

2014


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Yusuf, Juita-Elena (Wie); St. John, Burton III; and Ash, Ivan K., "The Role of Politics and Proximity in Sea Level Rise Policy Salience: A Study of Virginia Legislators' Perceptions" (2014). *School of Public Service Faculty Publications*. 7.
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The Role of Politics and Proximity in Sea Level Rise Policy Salience: A Study of Virginia Legislators' Perceptions

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Citation: Yusuf, J., B. Saint John and I. K. Ash. 2014. The Role of Politics and Proximity in Sea Level Rise Policy Salience: A Study of Virginia Legislators' Perceptions. *Journal of Environmental Studies and Sciences*. 4(3): 208-217.

Abstract

The acceleration of sea level rise (SLR) has become a threat to the stability of nation-states worldwide, and associated with risks to environmental sustainability, economic infrastructure, and public health. However, from both an international and U.S. perspective, there is a lack of research examining legislative decision makers' perceptions about policies regarding SLR. This study addresses that gap by examining how politics and proximity affects Virginia state legislators' perceptions of the saliency of SLR. A survey of these legislators reveals their perceptions of credible sources of information, SLR-related risk, and who should take the lead to address SLR. While this study confirms other research about the effects of political party, it finds that proximity to coastal areas also greatly influences the perceived saliency of SLR. The findings from this research project enhance our understanding of the challenges inherent in addressing sea-level rise at the state level. Finally, this study points to implications for agenda setting and suggests areas of further study regarding SLR policy at the state and local government levels.

Keywords: Sea level rise, climate change, state policy, political ideology, geopolitics

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Introduction

The acceleration of sea level rise (SLR) – spurred by changes in global climate – has become a threat to the stability of nation-states around the world. The increased global risk of flooding due to SLR has been acknowledged by reports from the Organization for Economic Cooperation and Development (Nicholls et al. 2007) and the Intergovernmental Panel on Climate Change (2007, 2013). In the U.S., recent governmental reports indicate that low-lying coastal areas are vulnerable to flooding due to SLR; several states along the eastern seaboard, ranging from Maine to Florida, are at risk.

These states are vulnerable to extensive public and private asset damage due to accelerated SLR. In the U.S., individual states have played a prominent role in addressing environmental issues such as climate change and SLR (Selin and VanDeveer 2007; Wheeler 2008). However, no research has been done to determine how state legislators view the saliency of SLR as a policy issue. Accordingly, this study examines the factors that affect policymakers' perceptions of SLR at the state level. Our unique study addresses this research question: how do politics and proximity affect state-level policymakers' perceptions of the salience of SLR as a policy issue? Using data from a survey of Virginia legislators we analyze who legislators see as credible sources of information concerning SLR, what risks they perceive to be associated with SLR, and who they perceive should take the lead to address SLR.

Climate change and sea level rise

Climate change has become an important concern for supranational, national, and subnational governments worldwide. Sea level rise is a component of climate change that has seen significant growth in awareness and concern. Globally, the IPCC 2007 and 2013 reports pointed to coastal areas as the most vulnerable to climate change-induced effects on sea levels. Furthermore, “the risks associated with SLR will disproportionately affect low-lying areas, including many developing countries, as well as highly-populated areas” (Poulter et al. 2009). In the U.S., SLR has become increasingly associated with climate change, particularly in response to recent events such as record rain fall and more severe hurricanes and Nor’easters.

SLR can cause increased beach erosion, loss of agricultural and cultural resources, and potential inundation of coastal land that could result in displacement of millions of residents. A rise of one-meter would affect 1.1 million km² of coastal area involving 108 million people; a five meter rise would affect 2.0 million km² and put 431 million people at risk (Rowley et al. 2007). SLR also exacerbates the effects of hurricanes and storms, resulting in more severe storm surge and flooding. Other serious risks include changes in groundwater salinity; increased probabilities of the spread of infections and disease; reduction in agricultural productivity; and severe strain on the aging wastewater and other public infrastructure systems (Binder 2011; Selman and Daigle 2011).

The saliency of sea level rise policies at the subnational, state level and in Virginia

It is important to understand SLR policy salience at the state level. While individual action is important in reducing the human impact on the environment, governments are the actors that can exact the most change through the implementation of environmentally-conscious

policies. In the arena of climate change-related policies, states are often “policy innovators” (Posner 2010), displaying a “policy entrepreneurship” (Rabe 2004) that is evident in the willingness of state officials to work with industry and environmental groups. States have initiated such climate policy measures as mandating how much electricity should come from renewable resources, installing carbon cap-and-trade laws, and mandating that industry disclose carbon emissions (Rabe 2010). Therefore, understanding policymakers’ perceptions of the salience of climate change and SLR is an important factor in determining the political capacity to respond to these issues.

In the U.S., various studies have examined public perceptions of climate change and SLR (Brody et al. 2008; Brody et al. 2010; McCright and Dunlap 2011; Dunlap et al. 2001; Hamilton 2011; Zia and Todd 2010). However, policy studies on climate change have been sparse; (Rabe 2010) pointed out that, from 1998-2009, the top-ranked, English language public management journals produced “only a pair of articles on the application of management theory to the challenge of climate change.” Not surprisingly, both from an international and U.S perspective, there is a lack of research specifically examining the perceptions of legislative decision makers at any level of government regarding SLR. The one exception is a Swedish study (Sundblad et al. 2009) that found that politicians had significantly more accurate knowledge about climate change and were more confident in their knowledge of SLR compared to laypersons. However, that study did not address these officials’ awareness or perceptions with an eye toward discerning the potential policy leanings of the legislators. In the U.S., Brody et al. (2012) studied Florida state and local officials’ perceptions regarding climate change, mitigation, and adaptation but did not include that state’s legislators. Moser (2005) focused on state-level policy and management

responses to SLR in three American states (Maine, North Carolina, South Carolina) – but her interviewees also did not include legislators.

In sum, there have been few studies to date that involve legislators and legislative decision making regarding SLR. Our work addresses that gap by focusing on state legislators and their perceptions of risks associated with SLR. This focus at the state level is appropriate as, in the U.S., individual states have the authority to decide how to handle climate change issues such as SLR (Selin and VanDeveer 2007; Wheeler 2008). While some vulnerable local governments have taken action to address SLR, most localities require participation from their respective states to implement policies. Localities are often constrained by state-level policies and regulations, and lack the autonomy to respond to SLR. Furthermore, localities often rely on their states for funding to implement SLR adaptation strategies. Thus, the prominent role of states makes state-level policymakers an important population to study with regards to their knowledge of, and concern for, SLR.

As suggested by Brody et al. (2010), little is known about how subnational governments approach the issue of policies regarding climate change and SLR. At the state level, the absence of legislative items suggests that there has been little action. What little action that has taken place appears to minimize concern over SLR. Poulter et al. (2009) noted that, in North Carolina, a state highly vulnerable to SLR, “while researchers and coastal managers have been promoting awareness of the potential effects of SLR on North Carolina since the mid-1970s, few policies have been implemented to reduce SLR-related impact.” More recently, in 2011, the North Carolina legislature passed legislation dictating how SLR can be measured and determined (S.L. 2012-202, General Assembly of North Carolina, 2011). Specifically, the North Carolina statute stipulates that projected rates of SLR must be linearly extrapolated from historical data, making

it unlawful for North Carolina's Department of Coastal Management to use current predictive models that acknowledge accelerating SLR. In Virginia, only one bill concerning SLR passed the 2012 legislative session. Even then, the bill (Virginia House Joint Resolution 50) restricted action to studying how efforts to prevent "recurrent flooding" were handled in other states.

To address the lack of available information about subnational SLR policymaking, our study is focused on how Virginia legislators perceive SLR information sources, levels of SLR-related risk, policy leadership roles, and how these factors point to implications for SLR policymaking. Although this particular line of research has been overlooked in the extant literature, it is important to examine the saliency of SLR specifically to state legislators for numerous reasons. First, state and local officials normally place mitigation of environmental issues *below the mid-range of their concerns* (Brody et al. 2012). Second, *governments are the actors that can exact the most change* through the implementation of policies. This makes it important to gauge policymakers' perceptions of a climate change dynamic like SLR since they determine the "political capacity to respond to climate change" (Stedman 2004). Third, as suggested by Brody et al. (2010) *little is known about how subnational governments approach the issue* of climate change policies. Fourth, *the absence of legislative proposals and policy enactment* further amplifies this question of how salient SLR is to state legislators.

Drivers of policymakers' perception of sea level rise – politics and proximity

Both in the U.S. and internationally, scholars have studied how ideology and the politicization of science have informed the perspectives of policymakers and their constituents about climate change (Hamilton 2011; McCright and Dunlap 2010; Pellizzoni 2011). However, the drivers that can influence policymakers' perspectives are more complicated. Indeed, how

policymakers choose to react to climate change is affected by culture, values, beliefs, international relations, economic factors, and contentious politics among elite actors (Rootes et al. 2012; Stedman 2004; Takahashi and Meisner 2011).

Researchers have offered a number of potential drivers of policymakers' perspectives on SLR, including political ideology (Bender 2011; Grundmann 2007; Hindman 2009), interest group influence (Cook 2010; Selin and VanDeveer 2007), news framing (Foust and Murphy 2009), and the effects of past information-seeking (Kahlor and Rosenthal 2009). Many of these are interrelated. Consider how key issues of politics and proximity are revealed in the information sources available to state legislators. Moser, in referring to the work of Steel et al. (2001) on the role of scientists in the environmental policy process, noted that "To the technical community (or communities), credibility means that the information is 'true' or at least better than competing information and that it was derived via standard scientific methods and procedures." However, policy decision makers who lack technical knowledge or expertise "use 'proxies' to assess 'truth' – such as assurances about the scientific method, the source of information, or past performance, credentials and expertise of assessors" (Moser 2006). One can reasonably assume that most legislators have neither technical knowledge of the scientific intricacies of SLR nor direct access to understandable information from scientists. So, to carry the observation further, this suggests that legislators would tend to rely on two, readily-available, non-technical sources of information: the news media, and ostensibly-independent sources (scientists, think tanks) that are actually sponsored by vested interests (political parties, corporations, nonprofits, etc.) who attempt to emphasize certain aspects of science (Rampton and Stauber 2001). Therefore, we hypothesize that news media outlets and scientists will be seen by Virginia legislators as more credible than other sources (e.g., non-governmental organizations,

professional associations, etc.) Accordingly, as Garvin (2001) noted, information and knowledge that drive decision making regarding climate change (and SLR) is contextual, instrumental, and highly political.

Other factors also inform policymakers' perspectives on SLR. For example, Policymakers must consider the mission of the organization (Brody et al. 2010). While the mission for a state legislature is not always clear cut, the broader drivers of legislative action in a democratic context are constituent-driven. However, constituency concerns regarding climate change are complicated by the "classic rivalry between economic and environmental interests" (Brunner 2008). Business or economic imperatives are often more tangible and immediate than environmental concerns; policymakers often exhibit a strong focus on the benefits of development (Abel et al. 2011). Legislators factor in the often readily-apparent benefits of economic policies (e.g., new development creates employment) as opposed to the long-term benefits of environmental policies (e.g., restoring wetlands may protect coastal areas from downstream flooding). Consequently, economic interests can often trump environmental interests; moreover, there is a reluctance to pass environmental legislation that may interfere with business (Bender 2011; Keeler 2007). Further complicating the picture, the policymaking arena in the U.S. (like several other countries) tends to overemphasize whole-nation adaptation thinking about climate change effects like SLR, rather than encourage local adaptation policymaking (Heazle et al. 2013). Therefore, we hypothesize that economic risks of sea level rise, may be more salient to policymakers than environmental risks.

The arena of environmental science has also become intensely political, as different interest groups rely on different sources of knowledge to support their particular goals (Grundmann 2007). Hart and Victor (1993) argued that political factors have played an

important role in deciding climate change's relevance as a policy and research area. Even at the supranational level, Hulme and Mahoney (2010) suggested that the emergence of the IPCC was itself a political act. While studies examining the politicization of environmental policy have mainly been undertaken at the national or international level (e.g., Aitken 2012; Fielding et al. 2012; Swyngedouw 2010), our study is interested in describing how this tendency also appears at the state level.

In the American context, politics plays an important role in environmental policies and particularly climate policies. Republicans and conservatives are generally opposed to environmentalism, skeptical of climate change, and tend to be against climate change policies (Grundmann 2007; Jacques et al. 2008). Studies of legislative decisions regarding U.S. environmental policy have shown that, since the 1970s, Republicans tend to be less pro-environment than Democrats (Dunlap et al. 2001; Dunlap and Allen 1976; Kamieniecki 1995). In fact, "it is not an exaggeration to say that the Democrats have become the 'environmental party,' and the Republicans the 'anti-environmental party'" (Dunlap et al. 2001). This fracture is not surprising, as the stance of the Republican Party – pro-business, limited government, and caution about social change – makes it logical for Republicans to be less supportive of policies in favor of environmental protection.

Dunlap and McCright (2008) noted that "Nowhere is the partisan gap ... more apparent than on climate change." They point to a movement by the conservatives in the 1990s to challenge both climate science and climate policy as a driving force for this polarization. This divide along political party lines and ideologies also exists concerning SLR. Many Republican leaders are skeptical of climate change and SLR, and the debate often follows the traditional model of pitching the economy against the environment. Therefore, we hypothesize that at the

state level, Republican legislators would view SLR as less salient than would their Democratic counterparts.

Finally, proximity to the impact and consequences of SLR is an important driver. In an examination of public support for interventionist climate change policies, Zahran et al. (2006) tested whether physical vulnerability to climate change is related to support for policy. They explored how proximity to a coastline would influence support for climate policies. While they found that proximity matters, those living near the coastline and at negative elevation relative to the coast were less likely to support government policies to address climate change. However, a subsequent study of perceptions of climate change conducted by Brody et al. (2008), found that individuals consider themselves at risk of climate change when the threat or sense of vulnerability is most overt. Their work suggested that residents' perceptions of risk would be higher for those living closer to the coastline, at lower elevation, in areas at high risk of SLR, and within the 100-year floodplain. In another study, researchers surveyed representatives of local, regional, and state agencies (e.g., planning, public health, economic development, etc.) that might be involved in addressing climate change and SLR (Brody et al. 2010). They found that levels of concern regarding mitigation were substantially higher for those in coastal regions. Informed by these studies, we hypothesize that legislators will perceive SLR as a more salient policy issue if they represent constituencies living in geographic areas closer to the coastline and/or below sea level, which are more susceptible and vulnerable to the effects of SLR such as flooding.

Flooding from sea level rise and associated storm surge is an increasingly critical issue along the eastern seaboard of the U.S., especially in states like Virginia and North Carolina. Various studies have examined SLR in American states, focusing on California, Florida, Hawaii,

Maine, and North Carolina (Brody et al. 2008; Poulter et al. 2009; Moser and Tribbia 2006; Moser 2006, 2005), but none have examined how state legislators see the saliency of SLR to their state, nor how Virginia legislators perceive the policy relevance of SLR, which is the focus of this study.

This omission is surprising, as Virginia is particularly well-suited for this study of the saliency of SLR. High-profile reports (Governor's Commission on Climate Change 2008; National Oceanic and Atmospheric Administration 2012) identify Virginia's coastline as particularly vulnerable to extensive asset damage due to accelerated SLR. In Virginia, two metropolitan areas are considered vulnerable to flooding and SLR: Northern Virginia (part of the Washington D.C. metropolitan area) and the Hampton Roads region (located in the southeastern part of the state). In all, the potential threats across coastal Virginia include risks to regional transportation and other public infrastructure, ports and logistics, government and military operations, tourism, wetlands, and coastal ecosystems (Pyke et al. 2008; Wu et al. 2009).

To summarize, researchers have proposed likely drivers of legislators' perspectives concerning environmental policy, many of which relate to issues of politics and proximity. However, research is lacking that explicitly examines legislators' views about the information they receive on SLR, the potential risks of SLR, and who should assume policy leadership in addressing SLR. This study addresses that gap in the literature by examining Virginia state legislators' awareness of and concern for sea level rise. Virginia is a coastal state, and SLR poses a considerable threat to millions of Virginia residents, making it an issue that would appear to be salient to state policymakers, particularly those who represent coastal populations.

Methodology

Our analysis of policymakers' perceptions regarding SLR utilizes a web-based survey of state-level legislators in Virginia. We emphasize state legislators because in the subnational context state policies must be adopted by the state legislature in the form of legal statutes. Once these statutes are passed by members of the legislature, the policy becomes law. Also, in the U.S., local governments (e.g., municipalities) are defined as creatures of the state and therefore cannot make policy or take action regarding SLR without authorization from the state in the form of legislation or policies that enable local government responses. Therefore, state-level policymakers (i.e. state legislators) make decisions regarding SLR that not only affect the state but the localities as well.

We focus our analysis on one state, Virginia, which is a typical state affected by SLR. This state has an extensive coastline that is at risk for SLR effects, significant public and private assets that are vulnerable, and economic activity that can be disrupted by flooding or other consequences of SLR. The focus on only one state allows us to control for external factors that may vary across states and affect how legislators perceive SLR as a policy issue.

Our survey population consisted of all 140 elected members of the Virginia General Assembly (the legislative decision making body for the state). Like most U.S. states, Virginia has a bicameral legislature; the General Assembly comprises a House of Delegates and a Senate. Four web links were created to distinguish different groups of legislators based on party and geography: coastal Republicans, coastal Democrats, non-coastal Republicans, and non-coastal Democrats.¹

¹ Legislators were categorized as representing coastal districts if their constituent districts were located east of Interstate-95 (a north-state highway that, on average, is about 60 miles from Virginia's coastlines). Legislators were also asked to characterize their district as coastal or non-coastal. There was a 75% overlap in the I-95 and

Legislators were sent email invitations with a link to the web survey (see Appendix). Within 10 days of the initial email invitation, an email reminder/thank you was sent, followed by reminder telephone calls. A hard copy of the survey was also mailed to the legislators' local district offices, followed by a final email reminder. These efforts resulted in 36 completed surveys (10 each from non-coastal Republicans and Democrats and 8 each from coastal Republicans and Democrats), a 26% response rate. Respondents reflected 26% of the population of the House of Delegates and 25% of the Senate.²

Results and findings

Our results point to significant findings in three key areas: sources of information regarding SLR, risks of SLR, and policy leadership to address SLR. These three areas will be discussed next and examined with respect to the roles of politics and proximity.

Sources of information

We asked state legislators to indicate the extent to which they perceived different sources of information as being credible. Legislators rated scientists as the most credible source of information, followed by federal and state agencies. Legislators rated their constituents as having somewhat lower credibility. They perceived their political party leadership to be the least credible.

legislators' self-categorizations. Accordingly, I-95 is used as a basis for determining coastal versus non-coastal legislators.

² The response rate of 26% may raise concerns regarding non-response bias. However, this study's adequate representation from coastal and non-coastal districts, and from both the House of Delegates and the Senate, suggests minimal response bias.

We also investigated the relationship of legislators' party affiliation and coastal region to their perception of the credibility of nine different SLR information sources. We conducted a 2 (Democrat vs. Republican) X 2 (Coastal vs. Non-coastal) X 9 (Source of Information) split-plot multivariate analysis of variance (MANOVA) on mean credibility ratings. Results reveal main effects of political party, $F(1, 28)=13.21, p<.001, \eta^2=.321$, and source of information, $F(8, 21)=15.03, p<.001, \eta^2=.851$. These relationships were subsumed within a significant Party X Source interaction, $F(8, 21)=3.84, p=.010, \eta^2=.570$ (see Figure 1).

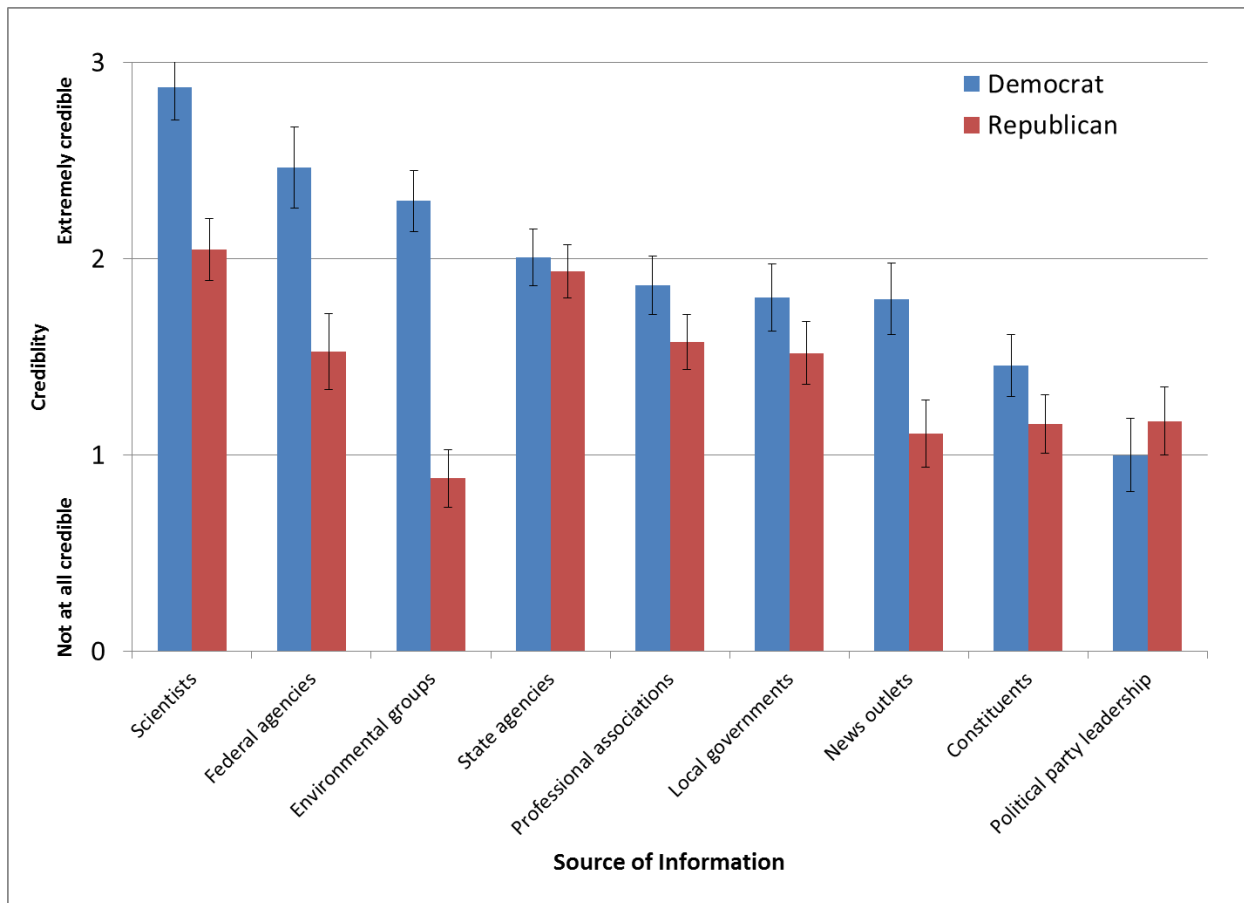


Figure 1. Mean credibility ratings for sources of SLR information as a function of political party.

Democratic legislators perceived news outlets [$t(34)=2.87, p<.01$], federal agencies [$t(34)=3.57, p<.001$], scientists [$t(32)=3.79, p<.001$], and environmental groups [$t(34)=6.02, p<.001$] as more credible, while Republican legislators assessed these sources as less credible. No significant differences were found between party members for other sources of information.

Perceptions of risk

SLR policy salience also hinges on legislators' perceptions of the consequences or risks of sea level rise. We asked state legislators to indicate the likelihood that effects of SLR will be felt in Virginia over the next several decades. Damages to private and public property were perceived to be the most likely risks of SLR, followed by increases in insurance premiums (see Table 1). Environmental risks were rated as a middle-level risk. In contrast, abandoning parts of coastal communities and disruptions to economic activity associated with commercial ports and military installations were considered to be the least likely consequences of SLR.

In order to follow up the difference between potential effects of sea level rise we conducted a series of post-hoc analysis using a Scheffé correction ($F_{\text{Scheffé}}=25.33$). Results of these analyses revealed two tiers of SLR effects that were significantly different, $F(1, 35)=37.93$. That is, legislators, across parties, rated the items on temporary and permanent damage to private and public property, disruption of transportation, increased insurance premiums, more frequent coastal flooding, increased storm surges, and beach erosion as more likely than the other SLR risks.

Table 1. Likelihood of Consequences/Risks of SLR

SLR Risks	Average Rating
General Risks	
More frequent flooding in coastal regions	3.11
Increased storm surge	2.97
Property Damage	
Temporary damage to private property	3.31
Temporary damage to public property	3.25
Permanent loss of private property	3.03
Permanent loss of public property	2.97
Economic Disruptions	
Increase in insurance premiums	3.23
Disruption of transportation	2.94
Relocation of businesses	2.83
Disruption of tourism	2.80
Loss of viable agricultural land	2.66
Disruption of military installations	2.59
Disruption of commercial ports	2.58
Environmental Risks	
Beach erosion	3.19
Contamination of freshwater sources	2.80
Abandoning parts of communities	2.59

**Rating scale is from 1 (not at all likely) to 4 (very likely)

In order to investigate the relationships of political party affiliation and coastal region to legislators' opinions of the likely impacts of sea level rise, we conducted a 2 (Democrat vs. Republican) X 2 (Coastal vs. Non-coastal) X 16 (Sea level rise impact) split-plot MANOVA on mean likelihood ratings. Results revealed a main effect of political party, $F(1, 27)=9.67, p<.01, \eta^2=.264$, and a main effect of sea level rise impact $F(15, 13)=2.67, p=.041, \eta^2=.755$ (see Figure 2). Across the possible impacts of sea level rise polled for in this sample, Democratic legislators rated potential effects as more likely than Republican legislators (Democrat $M=3.24, Se=.111$, Republican $M=2.65, Se=.131$).

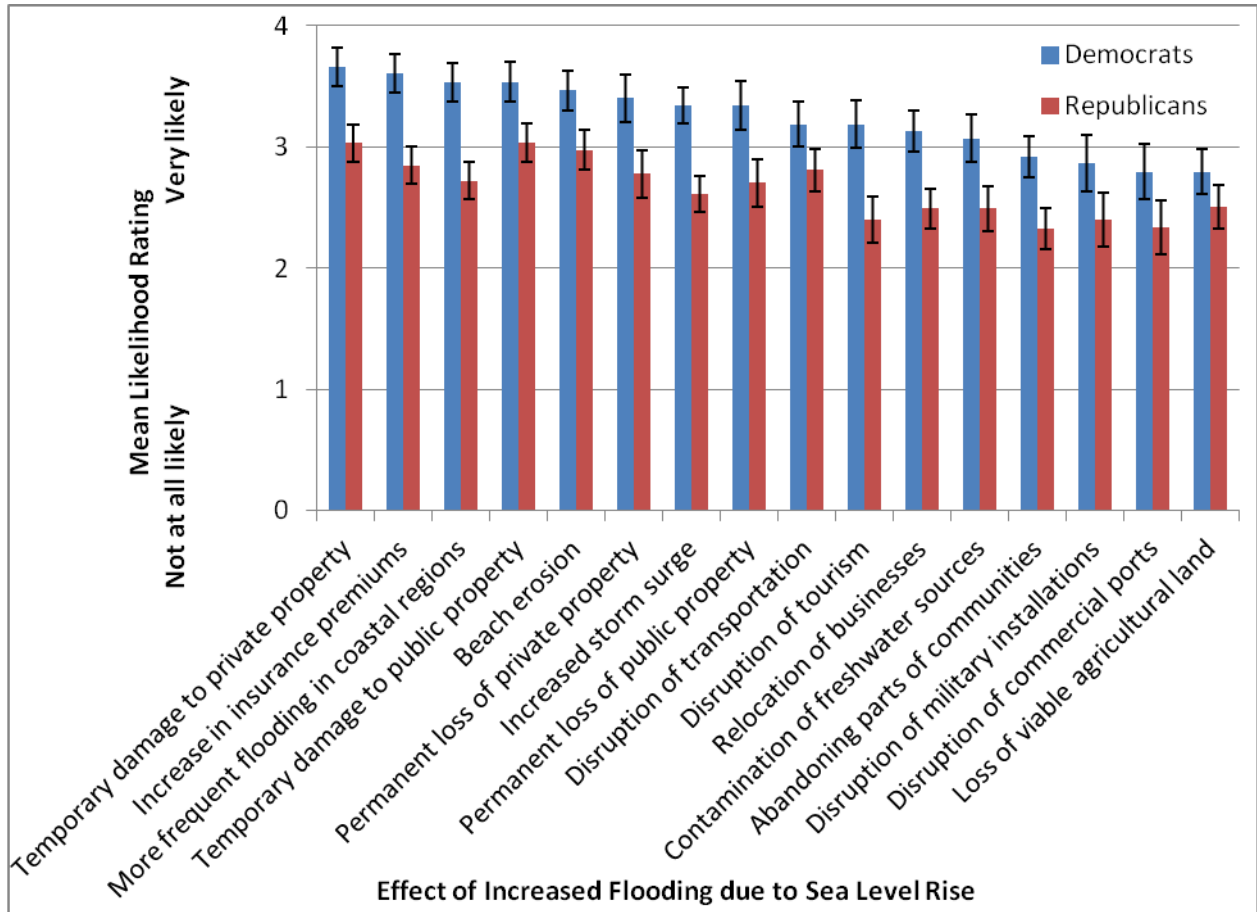


Figure 2: Mean likelihood rating of possible SLR impact as a function of political party.

Policy leadership

Finally, we asked legislators to indicate who they believed should take the lead in addressing SLR. Legislators were offered 10 possible choices and asked to select their top three. The overall results indicate that state legislators perceive that all levels of government (federal, state and local) should lead policy efforts. The top response (by almost 70% of respondents) was the federal government, followed by state agencies, local governments, the state Governor, the state General Assembly, and regional planning organizations (see Table 2).

Table 2. Top Three Choices for SLR Policy Leadership

Organization/Actor	%
Federal Government	69.4%
State Agencies	38.9%
Local Governments	36.1%
Governor	36.1%
General Assembly	30.6%
Regional Planning Organizations	30.6%
Affected Residents	11.1%
Affected Businesses	8.3%
Real estate Developers	5.6%
Non-governmental Organizations	0%

**Percent indicating should take the lead

We further investigated whether there were differences in who state legislators believed should assume policy leadership. Figures 3 and 4 display the percent of legislators who chose each option as one of their top three, by political party and proximity (coastal vs. noncoastal).

When examined by political party, Democratic legislators were more likely to rank the federal government as responsible for taking the lead in addressing flooding due to sea level rise [$\chi^2(1, N=36)=6.45, p<.05$] and Republican legislators were more likely to rank state agencies as responsible for policy leadership [$\chi^2(1, N=36)=7.48, p<.01$]. The differences between parties on local governments and regional planning organizations followed a similar pattern, but these differences did not reach the traditional statistical significance level. Legislators from both parties noted a role for sub-state actors; Democrats leaned towards local governments playing a leadership role, while Republicans perceived that regional planning organizations should take the lead in addressing SLR.

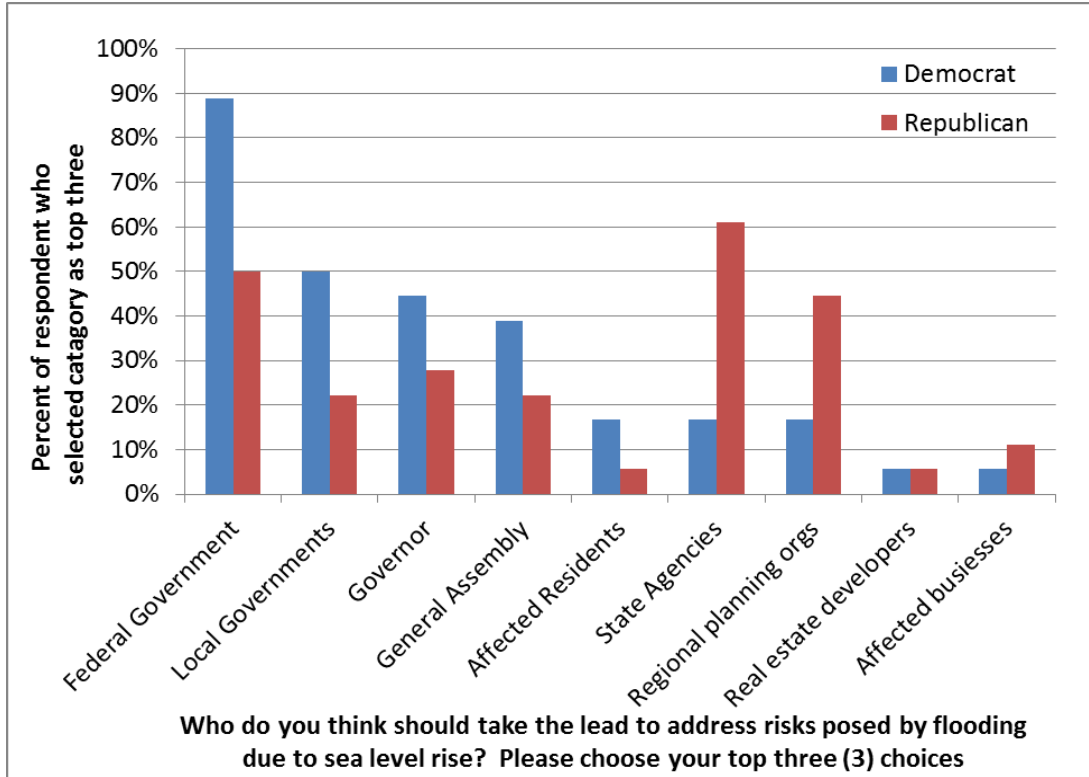


Figure 3: Percent of legislators ranking each agency as responsible for taking the lead on dealing with flooding due to SLR as a function of political party.

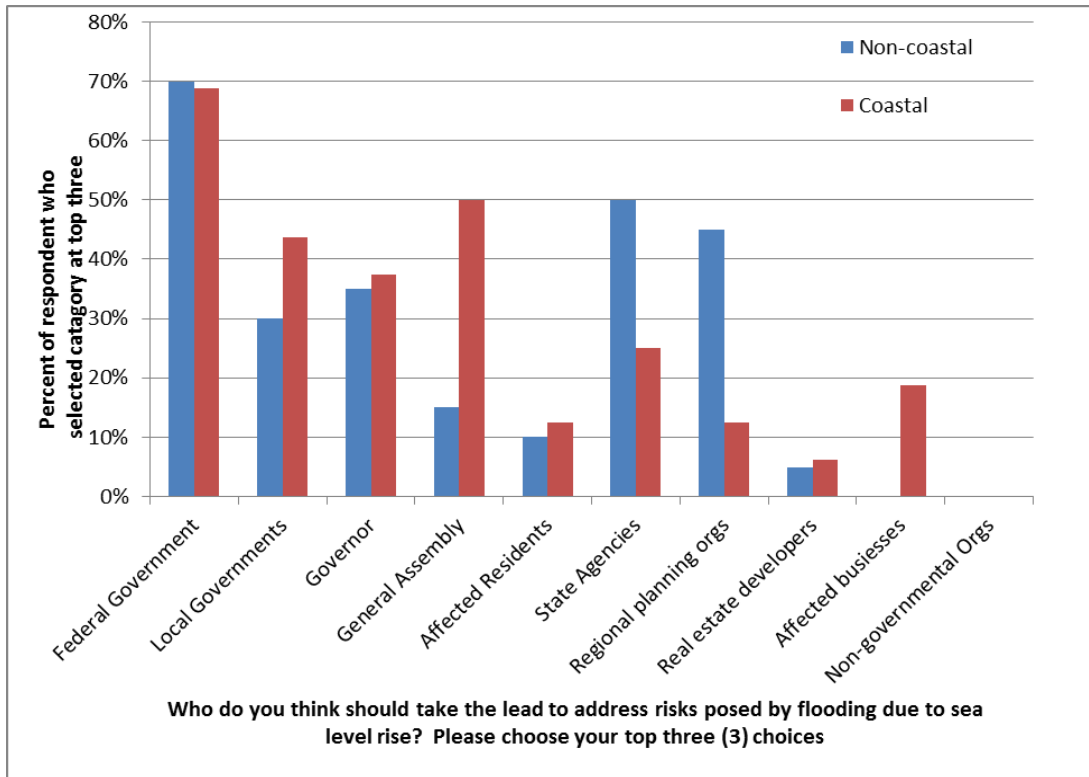


Figure 4: Percent of legislators ranking each agency as responsible for taking the lead on dealing with flooding due to SLR as a function of region.

When examined by proximity to the risk and consequences of SLR, coastal representatives were more likely to choose the General Assembly [$\chi^2(1, N=36)=5.13, p<.05$] and affected businesses [$\chi^2(1, N=36)=4.09, p<.05$] than their non-coastal counterparts. Non-coastal legislators were more likely to choose regional planning organizations [$\chi^2(1, N=36)=4.25, p<.05$]. Additionally, both coastal and non-coastal legislators showed a propensity for the federal government to take the lead.

Summary of findings

In general, our findings point to Democratic legislators having a more expansive view of sea level rise. First, Democrats, compared to Republicans, indicated they find numerous information sources more credible (e.g., news outlets, federal government, scientists, and environmental sources). Second, Democrats saw SLR as posing more risks – they found all proposed consequences of flooding due to SLR to be more likely. Finally, Democratic legislators indicated they see a need for national leadership regarding SLR, voicing that the federal government should be a key player in addressing SLR. At the same time they also noted the need for a leadership role by the state (through the Governor and the General Assembly) and the local governments that are directly affected by SLR.

Republican members of the Virginia General Assembly were more guarded in their assessments of credible sources of SLR information, viewing the different sources of information as being less credible compared to their Democratic counterparts. While they indicated that temporary damage to private and public property were the most significant concerns, they also perceived that all the proposed consequences of flooding due to SLR were less likely. They differed significantly from the Democratic members in who should take the lead in addressing

SLR, favoring state agencies and regional planning organizations over the federal government, the Governor, the General Assembly, and local governments.

However, there are some modifications to these observations when it comes to the question of who should take the lead, and it has less to do with political party and more to do with proximity to SLR and with a perception of available resources. Coastal legislators believed that a mixture of both the General Assembly and local affected businesses should take primary responsibility for addressing flooding due to SLR. This aligns with the concept that those most vulnerable who also have resources (e.g. businesses) should take a leadership role, but do so in concert with the guidance and assistance of the state. In contrast, non-coastal legislators tended to favor regional planning commissions as the leadership entity. This reflects a more deliberate approach for areas that are not directly in the path of increased flooding, yet would need to call on regional resources to assist in planning for possible other effects of flooding (transportation concerns, temporary damage to other state infrastructure, etc.).

Conclusion and implications

This study examined how state legislators perceived the salience of SLR as a policy issue, filling a notable gap in the extant literature which has focused almost exclusively on the general public and non-legislative government officials. Specifically, this study provides previously undocumented insights into how public policy considerations about SLR are understood at the subnational, state level with particular emphasis on how politics and proximity shape legislators' perceptions of SLR policy salience. Despite widespread recognition that SLR is a problem to be addressed on a large scale, this study shows that a significant portion of Virginia state legislators see SLR as a questionable risk. We found little agreement among Virginia

legislators on credible sources of information and risks of SLR, and no consensus on the nexus of leadership for addressing SLR. Legislators' perceptions of the credibility of different sources of information, assessments of risk, and preferences for policy responsibility vary, in great part, due to political party, ideological influence, and proximity to vulnerable areas.

The results point to just how complex and difficult it is for an issue like SLR to achieve saliency at the state level. SLR saliency for legislators is a complicated dynamic, with a lack of consensus on many aspects of SLR preventing it from getting on policy agendas. Furthermore, the perceived low saliency of SLR risks by Virginia legislators point to how systematized factors interact as impediments. First, the *politicization of climate change* reveals Democrats supporting the science of climate change, while Republicans tend to express, at a minimum, skepticism. Second, *the role of policymakers* as regards the risks of SLR is influenced by legislator proximity to coastal areas and the impacts of SLR. Third, *institutional barriers* are likely at play as state legislators' views on who should take the policy lead vary significantly. And, though this study did not directly address these two issues, both the *slow-onset nature of SLR* and the *lack of public knowledge/awareness of SLR* additionally complicate the matter.

Our findings point to the need for further research into the intricacies of SLR policy saliency. In-depth qualitative research may be useful for gaining additional insight into barriers that prevent SLR from gaining momentum as a policy issue. Detailed analysis of legislative items/bills as they move through the legislative process may offer additional information about policy deliberations regarding SLR. Finally, while our focus on one state was important to control for context and other state-level factors, "no two states are likely to face the same risks from accelerating climate change, no two will likely frame such policy options in identical fashion or have comparable capacity to formulate policy" (Rabe 2011). Accordingly, further

research should examine how SLR policymaking is addressed in the context of other vulnerable subnational governments, both in the U.S. and worldwide.

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Appendix

Please rate the credibility of the following sources as relates to information about the risks of flooding due to sea level rise. **Please rate these sources on a scale of 0 to 3 where 0 means 'Not at all credible' and 3 means 'Extremely credible' by marking an 'X' in the appropriate box.**

	0 Not at all credible	1	2	3 Extremely credible
News outlets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Federal Agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scientists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local governments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constituents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political Party Leadership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following is a list of possible consequences of flooding due to sea level rise. Please indicate how likely each is to occur in Virginia within the next several decades. **Please indicate whether you think each of the following are 'Very likely,' 'likely,' 'not likely,' or 'not at all likely' by marking an 'X' in the appropriate box.**

	Very likely	Likely	Not likely	Not at all likely
Temporary damage to <i>private</i> property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permanent loss of <i>private</i> property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporary damage to <i>public</i> property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permanent loss of <i>public</i> property	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abandoning parts of communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disruption of transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disruption of military installations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disruption of commercial ports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disruption of tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very likely	Likely	Not likely	Not at all likely
Relocation of businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase in insurance premiums	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More frequent flooding in coastal parts of Virginia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased storm surge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beach erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss of viable agricultural land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contamination of freshwater sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Who do you think should take the lead to address risks posed by flooding due to sea level rise? **Please respond by marking an 'X' next to your top three choices. Please choose only 3 options.**

- Federal government
- Governor
- General Assembly
- Affected residents
- Real estate developers
- State agencies
- Non-governmental organizations
- Local governments
- Regional/local planning organizations
- Affected businesses