answer and submit this survey. Completing the survey will take approximately 20-30 minutes.

Risks and Benefits:

Risks to participating in the survey are minimal. There is some chance that research partners would be able to attribute answers to you based on your answers to demographic questions. You will not receive any direct benefits for your participation, but you will hopefully find it rewarding to share your knowledge. We hope that results from this survey could inform the development of more effective strategies for sea level rise planning in the region. There is no monetary or other incentive for your participation in this survey.

Confidentiality and Use of Information:

The HSU research team will be collecting the raw survey data. After receiving your answers, the HSU team will remove any names, contact information, and demographic data from dataset before sharing it with anyone else. Once that information has been stripped, data from the survey will be shared with the County of Humboldt Planning and Building Department - Long Range Planning for use in their Humboldt Bay Sea Level Rise Regional Planning Feasibility Study. Results from the survey could be used in future reports, publications, and presentations on the topic and incorporated into sea level rise planning efforts. Survey data that is stripped of additional identifying details, including the specific name of the organization where you work, may be made available to funders, the public, and other researchers.



Research records will be kept in a locked file cabinet or password protected server; only the HSU researchers will have access to the original records. The data will be maintained in a safe location and may be used for future research studies or distributed to another investigator for future research studies without additional informed consent from you.

#### Voluntary Participation:

Your participation in this survey is voluntary and you have the right to change your mind and withdraw at any time prior to submitting your answers to the survey questions. If you would like to withdraw your answers after their submission, please contact a member of the project team.

#### Contact Information:

If you have any questions about HSU's research project or this survey, please email or call Kristen Orth-Gordinier at [kmo29@humboldt.edu](mailto:kmo29@humboldt.edu) or (808) 250-3644. Or you can contact Kristen's Faculty Advisor: Dr. Laurie Richmond at [laurie.richmond@humboldt.edu](mailto:laurie.richmond@humboldt.edu) or (707) 826-3202.

If you have questions about Humboldt County's Humboldt Bay Sea Level Rise Planning Feasibility Study, please contact Sarah Wickman at [swickman@co.humboldt.ca.us](mailto:swickman@co.humboldt.ca.us)

If you have any concerns with this survey or questions about your rights as a survey participant, contact the Institutional Review Board for the Protection of Human Subjects at [irb@humboldt.edu](mailto:irb@humboldt.edu) or (707) 826-5165.

If you would like to know more about personal data collection from SurveyMonkey, see their Privacy Notice [here](#).

Please print this informed [consent form](#) and retain it for your future reference.

1. If you are at least 18 years of age and agree to voluntarily participate in this research as described, please check "I consent" below to begin the survey. Thank you for your participation in this research.
  - I consent
  - I do not consent

## A Little About Yourself

2. Choose the category that best describes your primary agency/organization. (If you work for or represent multiple agencies/organizations, please choose a primary organization because we ask questions about your agency/organization later in this survey.)
  - City Government
  - County Government
  - State Government
  - Federal Government
  - Tribal Government
  - Infrastructure/Service Provider/Community Services District (e.g., roads, water, sewer, gas, electric)
  - Regional District or Association or Special District (e.g., Harbor District, etc.)



- Non-Government Organization
- Academia/Research
- Private Sector Consultant
- Trade/Business/Industry Group
- Agricultural Industry
- Other (please specify)

3. Please identify the specific agency/organization you work for or are associated with. (We understand the information you provide in this survey may not represent an official view of the agency/organization you work for and therefore will not be treated as such. However, answer this question will be especially helpful to build our understanding of local sea level rise planning efforts, as well as the needs of various stakeholders.)

• \_\_\_\_\_

4. Please indicate if you are an elected official.

- Yes
- No

5. When, if ever, do you think the Humboldt Bay region will start to be impacted by sea level rise?

- It is already being impacted
- Within the next 5 years
- Within the next 6-10 years
- Within the next 11-25 years
- Within the next 26-50 years
- Within the next 51-100 years or more
- Never
- I don't know

6. What is the frequency of your involvement in sea level rise (SLR) related work (e.g., SLR planning/policy, SLR research, SLR outreach/education, SLR adaptation implementation, etc.)?

- Never/Not involved in work
- Rarely involved (1 time or less per year)
- Occasionally involved (2-11 times per year)
- Moderately involved (monthly)
- A great deal/very involved (daily, weekly)

7. Please identify approximately how many years you have been involved with sea level rise work in a professional capacity.

• [scale in 1-year increments]:





## Your Agency's/Organization's Sea Level Rise Coordination & Collaboration

8. Is your agency or organization using a specific timeline and/or projection for their SLR planning or advocacy?
- Yes
- No

If answer to Question 8 is "Yes"

9. Please fill in the blanks using the text boxes below: My agency/organization is planning for \_\_\_\_ feet of SLR by the year \_\_\_\_.
- Feet of SLR: \_\_\_\_\_
  - By what year: \_\_\_\_\_
10. Please state where this projection guidance comes from (i.e., Specific Local Studies, Ocean Protection Council, etc.):
- \_\_\_\_\_

If answer to Question 8 is "No"

11. If your agency/organization is NOT using a specific timeline and/or projection for SLR planning, please state why:
- \_\_\_\_\_

12. In the past 4 years, which of the following activities did your agency/organization collaborate and engage in with other agencies/organizations in reference to sea level rise (SLR) on Humboldt Bay? If you're not currently engaged, which collaborative activities do you think would be of interest for your agency/organization? ("SLR-related" activities could include projects, studies, or work where SLR is not the only focus, such as multi-benefit projects that consider SLR as well as infrastructure protection, habitat enhancement, flood control, public access, education, etc.)

Activity	Engaged	Not Engaged, Very Interested	Not Engaged, Somewhat Interested	Not Engaged, Not Interested	I don't know
Sharing information about your organization's SLR policies, projects, and/or research with other agencies/organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carrying out SLR studies that inform multiple agencies/organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordinating with other agencies/organization to help streamline permitting processes related to SLR adaptation (e.g., programmatic permit, joint permit application)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





Implementing SLR-related projects with other agencies/organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sharing personnel with other agencies/organizations for SLR-related work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collaborating with other agencies/organizations to apply for and/or secure SLR-related project funding through grants or other sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contributing funding towards SLR-related projects that benefit multiple agencies/organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attending regular SLR planning or technical meetings hosted by another agency/organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hosting regular SLR planning or technical meetings and inviting other agency/organization to attend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordinating with agencies/organizations regarding equity and environmental justice considerations into SLR planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Please type any additional comments below about types of coordination your agency/organization is involved with or interested in: \_\_\_\_\_

Your Opinions About Sea Level Rise Work:

The following five questions ask you to rate your level of agreement with statements about sea level rise (SLR) planning on Humboldt Bay.

14. Rate your level of agreement with the following statements about **coordination** of SLR planning on Humboldt Bay?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
SLR planning will only be successful if local governments, Tribes, management agencies, and the public work together and coordinate on SLR planning activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The current governmental/institutional structure is sufficient for addressing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



SLR impacts and concerns on Humboldt Bay.					
I trust the other agencies/organizations that I need to work with in order to accomplish SLR planning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is clear communication between agencies/organizations about their SLR planning efforts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Existing environmental laws and regulations present an insurmountable barrier/obstacle to SLR adaptation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Rate your level of agreement with the following statements about **your primary agency/organization** and SLR planning on Humboldt Bay?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	N/A
Leadership within my agency/organization is making SLR adaptation planning a priority.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My agency/organization has enough data/information now to begin implementing sea level rise adaptation plans and activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My agency/organization is kept waiting to plan for SLR until key decisions are made by other agencies/organizations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My agency/organization currently has more pressing issues that take priority over SLR planning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It has been hard for my agency/organization to leave the status quo in order to plan for a different future (with potentially higher sea levels).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Rate your level of agreement with the following statements about **funding** of SLR planning on Humboldt Bay?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
My agency/organization has enough funding to engage in SLR planning as much as we would like.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My agency/organization has sufficient staff resources to dedicate to SLR planning activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Humboldt Bay region is getting sufficient support from the State of California to do SLR planning and adaptation work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Humboldt Bay region is getting sufficient support from the federal government to do SLR planning and adaptation work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Rate your level of agreement with the following statements about **public engagement** in SLR planning on Humboldt Bay?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Public engagement with residents and business owners has been effective in educating them about SLR impacts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There has been sufficient effort to include local communities, businesses, and residents that may be impacted by SLR in local SLR planning and decision making on Humboldt Bay to date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Members of the public are clearly interested in policies and planning to address SLR in the Humboldt Bay region.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SLR planning processes on Humboldt Bay to date have sufficiently incorporated equity and social justice considerations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Rate your level of agreement with the following statements about general stakeholder engagement within SLR planning on Humboldt Bay?



	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Humboldt Bay stakeholders generally agree on risks posed by SLR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Humboldt Bay stakeholders generally agree on the actions that are needed to address SLR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stakeholders have conflicting values/preferences that do not allow for agreement in selecting adaptation strategies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Currently in regional conversations about SLR, all the right stakeholders are in the room.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Are there any groups, organizations, sectors, or types of people that you think have been missing or not sufficiently included in SLR-related planning and activities on Humboldt Bay? Please list.

- Type your answer(s) here: \_\_\_\_\_

20. If you have any additional comments on SLR planning opportunities or challenges, please type them here: \_\_\_\_\_

### Regional Coordination Priorities & Future Actions

The following three questions ask about how you would prioritize various sea level rise (SLR) planning efforts, public outreach efforts, and regional projects and programs.

21. If you had to decide what regional SLR **planning efforts** should be implemented in the Humboldt Bay region, how would you prioritize each of the potential approaches listed below?

	Not a priority	Low priority	Medium priority	High priority	Essential priority	I don't know
Create an overarching regional SLR adaptation plan for Humboldt Bay.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop a formal management or governing structure for working regionally across jurisdictions and organizations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Complete updated SLR vulnerability assessments for all areas around Humboldt Bay.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporate equity and environmental justice considerations into SLR planning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop regulatory solutions to allow for reuse of dredge spoils for SLR adaption projects such as living shorelines.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop regulatory solutions to allow for wetland fill for the purpose of SLR adaptation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Address planning conflicts resulting from the California Coastal Commission's retained coastal development permitting authority in Local Coastal Program areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop a SLR hazard zone in which SLR impacts must be considered in all development projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: ____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. How would you prioritize the following SLR **public outreach efforts** in the Humboldt Bay region?

	Not a priority	Low priority	Medium priority	High priority	Essential priority	I don't know
Create a single regional information platform concerning the status of projects and research related to sea level rise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordinate public outreach strategies to educate residents and business owners regarding SLR impacts and planning efforts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create a public engagement process to identify community goals and actions for addressing SLR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Other: ____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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23. How would you prioritize the following sea SLR **projects and programs** in the Humboldt Bay region?

	Not a priority	Low priority	Medium priority	High priority	Essential priority	I don't know
Develop regional projects aimed at the development/enhancement of man-made physical barriers (sea walls, levees, etc.) to protect areas at risk from SLR flooding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop regional projects aimed at the development/enhancement of natural physical barriers (such as wetlands, sand dunes, living & natural shorelines) to protect areas at risk from SLR flooding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop a regional program for habitat restoration/enhancement and mitigation projects in areas vulnerable to SLR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop projects aimed at remediating contaminated sites and pollutant sources that are vulnerable to SLR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collaborate regionally to develop a plan for measured retreat and/or relocation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: ____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. The County's Feasibility Study will include an evaluation of the feasibility of multiple sea level rise (SLR) regional coordination options. Given what you know now, what is your initial support for various options for regional coordination of SLR planning?

	Strongly oppose	Somewhat oppose	Neutral	Somewhat favor	Strongly favor
No regional planning should occur, local jurisdictions should individually respond to SLR as they see fit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Engage in the sharing of information and coordinated planning with other organizations through working groups with no formal agreement or commitment (e.g., an initiative).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create a formal collaborative partnership between existing agencies and stakeholders to address sea level rise (e.g., Memorandum of Understanding, Memorandum of Agreement, Joint Powers Authority).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Empower or retool an existing regional agency (e.g., Harbor District, Humboldt County Association of Governments, Humboldt County, Humboldt County Flood Control District, etc.) to serve as a lead agency to coordinate and address regional sea level rise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Establish a new regional authority to address sea level rise and/or climate change (ex. Joint Powers Association, Special District).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use the sliding scales below to provide more thoughts on what type of structure you think would be best for effective coordination of SLR planning for the Humboldt Bay region.

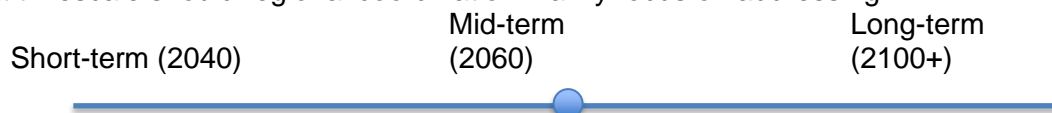
25. Where should the majority of the planning control and authority be?



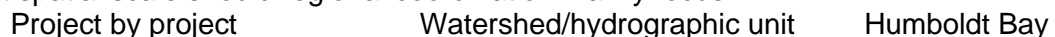
26. What level of involvement do you think your agency/organization should have in a regional SLR planning effort?



27. On what timescale should regional coordination mainly focus on addressing?



28. On what spatial scale should regional coordination mainly focus?



29. Please add any other thoughts on how to regionally coordinate SLR planning and adaptation: \_\_\_\_\_

30. How should SLR planning and adaptation (either a stand-alone project or within other projects) be funded? Indicate your level of support for the various potential funding mechanisms listed below:

	Strongly oppose	Somewhat oppose	Neutral	Somewhat favor	Strongly favor
Increase funding for SLR protection by cutting other local programs and services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilize external grant funds when available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage insurance companies to require upgrades on homes/businesses to reduce SLR risks as a condition of insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Require individuals/businesses to pay for their own SLR protection to minimize local government costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pass local tax measures to address SLR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pass state laws, programs, or bond measures with mechanisms to fund SLR work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pass federal laws or programs with mechanisms to fund SLR work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utilize public funds for SLR adaptation projects on private lands that will protect both public and private assets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Funding should not be spent on SLR planning and adaptation work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify): _____					



## Your feelings about SLR and being involved in SLR-related work

31. Please rank your level of agreement with each statement about how you feel about performing SLR-related work

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I find SLR work engaging and fulfilling.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am personally quite worried about SLR.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The technical complexity of SLR science is overwhelming.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having to address SLR in what I do means a big additional workload.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The uncertainty associated with SLR makes me uncomfortable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't know what to do to prepare for SLR, so I feel less confident in my work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am worried about how our SLR planning decisions will impact future generations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am discouraged by our lack of forward movement of SLR adaptation actions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am inspired by how much work the Humboldt Bay region has accomplished.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Demographics

32. What is your age?

- 18-34 years
- 35-44 years
- 45-64 years
- Over 64 years
- Prefer not to answer

33. What gender do you identify with?

- Female



- Male
- Genderqueer
- Non-binary
- Prefer to self-identify: \_\_\_\_\_
- Prefer not to answer

34. What is the highest level of education you have completed?

- Less than 12th grade (no high school diploma)
- High school graduate, or equivalent
- Some college, no degree
- Associate's degree
- Bachelor's degree
- Post-graduate degree (Master/PhD)
- Prefer not to answer

35. What is your race or ethnicity? (*check all that apply*)

- African American or Black
- American Indian, Alaskan Native, or Native American
- Asian or Asian American
- Caucasian, European American, or White
- Hispanic, Latino, or Spanish
- Middle Eastern or North African
- Native Hawaiian or Other Pacific islander
- Not Listed (please specify): \_\_\_\_\_
- Prefer not to answer

Thank you for your participation in this research survey!

Please press "Done" to submit your answers.

36. If you would like, please provide your email address so we can remove you from our email follow-up list. Your email will not be associated with your survey responses:

- \_\_\_\_\_

### **Additional Project Information**

For more information on Humboldt County's Humboldt Bay Sea Level Rise Regional Planning Feasibility Study please contact Sarah Wickman at [swickman@co.humboldt.ca.us](mailto:swickman@co.humboldt.ca.us) or 707-445-7541.

Click here [<http://humboldtslri.org/regional-coordination/>] for more information on the HSU research project "Social science research to help advance regional coordination and collaboration of sea level rise adaptation and planning on Humboldt Bay" or contact Kristen Orth-Gordinier at [kmo29@humboldt.edu](mailto:kmo29@humboldt.edu)

### **Funding Information**

This survey was prepared through a joint effort by the County of Humboldt Planning and Building Department - Long Range Planning staff and HSU Environmental Science & Management researchers.



Humboldt County’s Humboldt Bay Sea Level Rise Regional Planning Feasibility study is funded by California Coastal Commission grant LCP-19-01. This study is part of California Climate Investments, a statewide program that puts billions of Cap-and-Trade Dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment—particularly in disadvantaged communities. The Cap-and-Trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investments projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low-income communities, and low-income households across California. For more information, visit the California Climate Investments website at: [www.caclimateinvestments.ca.gov](http://www.caclimateinvestments.ca.gov).

HSU research project “Social science research to help advance regional coordination and collaboration of sea level rise adaptation and planning on Humboldt Bay” by Kristen Orth-Gordinier and Dr. Laurie Richmond is funded by NOAA Grant #NA18OAR4170073, California Sea Grant College Program Project #130741187, through NOAA’S National Sea Grant College Program, U.S. Dept. of Commerce.



## Appendix iii - SLR Stakeholder Interviews 2021

The Humboldt Bay Sea Level Rise Regional Planning Feasibility study is part of California Climate Investments, a statewide program that puts billions of Cap and Trade Dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment particularly in disadvantaged communities. The Cap and Trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investments projects include affordable housing, renewable energy, public transportation, zero emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low income communities, and low income households across California. For more information, visit the California Climate Investments website at: [www.caclimateinvestments.ca.gov](http://www.caclimateinvestments.ca.gov).

# SLR Stakeholder Interviews 2021

LCP Local Assistance Grant: LCP-19-01  
Task 1. Outreach  
March 2022

Orth-Gordinier, Kristen  
Richardson, Michael  
Shikany, Lisa  
Wickman, Sarah



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## Overview

The Humboldt Bay Sea Level Rise (SLR) Regional Planning Feasibility Study is an effort by Humboldt County to explore if and how regional collaboration for managing sea level rise might be implemented in the Humboldt Bay region. As a part of this effort, a Stakeholder Catalogue was created to identify asset owners, managers, and other parties that will or could be implicated in regional SLR planning. To support the creation and accuracy of this stakeholder catalogue, an outreach campaign consisting of two surveys for different target audiences and a set of stakeholder group interviews were conducted.

From July to August 2021, 18 stakeholder groups were able to participate in these interviews:

**Agricultural Property Owner** (one individual associated with the Farm Bureau)

**California Coastal Commission**

**California Fish and Wildlife**

**Caltrans**

**City of Arcata**

**City of Eureka**

**Humboldt Bay Harbor, Recreation, & Conservation District**

**Humboldt Bay Municipal Water District**

**Humboldt Community Services District**

**Humboldt County**

**Humboldt County Resource Conservation District**

**Manila Community Services District**

**NOAA**

**Peninsular Community Services District**

**PG&E**

**US Army Corps**

**US Fish and Wildlife Service/Humboldt Bay National Wildlife Refuge staff**

**Wiyot Tribe**

## Interview Script

“Hello, thank you for meeting with us. We really appreciate you taking the time out of your busy day to meet with us.”

(Interviewer Introductions)

“Our main goals for these stakeholder interviews are to:

1. Confirm stakeholder description
2. Identify a threshold for which you will no longer be able to provide services or conditions would degrade critical assets due to sea level rise impacts
3. Find ways to increase feasibility and effectiveness of regional sea level rise planning, and of adaptation projects protecting assets;
4. Explore ways collaboration might help with sea level rise planning and adaptation; and
5. Identify desired outcomes for regional sea level rise planning, adaptation, and management in the Humboldt Bay region.

Do you have any questions or concerns before we proceed?

Are you comfortable with us recording this?”



## Interview Questions

### **1. Confirm Stakeholder Description**

*You were sent a general description the County has created for STAKEHOLDER GROUP in regard to sea level rise. Could you identify any major improvements or additions you would like to discuss?*

*Aside from the assets and concerns we have described, what other responsibilities and concerns does your department in the STAKEHOLDER GROUP have in Humboldt Bay?*

### **2. Planning Process**

*Does the planning process section describe the projects your department in the STAKEHOLDER GROUP have completed and is working on to address SLR?*

*Are there any other steps your department in the STAKEHOLDER GROUP has already taken to address sea level rise that aren't included in the Inventory?*

### **3. Identify the assets most at significant risk from sea level rise impacts.**

*Can you identify your most significant assets that would be subject to multiple jurisdictions and would benefit from regional planning?*

*In regard to your significant assets, what adaptation measures would most benefit from a regional approach?*

### **4. Identify what conditions would make continued asset use infeasible.**

*Could you identify a threshold for which you will no longer be able to provide services such as wastewater treatment due to sea level rise impacts?*

*Could you identify a threshold for which conditions would degrade critical assets due to sea level rise impacts?*

**5. Identify desired outcomes for regional sea level rise adaptation and management.**

*Do you have any thoughts on what desired outcomes might be for a regional effort to address sea level rise?*

*Are there projects or programs your department in the STAKEHOLDER GROUP would like to see implemented regionally?*

**6. Identify factors that would increase feasibility and effectiveness of regional adaptation projects.**

*Do you feel there are components lacking (such as financial support or governmental guidance) that hinder feasibility, implementation, and effectiveness of those projects?*

*When there are multiple jurisdictions involved, what ways can the County and others increase feasibility and effectiveness of sea level rise adaptation projects?*

**7. Identify ways collaborative efforts could be advanced.**

*Do you have any thoughts on what might be done to streamline design and permitting for SLR adaptation projects?*

*Does your department in the STAKEHOLDER GROUP implement any projects that involve both the public and private entities such as landowners and coastal businesses in regard to sea level rise?*

*o(If yes) In thinking about SLR planning and adaptation implementation, what are the most important considerations to ensure success of these projects in terms of coordination and collaboration between the public and private stakeholders?*

*How can local agencies better collaborate with state or federal agencies to address sea level rise impacts on assets?*

*o (or vice versa depending on agency)*

*Who would you like to see collaborate with your department in STAKEHOLDER GROUP or would like to collaborate more with?*

## Analysis

For every interview, one to two interviewers were assigned the task of note taking for answers. These notes were transcribed into a single running document and shared among interviewers to collect note additions and edits. In addition, all interviews were recorded and used to ensure the accuracy of interview notes. A simplified category system for answers, referred to as “shared themes” within the Stakeholder Catalogue, were created from the notes and turned into a coding system. Interview recordings were reviewed to identify all coded responses in order to quantify prevalence of shared themes among all stakeholders.

There were 24 code categories identified from notes:

- Shared Funding Coordination**
- Regional Coordination in General**
- Increased Landowner Participation**
- Diked Former Tidelands**
- Restoration and Mitigation**
- Permitting**
- Communication between Stakeholders**
- Shoreline**
- Personnel Constraints**
- Transportation Infrastructure**
- Dedicated Time Constraints**
- Wastewater Concerns**
- Interest in County Lead Effort**
- Dredged Material**
- Additional Governmental Guidance**
- Regional Prioritization of projects**
- Relocation Coordination**
- Fishing Coordination**
- Include more NGOs**
- Utilities Concerns**
- Recreational Coordination**
- Safety and hazard mitigation**
- Continue with existing stakeholder group**
- Phased adaptation strategies**

A detailed description of these code categories is included within the Stakeholder Catalogue on page 12. However, two of these code categories were only identified by one stakeholder and so were excluded from the Stakeholder Catalogue: **Continue with Existing Stakeholder Groups** and **Phased Adaptation Strategies**. As these responses were not options explicitly offered in the questions, there might be more support for these strategies and themes than the interview data would suggest. It is also important to note that these identified themes seek to provide general guidance in future planning and collaboration efforts and do not necessarily represent the official view of the agency/organization for which the stakeholder interviewees work. Results for coded themes presence or absence within interviews are reported in the table on the next page.

## Results

Table 1. Shared Interview Themes for all eighteen stakeholder groups reported by presence (indicated by a 1) or absence (indicated by blank space) of coded theme within interview.

Shared Interview Themes	Wiyot Tribe	City of Arcata	City of Eureka	Humboldt County	Caltrans	Harbor District	HBMW/D	HCSD	MCS/D	PCSD	PG&E	HCRC/D	USFWS	California Fish and Wildlife	California Coastal Commission	NOAA	Army Corps	Private Property Owner	Total	Percent of stakeholder groups that shared theme
Shared Funding Coordination	1	1		1	1	1	1	1	1	1	1	1	1		1	1	1	1	16	94%
Regional Coordination in General	1	1	1	1		1	1		1	1	1	1		1	1	1		1	14	82%
Landowner Participation				1	1	1	1				1	1	1	1	1	1	1		11	65%
Diked Former Tidelands			1	1			1					1	1	1	1	1	1	1	10	59%
Restoration and Mitigation	1				1					1		1	1	1	1	1	1	1	10	59%
Permitting		1	1			1	1					1	1	1		1	1	1	10	59%
Communication between Stakeholders	1	1		1	1		1	1	1		1		1				1		10	59%
Shoreline			1	1						1			1	1	1	1	1		8	47%
Personnel Constraints			1			1			1		1	1		1	1		1		8	47%
Transportation Infrastructure	1		1	1				1		1					1	1			7	41%
Dedicated Time Constraints			1						1		1	1		1	1		1		7	41%

<b>Wastewater Concerns</b>		1	1					1	1	1						1			6	35%
<b>Interest in County Lead Effort</b>	1	1			1				1		1							1	6	35%
<b>Dredged Material</b>			1			1						1		1				1	5	29%
<b>Additional Governmental Guidance</b>			1	1				1				1		1					5	29%
<b>Regional Prioritization of Projects</b>	1	1				1					1							1	5	29%
<b>Relocation Coordination</b>				1						1						1	1		4	24%
<b>Fishing Coordination</b>	1									1								1	3	18%
<b>Include more NGOs</b>	1				1													1	3	18%
<b>Utilities Concerns</b>											1					1	1		3	18%
<b>Recreational Coordination</b>										1								1	2	12%
<b>Safety and Hazard Mitigation</b>	1								1										2	12%
<b>Continue with existing stakeholder group</b>					1														1	6%
<b>Phased adaptation strategies</b>																1			1	6%