Apr 4th, 1:30 PM - 3:00 PM

Supporting diverse Pacific NW marine data access needs via the NANOOS Visualization system (NVS) and data services

Emilio Mayorga
University of Washington

Troy Tanner
University of Washington

Jonathan Allan
NANOOS/OR Dept. of Geology and Mineral Industries

J. A. (Jan A.) Newton
University of Washington

Rachel Wold
University of Washington

NANOOS

Northwest Association of Networked Ocean Observing Systems

IOOS

Supporting diverse Pacific NW marine data access needs via the NANOOS Visualization System (NVS) and data services

Emilio Mayorga, NANOOS / APL - University of Washington
emiliom@uw.edu
Troy Tanner, NANOOS / APL - University of Washington
Jonathan Allan, NANOOS / OR Dept. of Geology and Mineral Industries
Jan Newton, NANOOS / APL - University of Washington
Rachel Wold, NANOOS / APL - University of Washington

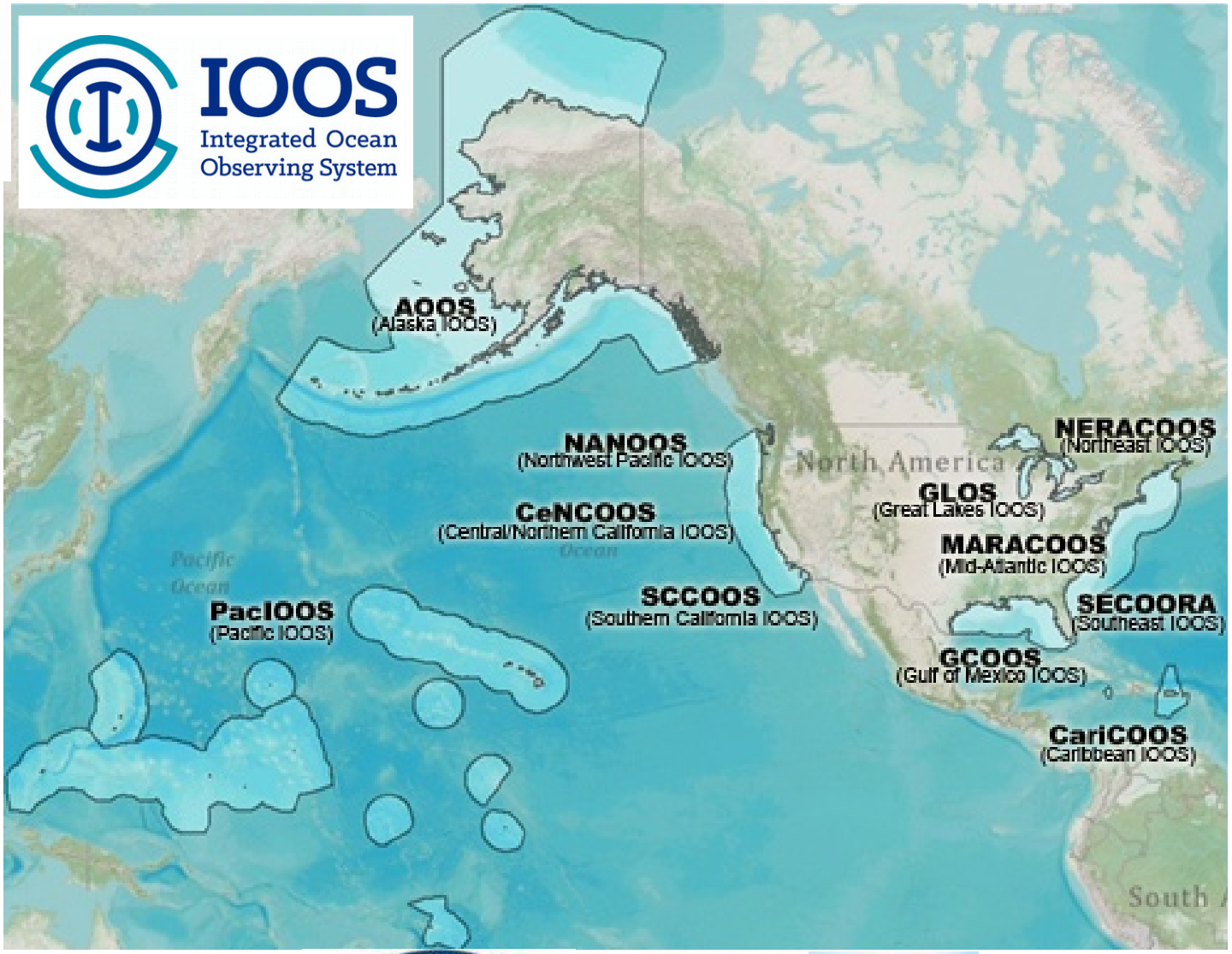
Salish Sea Ecosystem Conference / Salish Sea Marine Ecosystem Data Collation and Management panel.
2018 Apr. 4, Seattle

What is IOOS?

- The Integrated Ocean Observing System (IOOS) in the U.S. is a **national-regional** partnership working to provide **new tools and forecasts** to improve safety, enhance the economy, and protect health.
- **Integrated ocean information** is available in near-real-time, as well as retrospectively.
- **Easier and better access** to this information is improving our ability to understand and predict coastal events and conditions (e.g., waves, acidification, etc.).
- Such knowledge is **widely used and needed**…!

Coastal U.S. IOOS:

17 Federal Agencies; 11 Regional Associations



BOEM
Bureau of Ocean Energy Management

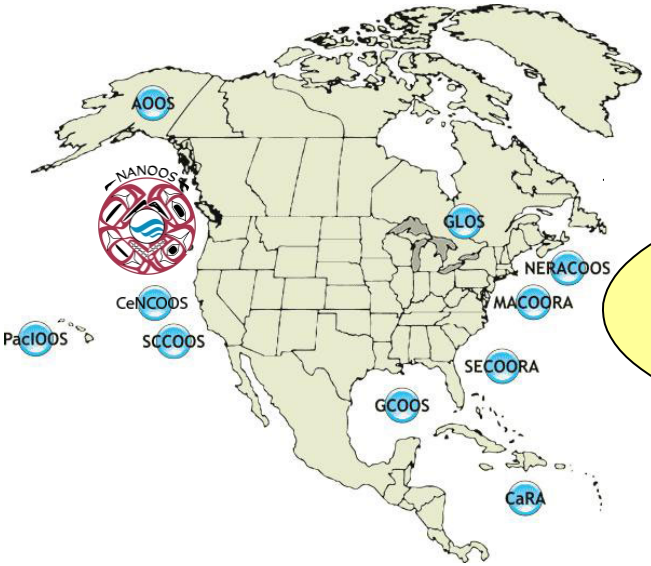
USGS

US Army Corps of Engineers

FDA

IOOS
Integrated Ocean Observing System

CONSISTENT NATIONAL CAPABILITY



assure

Regional Associations

engage

Observations

Forecasts/Modeling

Data Management

User Products

Outreach

Leverage and Link

DIVERSE LOCAL STAKEHOLDERS

NANOOS Visualization System: Rationale and Goals

- **Disparate suite of web sites available to the public** (serving a wide range of data).
- **Regional needs: seamless delivery of coastal, estuarine and ocean data to stakeholders within the NANOOS domain**

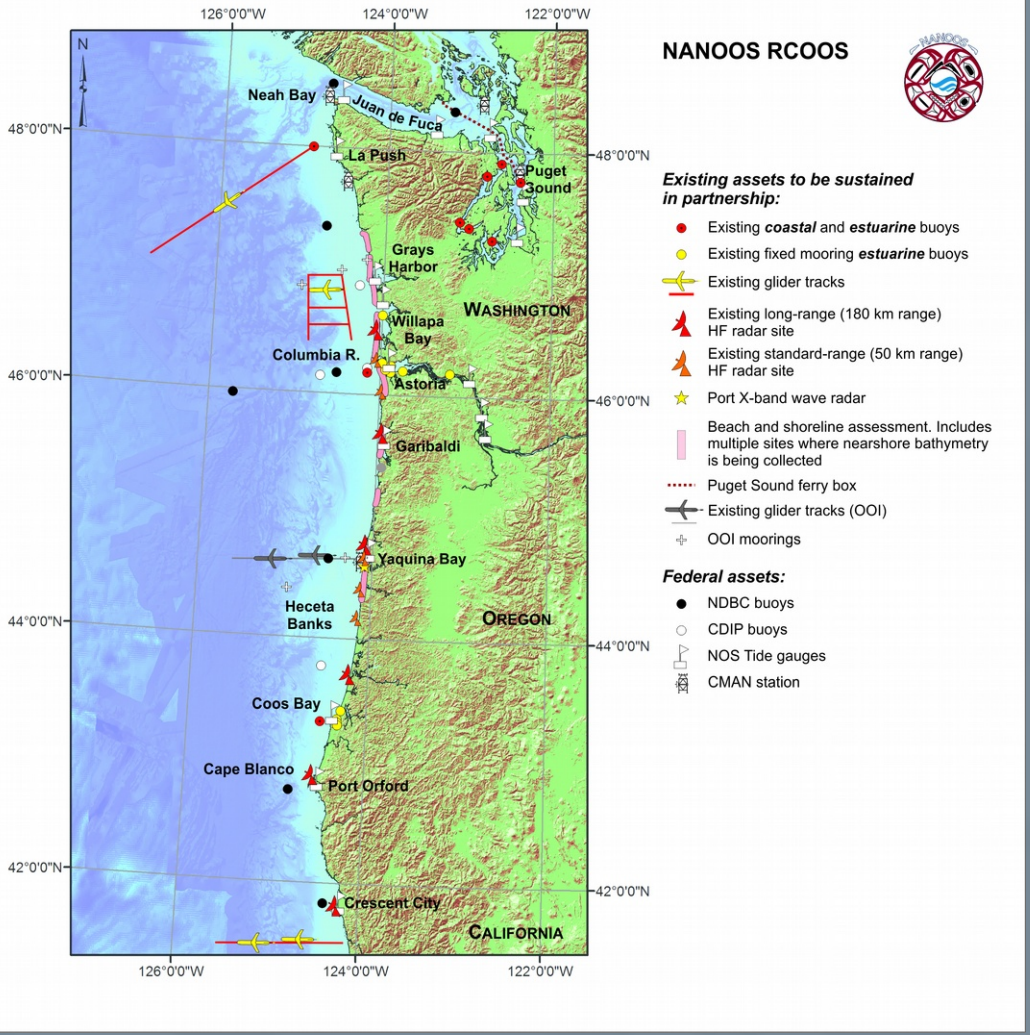
  (+external partners, other IOOS RA's, and national/international programs).
- **NANOOS currently provides access to 47 different types of variables, and in total ~200 'assets' & 10 model/forecast overlays.**

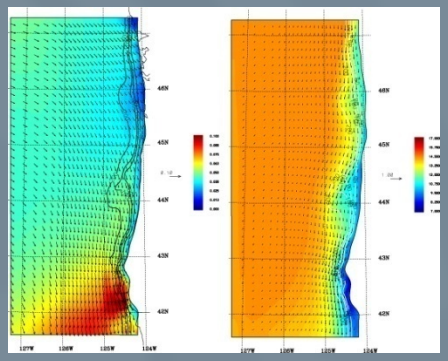
  Effective delivery of these data and product feeds can lead to:
  - **greater situational awareness (local and regional scales);**
  - **improved access to and understanding of environmental variables/conditions; and,**
  - **enable development and access to short- and long-term time-series.**
- Overall goal: to aid our understanding of **climate variability**, **safety**, **operations**, and lead to **improved resource management** and **regional productivity**.

A Challenge - Many stakeholders and many potential data providers/sources

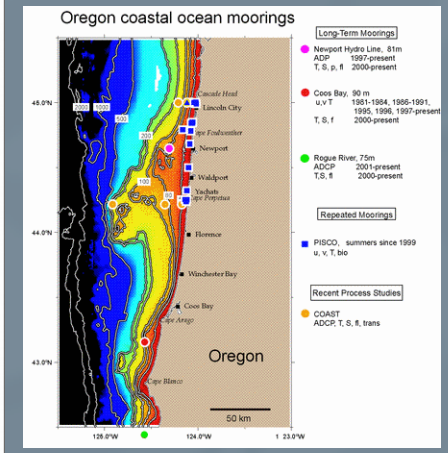
- State agencies (e.g. ODFW, WADOE, DSL, etc.)
- Federal agencies (NOAA, NWS, FEMA, US Coast Guard, etc.)
- Cities and Counties
- Ocean engineering (instruments, wave energy, telecommunication)
- NGO's
- Ports
- Bar pilots
- Fishers (recreational and commercial)
- Shellfish growers
- Recreational boaters
- Tribes
- Geotechnical consultants
- Universities/researchers
- Schools (K-12)
- Public-at-large
- Scientists
- and many others…

A Challenge - Many Data Types & How to Display Complex Data Effectively

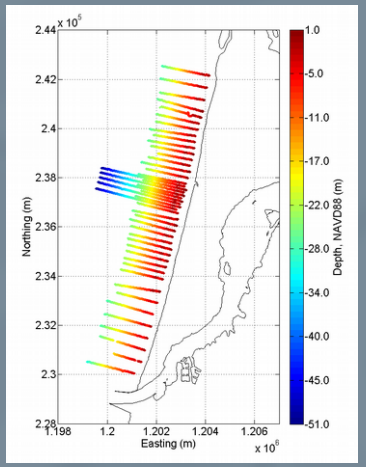




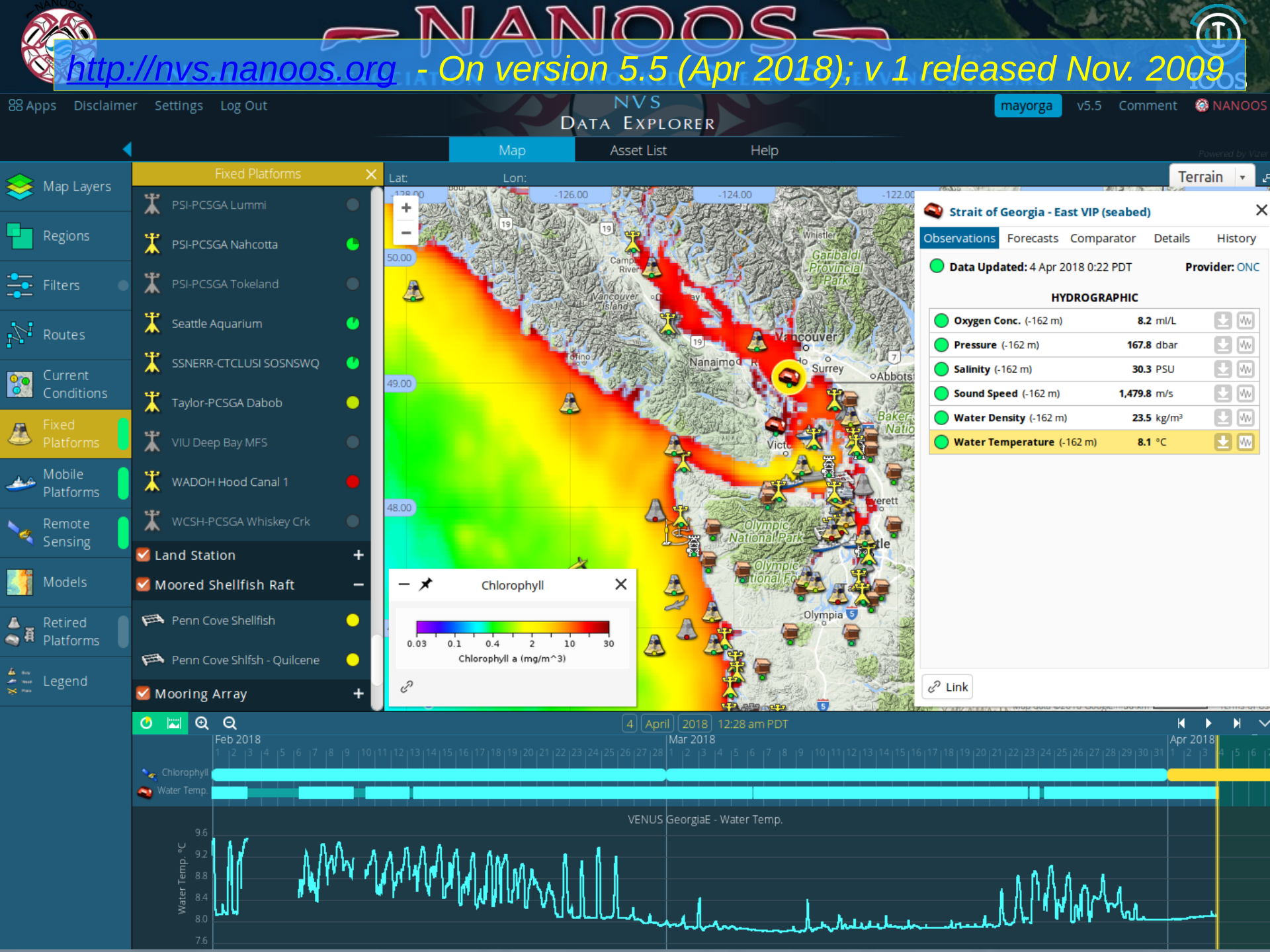
Overlays (Satellite, Models, & other geospatial data)



Shelf moorings & gliders



Shorelines & Bathymetry


http://nvs.nanoos.org - On version 5.5 (Apr 2018); v 1 released Nov. 2009
NANOOS
Apps
Disclaimer
Settings
Log Out
NVS
Data Explorer
mayorga
v5.5
Comment
NANOOS
Map
Asset List
Help
Map Layers
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Fixed Platforms
PSI-PCSGA Lummi
PSI-PCSGA Nahcotta
PSI-PCSGA Tokeland
Seattle Aquarium
SSNERR-CTCLUSI SOSNSWQ
Taylor-PCSGA Dabob
VIU Deep Bay MFS
WADOH Hood Canal 1
WCSH-PCSGA Whiskey Crk
Land Station
Moored Shellfish Raft
Penn Cove Shellfish
Penn Cove Shlfsh - Quilcene
Mooring Array
Lat:
Lon:
Terrain
Chlorophyll
0.03
0.1
0.4
2
10
30
Chlorophyll a (mg/m^3)
Strait of Georgia - East VIP (seabed)
Observations
Forecasts
Comparator
Details
History
Data Updated: 4 Apr 2018 0:22 PDT
Provider: ONC
HYDROGRAPHIC
Oxygen Conc. (-162 m) 8.2 ml/L
Pressure (-162 m) 167.8 dbar
Salinity (-162 m) 30.3 PSU
Sound Speed (-162 m) 1,479.8 m/s
Water Density (-162 m) 23.5 kg/m³
Water Temperature (-162 m) 8.1 °C
Link
4 April 2018 12:28 am PDT
Feb 2018
Mar 2018
Apr 2018
Chlorophyll
Water Temp.
VENUS GeorgiaE - Water Temp.
Water Temp. °C

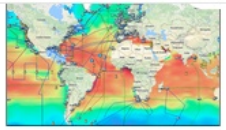
NANOOS

Northwest Association of Networked Ocean Observing Systems

IOOS | Integrated Ocean Observing System

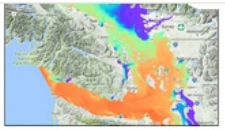
- Home
- About
- News
- Join
- Contact
- Disclaimer
- Site Map
- NVS
- Products
- Education
- Merchandise
- mayorga
- Account Settings
- Log Out
- Internal Site

NANOOS Participates in NOAA West Watch

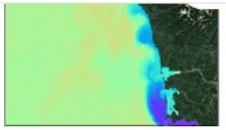


Updated GOA-ON Website Launched

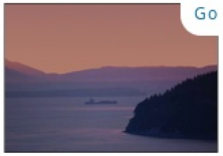
Fukushima Radiation Levels in the Pacific Northwest



University of British Columbia Salish Sea Model Live on NVS



Webinar: Forecasting pH and aragonite saturation state in the

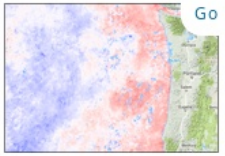


Go

2016 Puget Sound Marine Waters Overview

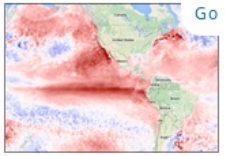
Go

High-Frequency Radars Coming to the Washington Coast!



Go

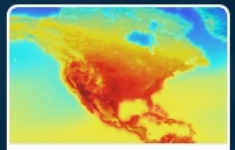
How Typical are Current Conditions?



Go

Special Collection Announced for Pacific Anomalies

Areas of Emphasis



Climate

Coastal Hazards

Ecosystem Assessment

Fisheries & Biodiversity

Maritime Operations

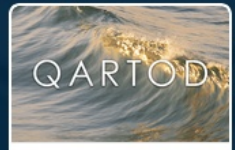
Quick Links

Data Exploration & Visualization

Earthquake and Tsunami

IOOS Pacific Region Ocean Acidification

J-SCOPE



Manuals for Real-Time Quality Control

NANOOS

Northwest Association of Networked Ocean Observing Systems

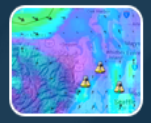
IOOS

Apps | Disclaimer | Settings | Log In

NVS

v5.4 | Contact | NANOOS

Powered by Vizer


Data Explorer


Tsunami Evacuation Zones

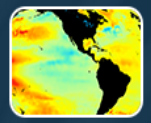

Boaters

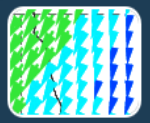

Tuna Fishers


Shellfish Growers


Beach and Shoreline Changes


Maritime Operations


Climatology


High Frequency Radar


Cruises


Gliders


Help

Additions & Updates

View Last 3 Months

HMSC Newport — *Updated on 6 Jul 2017*
Station is offline since 6/22 due to sensor malfunction. It will likely be a few months before station is back online.

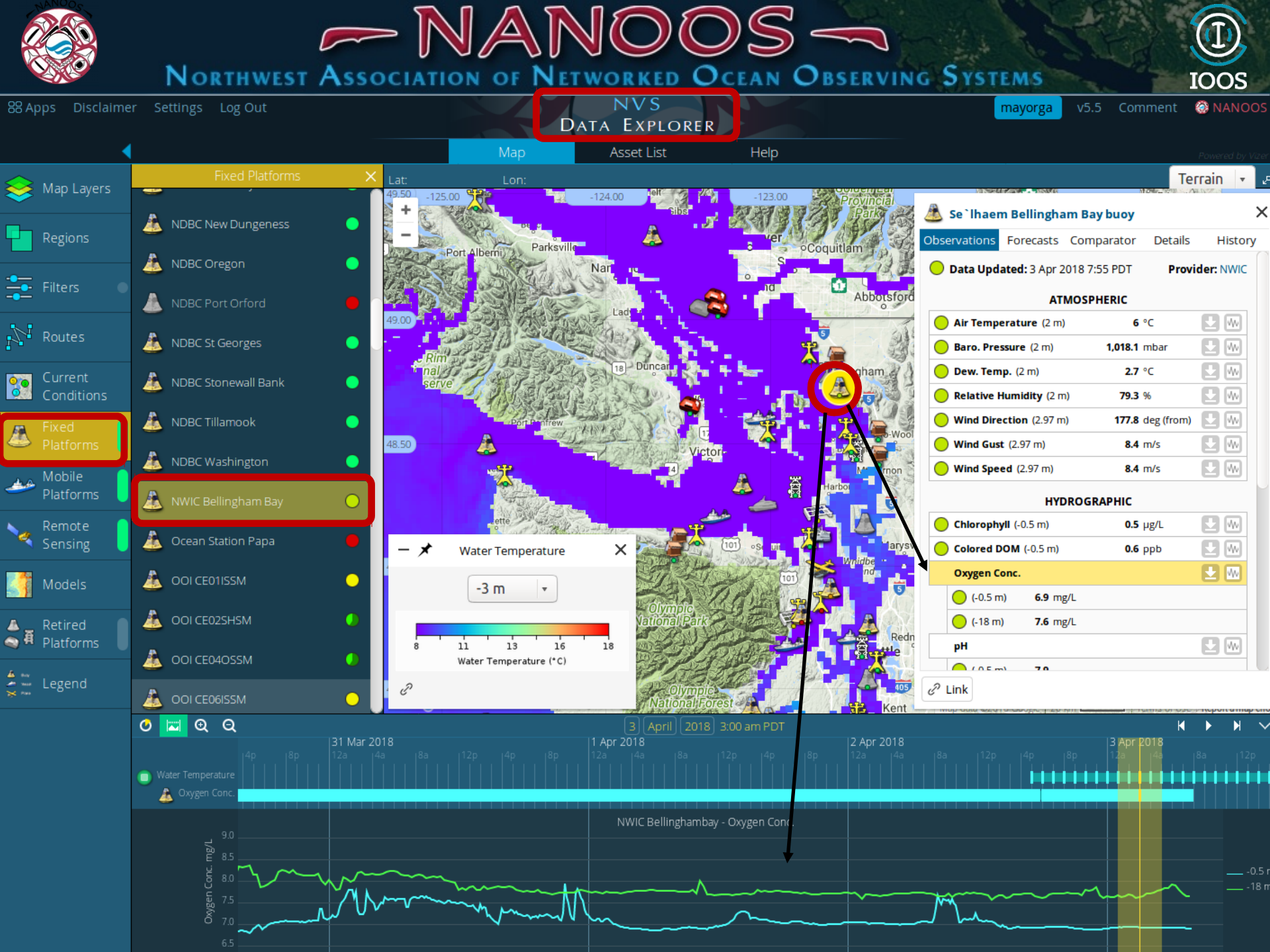
OSU CB-06 — *Added on 5 Jul 2017*
New NANOOS shelf mooring deployed 6/10, 6 nm off Coos Bay / Cape Arago as relocation of now-decommissioned NH-10 mooring. Measures (in near-real-time) weather, temp. & salt (1.5 m), and currents. PMEL air & water CO2 and 1-m temp. & salt also deployed.

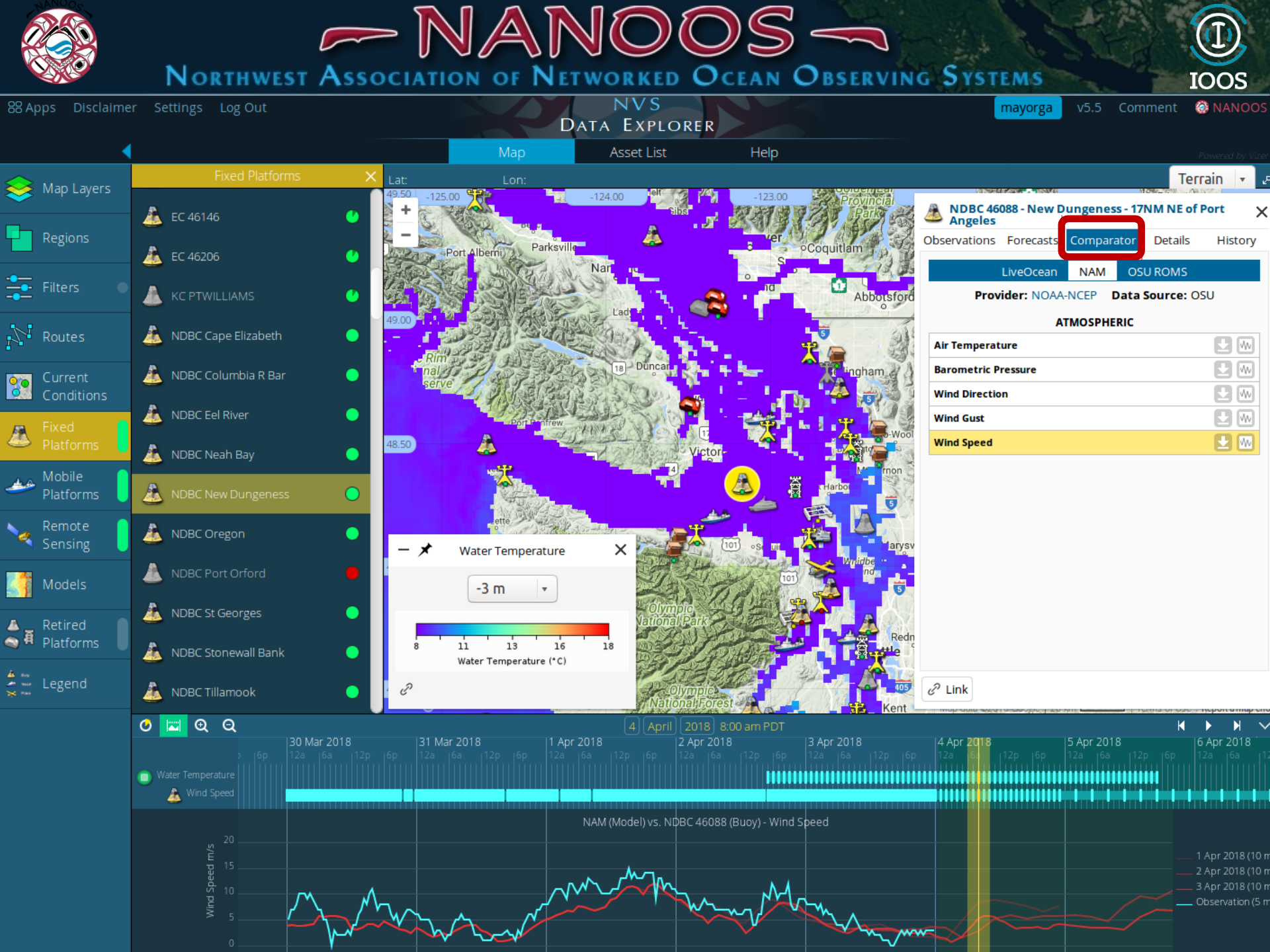
OSU NH-10 — *Updated on 5 Jul 2017*
The NH-10 mooring has been relocated to a new location offshore of Coos Bay, designated as CB-06. See the OOI CE02SHSM mooring for continued data near the NH-10 station location.

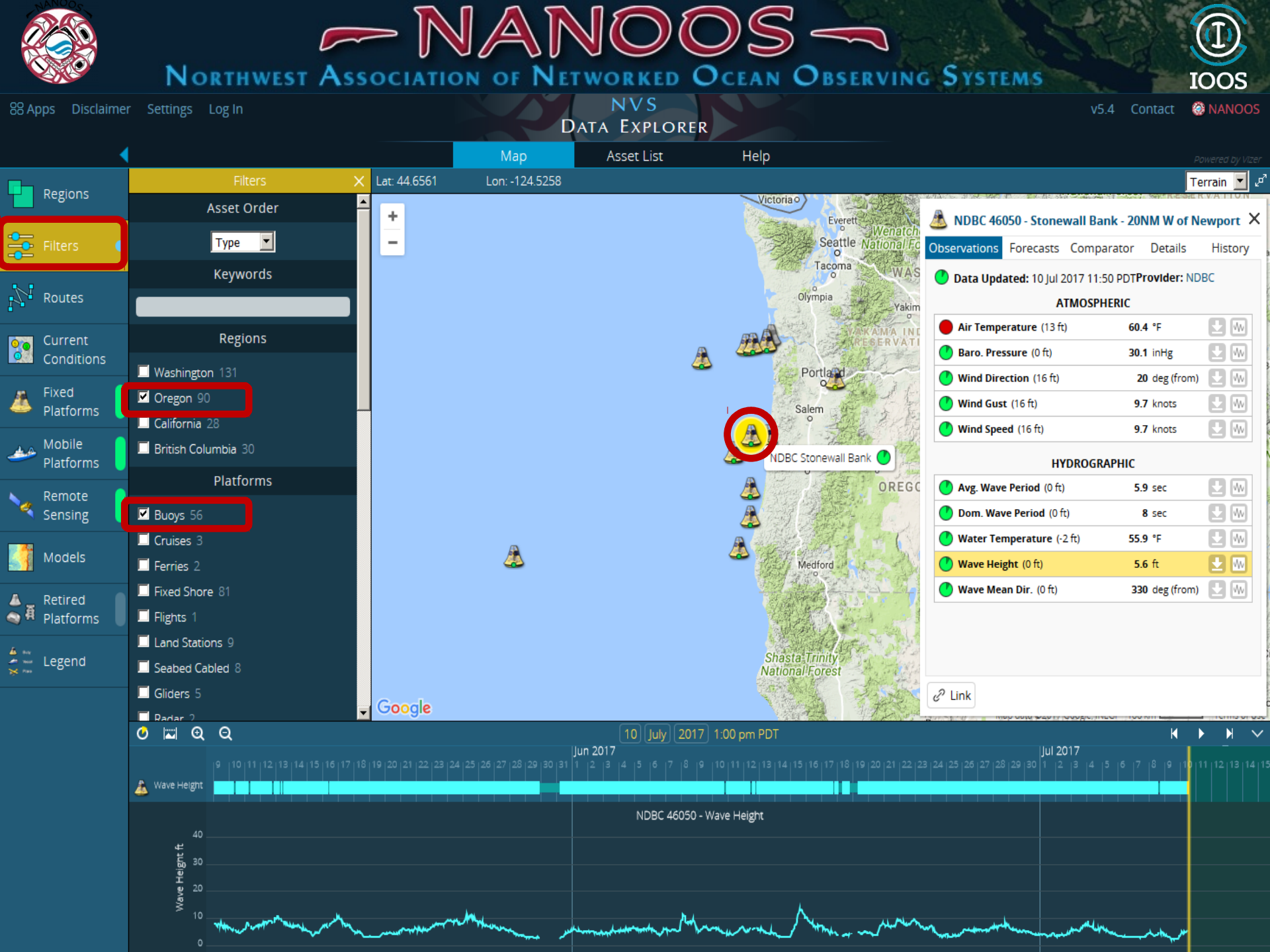
CMOP Saturn02 — *Updated on 23 Jun 2017*
Mooring was redeployed in early June. NVS harvesting is now restored, with an updated weather and water sensor configuration for this multi-depth asset.

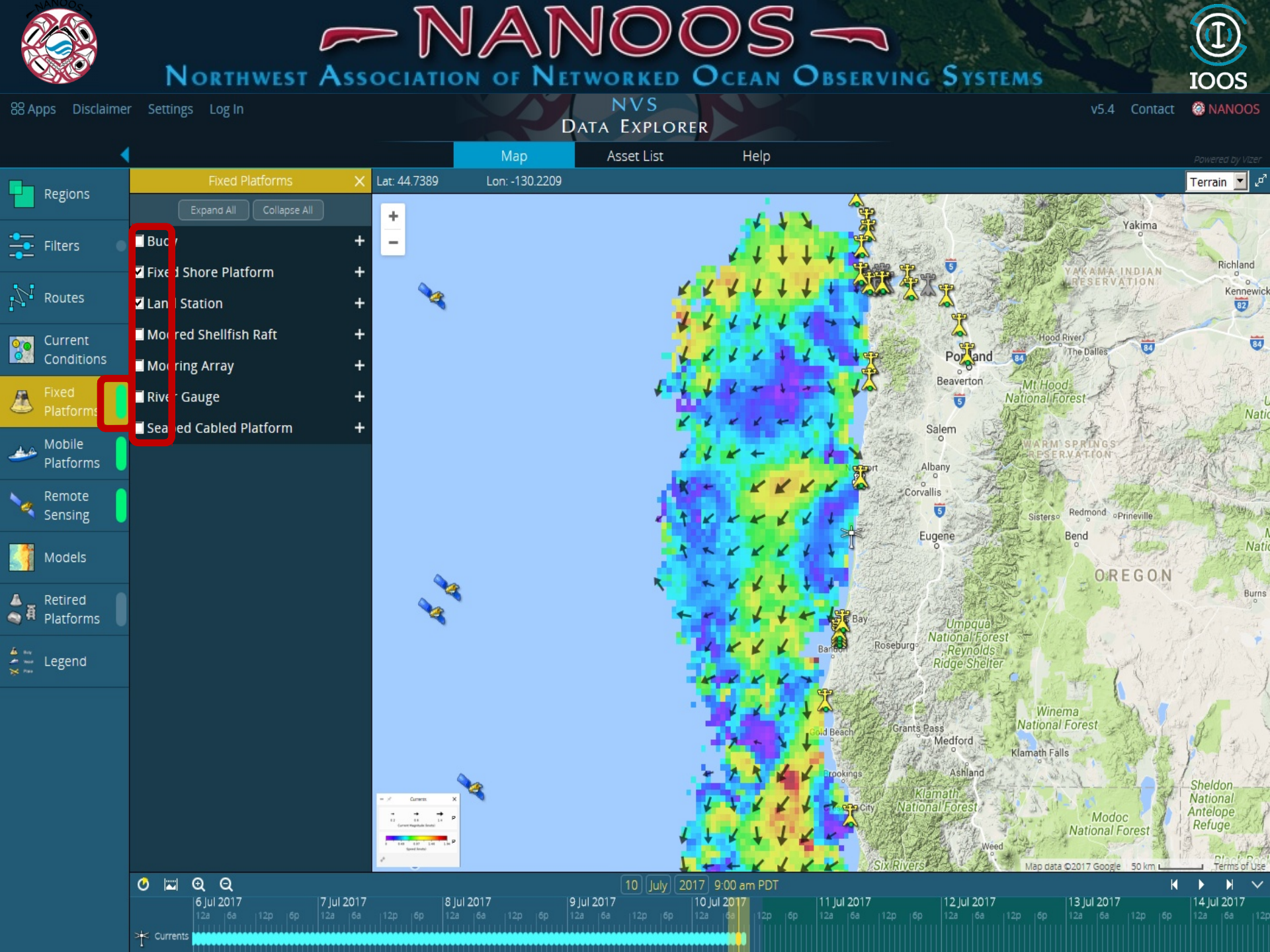
Taylor-PCSGA Dabob — *Updated on 21 Jun 2017*
Sensor are back online starting on June 14, after a gap due to instrument problems and maintenance.

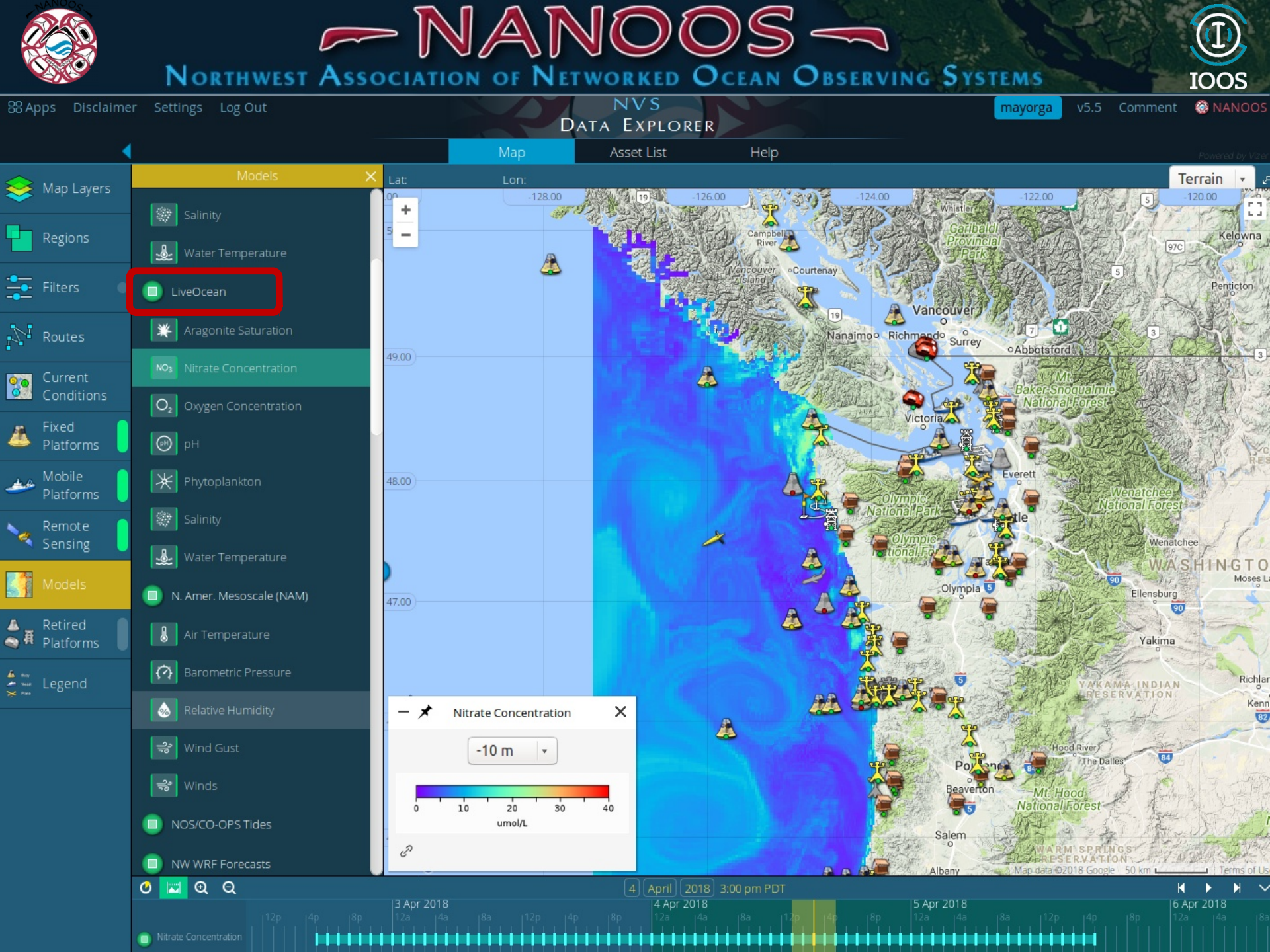
NDBC Washington — *Updated on 7 Jun 2017*
Buoy deployed and data released on 5/31/2017; but continuous data transmission started on Jun. 5. Buoy location was updated (previous deployment position was 42.612 N, 130.537 W)

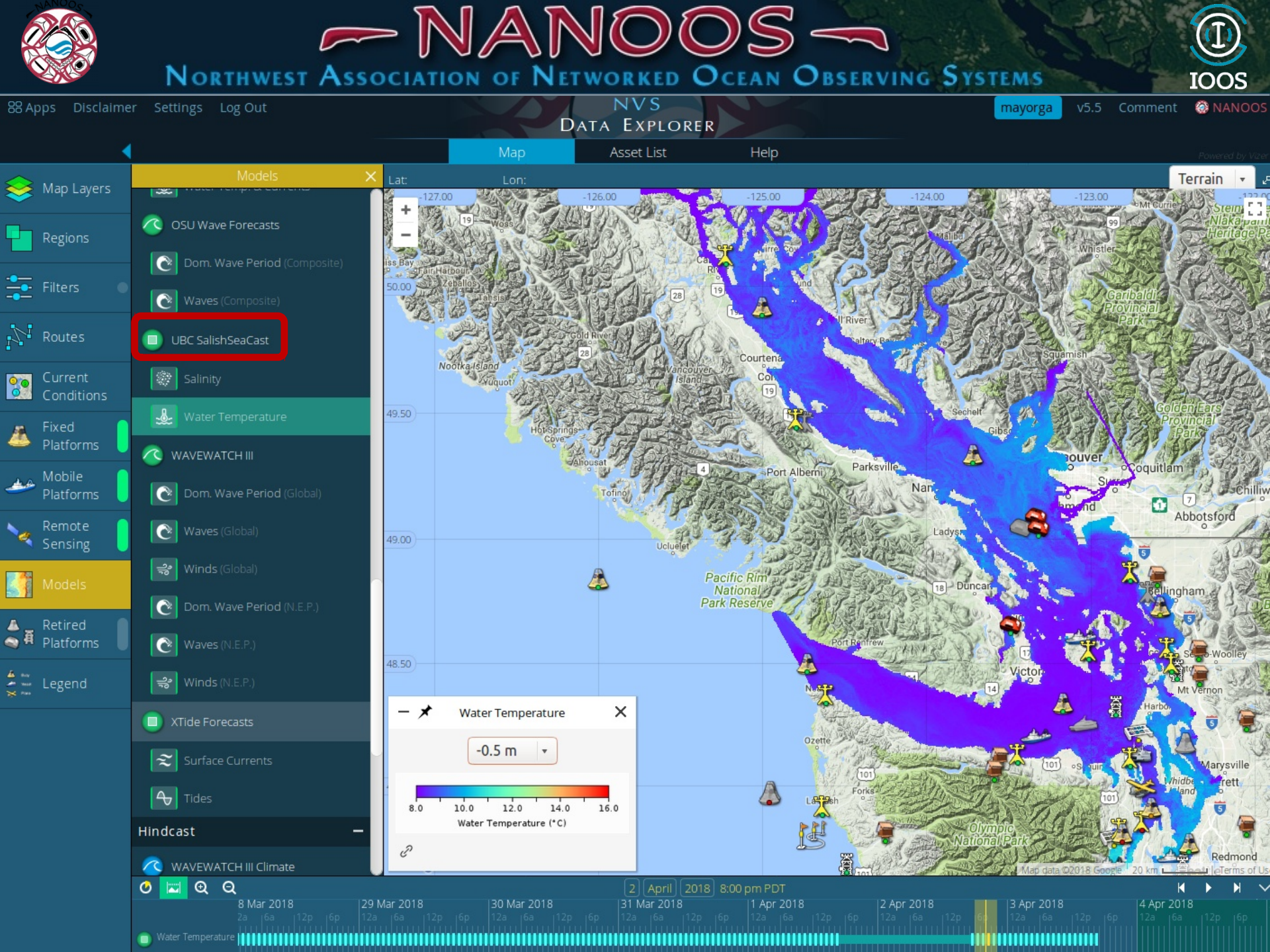

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log Out
NVS
Data Explorer
mayorga
v5.5
Comment
NANOOS
Map
Asset List
Help
Map Layers
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Fixed Platforms
NDBC New Dungeness
NDBC Oregon
NDBC Port Orford
NDBC St Georges
NDBC Stonewall Bank
NDBC Tillamook
NDBC Washington
NWIC Bellingham Bay
Ocean Station Papa
OOI CE01ISSM
OOI CE02SHSM
OOI CE04OSSM
OOI CE06ISSM
Lat:
Lon:
Terrain
Water Temperature
-3 m
8
11
13
16
18
Water Temperature (°C)
Se`lhaem Bellingham Bay buoy
Observations
Forecasts
Comparator
Details
History
Data Updated: 3 Apr 2018 7:55 PDT
Provider: NWIC
ATMOSPHERIC
Air Temperature (2 m) 6 °C
Baro. Pressure (2 m) 1,018.1 mbar
Dew. Temp. (2 m) 2.7 °C
Relative Humidity (2 m) 79.3 %
Wind Direction (2.97 m) 177.8 deg (from)
Wind Gust (2.97 m) 8.4 m/s
Wind Speed (2.97 m) 8.4 m/s
HYDROGRAPHIC
Chlorophyll (-0.5 m) 0.5 µg/L
Colored DOM (-0.5 m) 0.6 ppb
Oxygen Conc.
(-0.5 m) 6.9 mg/L
(-18 m) 7.6 mg/L
pH
Link
3 April 2018 3:00 am PDT
31 Mar 2018
1 Apr 2018
2 Apr 2018
3 Apr 2018
Water Temperature
Oxygen Conc.
NWIC Bellinghambay - Oxygen Conc
Oxygen Conc. mg/L
9.0
8.5
8.0
7.5
7.0
6.5

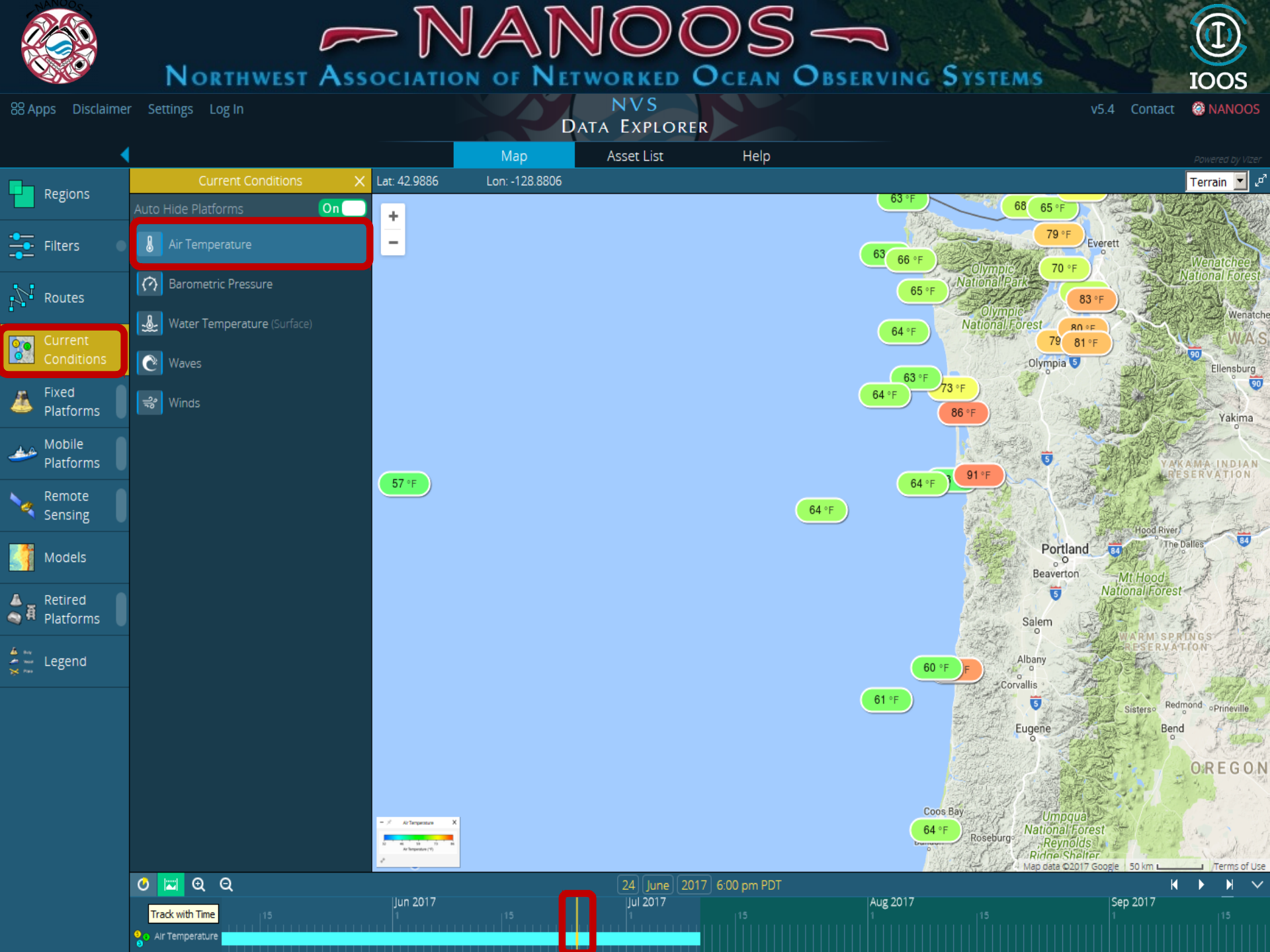

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log Out
NVS
Data Explorer
mayorga
v5.5
Comment
NANOOS
Map
Asset List
Help
Map Layers
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Fixed Platforms
EC 46146
EC 46206
KC PTWILLIAMS
NDBC Cape Elizabeth
NDBC Columbia R Bar
NDBC Eel River
NDBC Neah Bay
NDBC New Dungeness
NDBC Oregon
NDBC Port Orford
NDBC St Georges
NDBC Stonewall Bank
NDBC Tillamook
Lat:
Lon:
Terrain
Water Temperature
-3 m
8
11
13
16
18
Water Temperature (°C)
NDBC 46088 - New Dungeness - 17NM NE of Port Angeles
Observations
Forecasts
Comparator
Details
History
LiveOcean
NAM
OSU ROMS
Provider: NOAA-NCEP
Data Source: OSU
ATMOSPHERIC
Air Temperature
Barometric Pressure
Wind Direction
Wind Gust
Wind Speed
Link
4
April
2018
8:00 am PDT
30 Mar 2018
31 Mar 2018
1 Apr 2018
2 Apr 2018
3 Apr 2018
4 Apr 2018
5 Apr 2018
6 Apr 2018
Water Temperature
Wind Speed
NAM (Model) vs. NDBC 46088 (Buoy) - Wind Speed
Wind Speed m/s
1 Apr 2018 (10 m
2 Apr 2018 (10 m
3 Apr 2018 (10 m
Observation (5 m

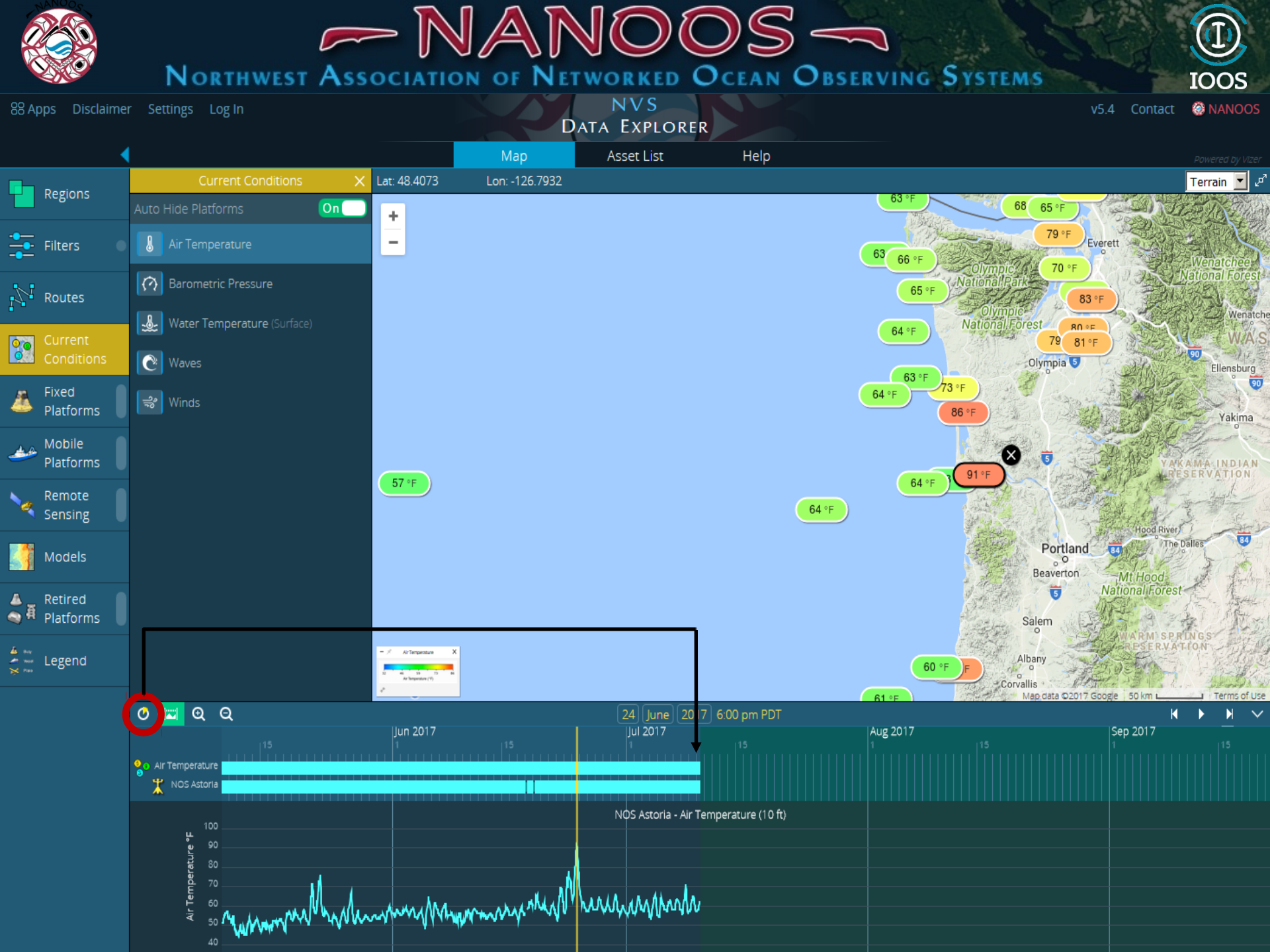

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Data Explorer
v5.4
Contact
NANOOS
Map
Asset List
Help
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Filters
Asset Order
Type
Keywords
Regions
Washington 131
Oregon 90
California 28
British Columbia 30
Platforms
Buoys 56
Cruises 3
Ferries 2
Fixed Shore 81
Flights 1
Land Stations 9
Seabed Cabled 8
Gliders 5
Radar 2
Lat: 44.6561
Lon: -124.5258
Terrain
Victoria
Everett
Seattle
Tacoma
Olympia
Yakima
Portland
Salem
Medford
NDBC Stonewall Bank
Shasta Trinity National Forest
Google
NDBC 46050 - Stonewall Bank - 20NM W of Newport
Observations
Forecasts
Comparator
Details
History
Data Updated: 10 Jul 2017 11:50 PDT Provider: NDBC
ATMOSPHERIC
Air Temperature (13 ft) 60.4 °F
Baro. Pressure (0 ft) 30.1 inHg
Wind Direction (16 ft) 20 deg (from)
Wind Gust (16 ft) 9.7 knots
Wind Speed (16 ft) 9.7 knots
HYDROGRAPHIC
Avg. Wave Period (0 ft) 5.9 sec
Dom. Wave Period (0 ft) 8 sec
Water Temperature (-2 ft) 55.9 °F
Wave Height (0 ft) 5.6 ft
Wave Mean Dir. (0 ft) 330 deg (from)
Link
10 July 2017 1:00 pm PDT
Jun 2017
Jul 2017
Wave Height
NDBC 46050 - Wave Height
Wave Height ft
40
30
20
10
0

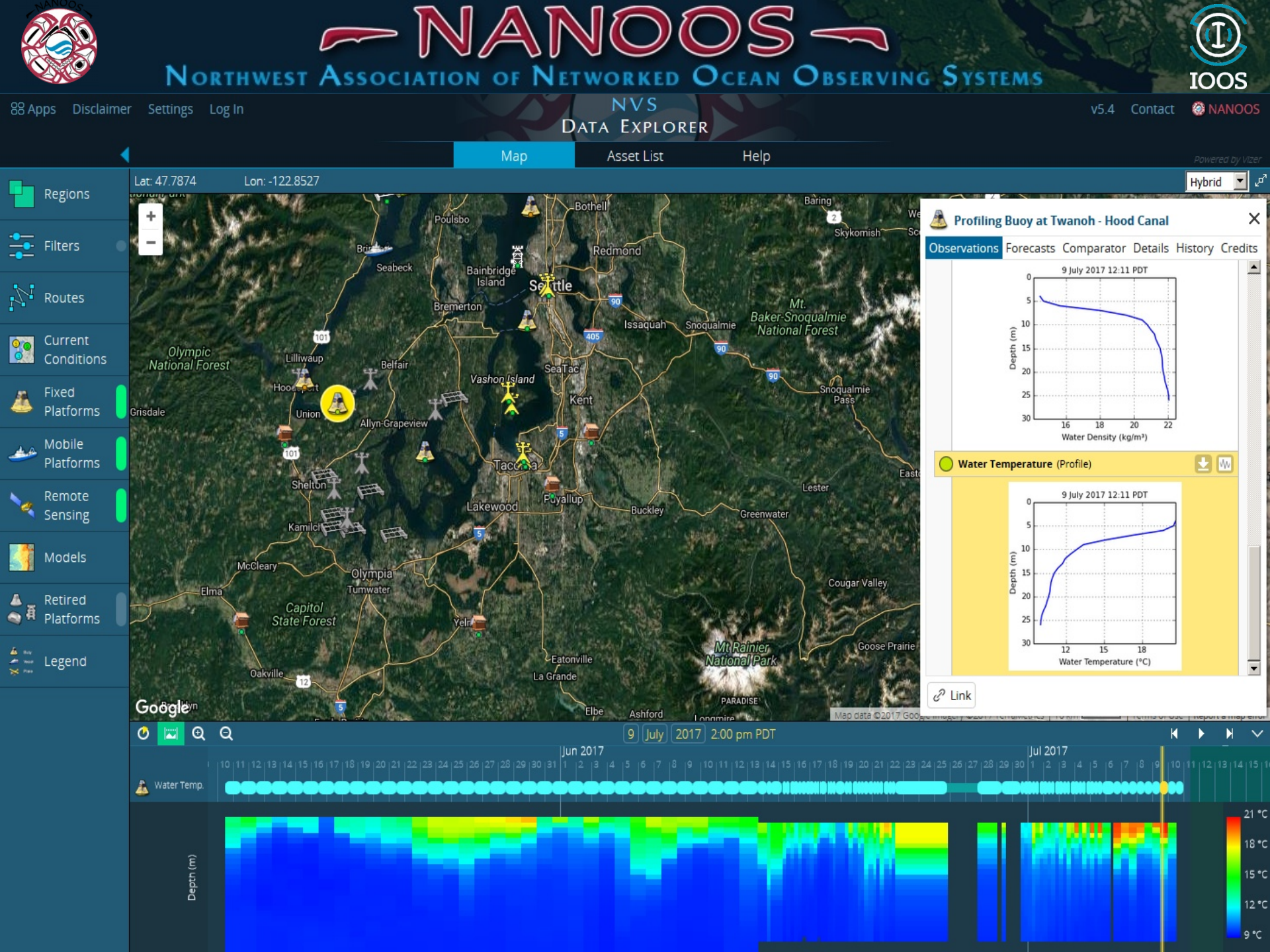

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Data Explorer
v5.4
Contact
NANOOS
Map
Asset List
Help
Powered by Vizer
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Fixed Platforms
Expand All
Collapse All
Buoy
Fixed Shore Platform
Land Station
Moored Shellfish Raft
Mooring Array
River Gauge
Seafloor Cabled Platform
Lat: 44.7389
Lon: -130.2209
Terrain
Yakima
Richland
Kennewick
Hood River
The Dalles
Portland
Beaverton
Salem
Albany
Corvallis
Eugene
Sisters
Redmond
Prineville
Bend
OREGON
Roseburg
Grants Pass
Medford
Klamath Falls
Ashland
Gold Beach
Mt Hood National Forest
Umpqua National Forest
Reynolds Ridge Shelter
Winema National Forest
Klamath National Forest
Modoc National Forest
Sheldon National Antelope Refuge
Warm Springs Reservation
Yakama Indian Reservation
Map data ©2017 Google
50 km
Terms of Use
10 July 2017 9:00 am PDT
6 Jul 2017
7 Jul 2017
8 Jul 2017
9 Jul 2017
10 Jul 2017
11 Jul 2017
12 Jul 2017
13 Jul 2017
14 Jul 2017
Currents

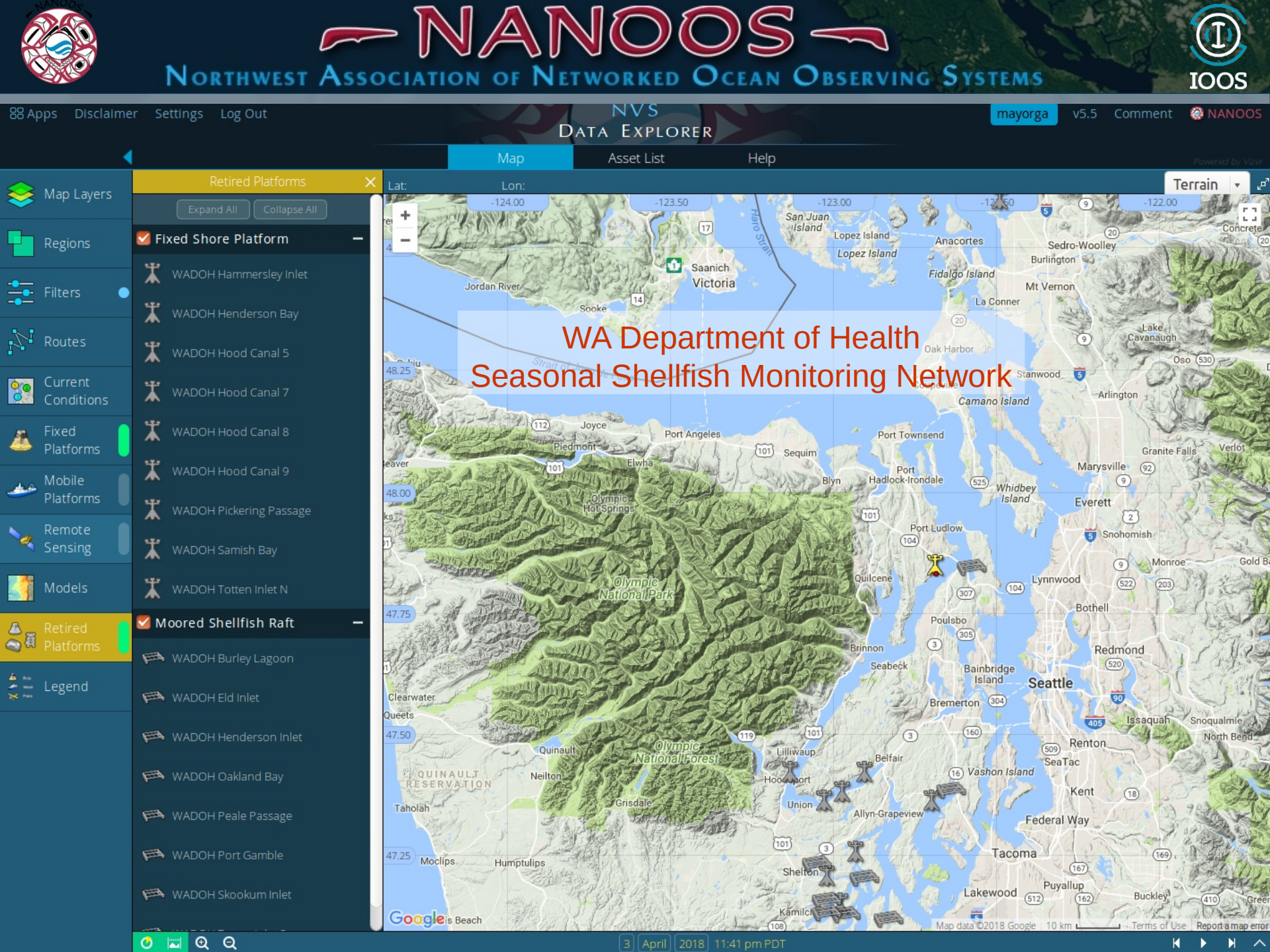

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log Out
NVS
Data Explorer
mayorga
v5.5
Comment
NANOOS
Map
Asset List
Help
Map Layers
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Models
Salinity
Water Temperature
LiveOcean
Aragonite Saturation
Nitrate Concentration
Oxygen Concentration
pH
Phytoplankton
Salinity
Water Temperature
N. Amer. Mesoscale (NAM)
Air Temperature
Barometric Pressure
Relative Humidity
Wind Gust
Winds
NOS/CO-OPS Tides
NW WRF Forecasts
Lat:
Lon:
Terrain
Nitrate Concentration
-10 m
0
10
20
30
40
umol/L
Vancouver
Victoria
Seattle
Everett
Tacoma
Olympia
Bellingham
Nanaimo
Richmond
Surrey
Abbotsford
Whistler
Kelowna
Penticton
Wenatchee
Yakima
Ellensburg
Olympic National Park
Mt. Baker-Snoqualmie National Forest
Wenatchee National Forest
Mt. Hood National Forest
Yakama Indian Reservation
Warm Springs Reservation
Portland
Beaverton
Hood River
The Dalles
Salem
Albany
4 April 2018 3:00 pm PDT
3 Apr 2018
4 Apr 2018
5 Apr 2018
6 Apr 2018
Nitrate Concentration
Map data ©2018 Google
50 km
Terms of Use


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log Out
NVS
Data Explorer
mayorga
v5.5
Comment
NANOOS
Map
Asset List
Help
Map Layers
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Models
OSU Wave Forecasts
Dom. Wave Period (Composite)
Waves (Composite)
UBC SalishSeaCast
Salinity
Water Temperature
WAVEWATCH III
Dom. Wave Period (Global)
Waves (Global)
Winds (Global)
Dom. Wave Period (N.E.P.)
Waves (N.E.P.)
Winds (N.E.P.)
XTide Forecasts
Surface Currents
Tides
Hindcast
WAVEWATCH III Climate
Lat:
Lon:
Terrain
Water Temperature
-0.5 m
8.0
10.0
12.0
14.0
16.0
Water Temperature (°C)
Nootka Island
Vancouver Island
Courtenay
Port Alberni
Parksville
Tofino
Ucluelet
Pacific Rim National Park Reserve
Victoria
Duncan
Bellingham
Abbotsford
Mt Vernon
Olympic National Park
Whistler
Squamish
Coquitlam
Redmond
Marysville
Garibaldi Provincial Park
Golden Ears Provincial Park
2 April 2018 8:00 pm PDT
8 Mar 2018
29 Mar 2018
30 Mar 2018
31 Mar 2018
1 Apr 2018
2 Apr 2018
3 Apr 2018
4 Apr 2018
Water Temperature
Map data ©2018 Google
20 km
Terms of Use


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Data Explorer
v5.4
Contact
NANOOS
Map
Asset List
Help
Powered by Vizer
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Current Conditions
Auto Hide Platforms
On
Air Temperature
Barometric Pressure
Water Temperature (Surface)
Waves
Winds
Lat: 42.9886
Lon: -128.8806
Terrain
63 °F
68
65 °F
79 °F
Everett
63
66 °F
70 °F
Olympic National Park
Olympic National Forest
Wenatchee National Forest
65 °F
83 °F
64 °F
79
81 °F
Olympia
Ellensburg
63 °F
73 °F
64 °F
86 °F
Yakima
57 °F
64 °F
91 °F
64 °F
Portland
Beaverton
Hood River
The Dalles
Mt Hood National Forest
Salem
Albany
Corvallis
60 °F
61 °F
Eugene
Sisters
Redmond
Prineville
Bend
OREGON
Coos Bay
64 °F
Roseburg
Umpqua National Forest
Reynolds Ridge Shelter
Map data ©2017 Google
50 km
Terms of Use
24
June
2017
6:00 pm PDT
Track with Time
Air Temperature
Jun 2017
Jul 2017
Aug 2017
Sep 2017


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Data Explorer
v5.4
Contact
NANOOS
Map
Asset List
Help
Powered by Vizer
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Current Conditions
Auto Hide Platforms
On
Air Temperature
Barometric Pressure
Water Temperature (Surface)
Waves
Winds
Lat: 48.4073
Lon: -126.7932
Terrain
Everett
Olympic National Park
Olympic National Forest
Wenatchee National Forest
Olympia
Ellensburg
Yakima
Portland
Beaverton
Hood River
The Dalles
Mt Hood National Forest
Salem
Albany
Corvallis
YAKAMA INDIAN RESERVATION
WARM SPRINGS RESERVATION
Map data ©2017 Google
50 km
Terms of Use
24 June 2017 6:00 pm PDT
Jun 2017
Jul 2017
Aug 2017
Sep 2017
Air Temperature
NOS Astoria
NOS Astoria - Air Temperature (10 ft)
Air Temperature °F

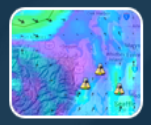

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Data Explorer
v5.4
Contact
NANOOS
Map
Asset List
Help
Powered by Vizer
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Lat: 47.7874
Lon: -122.8527
Hybrid
Profiling Buoy at Twanoh - Hood Canal
Observations
Forecasts
Comparator
Details
History
Credits
9 July 2017 12:11 PDT
Depth (m)
Water Density (kg/m³)
Water Temperature (Profile)
9 July 2017 12:11 PDT
Depth (m)
Water Temperature (°C)
Link
Bothell
Poulsbo
Redmond
Seattle
Bainbridge Island
Bremerton
Issaquah
Snoqualmie
Mt. Baker-Snoqualmie National Forest
Olympic National Forest
Lilliwaup
Belfair
Vashon Island
SeaTac
Kent
Snoqualmie Pass
Grisdale
Union
Allyn-Grapeview
Shelton
Lakewood
Puyallup
Buckley
Greenwater
Lester
Kamilche
McCleary
Olympia
Tumwater
Elma
Capitol State Forest
Cougar Valley
Mt Rainier National Park
Goose Prairie
Eatonville
La Grande
Oakville
PARADISE
Elbe
Ashford
Google
9 July 2017 2:00 pm PDT
Jun 2017
Jul 2017
Water Temp.
Depth (m)
21 °C
18 °C
15 °C
12 °C
9 °C


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log Out
NVS
Data Explorer
mayorga
v5.5
Comment
NANOOS
Map
Asset List
Help
Map Layers
Regions
Filters
Routes
Current Conditions
Fixed Platforms
Mobile Platforms
Remote Sensing
Models
Retired Platforms
Legend
Retired Platforms
Expand All
Collapse All
Fixed Shore Platform
WADOH Hammersley Inlet
WADOH Henderson Bay
WADOH Hood Canal 5
WADOH Hood Canal 7
WADOH Hood Canal 8
WADOH Hood Canal 9
WADOH Pickering Passage
WADOH Samish Bay
WADOH Totten Inlet N
Moored Shellfish Raft
WADOH Burley Lagoon
WADOH Eld Inlet
WADOH Henderson Inlet
WADOH Oakland Bay
WADOH Peale Passage
WADOH Port Gamble
WADOH Skookum Inlet
Lat:
Lon:
Terrain
WA Department of Health
Seasonal Shellfish Monitoring Network
Saanich
Victoria
Jordan River
Sooke
Port Angeles
Port Townsend
Sequim
Port Hadlock-Irondale
Whidbey Island
Everett
Marysville
Snohomish
Lynnwood
Bothell
Poulsbo
Brinnon
Seabeck
Bainbridge Island
Seattle
Bremerton
Redmond
Issaquah
Renton
SeaTac
Kent
Federal Way
Tacoma
Lakewood
Puyallup
Shelton
Olympic National Park
Olympic National Forest
Olympic Hot Springs
Quilcene
Port Ludlow
Oak Harbor
Camano Island
Stanwood
Arlington
Lopez Island
Anacortes
Burlington
Mt Vernon
La Conner
Fidalgo Island
San Juan Island
Sedro-Woolley
Concrete
Granite Falls
Monroe
Vashon Island
Belfair
Allyn-Grapeview
Union
Hoodsport
Lilliwaup
Quinault
Neilton
Grisdale
Taholah
Clearwater
Queets
QUINAULT RESERVATION
Moclips
Humptulips
Kamilche
Beach
Google
Map data ©2018 Google
10 km
Terms of Use
Report a map error
3
April
2018
11:41 pm PDT

NANOOS

Northwest Association of Networked Ocean Observing Systems

IOOS


Data Explorer


Tsunami Evacuation Zones

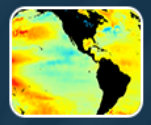

Boaters

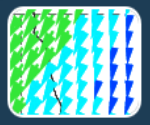

Tuna Fishers


Shellfish Growers


Beach and Shoreline Changes


Maritime Operations


Climatology


High Frequency Radar


Cruises


Gliders


Help

Additions & Updates

View Last 3 Months

HMSC Newport — *Updated on 6 Jul 2017*
Station is offline since 6/22 due to sensor malfunction. It will likely be a few months before station is back online.

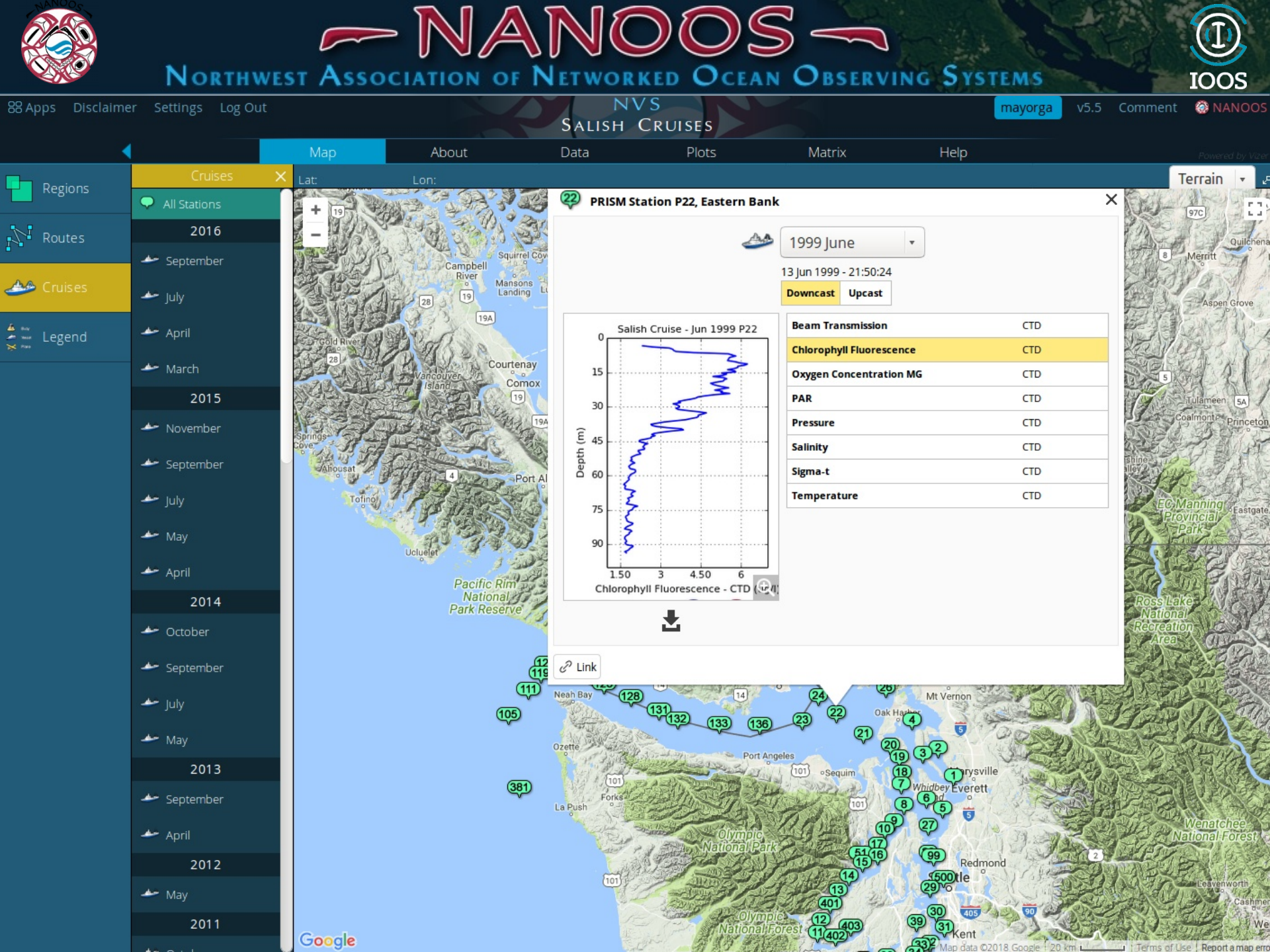
OSU CB-06 — *Added on 5 Jul 2017*
New NANOOS shelf mooring deployed 6/10, 6 nm off Coos Bay / Cape Arago as relocation of now-decommissioned NH-10 mooring. Measures (in near-real-time) weather, temp. & salt (1.5 m), and currents. PMEL air & water CO2 and 1-m temp. & salt also deployed.

OSU NH-10 — *Updated on 5 Jul 2017*
The NH-10 mooring has been relocated to a new location offshore of Coos Bay, designated as CB-06. See the OOI CE02SHSM mooring for continued data near the NH-10 station location.

CMOP Saturn02 — *Updated on 23 Jun 2017*
Mooring was redeployed in early June. NVS harvesting is now restored, with an updated weather and water sensor configuration for this multi-depth asset.

Taylor-PCSGA Dabob — *Updated on 21 Jun 2017*
Sensor are back online starting on June 14, after a gap due to instrument problems and maintenance.

NDBC Washington — *Updated on 7 Jun 2017*
Buoy deployed and data released on 5/31/2017; but continuous data transmission started on Jun. 5. Buoy location was updated (previous deployment position was 42.612 N 130.537 W)


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log Out
NVS
Salish Cruises
mayorga
v5.5
Comment
NANOOS
Map
About
Data
Plots
Matrix
Help
Regions
Routes
Cruises
Legend
Cruises
All Stations
2016
September
July
April
March
2015
November
September
July
May
April
2014
October
September
July
May
2013
September
April
2012
May
2011
Lat:
Lon:
Terrain
PRISM Station P22, Eastern Bank
1999 June
13 Jun 1999 - 21:50:24
Downcast
Upcast
Salish Cruise - Jun 1999 P22
Depth (m)
0
15
30
45
60
75
90
1.50
3
4.50
6
Chlorophyll Fluorescence - CTD
Beam Transmission CTD
Chlorophyll Fluorescence CTD
Oxygen Concentration MG CTD
PAR CTD
Pressure CTD
Salinity CTD
Sigma-t CTD
Temperature CTD
Link
Campbell River
Courtenay
Comox
Vancouver Island
Tofino
Ucluelet
Pacific Rim National Park Reserve
Port Angeles
Sequim
Forks
La Push
Neah Bay
Ozette
Mt Vernon
Oak Harbor
Everett
Whidbey
Olympic National Park
Olympic National Forest
Redmond
Kent
Merritt
Aspen Grove
Coalmont
Princeton
Tulameen
Quilchena
EC Manning Provincial Park
Ross Lake National Recreation Area
Wenatchee National Forest
Leavenworth
Google

Cruises

- 2017 September
- 2017 July
- 2017 May
- 2017 April
- 2016 October
- 2016 September
- 2016 July
- 2016 April
- 2016 March
- 2015 November
- 2015 September
- 2015 July
- 2015 May
- 2015 April

Cross Sections

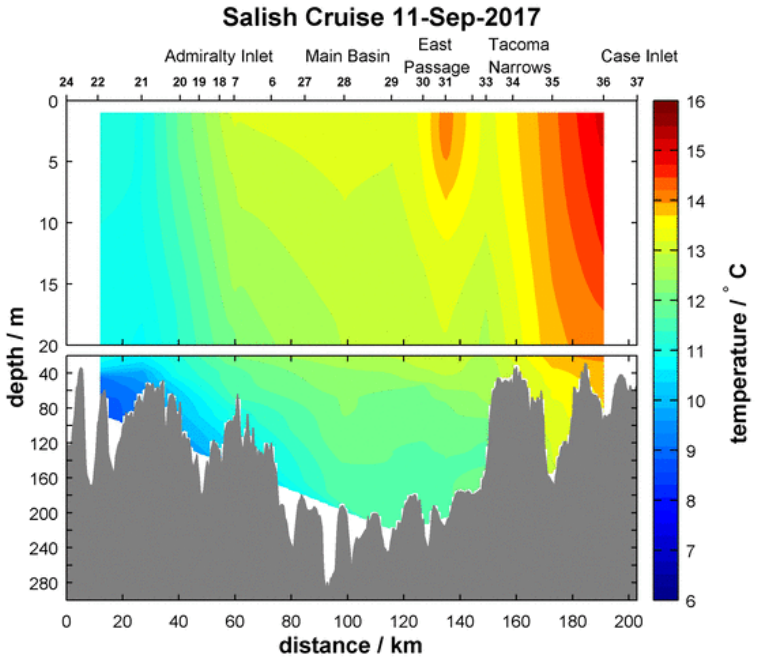
- Main Basin
- Hood Canal
- Whidbey Island
- Sound to Sea

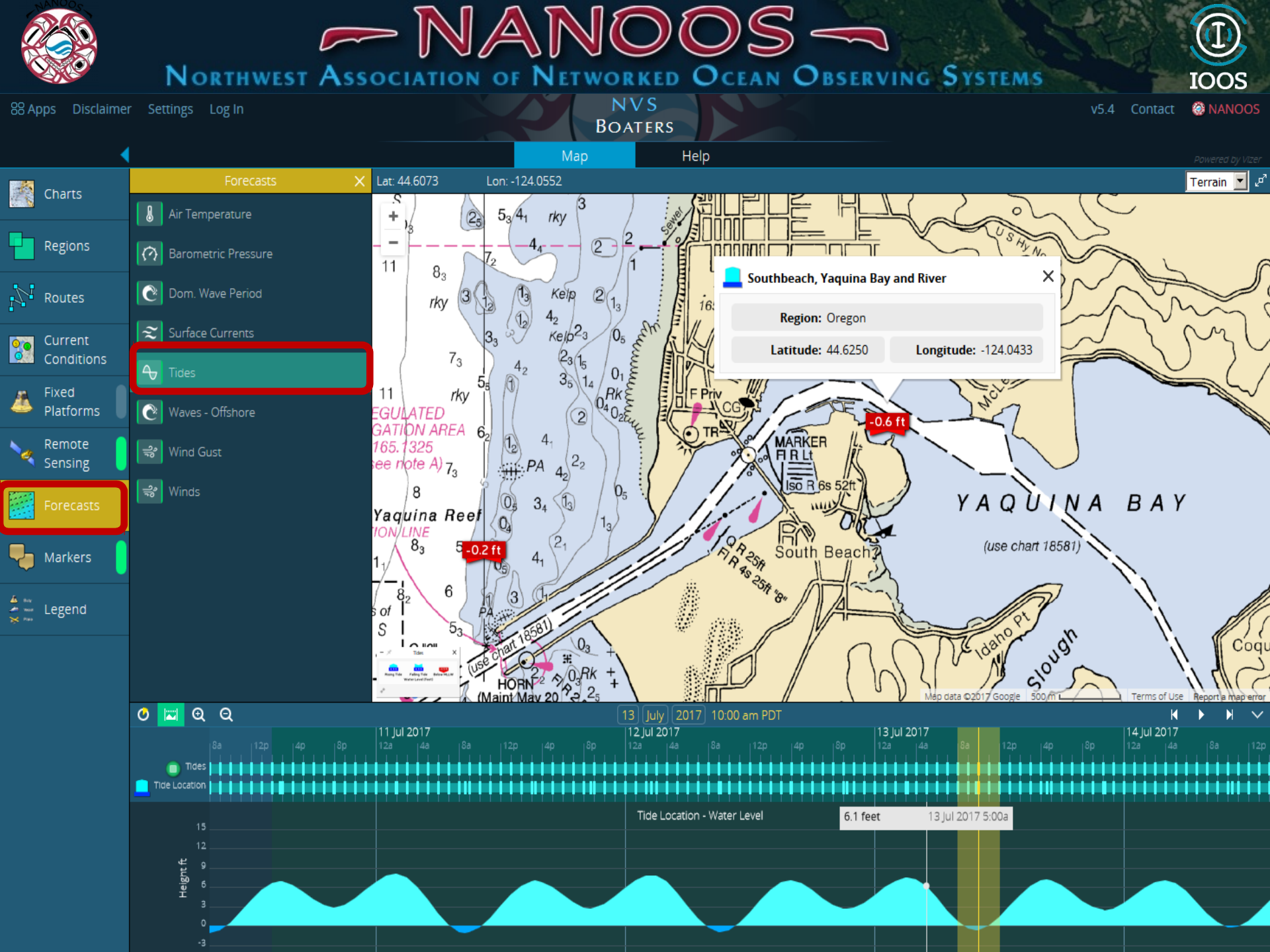
Scale

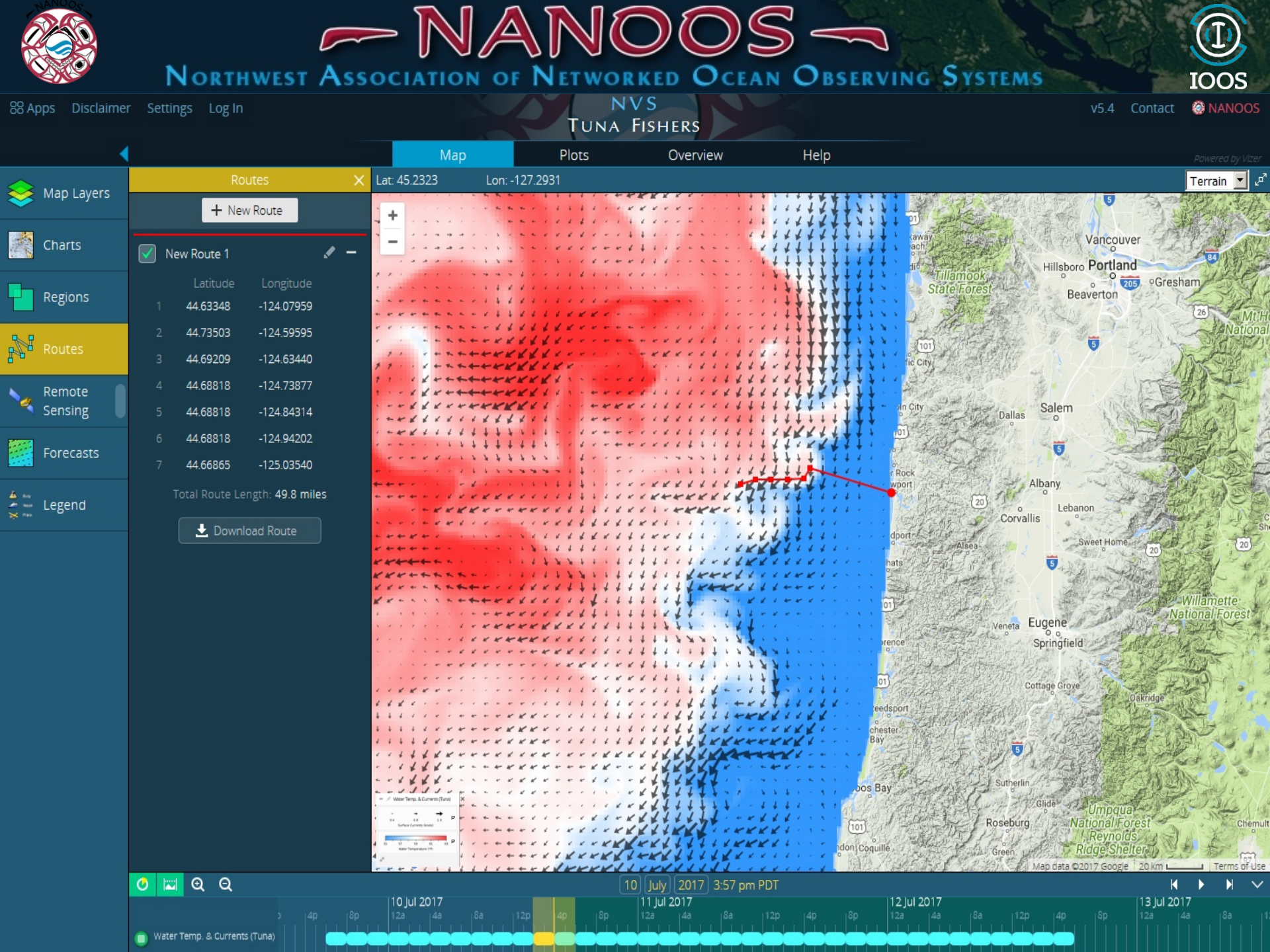
- Global
- Local

Variables

- Temperature - CTD
- Salinity - CTD
- Density - CTD
- Sigma-theta - CTD
- Oxygen Concentration MG - CTD
- Oxygen Concentration MOL - CTD
- Oxygen Concentration MG - Bottle
- Oxygen Concentration MOL - Bottle
- Oxygen Saturation - CTD
- Beam Transmission - CTD
- Beam Attenuation - CTD
- PAR - CTD
- Chlorophyll Fluorescence - CTD
- Chlorophyll Concentration - Bottle
- Phaeopigment Concentration - Bottle
- Nitrite - Bottle
- Nitrate - Bottle
- Nitrate + Nitrite - Bottle
- Ammonium - Bottle
- Silicate - Bottle
- Phosphate - Bottle
- Dissolved Inorganic Carbon - Bottle
- Total Alkalinity - Bottle




NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Boaters
v5.4
Contact
NANOOS
Map
Help
Powered by Vizer
Charts
Regions
Routes
Current Conditions
Fixed Platforms
Remote Sensing
Forecasts
Markers
Legend
Forecasts
Air Temperature
Barometric Pressure
Dom. Wave Period
Surface Currents
Tides
Waves - Offshore
Wind Gust
Winds
Lat: 44.6073
Lon: -124.0552
Terrain
Southbeach, Yaquina Bay and River
Region: Oregon
Latitude: 44.6250
Longitude: -124.0433
-0.6 ft
-0.2 ft
YAQUINA BAY
(use chart 18581)
Yaquina Reef
South Beach
MARKER
Iso R 6s 52ft
Idaho Pt
Slough
HORN
(Maint May 20
Map data ©2017 Google
500 m
Terms of Use
Report a map error
13 July 2017 10:00 am PDT
11 Jul 2017
12 Jul 2017
13 Jul 2017
14 Jul 2017
Tides
Tide Location
Tide Location - Water Level
6.1 feet
13 Jul 2017 5:00a
Height ft


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Tuna Fishers
v5.4
Contact
NANOOS
Map
Plots
Overview
Help
Powered by Vizer
Map Layers
Charts
Regions
Routes
Remote Sensing
Forecasts
Legend
Routes
+ New Route
New Route 1
Latitude
Longitude
1 44.63348 -124.07959
2 44.73503 -124.59595
3 44.69209 -124.63440
4 44.68818 -124.73877
5 44.68818 -124.84314
6 44.68818 -124.94202
7 44.66865 -125.03540
Total Route Length: 49.8 miles
Download Route
Lat: 45.2323
Lon: -127.2931
Terrain
Vancouver
Portland
Hillsboro
Beaverton
Gresham
Tillamook State Forest
Salem
Dallas
Albany
Corvallis
Lebanon
Sweet Home
Eugene
Springfield
Veneta
Cottage Grove
Oakridge
Willamette National Forest
Sutherlin
Roseburg
Glide
Umpqua National Forest
Reynolds Ridge Shelter
Coquille
Green
Chemult
Map data ©2017 Google
20 km
Terms of Use
10 July 2017 3:57 pm PDT
10 Jul 2017
11 Jul 2017
12 Jul 2017
13 Jul 2017
Water Temp. & Currents (Tuna)

NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS

Apps | Disclaimer | Settings | Log Out

NVS
La Push Glider

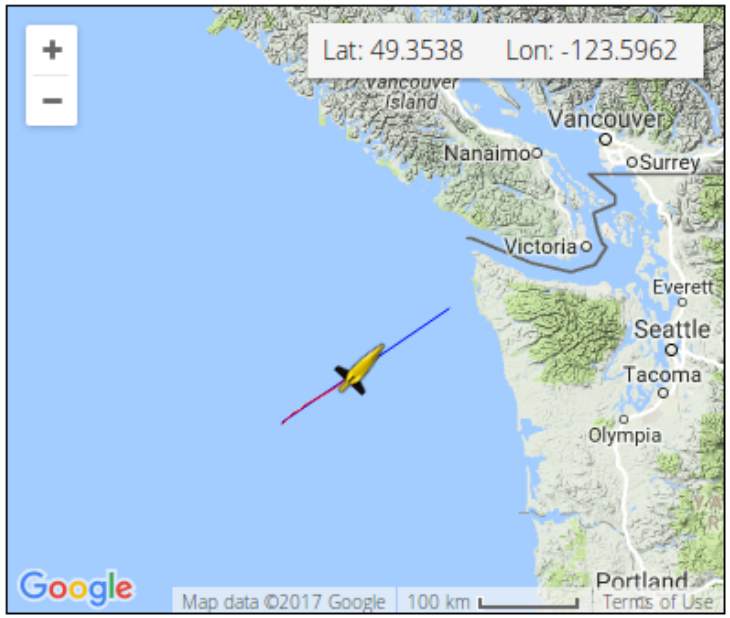
mayorga | v5.4 | Comment | NANOOS

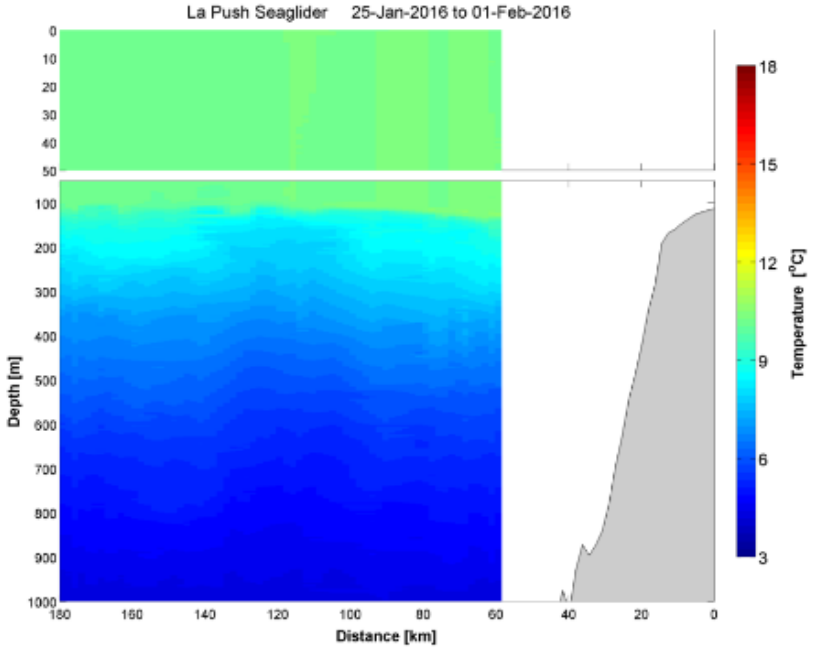
Plots | Annual Plots | Help

Powered by Vizer

Missions 2010-2016 | Type: Seaglider | Provider: UW IOP | Contact: Craig Lee

Temperature | Salinity | Density





29 January 2016 8:18 pm PST

2012 2013 2014 2015 2016

2010-2016

NANOOS

Northwest Association of Networked Ocean Observing Systems

IOOS

Apps | Disclaimer | Settings | Log In

NVS
Shellfish Growers

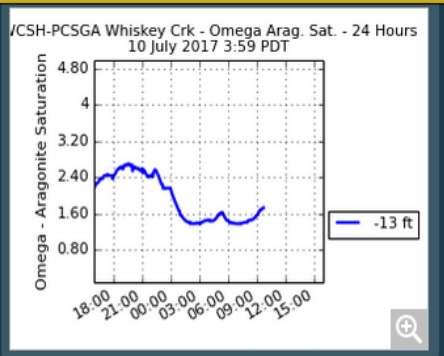
v5.4 | Contact | NANOOS

Map | About | Reference | Help

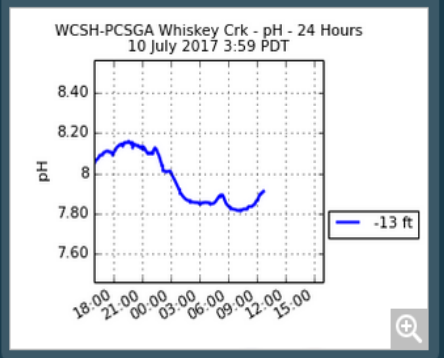
Powered by Vizer

- Regions
- Current Conditions
- Fixed Platforms
- Remote Sensing
- Forecasts
- Plots
- Legend

Plots

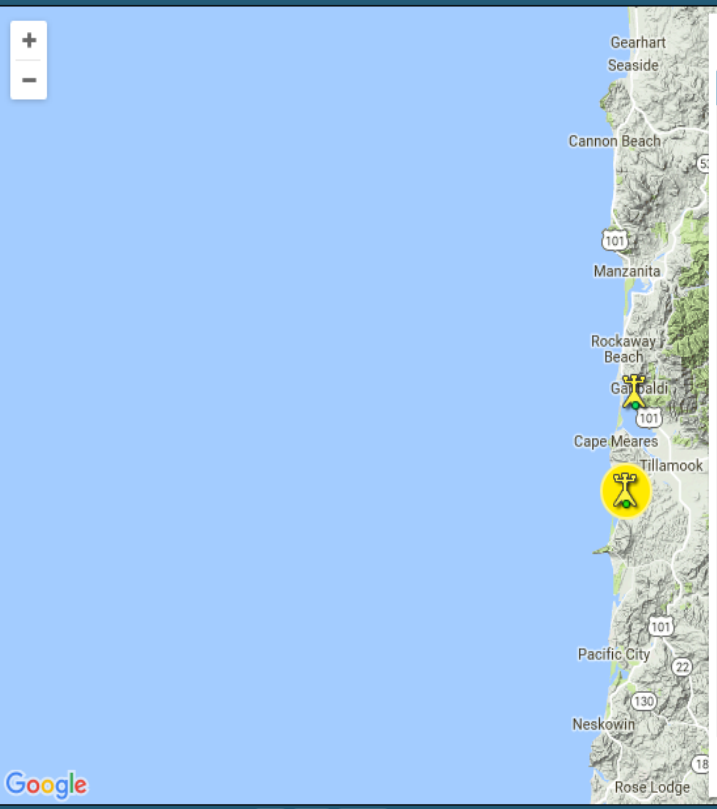


pH



Lat: 45.9378 Lon: -125.2304

Terrain



PCSGA - Whiskey Creek Shellfish Hatchery, Netarts Bay

Observations | Forecasts | Comparator | Details | History | Credits

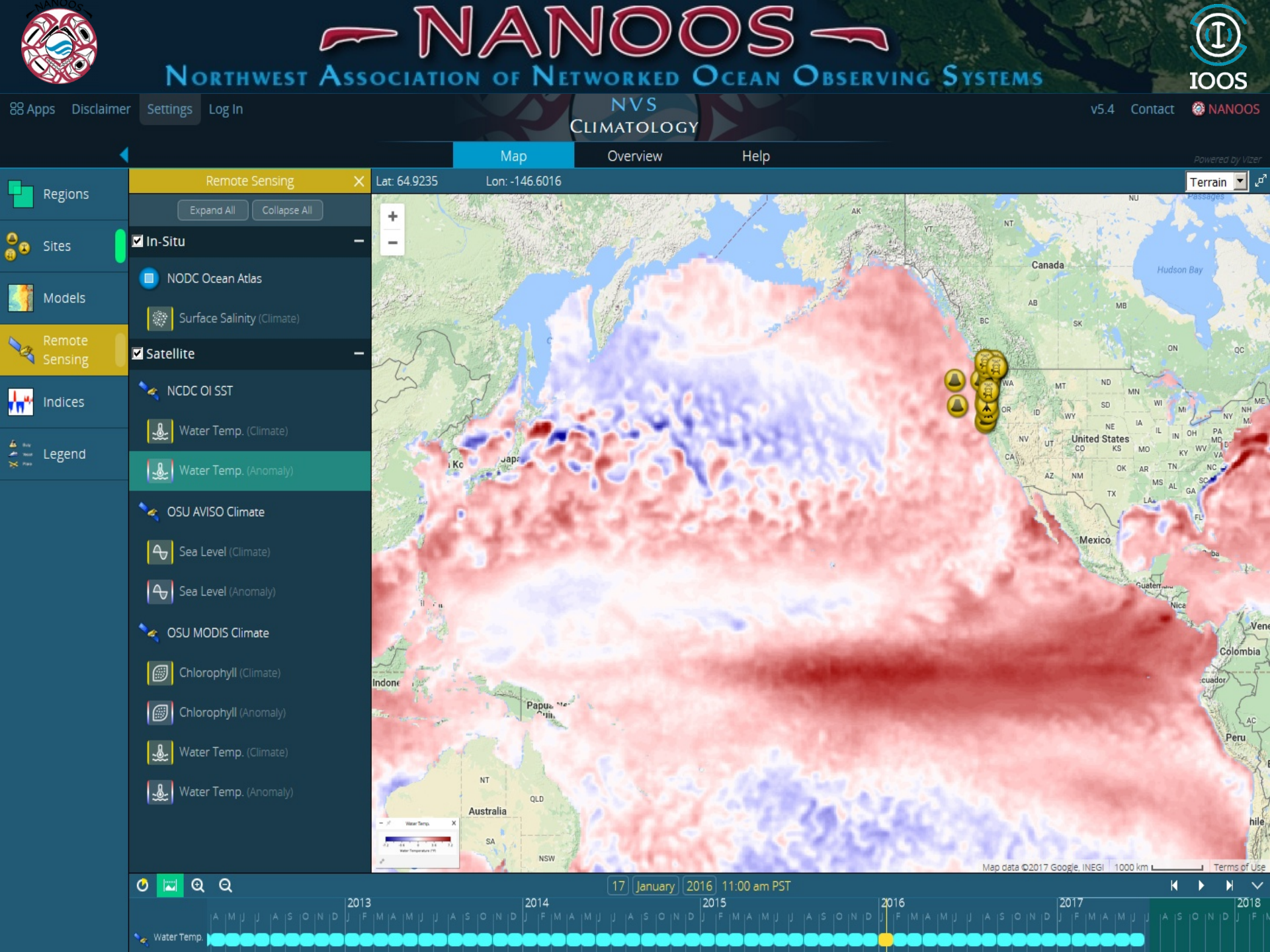
Data Updated: 10 Jul 2017 9:45 PDT **Provider:** WhiskeyCrShelf

HYDROGRAPHIC

Alkalinity (total) (-13 ft)	**2,301.4**	µmol/kg
CO2 Water (-13 ft)	**576.4**	µatm
TCO2 (-13 ft)	**2,065.6**	µmol/kg
Omega Arag. Sat. (-13 ft)	**1.7**	
pH (-13 ft)	**7.9**	
Salinity (-13 ft)	**33.4**	PSU
Water Temperature (-13 ft)	**57.2**	°F

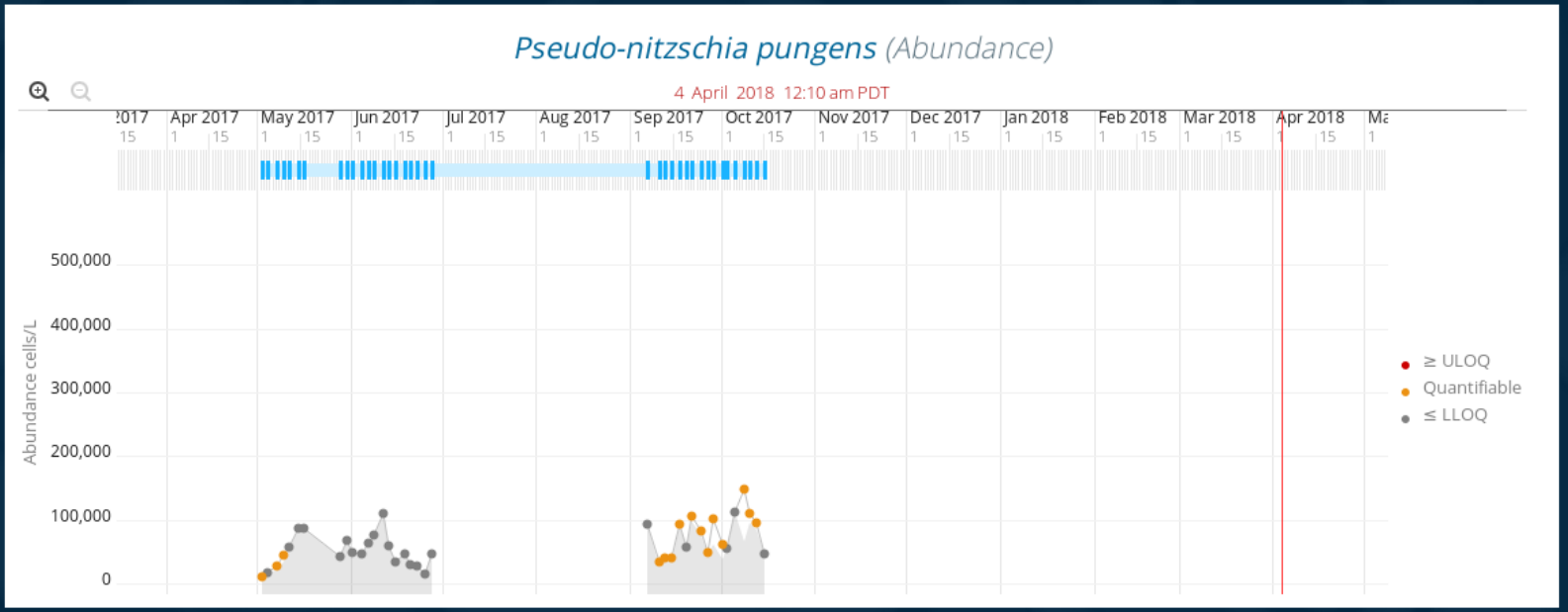
Link

10 July 2017 4:05 pm PDT


NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Apps
Disclaimer
Settings
Log In
NVS
Climatology
v5.4
Contact
NANOOS
Map
Overview
Help
Powered by Vizer
Regions
Sites
Models
Remote Sensing
Indices
Legend
Remote Sensing
Expand All
Collapse All
In-Situ
NODC Ocean Atlas
Surface Salinity (Climate)
Satellite
NCDC OI SST
Water Temp. (Climate)
Water Temp. (Anomaly)
OSU AVISO Climate
Sea Level (Climate)
Sea Level (Anomaly)
OSU MODIS Climate
Chlorophyll (Climate)
Chlorophyll (Anomaly)
Water Temp. (Climate)
Water Temp. (Anomaly)
Lat: 64.9235
Lon: -146.6016
Terrain
Canada
United States
Mexico
Colombia
Peru
Australia
Map data ©2017 Google, INEGI
1000 km
Terms of Use
17
January
2016
11:00 am PST
2013
2014
2015
2016
2017
2018
Water Temp.

The latest water measurements at the NEMO Observatory site where the Environmental Sample Processor is located 13 miles off La Push, Washington. Data are updated in near-real time. These products are provided to help understand where toxic algae may be moving and the conditions that may influence toxic blooms.

Species Abundance	Species Present / Not Detected	Toxins
Pseudo-nitzschia australis	*Alexandrium Species*	Domoic Acid Concentration
Pseudo-nitzschia multiseries	*Heterosigma akashiwo*	
Pseudo-nitzschia fraudulenta		
Pseudo-nitzschia pungens		



Quantitative cell abundances of *Pseudo-nitzschia pungens*. This species can sometimes produce domoic acid which can cause amnesic

J-SCOPE

Home
Forecasts
Year in Review
About the Model
Climatology
Model Performance
People
Partners
Disclaimer
Contact

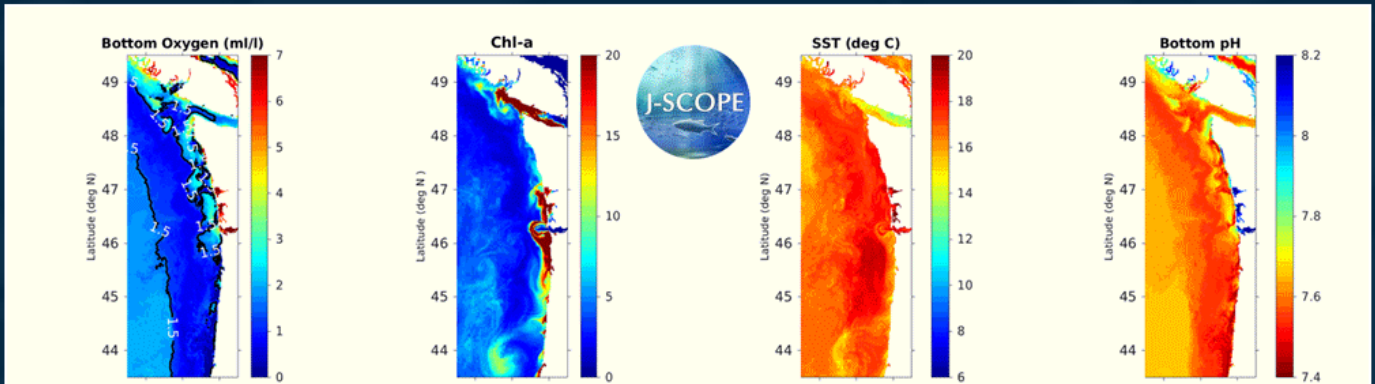
Forecast Origin Dates

Jan 2013 | Apr 2013 | Apr 2014 | Jan 2015 | Apr 2015 | Jan 2016 | Apr 2016 | Jan 2017 | Apr 2017 | Jan 2018

Overview | Chlorophyll | Sea Surface Temperature | Sardines | Oxygen | Ω | CA Current Indicators

The J-SCOPE forecast system for Washington and Oregon coastal waters presents preliminary results for the 2018 upwelling season. The CFS forecast indicates continued La Niña conditions until late spring, with more neutral conditions heading into the summer. In comparison to the climatological data, during the summer upwelling season (May - August), coastal regions are forecasted to have *slightly higher* sea surface temperatures (SST) with *slightly lower* temperatures subsurface. Bottom oxygen is forecasted to be *lower* over much of the region during the upwelling season. Chlorophyll concentrations vary spatially but mostly approach climatology. Bottom Ω is forecasted to be undersaturated throughout the upwelling season, with the exception of supersaturated conditions on shallow Washington shelves. Surface Ω is forecasted to be supersaturated throughout the upwelling season for all coastal areas.

The forecast system predicts the timing of the spring transition from downwelling to upwelling, the cumulative upwelling index, sea-surface temperature (SST), primary production, chlorophyll stock, dissolved oxygen, and sardine habitat. The forecast for 2018 is composed of three model runs that make up an ensemble. Each model run is initialized at a different time (January 5, January 15, January 25), and has complementary forcing files from the large scale model CFS. The details of the wind forcing for each model run can be found on the California Current Indicators tab. For each of the predicted quantities listed above, we report the ensemble average anomaly as well as the relative uncertainty within the ensemble, which is defined as the standard deviation of the ensemble divided by the mean of the ensemble and is reported as a percentage of the mean. All of these quantities are reported as monthly averaged anomalies from our new January-initialized reforecast climatology, which spans 2009 - 2017. An anomaly is an indication of how different conditions are to what they have been in the past. For more information about anomalies, please see the NANOOS Climatology App. These predicted quantities are key indicators for the California Current Integrated Ecosystem Assessment report.



NANOOS

Northwest Association of Networked Ocean Observing Systems

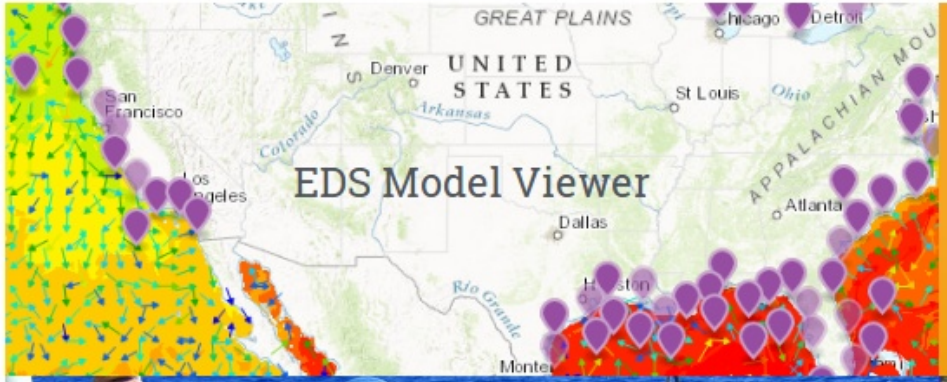
IOOS

IOOS | Integrated Ocean Observing System

IOOS DATA VIEWERS DACS REGIONAL ASSOCIATIONS ABOUT

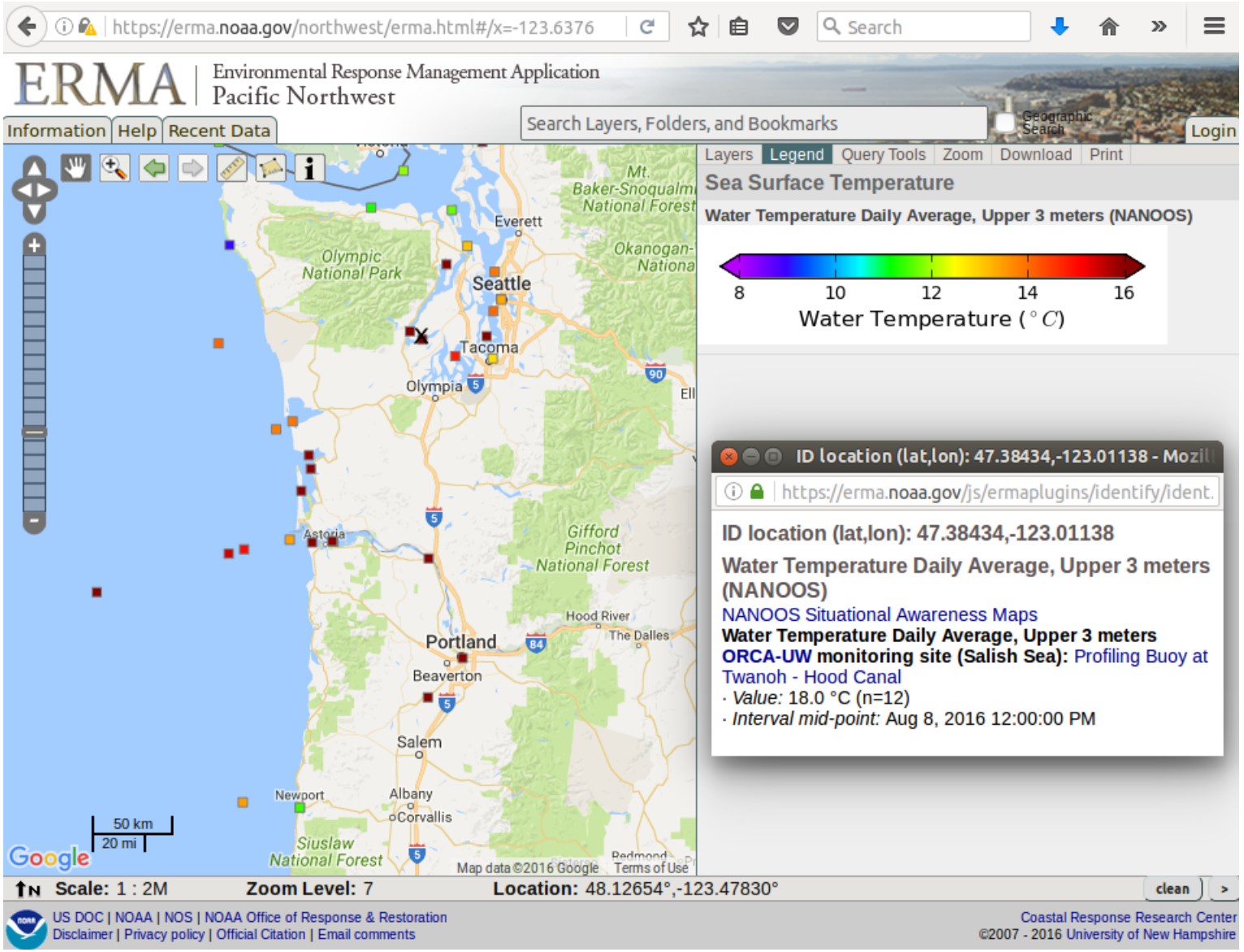
> Search IOOS Data

feedback

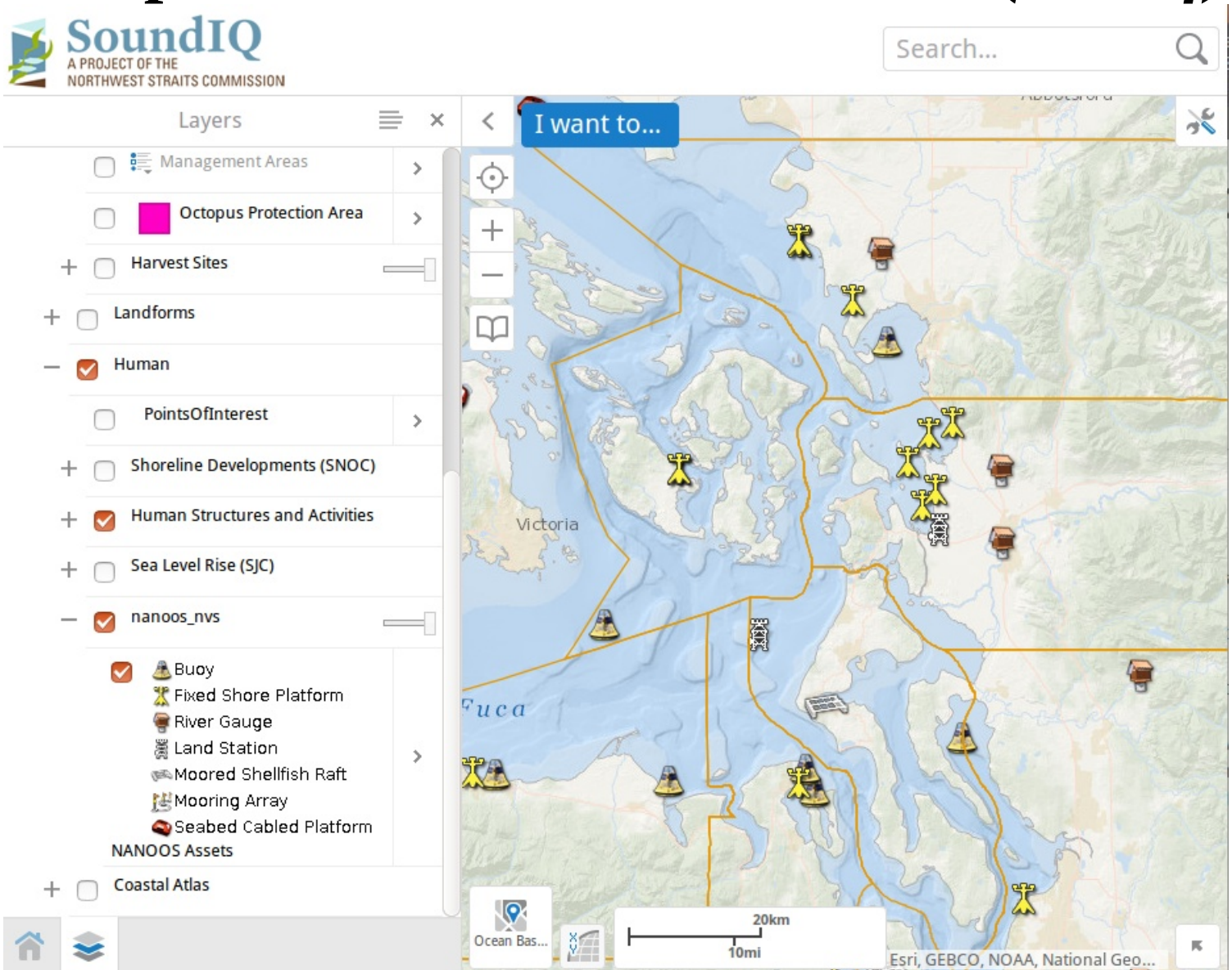


https://ioos.us See also https://ioos.noaa.gov/data/

Geospatial web services in action



Geospatial web services in action *(sort of)*



NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS

https://data.ioos.us/dataset?q=NANOOS&sort=metadata_

Search

THIS INSTANT!

IOOS
Integrated Ocean Observing System

Datasets | Organizations | Feedback | About

Search

IOOS Catalog

Based on standard-compliant, distributed service endpoints

/ Datasets

Filter by location Clear

Map data © OpenStreetMap contributors
Tiles by Stamen Design (CC BY 3.0)

Organizations

- NANOOS (80)
- Glider DAC (12)
- CeNCOOS (2)
- IOOS (1)

NANOOS

95 datasets found for "NANOOS" Order by: Last Modified

SG108-20130923T1728

Seaglider La Push NANOOS line, Washington. Glider covering a 200km SW-NE transect off La Push (Olympic Peninsula), Washington, as part of the Northwest Association of Networked...

ERDDAP-TableDAP ERDDAP

SG187-20100716T1208

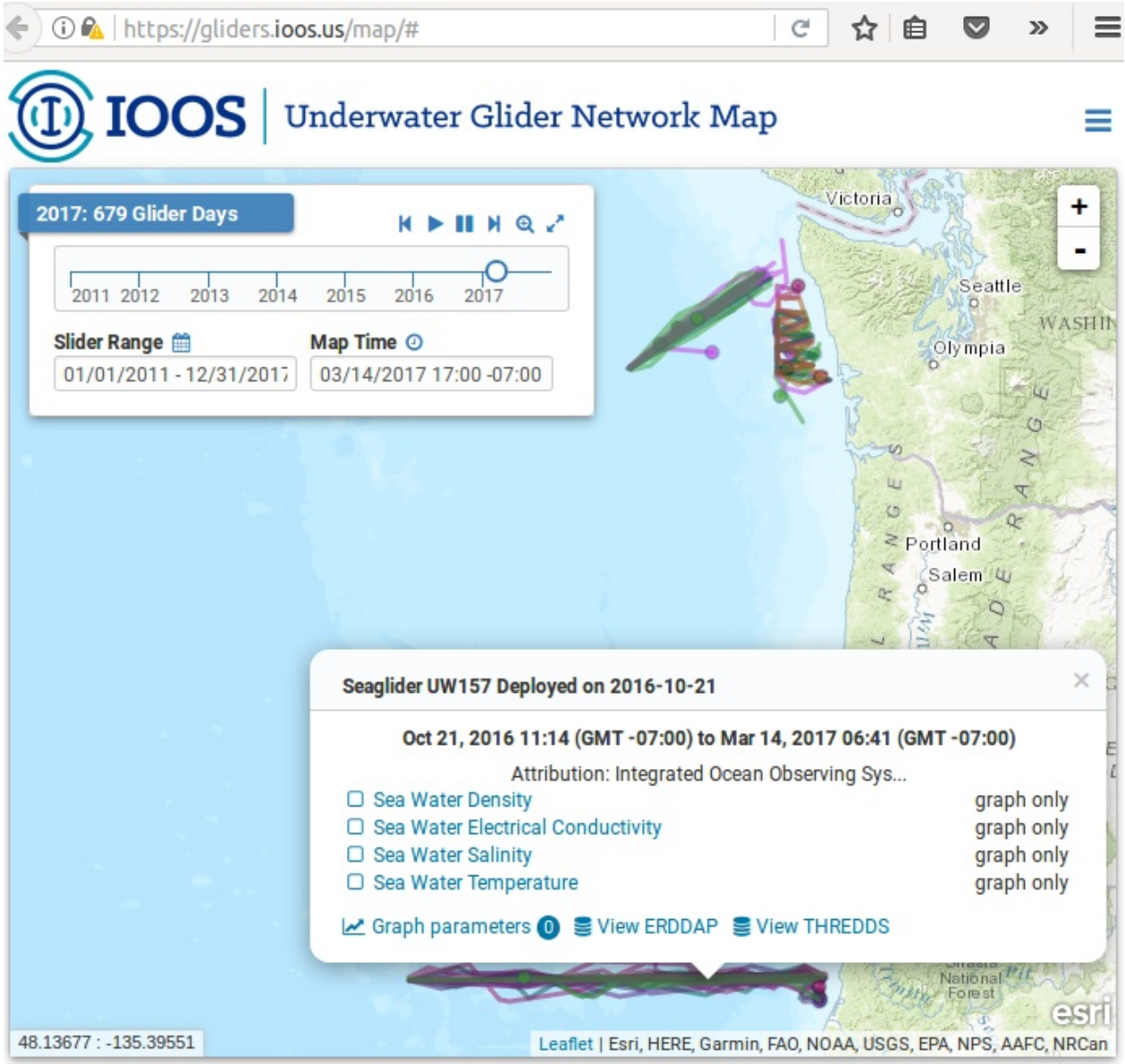
Seaglider La Push NANOOS line, Washington. Glider covering a 200km SW-NE transect off La Push (Olympic Peninsula), Washington, as part of the Northwest Association of Networked...

OPeNDAP SOS HTML

SG187-20120912T1125

Seaglider La Push NANOOS line, Washington. Glider covering a 200km SW-NE transect off La Push

https://data.ioos.us



https://gliders.ioos.us/map/

https://ioos.github.io/BioData-Training-Workshop/

IOOS BioData Workshop

IOOS | Integrated Ocean Observing System

IOOS Biological Data Training Workshop

Nav Feedback search...

Workshop Information

- Workshop Home
- Details & Instructions
  - Workshop Content Details
  - Sub-headers
    - Agenda & Presentations
    - Needed for workshop
    - Participant pre-work
    - Guidance on datasets
    - Python and R setup
  - Venue
  - Lodging
  - Group Dinner
- Agenda & Presentation Access

IOOS Biological Data Training Workshop

Summary: IOOS Biological Data Workshop Home page

Edit me

Thursday, February 8 – Friday, February 9, 2018
University of Washington, Seattle, Washington

Organized by IOOS, NANOOS and OBIS-USA

Workshop Overview

This workshop builds on the successful partnership between the U.S. Integrated Ocean Observing System (IOOS) and the Ocean Biogeographic Information System (OBIS-USA) in coordination with IOC's OceanTeacher Global Academy, and OBIS international to develop a community of practice around the management and analysis of marine biological data. It will provide hands-on training in a computer lab setting and is intended to educate participants on the benefits, goals, technology and process to standardize biological data (and associated physical or chemical data) and make it accessible via OBIS and IOOS, including the MBON Portal. The workshop will also expose participants to OBIS, IOOS and MBON applications for using those data.

See the Workshop Details and Instructions page for additional information about the workshop, including the location, hotels, and workshop preparations.

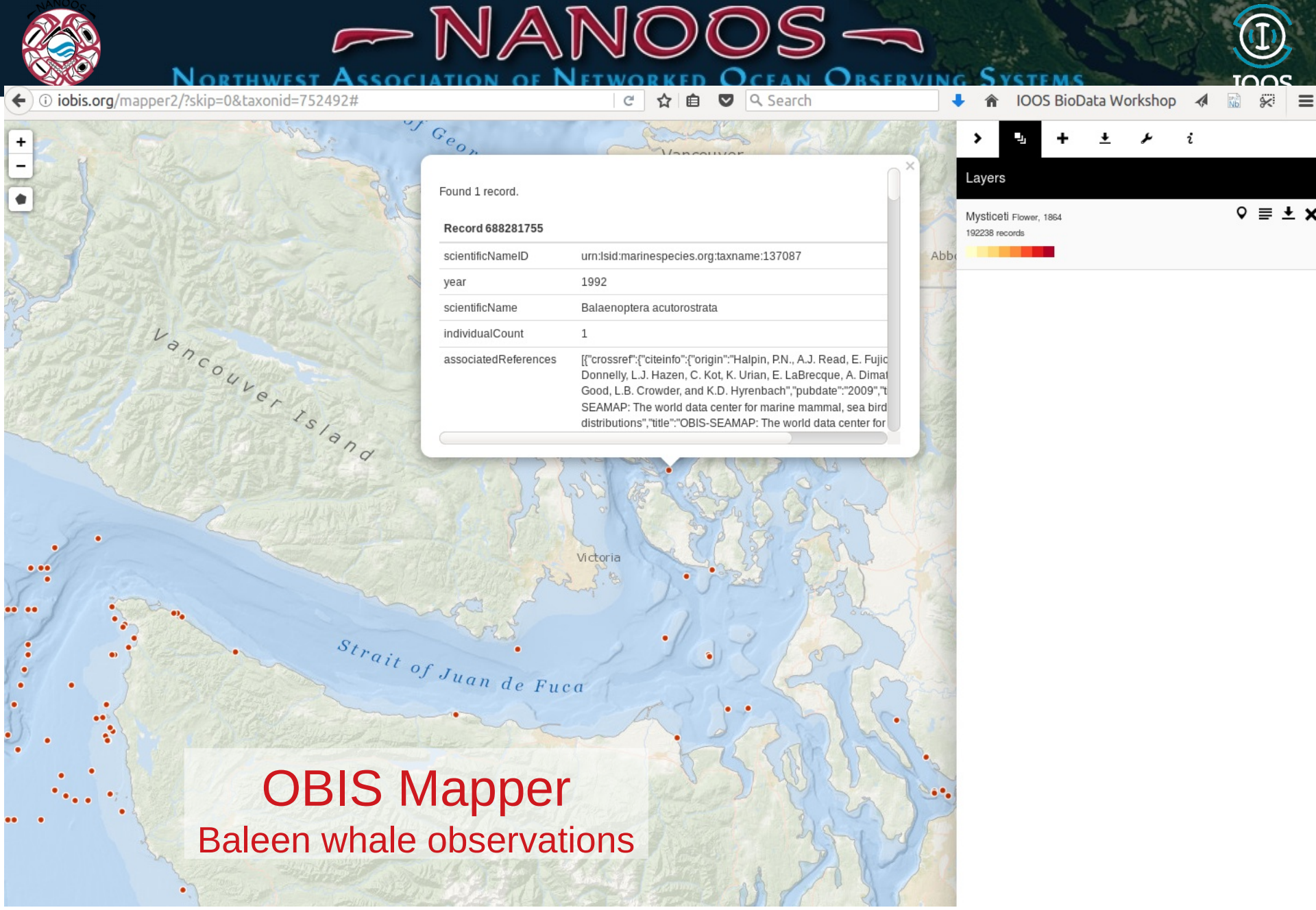
Scope

- IOOS and OBIS standards and tools for biological data
- Web services for data access
- Darwin Core, WoRMS (taxonomy) and metadata standards
- Hands-on data exercises

Outcomes

- Expand the IOOS and OBIS network of collaborators
- Improve marine biogeographic data quality

https://ioos.github.io/BioData-Training-Workshop/



http://iobis.org

Code Gallery

http://ioos.github.io/notebooks_demos/code_gallery/

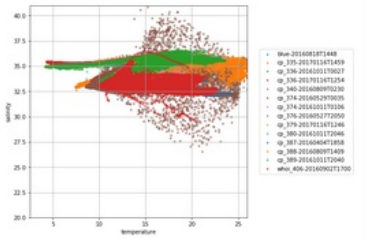
OTHER RESOURCES

1. Installing the IOOS conda environment
2. Opening netCDF files - hints from AODN
3. Unidata Jupyter notebook gallery
4. Extracting and enriching OBIS data with R
5. USGS-R examples

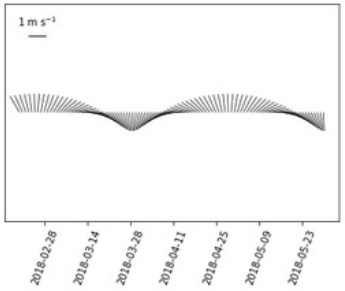
Coastal Ocean Wave Height Assessment

Investigating ocean models skill for sea surface height with IOOS catalog and Python

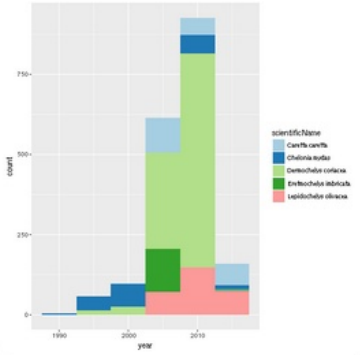
erddapy: a python client/URL builder for ERDDAP



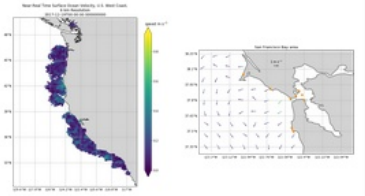
Creating a CF-1.6 timeSeries using pocean



Using r-obistools and r-obis to explore the OBIS database



Fetching data from a CSW catalog with Python tools




NANOOS
Northwest Association of Networked Ocean Observing Systems
IOOS
Thank you!
emiliom@uw.edu
http://www.nanoos.org
http://nvs.nanoos.org