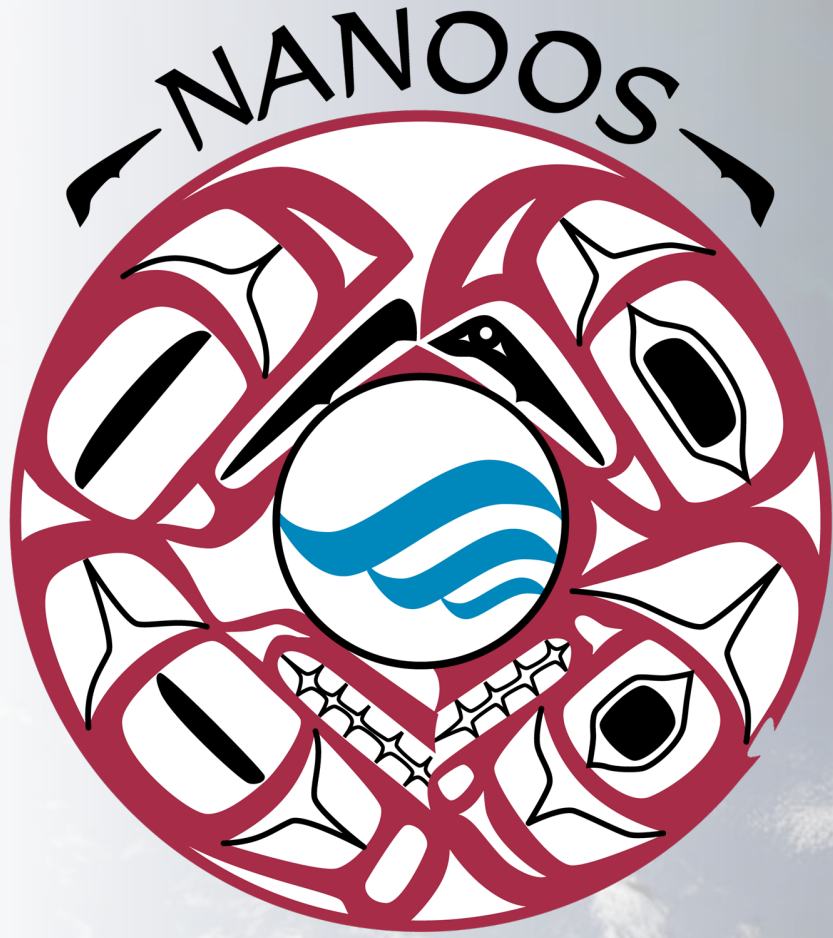
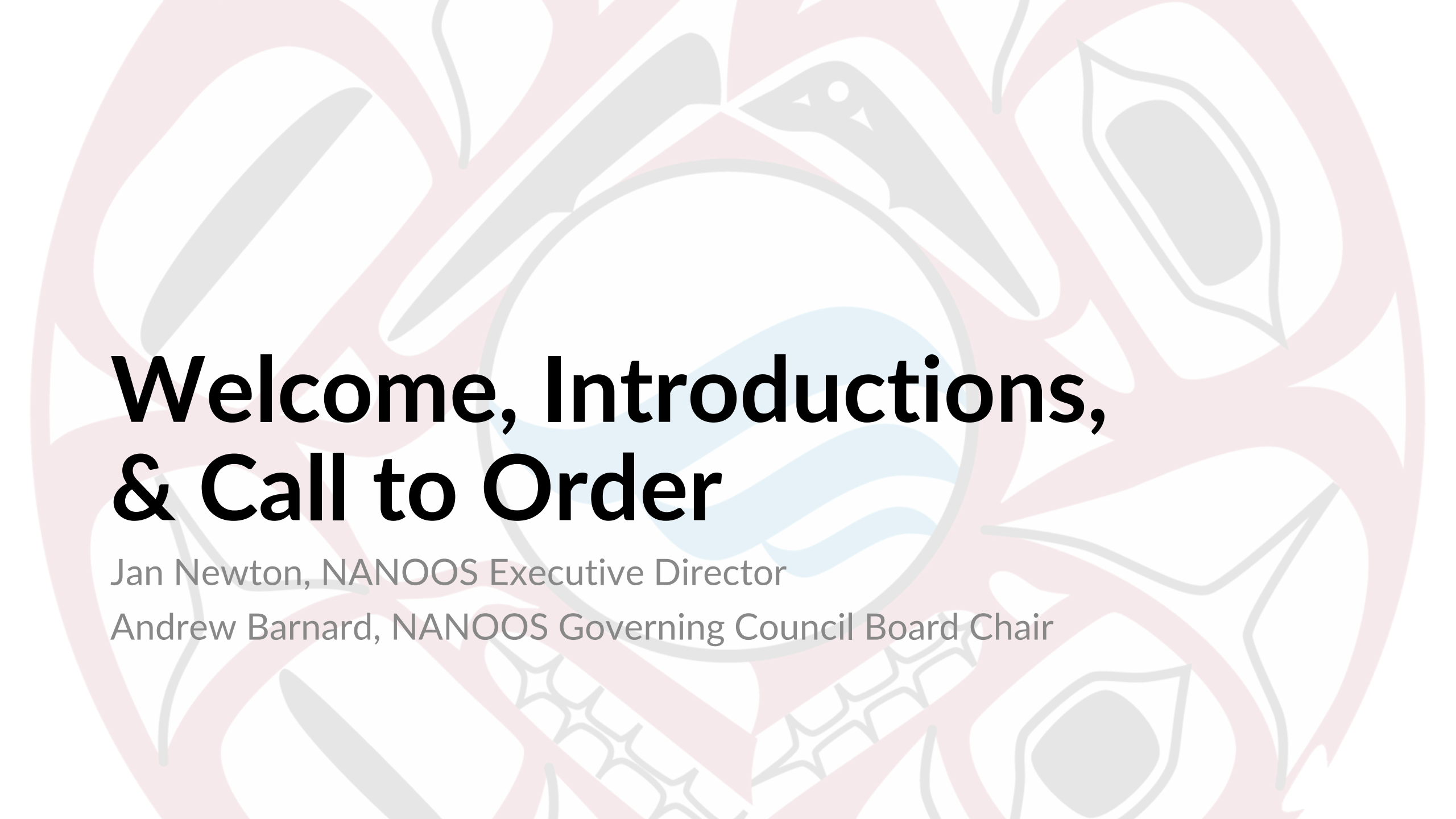




# Governing Council & Principal Investigators Annual Meeting

6 August 2026  
Vancouver, WA





# **Welcome, Introductions, & Call to Order**

Jan Newton, NANOOS Executive Director

Andrew Barnard, NANOOS Governing Council Board Chair

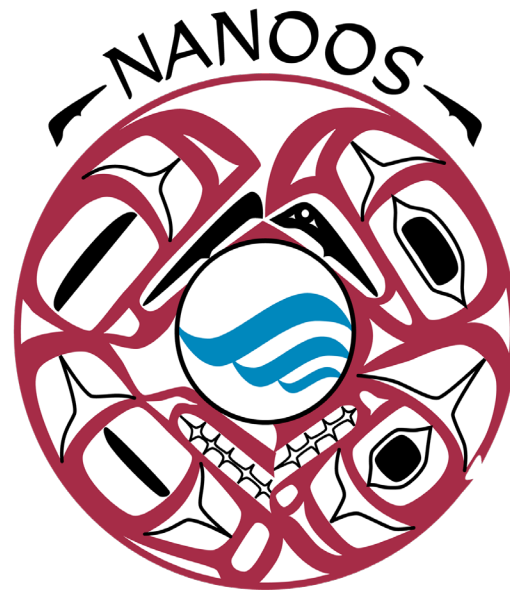
## Agenda Review:

| Time  | Agenda Topic                                                                                                                  | Lead                                                                                                                                                  |
|-------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:30  | Coffee & Goodies                                                                                                              |                                                                                                                                                       |
| 9:00  | Call to Order, Introductions, & Overview                                                                                      | J. Newton, NANOOS Executive Director<br>A. Barnard, NANOOS GC Board Chair                                                                             |
| 9:15  | NANOOS Director Updates                                                                                                       | J. Newton                                                                                                                                             |
| 9:50  | IOOS Association Updates<br>IOOS Program Office Updates                                                                       | K. Yarincik, IOOS Association Director<br>K. Arzayus, U.S. IOOS Program Director &<br>S. Fox, U.S. IOOS Regional Liaison                              |
| 10:30 | Break (group photo)                                                                                                           |                                                                                                                                                       |
| 10:45 | NANOOS Committee Updates: <ul style="list-style-type: none"><li>• Engagement</li><li>• DMAC</li><li>• User Products</li></ul> | R. Wold, NANOOS Engagement Lead &<br>C. Sullivan, NANOOS Engagement Specialist<br>S. Travis, NANOOS DMAC Lead<br>T. Tanner, NANOOS User Products Lead |
| 12:00 | NANOOS IJA and IRA Updates<br><a href="#">CDIP Survey</a>                                                                     | R. Carini, NANOOS Deputy Director<br>J. Newton                                                                                                        |
| 12:30 | Lunch (provided)                                                                                                              |                                                                                                                                                       |
| 1:30  | Member Updates from the Floor                                                                                                 | All                                                                                                                                                   |
| 2:45  | Canada CIOOS Pacific & ONC Updates                                                                                            | J. Watson, CIOOS Pacific Director & Ocean<br>Networks Canada Acting Science Director                                                                  |
| 3:00  | Break                                                                                                                         |                                                                                                                                                       |
| 3:15  | OOI Updates & Discussion                                                                                                      | J. Barth, EC Member & NANOOS PI (OSU)<br>J. Newton                                                                                                    |
| 3:45  | NANOOS Governance                                                                                                             | J. Newton                                                                                                                                             |
| 4:00  | NANOOS Funding Priorities                                                                                                     | J. Newton                                                                                                                                             |
| 4:15  | Reflections on Core Award/Success Stories                                                                                     | R. Carini                                                                                                                                             |
| 4:45  | Action Item Review and All Other Business                                                                                     | R. Carini & J. Newton                                                                                                                                 |
| 5:00  | Adjourn                                                                                                                       |                                                                                                                                                       |





## NANOOS Update







## Governing Council *last updated: August 2026*

- |                                                |                                                  |                                                 |
|------------------------------------------------|--------------------------------------------------|-------------------------------------------------|
| 1. Ocean Inquiry Project                       | 28. King County Dept Natural Resources & Parks   | 55. Ocean Networks Canada                       |
| 2. OR Dept of Land Conservation & Development  | 29. Quinault Indian Nation                       | 56. Lower Columbia Estuary Partnership          |
| 3. Surfrider Foundation                        | 30. Western Resources and Applications           | 57. Western Washington University               |
| 4. The Boeing Company                          | 31. OR Dept of State Lands                       | 58. Raincoast GeoResearch                       |
| 5. Oregon State University                     | 32. Columbia River Crab Fishermen's Association  | 59. WA Dept of Health                           |
| 6. Oregon Sea Grant                            | 33. Port of Neah Bay                             | 60. NOAA PMEL                                   |
| 7. Puget Sound Partnership                     | 34. Northwest Research Associates                | 61. Hakai Institute                             |
| 8. University of Washington                    | 35. Pacific Ocean Shelf Tracking Project         | 62. Salish Sea Expeditions                      |
| 9. Washington Sea Grant                        | 36. WA Dept of Fish and Wildlife                 | 63. Long Live the Kings                         |
| 10. WET Labs, Inc.                             | 37. Northwest Aquatic and Marine Educators       | 64. Rockland Scientific                         |
| 11. Oregon Health and Science University       | 38. Seattle Aquarium                             | 65. Northwest Indian College                    |
| 12. Quileute Indian Tribe                      | 39. NOAA Northwest Fisheries Science Center      | 66. Pacific Shellfish Institute                 |
| 13. OR Dept of Geology and Mineral Industries  | 40. Port Gamble S'Klallam Tribe                  | 67. Weatherflow                                 |
| 14. Humboldt State University                  | 41. The Nature Conservancy                       | 68. Oceans Blue Corp                            |
| 15. Marine Exchange of Puget Sound             | 42. Portland State University                    | 69. Columbia River Inter-Tribal Fish Commission |
| 16. WA Dept of Ecology                         | 43. NOAA Olympic Coast National Marine Sanctuary | 70. World Ocean Council                         |
| 17. Pacific Northwest National Laboratory      | 44. University of Victoria                       | 71. Ocean Aero                                  |
| 18. Port of Newport                            | 45. University of Oregon                         | 72. RBR Ltd                                     |
| 19. Puget Sound Harbor Safety Committee        | 46. Port Townsend Marine Science Center          | 73. Scoot Science                               |
| 20. Sound Ocean Systems, Inc.                  | 47. Intellicheck-Mobilisa                        | 74. Astraeus Ocean Systems                      |
| 21. Council of American Master Mariners        | 48. NortekUSA                                    | 75. Tini Scientific                             |
| 22. Pacific Northwest Salmon Center            | 49. Grays Harbor Historical Seaport              | 76. MRV Systems                                 |
| 23. Northwest Indian Fisheries Commission      | 50. Pacific Coast Shellfish Growers Association  | 77. BeadedStream                                |
| 24. Sea-Bird Scientific                        | 51. US Army Corps Engineers                      | 78. Washington Maritime Blue                    |
| 25. Western Association of Marine Laboratories | 52. Olympic National Park                        |                                                 |
| 26. Leidos                                     | 53. Oak Harbor Middle School                     |                                                 |
| 27. OR Dept of Fish and Wildlife               | 54. Vancouver Island University                  |                                                 |



### **Coastal ocean:**

Northern extent of California Current

*Winds, topography, freshwater input, ENSO & other climate cycles*

### **Major inland basins:**

Puget Sound-Georgia Basin, Columbia River

*Urban centers, nearshore development, climate variation*

### **Coastal estuaries:**

Willapa Bay, Grays Harbor, Yaquina Bay, Coos Bay, +20

*Resource extraction, development, climate*

### **Shorelines:**

Rocky to sandy, dynamic: storms, erosion

*Winds, development, climate*

### **Major rivers:**

Columbia River (~75% FW input to Pacific from US West Coast);

many rivers (e.g., Fraser, Skagit) via Strait Juan de Fuca

*Dredging, water regulation, climate change*

### **NANOOS Region User Groups:**

Maritime: shipping, oil transport/spill remediation

Fisheries: salmon, shellfish, crab, groundfish, aquaculture

Environmental management: HABs, hypoxia, OA, MHW

Shoreline: erosion, inundation, tsunامي

Hazards: search and rescue, national security

Educators: formal, informal, research

Marine recreation: boating, surfing, diving, fishing



# NANOOS Objectives for Y1 / FY2026 funds

1. Maintain NANOOS as the **U.S. IOOS PNW Regional Association**
2. Maintain and enhance **surface current and wave observations**
3. Sustain and enhance **buoys and gliders in the PNW coastal ocean**, in coordination with national and regional programs
4. Maintain and expand **multidisciplinary observational capabilities in PNW estuaries and the nearshore**, in coordination with local and regional programs
5. Maintain and enhance core elements of **beach and shoreline observing**
6. Provide sustained support to a **community of complementary regional numerical models**
7. Maintain, harden, and enhance the **NANOOS Data Management and Cyberinfrastructure (DMAC)** system for routine operational distribution of data and information
8. Continue to deliver existing, and create new, **innovative and transformative user-defined products and services** for PNW users
9. Sustain and strengthen **NANOOS engagement**



10 ISSUES

Maritime Operations/Safety

Harmful Algal Blooms

Coastal Hazards/Erosion

Hypoxia

Ecosystem Assessment

Marine Heat Waves

Ocean Acidification

Biodiversity

Tsunami Evacuation/Preparedness

Climate/Weather

## NANOOS BY THE NUMBERS

12 Academic

16 Federal/State/Local

21 Industry

18 NGO

5 Private/Emeritus

3 Tribes

3 Tribal Organizations

78  
MEMBER  
ORGANIZATIONS

5

Cruises

78

Buoys

247

ASSETS SERVED ON NVS

7

Gliders

2

Ferry-boxes

38

River Gauges

6

Regional Models

98

Fixed Shore Stations

13

HF Radar

1674

DATA STREAMS ACCESSIBLE ON NVS INFORM

47

DATA PRODUCTS

15

USER-SPECIFIC NANOOS APPS

Tsunami Evacuation Zones

Beach & Shoreline Changes

Boaters

Beach View

Fishers

Averages & Anomalies

Shellfish Growers

Backyard Buoys

Surfers

Ways Waters Moves

Data Explorer

Gliders

Seacast

Maritime Operations

Cruises

# NANOOS Budget Over Time

---

FY07-09: \$1.4M + 0.4M = \$1,800,000

FY10: \$1.7M + 0.4M = \$2,100,000

FY11-16: \$2,087,500 - \$2,848,900

FY17-21: \$3,216,463 - \$3,932,271  
(\$2,457,136 core - \$2,462,136 core)

FY22: **\$4,034,112** (\$3,076,136 core; \$430k HABs; \$29k HFR; \$459k OA; \$40k adds)  
Year 16 or 2 of current award

FY23: **\$4,231,964** (\$3,091,136 core; \$460k HABs; \$205k HFR; \$381k OA; \$95k adds)  
Year 17 or 3 of current award

FY24: **\$4,482,669** (\$3,091,136 core; \$430k HABs; \$203k HFR; \$408k OA; \$350k adds)  
Year 18 or 4 of current award

FY25: **\$5,200,000** (\$3,091,136 core; \$430k HABs; \$100k HFR; \$456k OA; \$1,123k adds)  
Year 19 or 5 of current award

FY26: \$??? (1 Sept start date)



**NANOOS**

Northwest Association  
of Networked Ocean  
Observing Systems

# FY25 (Year 5 of Current Award) Details

---

In NCE until 06/31/2027

- \$ 5,200,000
  - \$3,091,136 core
  - \$430,000 National HAB-ON for PNW HAB Bulletin, SoundToxins
  - \$455,599 NOAA OAP for OA measurements on Cha'ba & CB-06
  - \$100,000 HFR (90k retune; 10k ROWG)
    - Pass-throughs: \$614k SSCOFS V2 modeling (Khangaonkar); \$50k model infrastructure/AI (Zaron); \$135k glider collaboration (Barth); \$200k modeling (Durski); \$47k HackWeek; \$77k one-time add



NANOOS

Northwest Association  
of Networked Ocean  
Observing Systems



# NANOOS Funding Streams

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- Core
- Non-core add-ons
- IJA (BIL) Y3-4
- IRA (5y funding)
  - Topic 1 NANOOS directed
  - Topic 2 national and pan-regional:
    - Water levels, waves, webcams (WWW)
    - Ecosystem observations (EcoObs)



NANOOS

Northwest Association  
of Networked Ocean  
Observing Systems



Northwest Association of Networked Ocean Observing Systems



# 2025-2026 Highlights



## We are 23 years old!

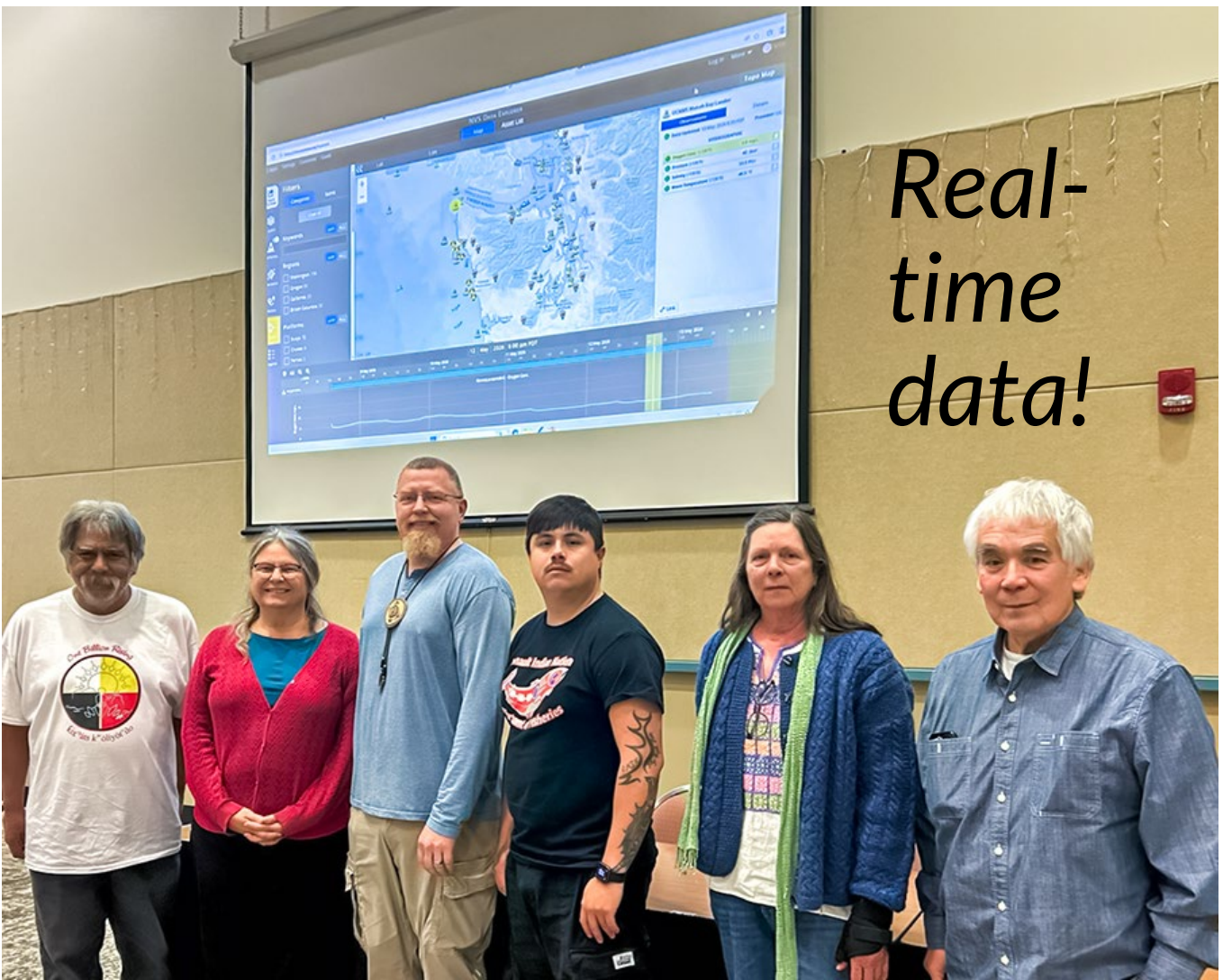
### Then

- R-T data from OCNMS
- Model transect tool
- Extend HFR up WA coast
- Sample HABs better
- Need biology
- Wave data on hyperlocal scale & at Columbia R. bar

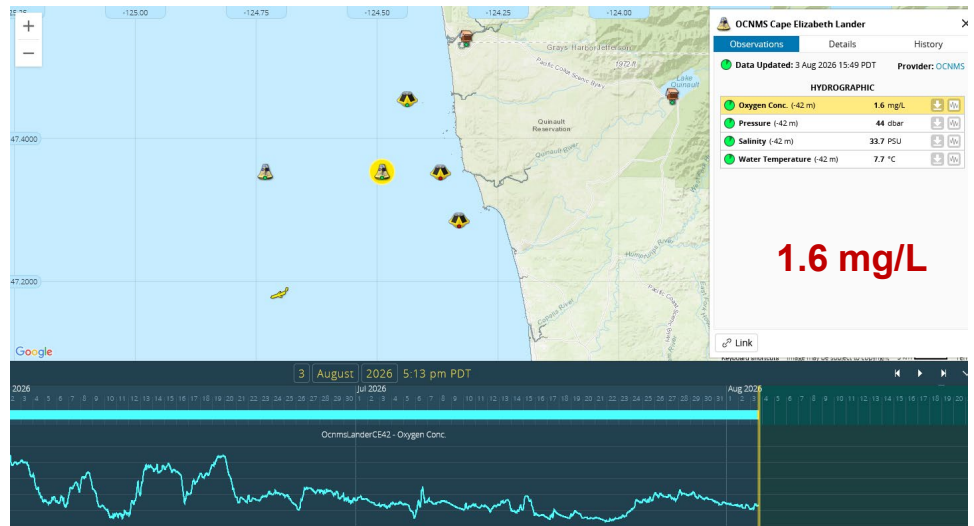
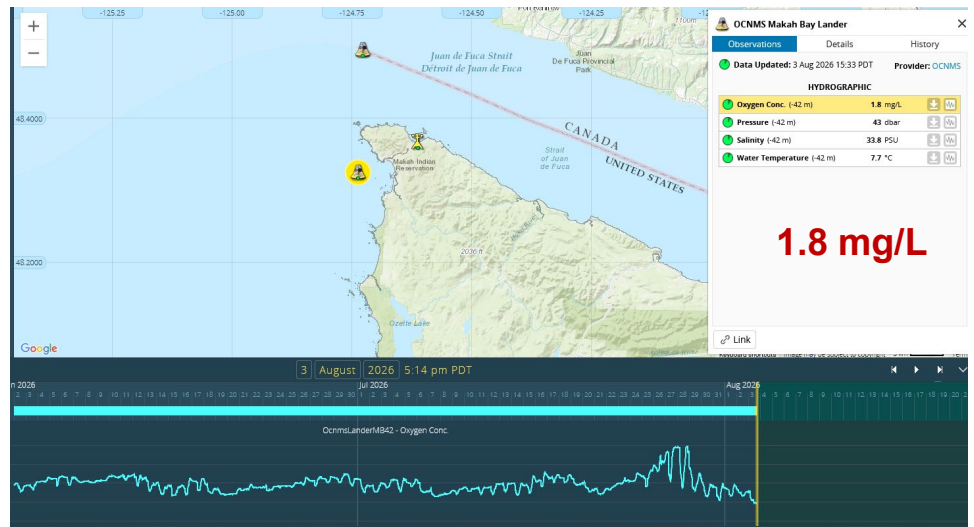
### Now

- Did it!
- Did it!
- Did it!
- Did it!
- Did some!
- Doing it!





OASes Community Workshop, Ocean Shores, WA, May 2026





## *Transect tool*



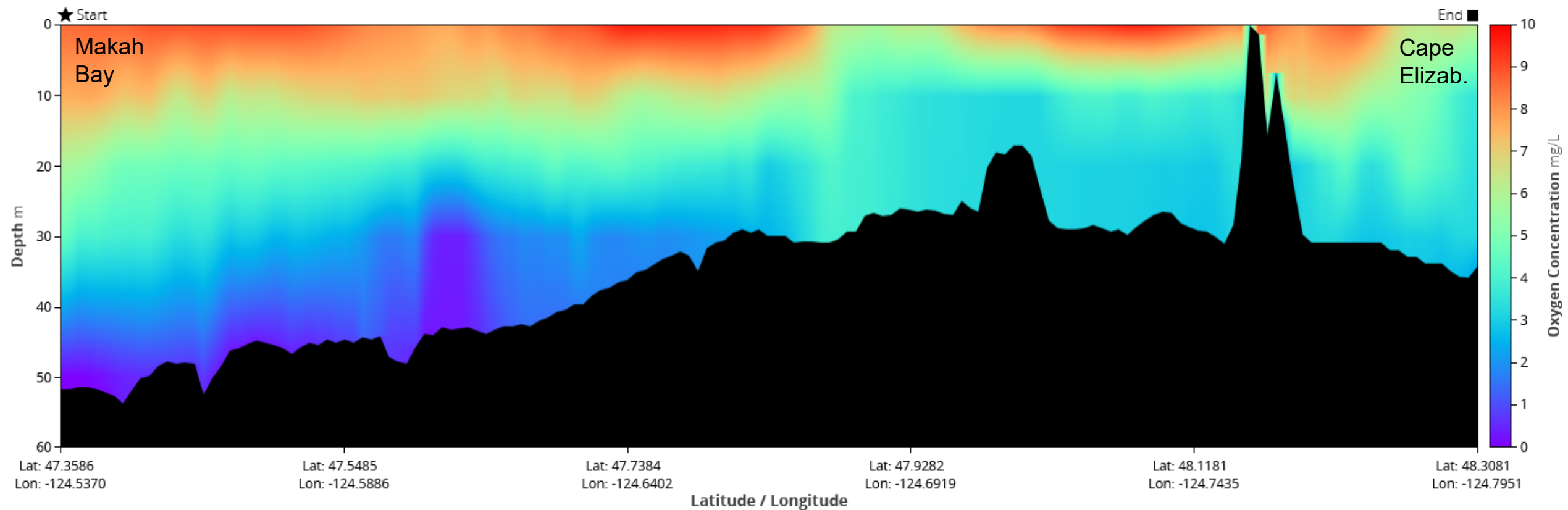
Transect Viewer

No Divider ▼

New Transect 1 ▼

LiveOcean - Oxygen Concentration ▼

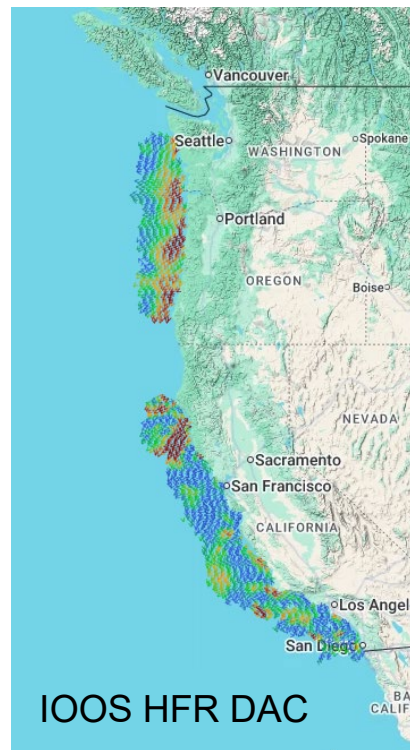
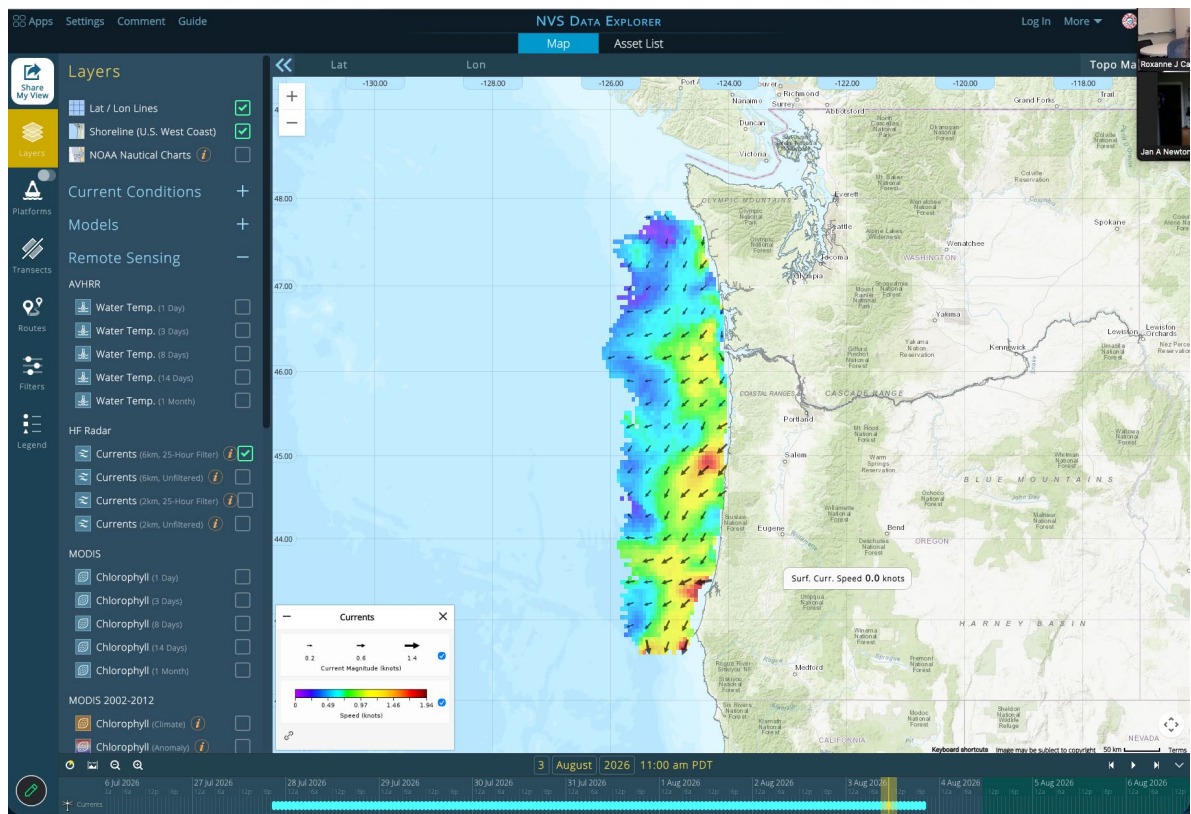
3 August 2026 5:00 pm PDT ▼







## NANOOS HFR



- Uses:
- HAB tracking
  - Navigation
  - Safe route planning
  - Coastal erosion
  - Forecasts

Newest installation  
at Kalaloch, WA



Radiowave Operators Working Group 14th Workshop  
May 5-7, 2026  
Newport, OR

ROWG  
14 in OR

About When Where Workshop Agenda Registration Transportation Weather Airports Lodging

Questions? Sponsors

About

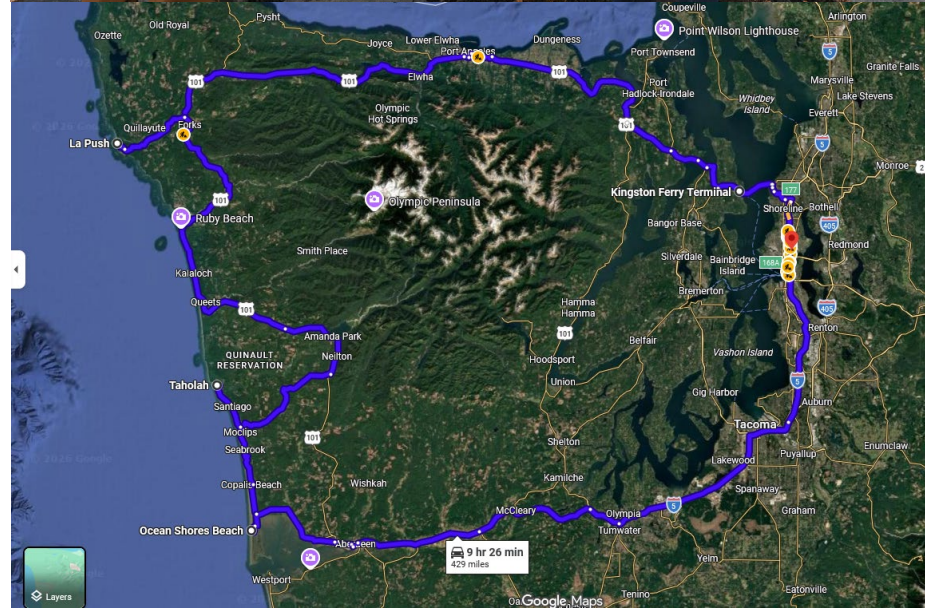
Hosted by Oregon State University (OSU) with the Northwest Association of Networked Ocean Observing Systems (NANOOS) and sponsored by the NOAA U.S. IOOS Office's Surface Currents Program with support from CODAR Ocean Sensors, Ltd., the ROWG-14 workshop will focus on fostering collaboration between new and experienced coastal high-frequency radar (HFR) operators, developing procedures governing operations, and providing recommendations to users, developers, manufacturers, and program managers.



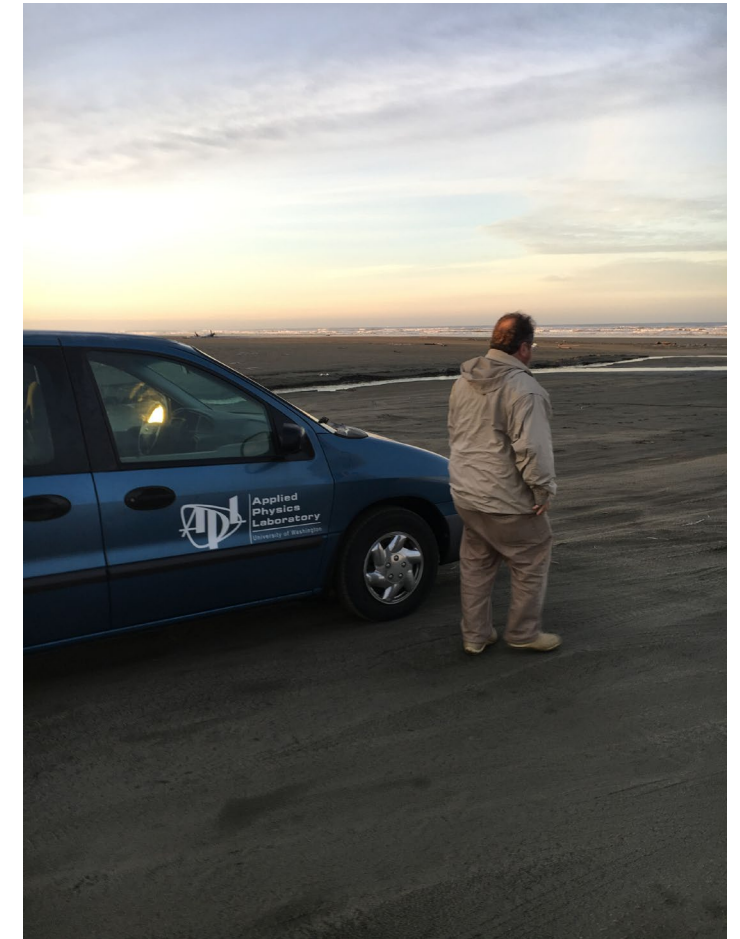


## Siting Westport and Kalaloch

*The “Then”*



- 9.5 hours
- 429 miles
- Numerous ‘sites’ to try to find two
- Dec 2017







# Pacific Northwest Harmful Algal Blooms Bulletin

Apr 22, 2026 HAB risk =

HAB risk key:

- = low
- = medium
- = high

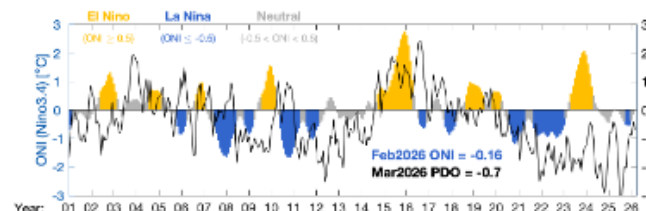


The statements, findings, conclusions, and recommendations do not necessarily reflect the views of NOAA or the Department of Commerce.

The new HFR data are already part of a HAB risk advisory for tribal and state governments

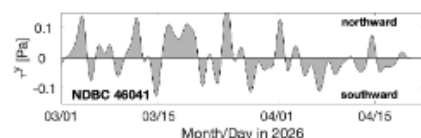
The “Now”

## Pacific Ocean Indices



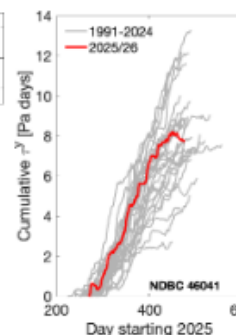
Research has shown that toxic HAB events off WA and OR tend to occur during or following periods of El Niño and/or positive phases of the PDO, when ocean temperatures are relatively warm.

## North-south Wind Stress

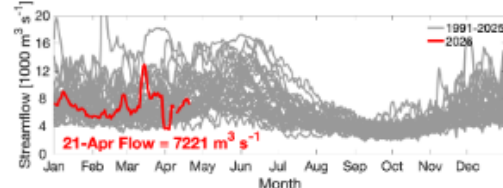


Southward wind stress drives coastal upwelling that can lead to plankton blooms. Northward wind stress tends to push any existing offshore plankton and toxins towards beaches. In addition, summer/fall toxic blooms often occur in years with a moderate cumulative upwelling index (i.e. during years with fluctuating winds) rather than in years with sustained upwelling or downwelling winds.

## Cumulative Wind Stress



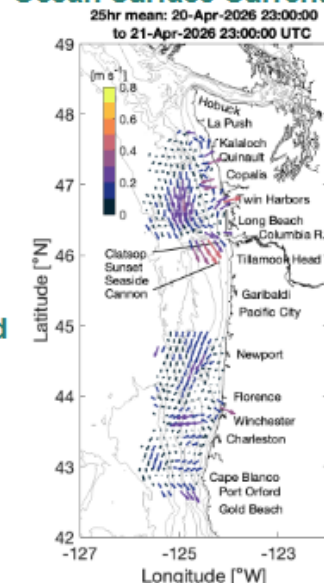
## Columbia River Discharge



The Columbia River plume can help transport HABs and toxins from the south, northward along the WA coast. However, the plume can also serve as a protective barrier by preventing offshore toxins from reaching beaches.

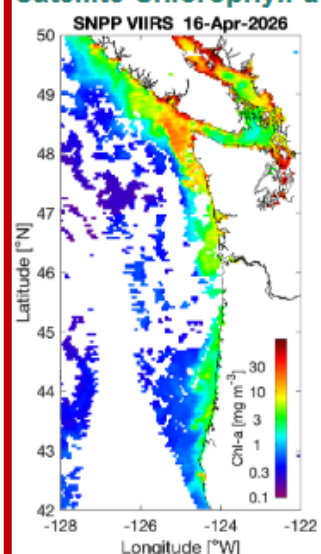
Model predicted sea surface salinity with particles released near the Juan de Fuca eddy and Heceta Bank and tracked three days into the future. Red dots indicate particles.

## Ocean Surface Currents



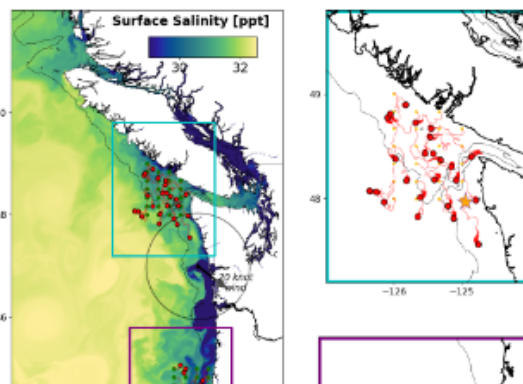
Primary currents flow north and south in winter and summer, respectively, except within ~10 km of shore, where fluctuations follow changes in wind direction.

## Satellite Chlorophyll-a



Clouds often obstruct satellite views, but the extent of phytoplankton blooms can at times be seen from space. Blooms do not necessarily reflect the presence of toxins.

## LiveOcean Forecast Model



**Summary** - Coastal winds have continued to be variable and relatively weak. When stronger pulses have appeared, the wind direction has not been conducive to strong upwelling. As a result, along-shelf surface currents, as captured by the HF radar network, also remain relatively weak with little net southward transport. The LiveOcean model further illustrates this, with Columbia River plume water present off both the WA and OR coasts. Shelf bottom temperature is still over 8 °C. Available satellite imagery indicate that moderate chlorophyll-a concentrations exist over the shelf throughout the region, with highest values off northern WA. *Pseudo-nitzschia* (PN) cells of both large and small morphologies now appear in low to moderate concentrations at many area beaches. The highest recent concentrations of large PN cells have generally been observed at southern WA and northern OR sites: 48,000 cells/L at Long Beach, and 31,000 cells/L at Columbia River South Jetty on 13-Apr. On 6-Apr, 120,000 cells/L large PN were also captured in a sample from Gold Beach, OR, but values had decreased to 4,000 cells/L on 13-Apr. Since concentrations of large PN have increased to moderate levels, particulate domoic acid (pDA) testing has begun. Generally, low pDA concentrations have been detected throughout the region with values <20 ng/L. The exception was at Long Beach, WA, where ~52 ng/L pDA was recorded on 13-Apr. No new offshore samples were available. Razor clam DA values remain low at WA beaches. The highest concentrations were 2 ppm at Long Beach, Willapa Spits, and Twin Harbors as of 16-Apr. In OR, razor clams from Sunset Beach contained 6 ppm DA as of 3-Apr while previous samples from Newport contained 10 ppm DA as of 6-Mar. Updated shellfish DA concentrations at both OR and WA beaches are expected this week.

**Forecast** - ENSO neutral conditions are expected through spring with a transition to El Niño by summer. The PDO index remains negative. Southward (upwelling-favorable) winds are



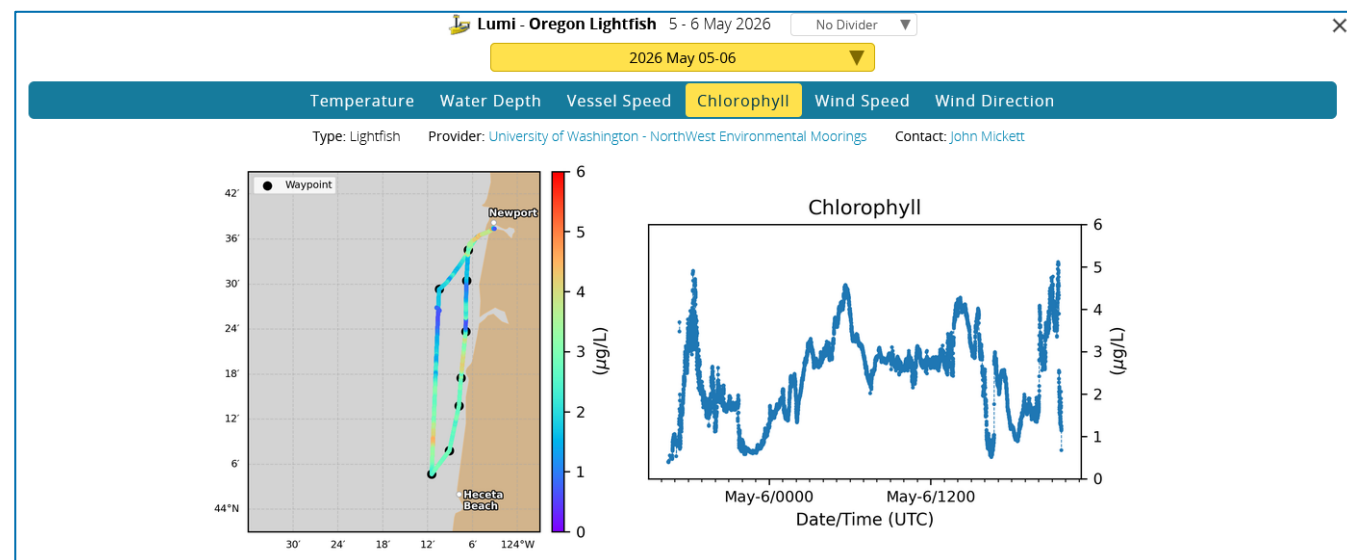
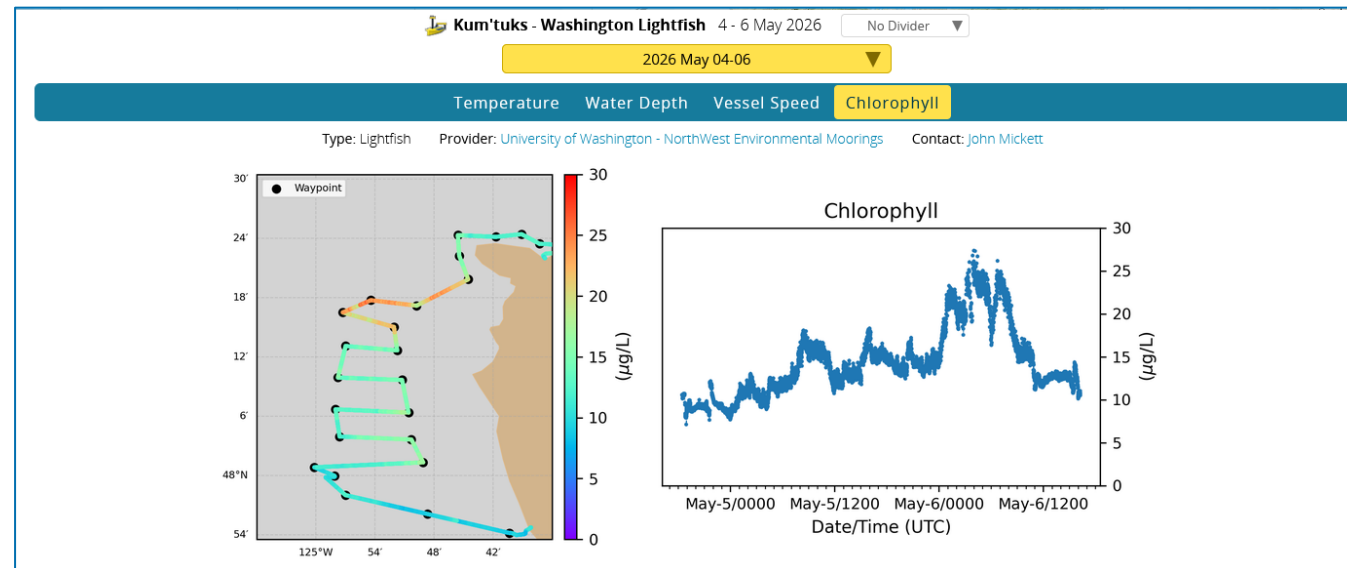
SeaSats “Lightfish”  
Autonomous Surface  
Vehicle with water  
sampler



The “Kum'-tuks” (*Chinook jargon for "To know/understand"*) Lightfish was deployed off the coast of Washington aboard the Olympic Coast Sanctuary's vessel R/V Storm Petrel. The solar-charged autonomous surface vehicle, augmented with a water sampling system designed and built by APL-UW, collected 16 offshore water samples for HAB toxin analysis from La Push to Neah Bay.

## Sampling HABs Remotely

The, “Lumi” (*Latin for “light”*) Lightfish successfully characterized the nearshore phytoplankton community within Heceta Bank, Oregon, during the spring HAB monitoring season. Deployments sampled 16 stations spanning approximately 30 miles of the central Oregon coast, providing valuable observations from a region known to retain HAB populations. Samples were analyzed at the OSU Hatfield lab for plankton abundance, species composition and levels of domoic acid, the HAB toxin that causes amnesic shellfish poisoning.







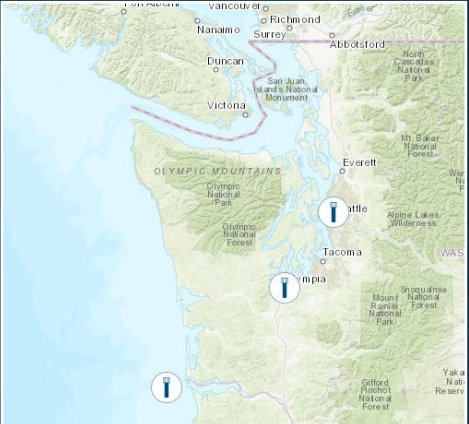
## Biology comes to NANOOS\*

**Imaging FlowCytobot (IFCB) Sampling in the Pacific Northwest**

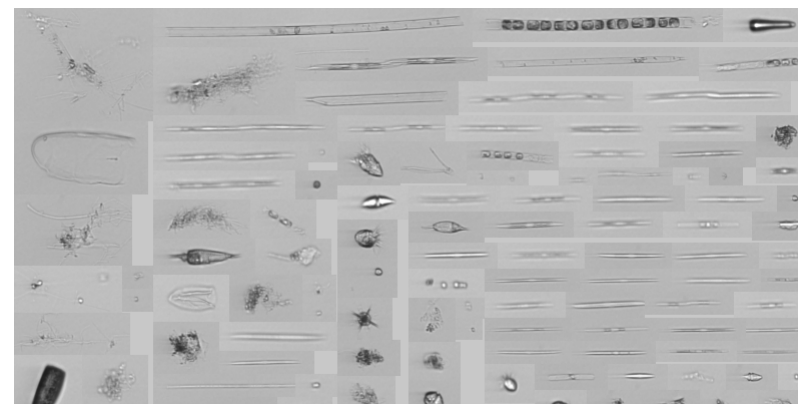
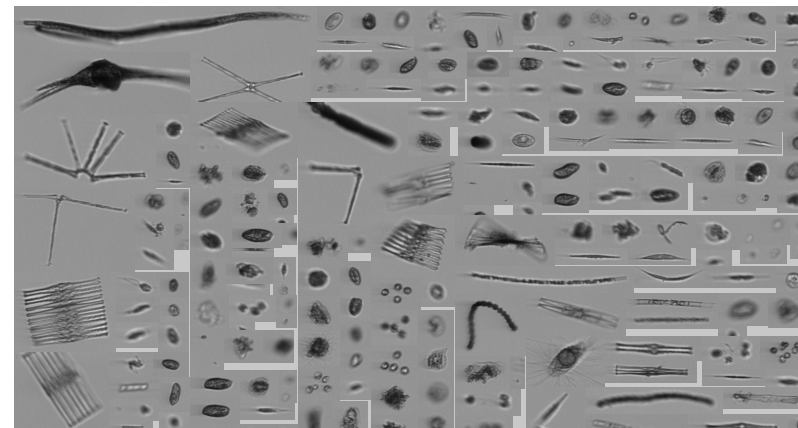
[Dashboard List](#) [How to Use Dashboards](#)

IFCB Dashboards are interactive, web-based portals that provide open access to image datasets generated by the IFCB. Through the dashboard interface, users can easily visualize when and where sampling occurred, explore images, and access associated metadata. User groups operating IFCBs in the PNW have multiple dashboards for different applications, accessible using the links below.

*Before downloading IFCB data for research or management purposes, please contact the associated primary investigator or use our [Contact](#) page to obtain permission.*



- APL-UW IFCB Dashboard**  
Ali Chase, APL-UW
- HABON IFCB Dashboard - Budd Inlet**  
Stephanie Moore, NOAA
- HABON IFCB Dashboard - Pacific Hake Survey**  
Stephanie Moore, NOAA

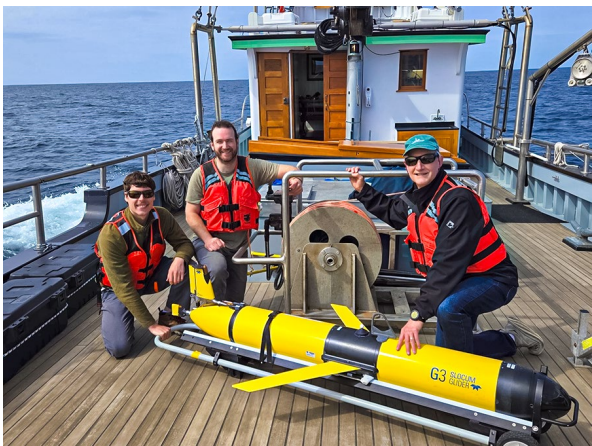


\*(not just chlorophyll)

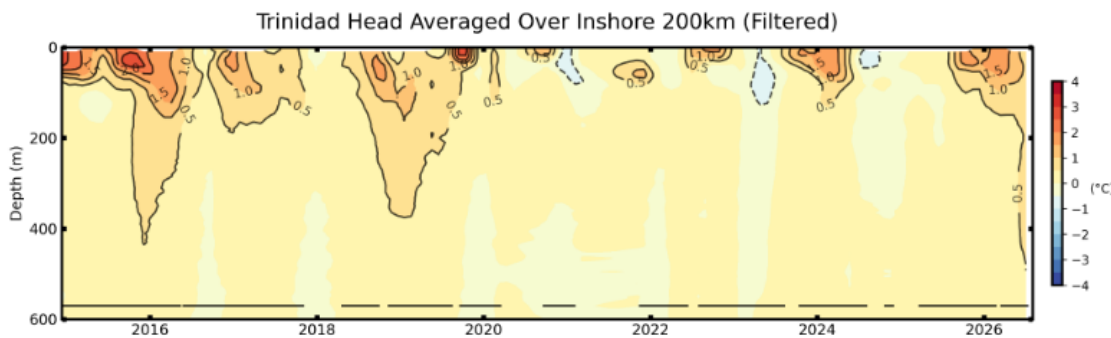




The “Share My View” tool is enabling customization useful in many other projects.



Customizable Oxygen Dashboards in the works.



**Figure JB.1:** Temperature anomaly from the Trinidad Head, CA (41° 3.5'N) glider line. Horizontal lines above the time axis indicate when the TH-Line glider was in the water.



## NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS (NANOOS)

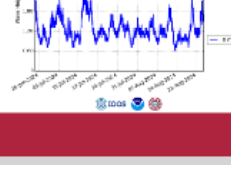
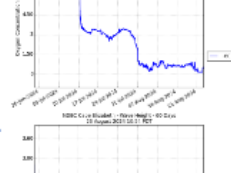
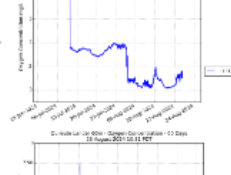
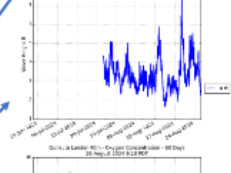
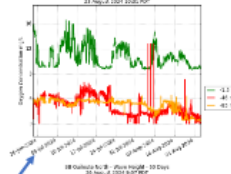
The eye on the Pacific Northwest's ocean and coast

The Northwest Association of Networked Ocean Observing Systems, **NANOOS**, is part of a national NOAA-funded effort, the U.S. Integrated Ocean Observing System, **IOOS**, designed to enable the broadest access to ocean data, tools, products, and knowledge. NANOOS provides coordination of people, technology, and data to make coastal ocean information more accessible and usable.

In response to the Hoh Tribe's request, here, on two pages, we provide links to tailored information of specific interest to the Hoh Tribe accessed from our comprehensive NANOOS Visualization System (**NVS**).

Here, each link takes you directly to updated data for oxygen or wave height. Other variables like temperature are also available to explore. When oxygen is below 2 mg/liter, that is hypoxia and sensitive organisms may be stressed or perish; oxygen below 5 mg/liter may cause avoidance behavior in some species. See real-time oxygen data, if available, from the UW *Cha'ba* mooring, two Quileute Tribe moorings (1, 2), and a UW *glider*. See real-time wave data from a Quileute Tribe *wave buoy* and a NOAA *NDBC mooring* at Cape Elizabeth. Just click on the image and you will see the latest data on NANOOS.





**nanoos.org**

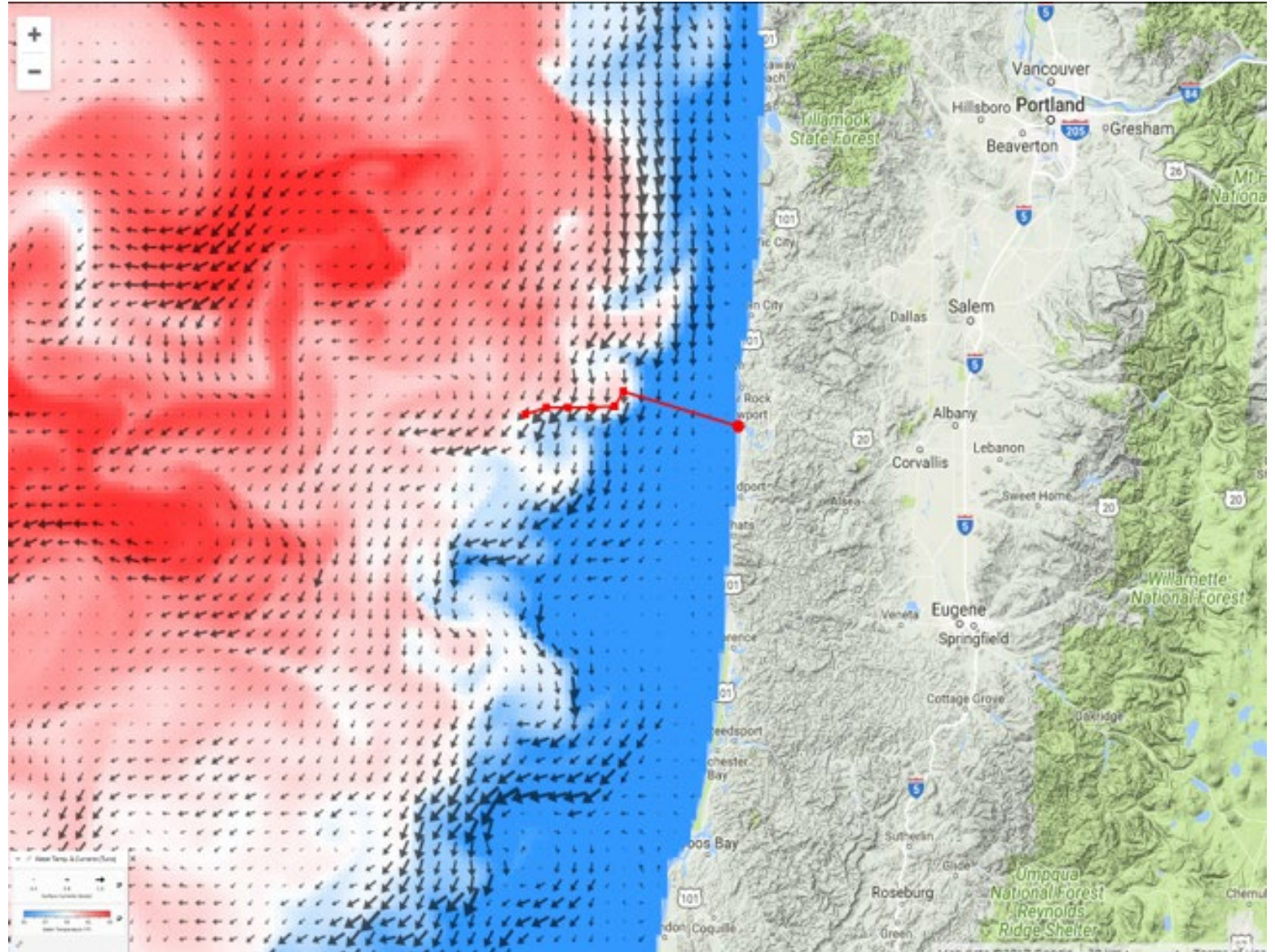


IOOS Modeling  
Workshop  
June 2026  
Washington DC

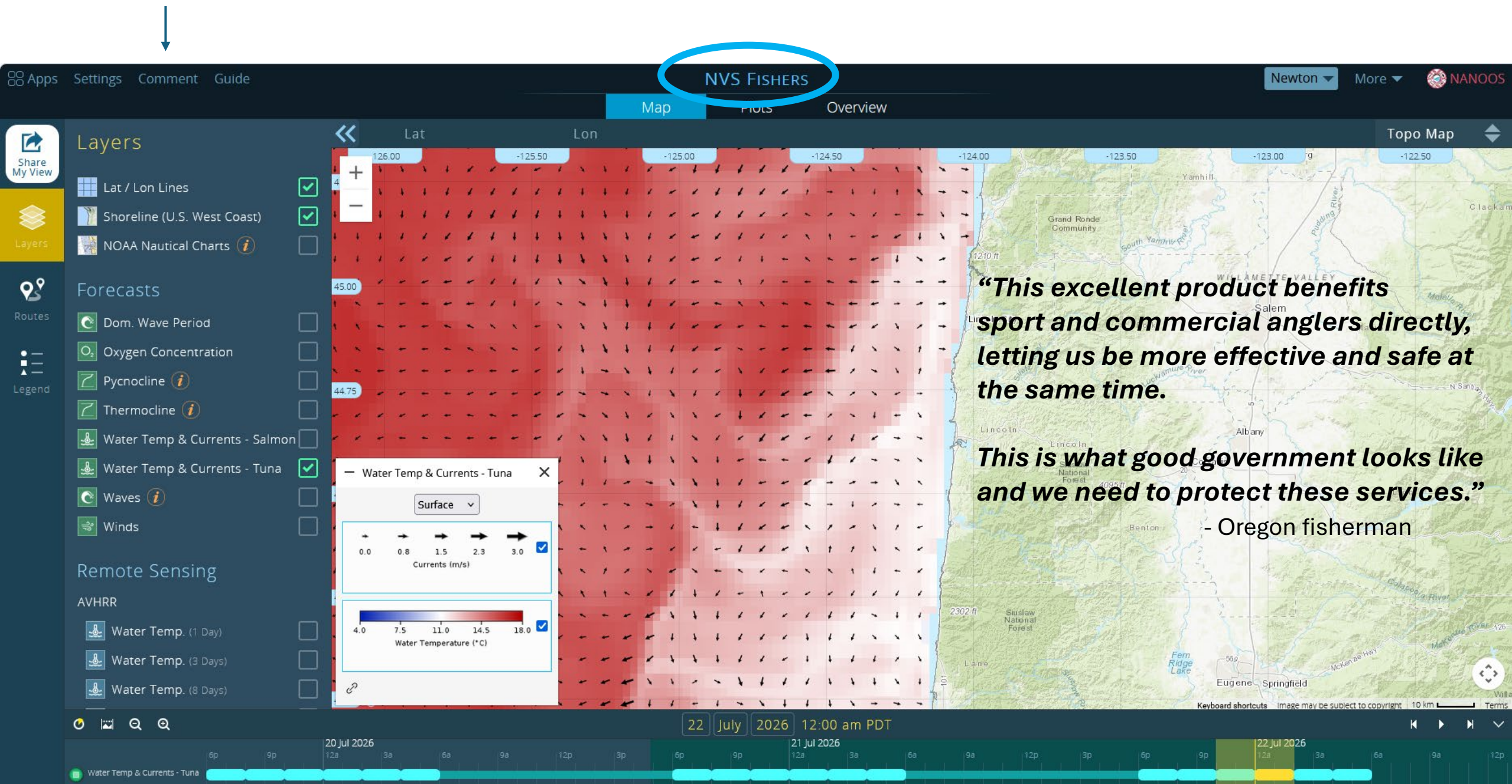
## OSU ROMS

Early on, making  
model output  
“useful” netted  
NANOOS many  
“users”!

Led to a (Tuna)  
“Fishers App”







<https://nvs.nanoos.org/Fishers>





## Layers

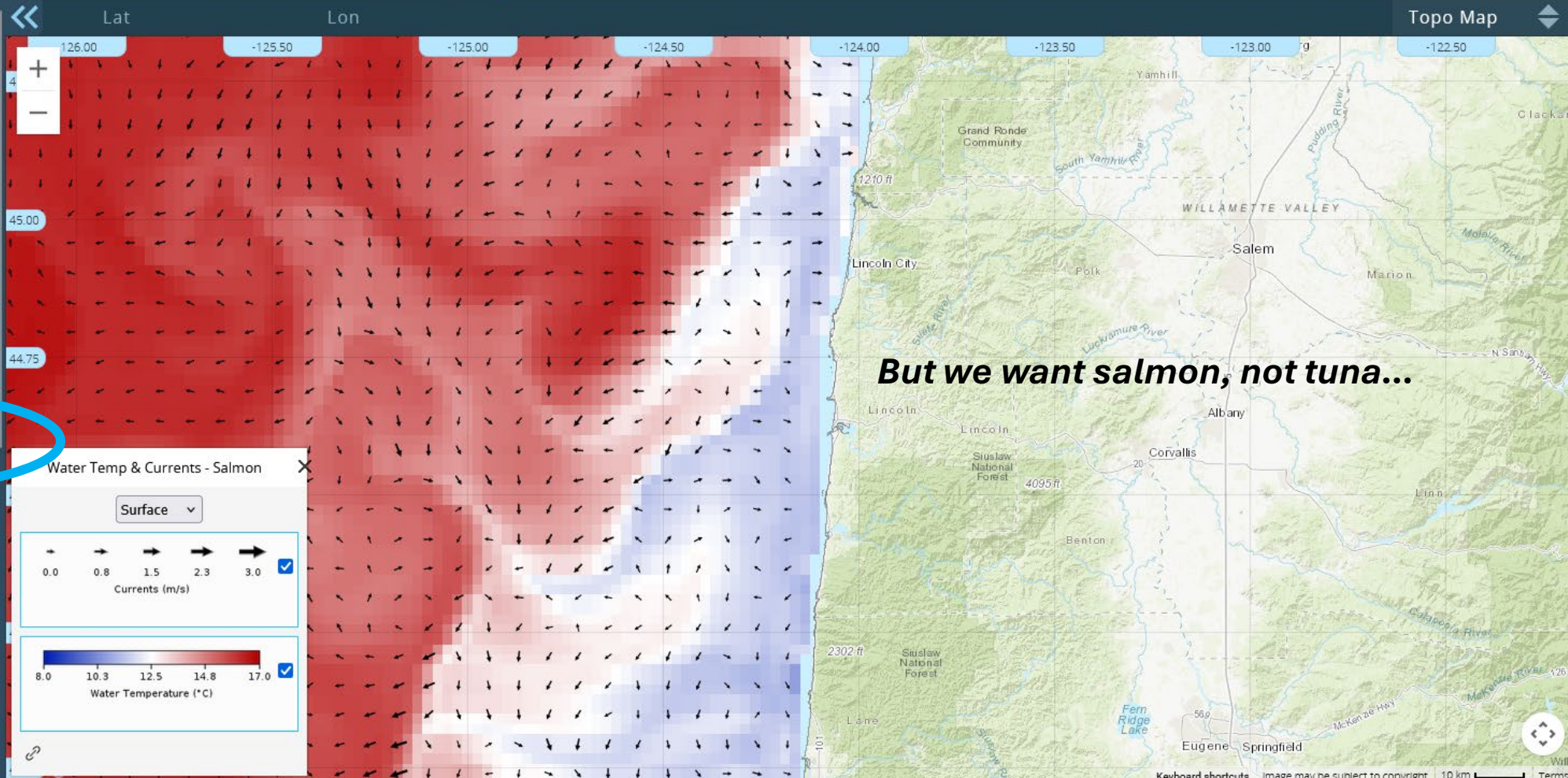
- ☒ Lat / Lon Lines
- ☒ Shoreline (U.S. West Coast)
- ☐ NOAA Nautical Charts 

## Forecasts

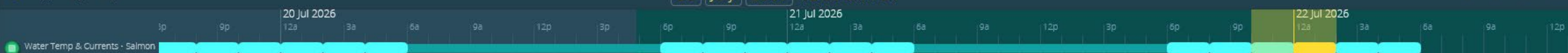
- ☐ Dom. Wave Period
- ☐ Oxygen Concentration
- ☐ Pycnocline 
- ☐ Thermocline 
- ☒ Water Temp & Currents - Salmon 
- ☐ Water Temp & Currents - Tuna
- ☐ Waves 
- ☐ Winds

## Remote Sensing

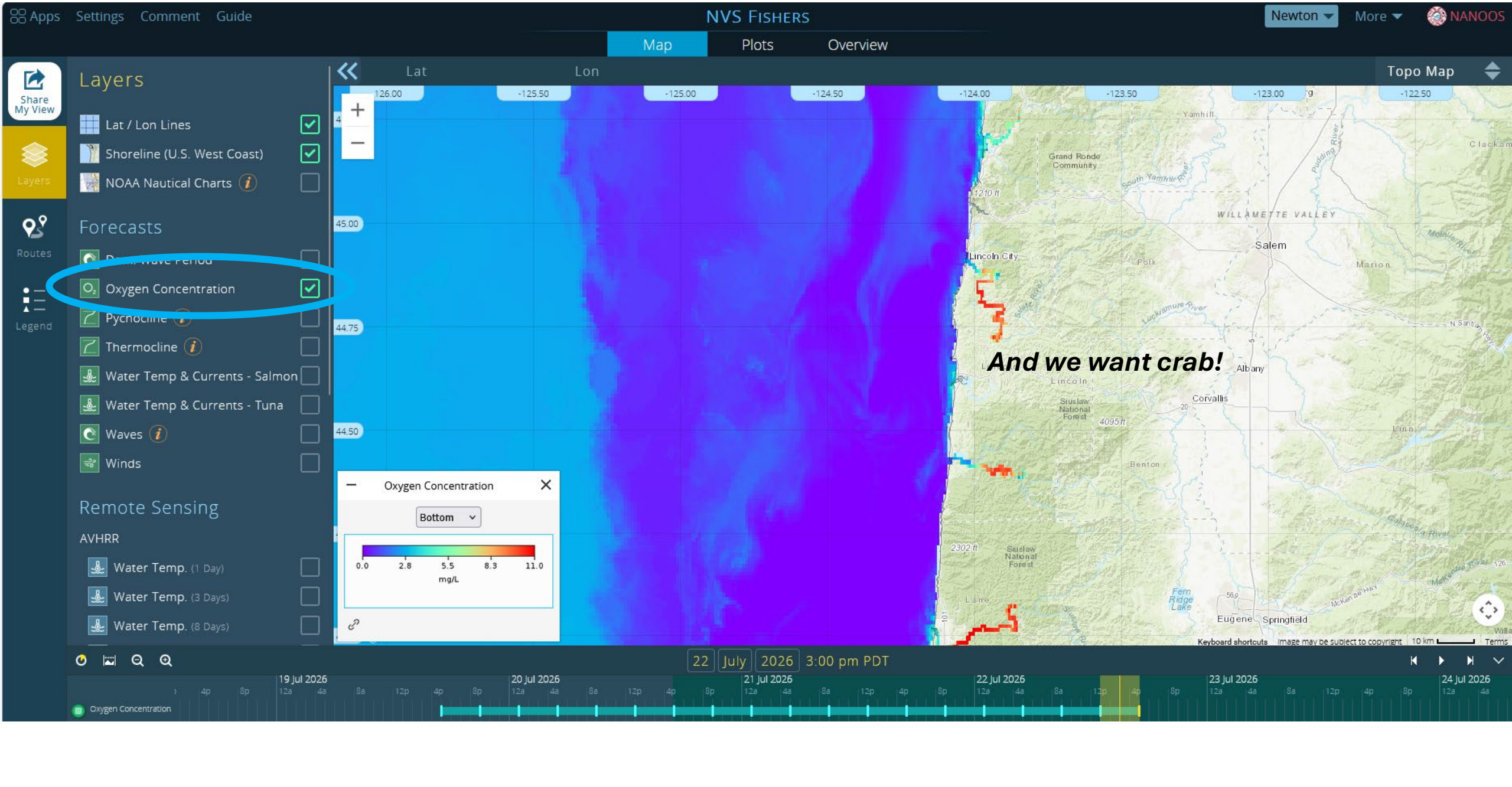
- ☐ AVHRR
- ☐ Water Temp. (1 Day)
- ☐ Water Temp. (3 Days)
- ☐ Water Temp. (8 Days)



22 July 2026 12:00 am PDT











## Layers

- ☒ Lat / Lon Lines
- ☒ Shoreline (U.S. West Coast)
- ☐ NOAA Nautical Charts 

## Forecasts

- ☐ Dom. Wave Period
- ☒ Oxygen Concentration
- ☐ Pycnocline 
- ☐ Thermocline 
- ☐ Water Temp & Currents - Salmon
- ☐ Water Temp & Currents - Tuna
- ☐ Waves 
- ☐ Winds

## Remote Sensing

### AVHRR

- ☐ Water Temp. (1 Day)
- ☐ Water Temp. (3 Days)
- ☐ Water Temp. (8 Days)



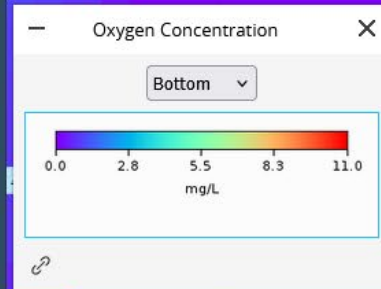
Lat

Lon



44.6500

44.6000

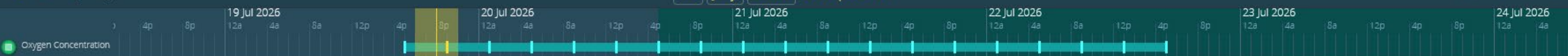


**Blue = hypoxia  
= dead crab**

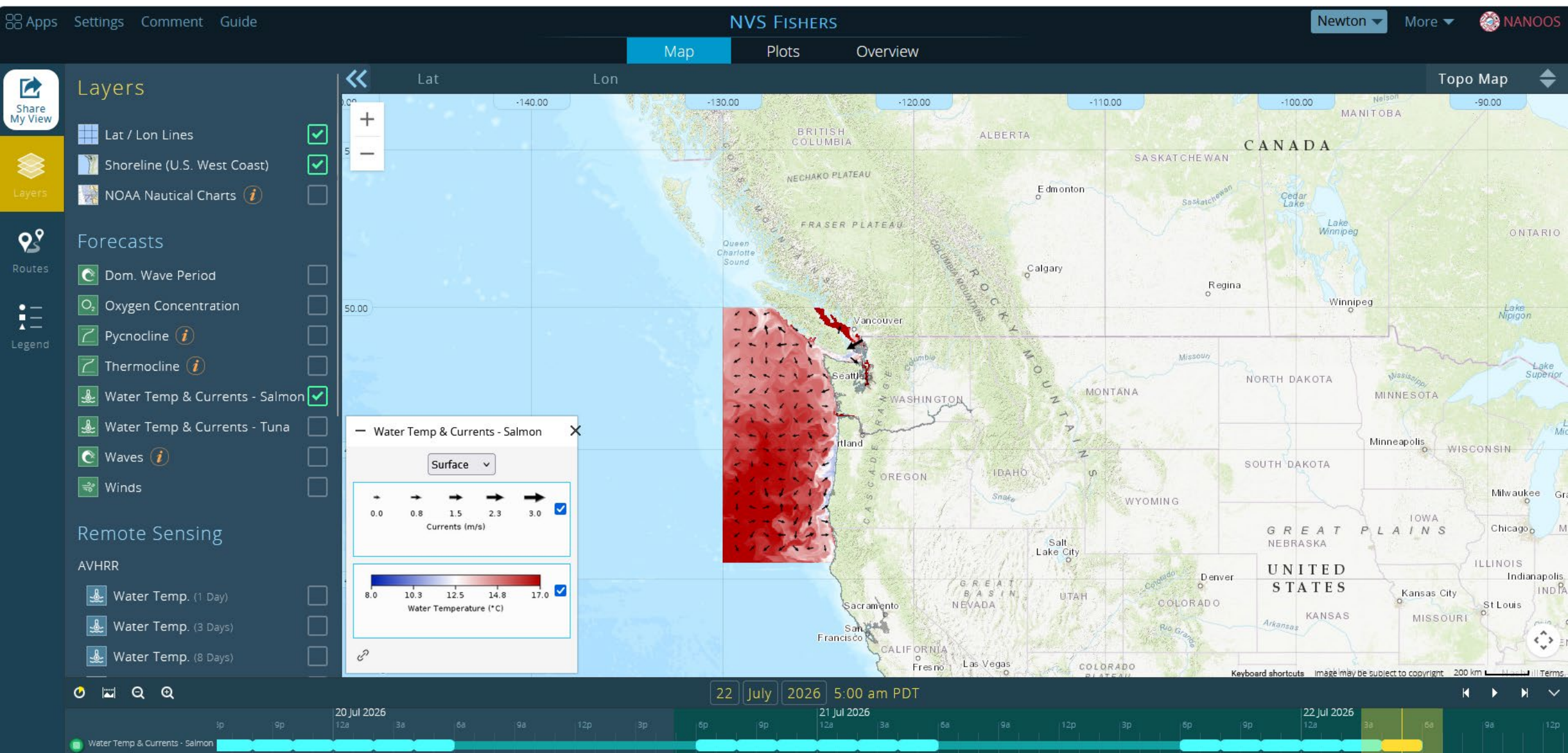
**Turquoise = no hypoxia  
= live crab**



19 July 2026 8:00 pm PDT







Same app, different models, user only needs to specify what information they need, keeping it easy access...

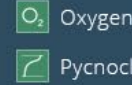




## Layers

 Shoreline

Forecast



 Oxygen

 Pycnocl

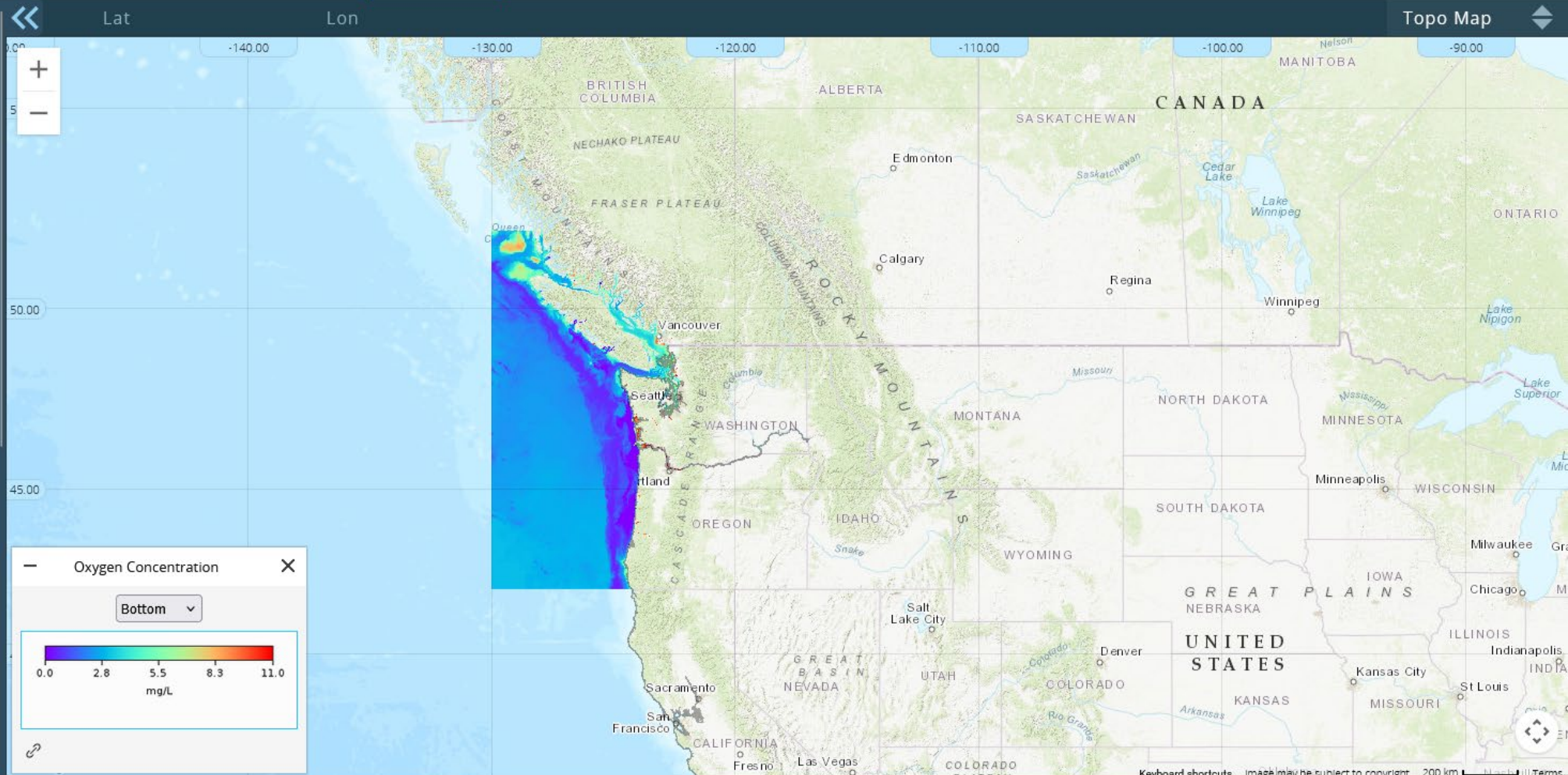
## Forecasts

- |                                                                                   |                                                                                               |                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------|
|  | Dom. Wave Period                                                                              | <input type="checkbox"/>            |
|  | Oxygen Concentration                                                                          | <input checked="" type="checkbox"/> |
|  | Pycnocline   | <input type="checkbox"/>            |
|  | Thermocline  | <input type="checkbox"/>            |
|  | Water Temp & Currents - Salmon                                                                | <input type="checkbox"/>            |
|  | Water Temp & Currents - Tuna                                                                  | <input type="checkbox"/>            |
|  | Waves        | <input type="checkbox"/>            |
|  | Winds                                                                                         | <input type="checkbox"/>            |

## Remote Sensing

AVHRR

- |                                                                                     |                      |                          |
|-------------------------------------------------------------------------------------|----------------------|--------------------------|
|  | Water Temp. (1 Day)  | <input type="checkbox"/> |
|  | Water Temp. (3 Days) | <input type="checkbox"/> |
|  | Water Temp. (8 Days) | <input type="checkbox"/> |



22 July 2026 5:00 am PDT

19 Jul 2026

20 Jul 2026

21 Jul 2026

22 Jul 2026

23 Jul 2026

24 Jul 2026

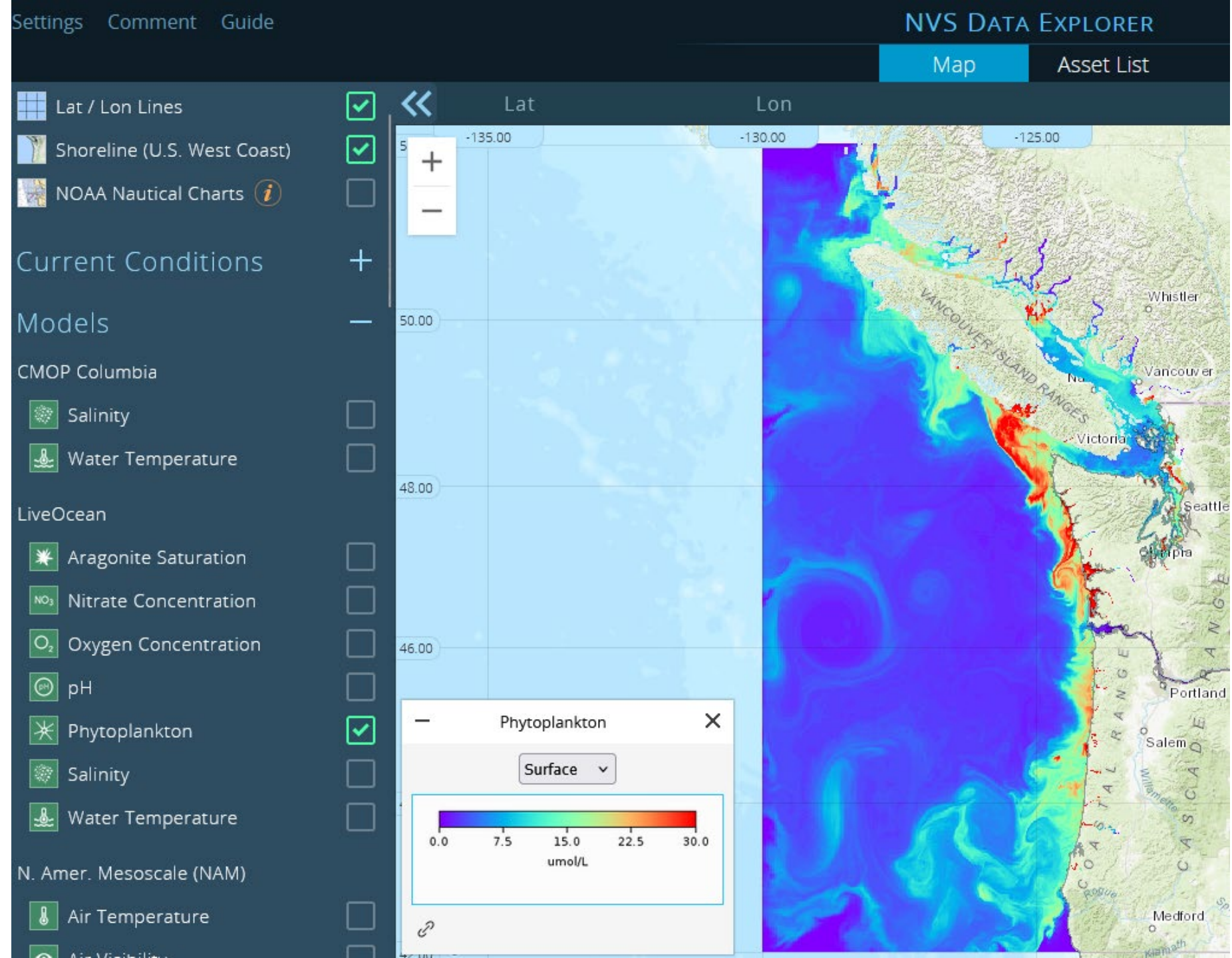
 Oxygen Concentration

Same app, different models, user only needs to specify what information they need, keeping it easy access...



# LiveOcean

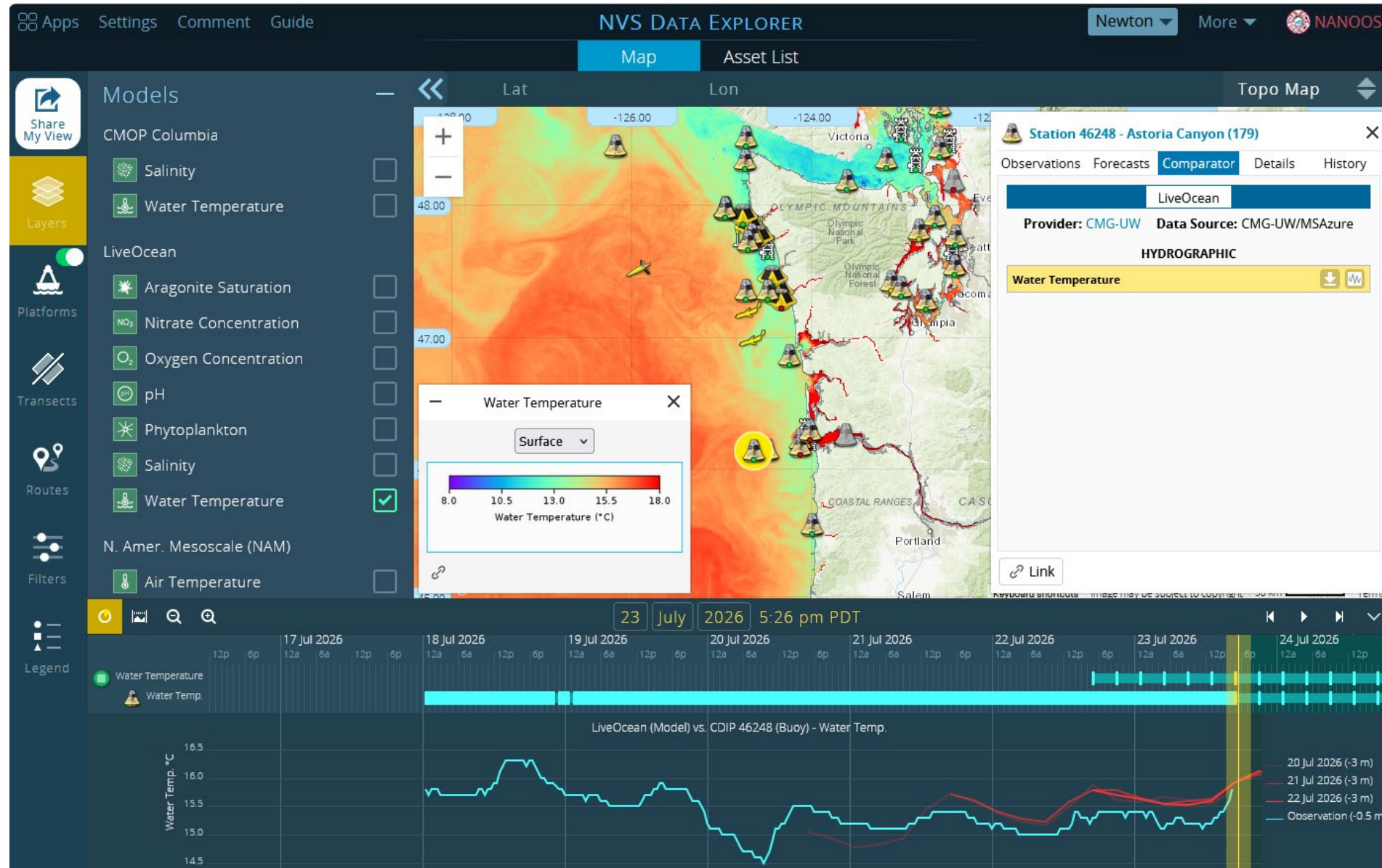
- ROMS, 72 h
- Simulates currents, tides, temperature, salinity, and **many biogeochemical fields** like oxygen, phytoplankton, and carbon
- Applications: track bottom hypoxia, HAB trajectories, OA conditions





**NANOOS NVS** is the main portal for LiveOcean forecasts, putting them in context with real-time buoy observations

*and, also, several other models!*



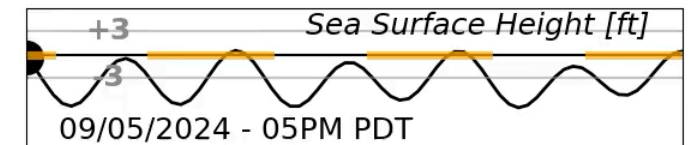
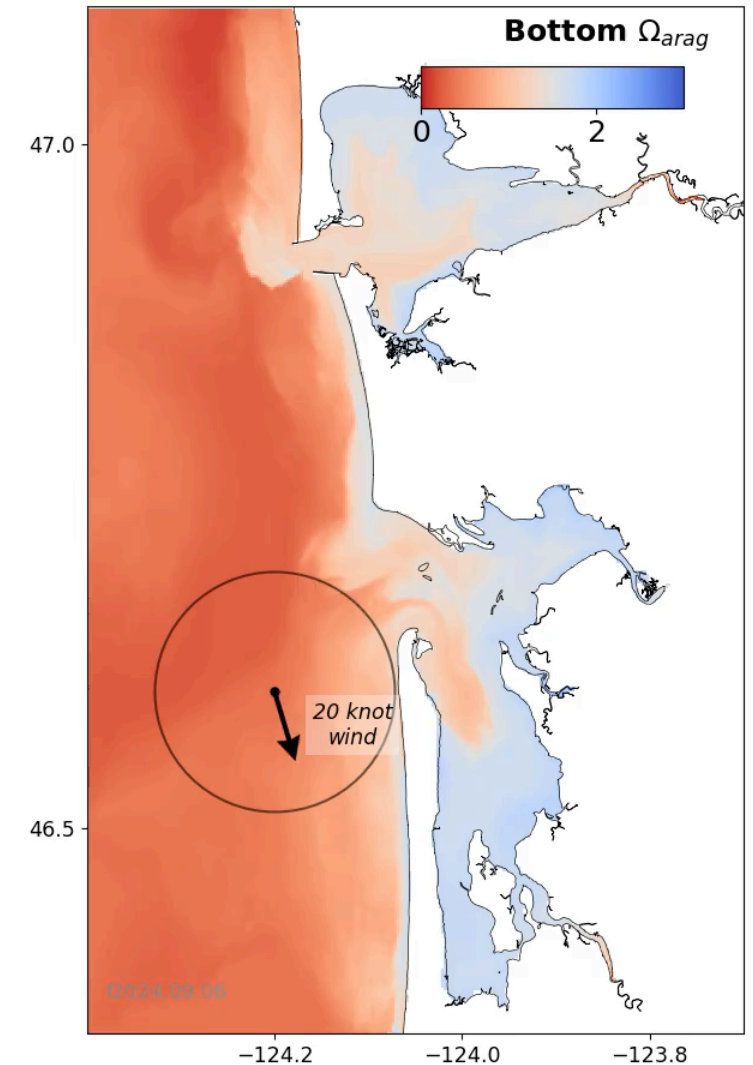
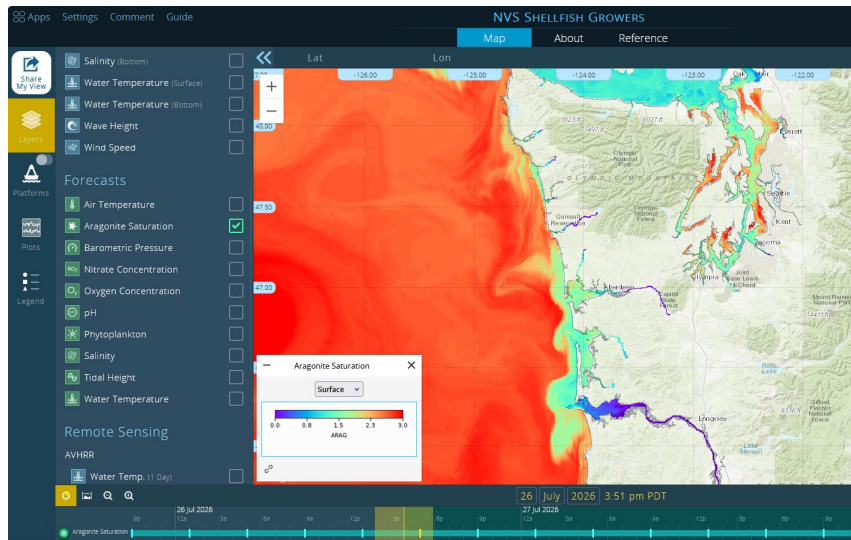
[nvs.nanoos.org/Explorer](https://nvs.nanoos.org/Explorer)

# LiveOcean Predicting Aragonite Saturation State for Oyster Growers in Willapa Bay

Pacific Coast Shellfish Growers Association:

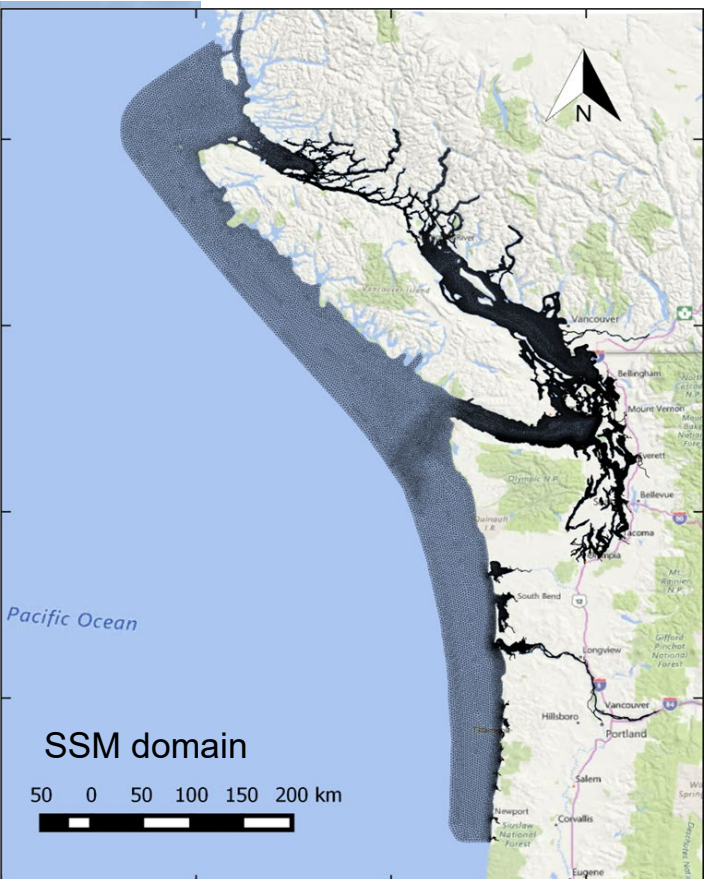
***LiveOcean “is a critical tool for our region – one that is widely used by many of our members concerned with the effects of ocean acidification, hypoxia, harmful algal blooms, and larval transport.”***

***“This current generation of shellfish farmer is reliant upon data and services from NANOOS”***





# Salish Sea Model & SSCOFS



- Hydrodynamic and biogeochemical model of Salish Sea developed by PNNL (FVCOM)
- Adopted by NOS and transitioned to COOPS for daily 6-hr operational nowcasts and 72-hr forecast
  - Salish Sea & Columbia River Operational Forecast System (SSCOFS)
    - ✓ IOOS COMT with NANOOS
- Multiple stakeholders including Washington State agencies, Tribes, NMFS, and U.S. EPA
  - Nutrient and toxics pollution control
  - Water quality and ecosystem management
  - Climate change, marine heatwaves, and sea level rise impact assessment
  - Nearshore restoration design/effects
  - Sediment management

NOAA OR&R  
USCG, U.S. Navy, DOH, Tribes  
Recreation and Fishermen

## SSCOFS Today's 2-day Forecast

12th March 2025

*Click the image below to link to SSCOFS webpage*

Daily hydrodynamic animations

| Water Surface Level | Currents | Temperature | Salinity |
|---------------------|----------|-------------|----------|
|---------------------|----------|-------------|----------|

Realtime model-data comparison and forecasts

Salish Sea and Columbia River Operational Forecast System (SSCOFS)

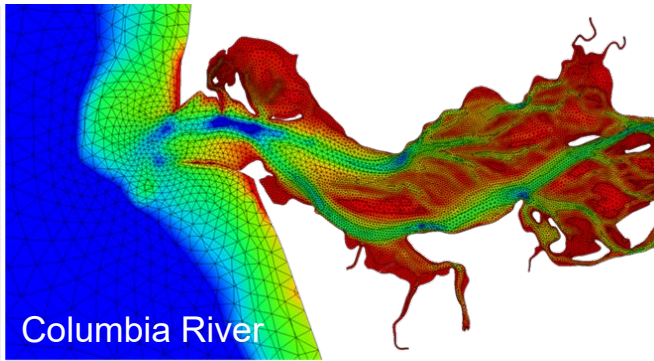
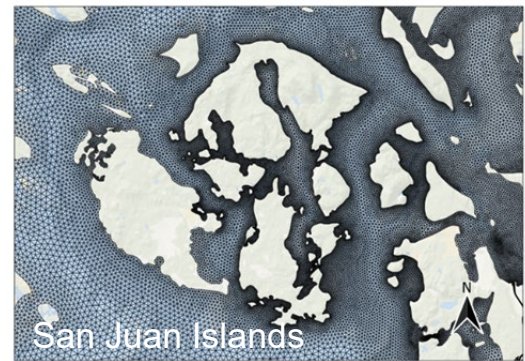
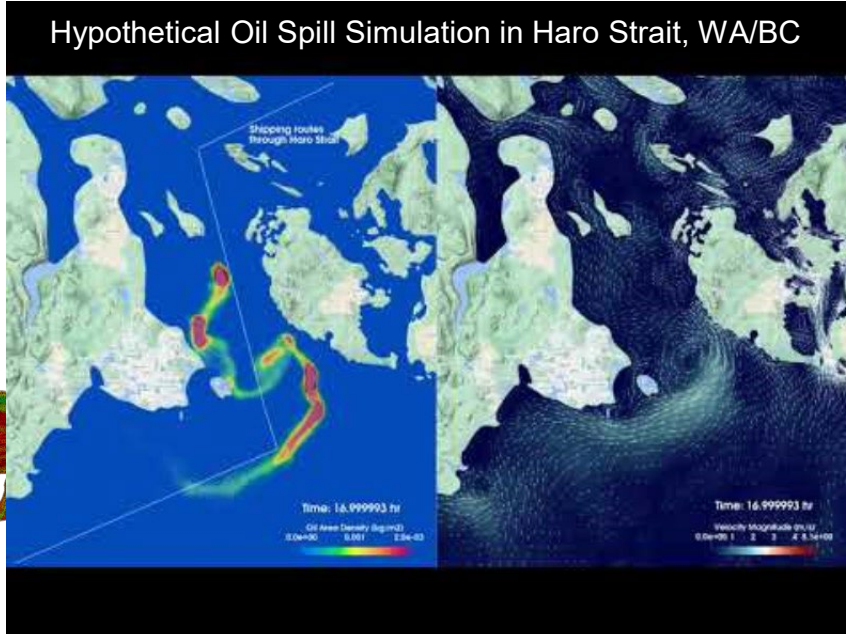
Find address or place

orca\_ts: NPB1

| Station         | Point Wells, WA |
|-----------------|-----------------|
| Name            | NPBY1           |
| Latitude        | 47.76           |
| Longitude       | -122.40         |
| temperature_url | View            |
| salinity_url    | View            |

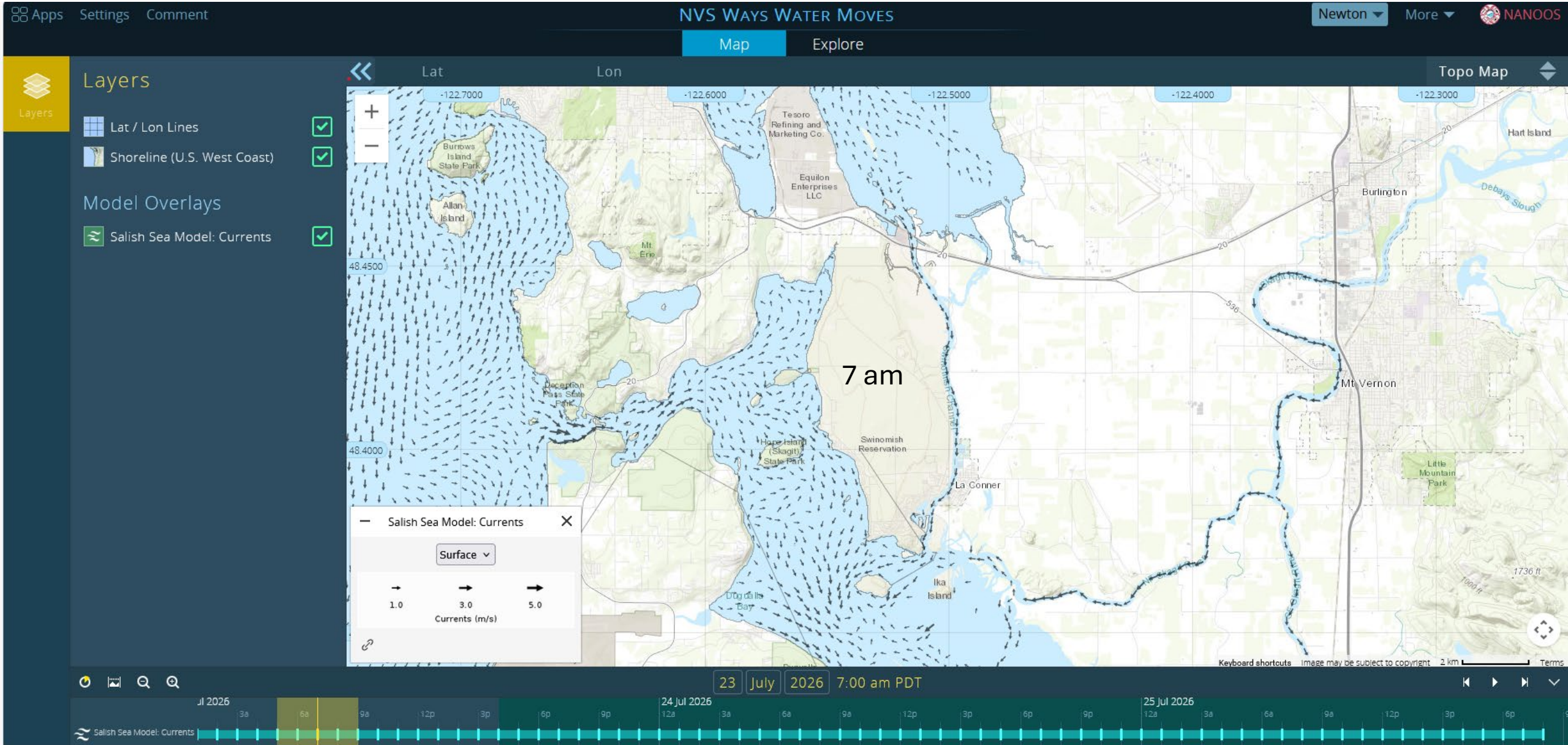
Temperature[°C]: Point Wells, WA

NPBY1 buoy measurement vs. SSCOFS forecast : Temperature (°C)





# Salish Sea Model: “Ways Water Moves” app



<https://nvs.nanoos.org/WaysWaterMoves>



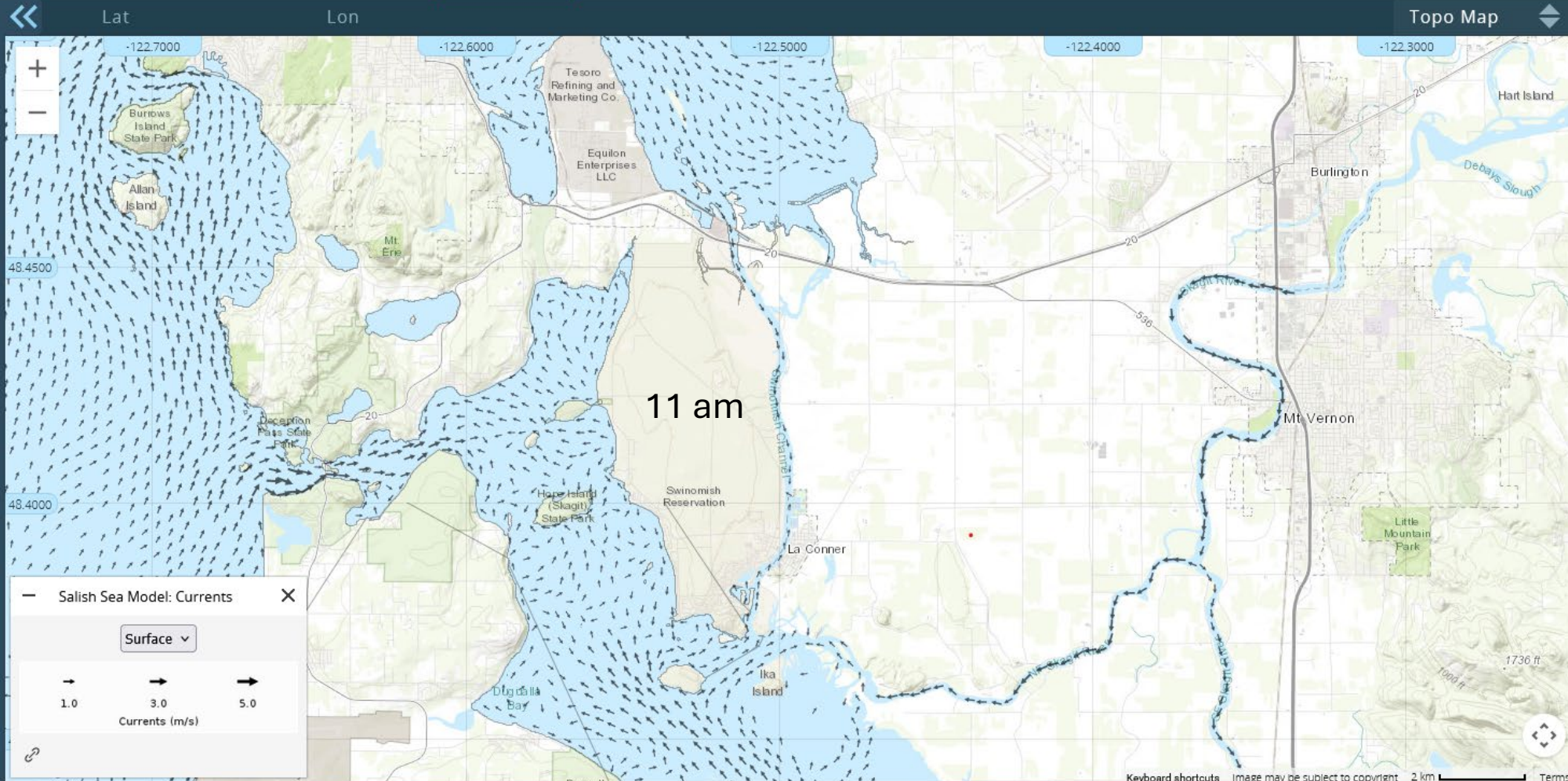


## Layers

- ☒ Lat / Lon Lines
- ☒ Shoreline (U.S. West Coast)

## Model Overlays

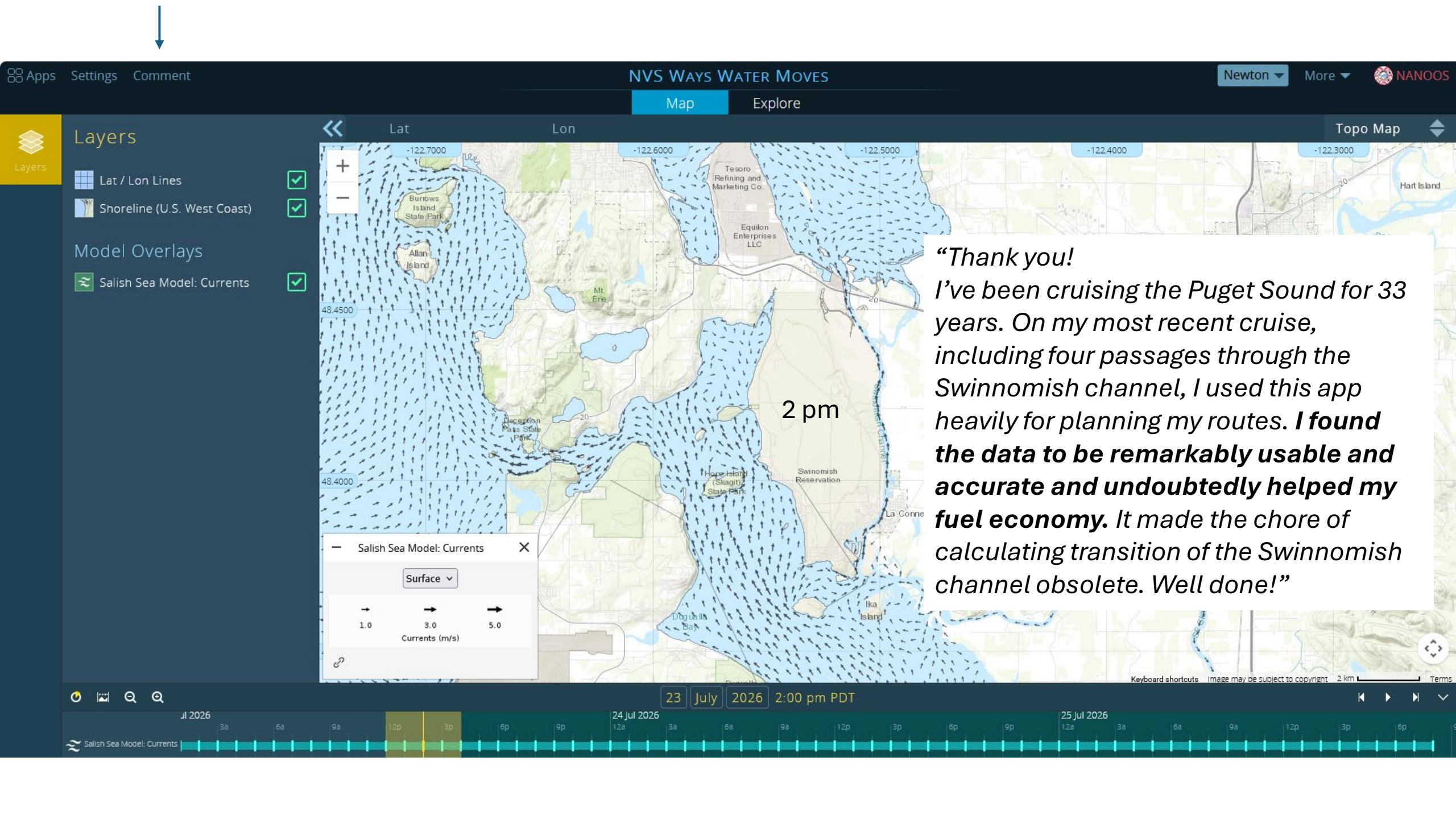
- ☒ Salish Sea Model: Currents



23 July 2026 11:00 am PDT









# CRITFC-CMOP

## Virtual Columbia River

SELFE - SCHISM

### Search & Recovery Support

The Seattle Times

Local News

Newsletters

LOCAL BIZ NATION SPORTS ENTERTAINMENT LIFE HOMES OPINION | THE TICKET JOBS EXPLORE

Politics Law & Justice Watchdog Mental Health Education Lab Project Homeless Traffic Lab Eastside Climate Lab Obituar

Business | Local Business | Local News | Northwest

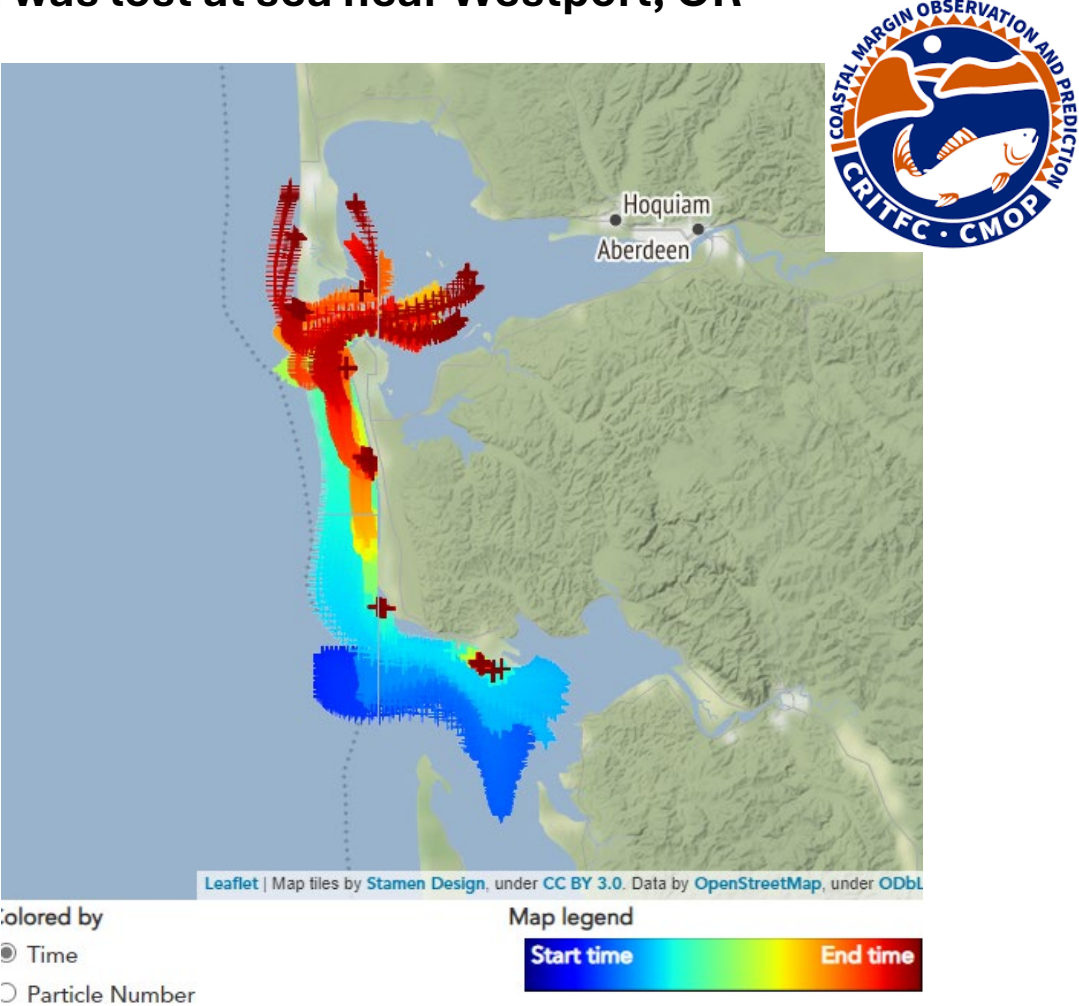
### Crossing the perilous Willapa Bay bar holds a steep cost

March 19, 2023 at 6:00 am

Listen to article Make us a preferred



Feb 9, 2023:  
Columbia River Inter-Tribal Fish Commission (CRITFC)  
Coastal Margin Observation and Prediction (CMOP) program’s  
**Virtual Columbia River Model provided particle tracking  
predictions for search and recovery efforts after a crab  
fisherman was lost at sea near Westport, OR**



# CRITFC-CMOP

## Virtual Columbia River

### Ecological classification support

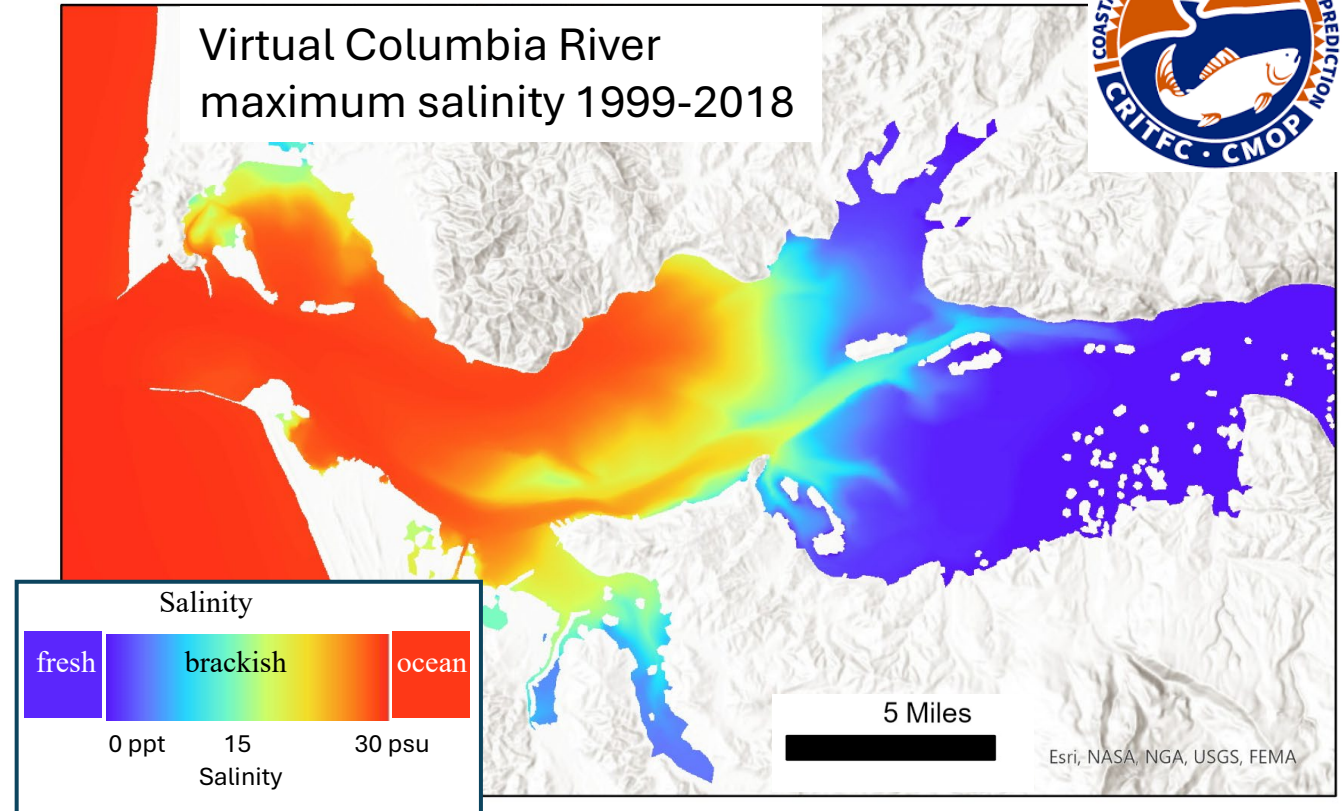
Columbia River Inter-Tribal Fish Commission (CRITFC) Coastal Margin Observation and Prediction (CMOP) program's **Virtual Columbia River Model provided estimated boundary of maximum salinity intrusion** to support Oregon Coastal Management Program, and the Pacific States Marine Fisheries Commission's Coastal and Marine Ecological Classification (CMECS) for the Columbia River



#### CORE CMECS GIS PROCESSING METHODS FOR THE COLUMBIA RIVER ESTUARY

##### *2.3 Estuarine Tidal Riverine Coastal*

Salinity less than 0.5 practical salinity units (PSU) considered Tidal Riverine. We gathered salinity observation values from the **CMOP Climatological Atlas** data set for points within our project boundary





# Your vision has and will guide NANOOS

---

- We have consistently heard that our NANOOS GC wants us to stay the course on NANOOS investments. → **5 y proposal**
- Sustaining our data streams and products continue to be our highest priority. → **IJA (BIL) investments**
- Meetings in Astoria kicked off how we chose to sustainably grow NANOOS for opportunities from new funding from the Inflation Reduction Act. → **IRA Topic 1 and 2 investments**
- The level of innovation and improvement is strong. → **OTT, etc.**

***NANOOS asked to participate in 15 OTT proposal submissions!!***



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of Networked Ocean  
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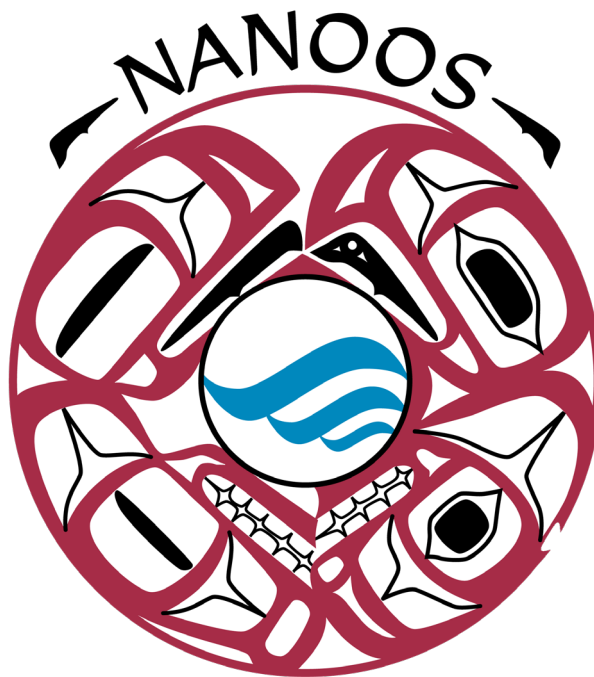


# NANOOS

Northwest Association of Networked Ocean Observing Systems



- We submit that NANOOS is strong despite the challenges
- Our strength lies in our collaboration to keep building the NANOOS vision together
- Our strength lies in our people

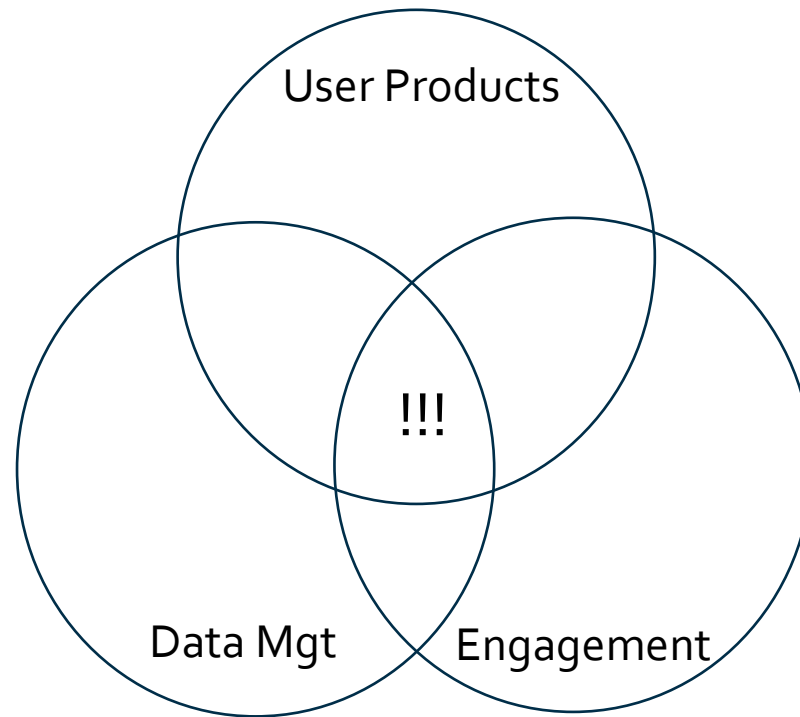


*And we want to hear  
from you...*





## NANOOS Tri-Committee





# NANOOS Tri-Com Updates

- Panel of Standing Committee Chairs
  - Education, Engagement & Outreach: Rachel Wold
  - DMAC: Seth Travis
  - User Products: Troy Tanner





# Outreach, Education, and Engagement Updates

Rachel Wold, OEE Lead  
Connie Sullivan, Outreach and Engagement

# Enhancing NANOOS Engagement in Oregon

---

Last year, NANOOS partnered with Oregon Sea Grant and OSU

- Education: Cait Goodwin
- Outreach and Engagement: Connie Sullivan



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# Outreach and Engagement:

## Increasing awareness and connecting with users

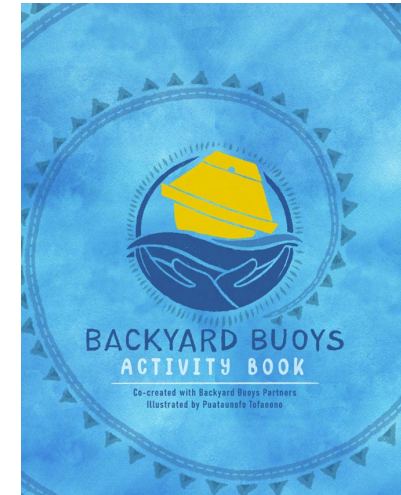
---

Engagement with general public, scientists, and targeted user groups:

- Sound Waters University, OneOcean
- Conferences (National Harbor Safety, PCSGA, OASeS, etc.)
- Hospitality industry seminar series
- Recreational and commercial fishers, boaters, surfers in PNW
  - Collect and utilize user feedback
- Backyard Buoys in Oregon

Active participation with external groups:

- IOOS Outreach Committee
- IOOS Strategic Comms WG
- Backyard Buoys Comms and Edu
  - Edu Kit and Activity Book!



# Education: Increasing ocean literacy

## Lesson plans online

- OA lesson plans updated to adhere to NGSS by EarthLab Ocean Literacy Interns
- Tsunami Sense

## Teacher Training

- OASeS OA Teacher Workshop
- Whidbey School District
- Oregon tsunami curriculum educator workshop (virtual)

## Activities to Connect with Students

- Middle school, High school and Undergraduate



**Multiple Stressors**

**Tsunami Sense**

**Next Generation Science Standards**  
For States, By States

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# Education: Connecting with Students

## Middle school

- Lesson plans
- TAF@Saghalie OA lessons
- TAF STEM Expo

## High school

- MHS Career Expo and Mentorship Program

## Undergraduate

- Research cruise experience with WOAC and One Ocean
- Interns (EarthLab, APL SURP STEAM, Glider internship for Tribal students with CRITFC and OSU)



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# Online Presence



- Home
- About
- News
- Join
- Contact
- Disclaimer
- NVS
- Products
- Data Archive
- Mobile Apps
- Workshops
- Education
- Videos
- rvander
- Account Settings
- Log Out
- Internal Site



Welcome to NANOOS, the Northwest Association of Networked Ocean Observing Systems.



**NANOOS Visualization System**  
NVS provides easy access to observations, forecasts, data, and visualizations



**NANOOS Data Archive**  
Access to NANOOS data via ERDDAP

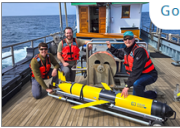


**Bipartisan Leadership in Ocean Observing Award Given to Rep. Bonamici**

On Ocean Data Day, the IOOS Association presented the Ocean Observing Award to Rep. Suzanne Bonamici, Bipartisan Ocean Caucus co-chair, ICC champion for IOOS and understanding of the ocean. The event also hosted a Congressional panel of experts shared their perspectives on supporting America's seafood economy. Margaret Pilaro, Executive Director of the Northwest Association of Networked Ocean Observing Systems, representing shellfish growers in the NANOOS region and across the Pacific Northwest, highlighted the value of ocean and coastal data for assessing environmental conditions, and the ability to use that data to make informed decisions.



Bipartisan Leadership in Ocean Observing Award Given to Rep. Bonamici



Glider Deployed Off R/V Western Flyer



Bellingham Bay Buoy is Back



Successful Lightfish Mission Aids HAB Detection



Washington Coastal Deployments

Latest news and updates from NANOOS![View this email in your browser](#)



**NANOOS Observer** Spring 2026



NANOOS

Northwest Association  
of Networked Ocean  
Observing Systems



# Online Presence



Northwest Association of Networked ...

1w •

Every day, ocean and coastal observing systems provide real-time information that helps industries operate ... more



20



1



5



Add a comment...



GIF



Marine Exchange of Puget Sound

1w •

2,117 followers

What he said! [Patrick Gallagher](#). Thank you for all the critical work you do for our region NANOOS



1



## Highlights

Data for 5/4/2026 - 8/1/2026

6,179  
Impressions

▲ 208%

298  
Reactions

▲ 198%

7  
Comments

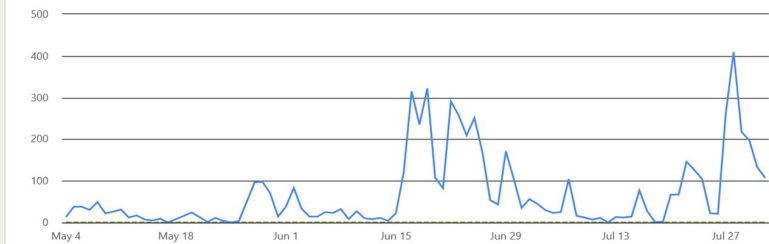
▲ 133.3%

12  
Reposts

▲ 100%

## Metrics

Impressions



# Follow, Like, Share!



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# Plans for the upcoming year

---

Continue expansion in Oregon via Oregon Sea Grant

- Education: tailor and deliver curricula
- Outreach and engagement: community and industry events; attend pre-existing ones and create novel events

Increase awareness and use within our member organizations

- Workshops, webinars, briefings, demos
  - Let us know if you want one!

Continue our webinar program and create a series of social media Reels

- Next up: Boaters, Tsunami
- Pacific Coast Congress of Harbormasters and Marina Managers Webinars
- Other ideas/requests?



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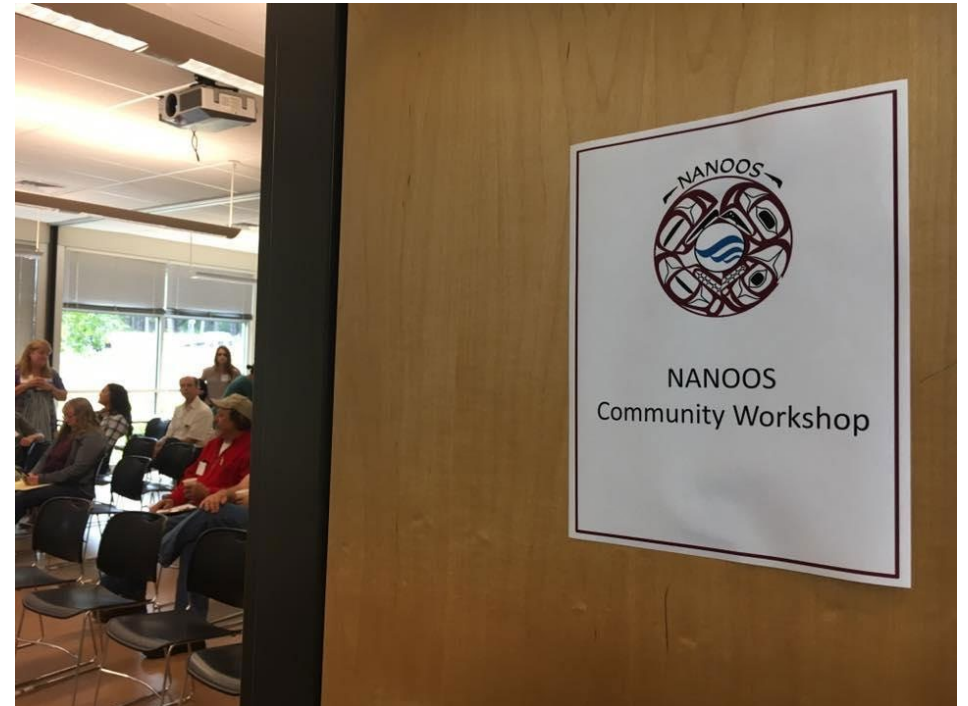
# Plans for the upcoming year

---

Question for the GC and Pls:

- What communities are we not engaging with that we should?

Please let us know and relay your ideas  
[rwold@uw.edu](mailto:rwold@uw.edu)



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# DMAC Updates

Seth Travis, DMAC  
6 August 2026



# NANOOS ERDDAP Updates

---

- ERDDAP services set up for a number of platforms, including:
  - All Platforms with an NDBC WMO Code:
    - Puget Sound ORCA moorings and Sel'haem - Bellingham Bay mooring
    - Cha'ba Coastal Mooring
    - OSU CB-06
  - OCNMS & Quileute Landers - CTD & ADCP
  - DOGAMI Beach Mapping Data
  - Mirrored NANOOS-supported datasets:
    - Backyard Buoys – mirrored from Backyard Buoys ERDDAP
    - Gliders – mirrored from IOOS GliderDac ERDDAP
    - Puget Sound Zooplankton Monitoring Program – mirrored from OBIS Data archive
- Happy to add more

<https://erddap.nanoos.org/erddap/>



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# NANOOS Persistent Identifiers

---

- Persistent Identifiers (PIDs) are digital references unique to a person/entity/object
  - Identifiers are enduring and registered digital references
  - PIDs can be linked together
  - Common PIDs include DOIs and ORCIDs
- Established NANOOS PIDs:
  - OceanExpert  
<https://oceanexpert.org/institution/24943>
  - ROR (Research Organization Registry)  
<https://ror.org/01a258x16>



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# NCEI – Data Archiving

---

- Working on establishing/reestablishing data pathways for data to be sent to NCEI for data archiving
  - New archive - Working with DOGAMI & WA Ecology on beach mapping data
  - Existing archive - Reestablishing data pathways for CRITFC data
- Involves establishing pathways both from data provider and to NCEI
- Where appropriate, also adding data to NANOOS ERDDAP
- Will use this process to inform future archiving efforts



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# Autonomous Vehicles App

---

- Expanded NVS Gliders app to include other autonomous vehicles
  - Added two new assets for the WA and OR Lightfish
- Building out Gliders app to include additional OOI Glider Transects



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# NANOOS Github Repositories

---

- Sharing all data processing and/or archiving code via Github repositories. This includes:
  - NVS Gliders plotting
  - Backyard Buoys ERDDAP
  - NCEI – Beach Mapping Data Archiving
  - More to be added

<https://github.com/nanoos-pnw>



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# IOOS DMAC Annual Meeting

---

- Attended the IOOS DMAC Annual Meeting in Silver Spring, MD from June 2-4, 2026
- Continued focus on NCEI archiving and data pathways to NDBC
- NOS Modeling RFI (Discussion yesterday)
- Significant discussion on emphasis on AI/Machine Learning



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# — NANOOS —

Governing Council &  
Principal Investigators  
Annual Meeting  
6 August 2026

User Products  
Troy Tanner





# Updates

## NANOOS

- Slideshow items
- Multi-stressors site
- New IFCB site
- J-SCOPE forecasts for January & April 2026
- User info download feature to aid E&O group
- Additional locations added to PNW Wave and Wind Forecasts product page
- Created Education Student Interactions section and Expedition page

## NVS

- Tsunami communities and brochures
- LiveOcean harvester
- Added new “Current Condition” variables
- Climatology harvester
- Updated Maritime Operations to meet Coast Guard needs
- Added MOCI index for Oregon to NVS Averages and Anomalies
- Autonomous Vehicles V2
- ONC platform harvester
- ONC platform profile harvester
- Added WMO code and URL to platforms
- Updated Washington tsunami region shapes
- Transect Tool
- NVS Mobile PWA

# Platforms: New & Updated



- **New**

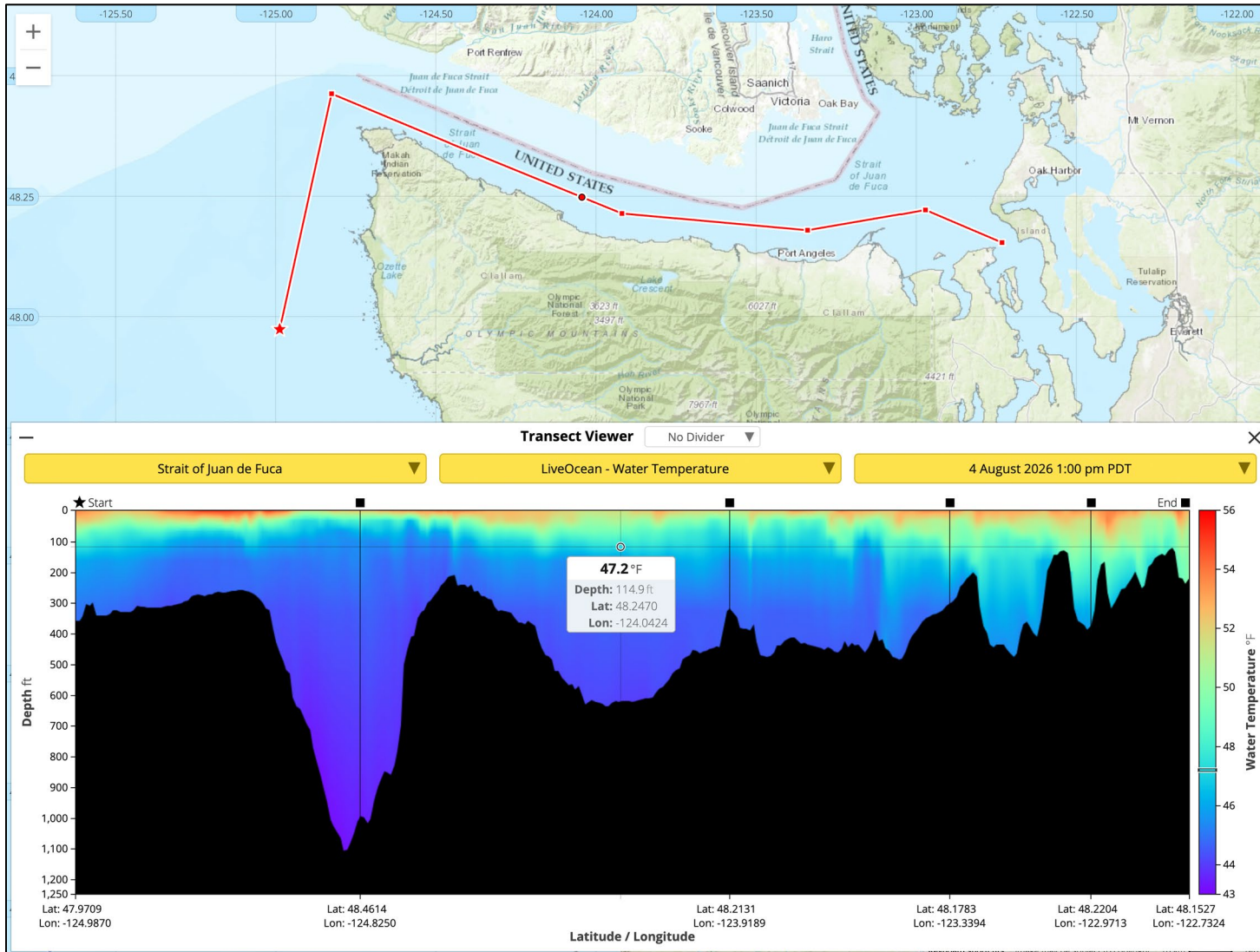
- Quinault Spotters
- ONC Platforms
- Backyard Buoys NDBC/CDIP/SWIFT Platforms
- OCNMS Landers
- Swinomish Little Hope Buoy

- **Updated**

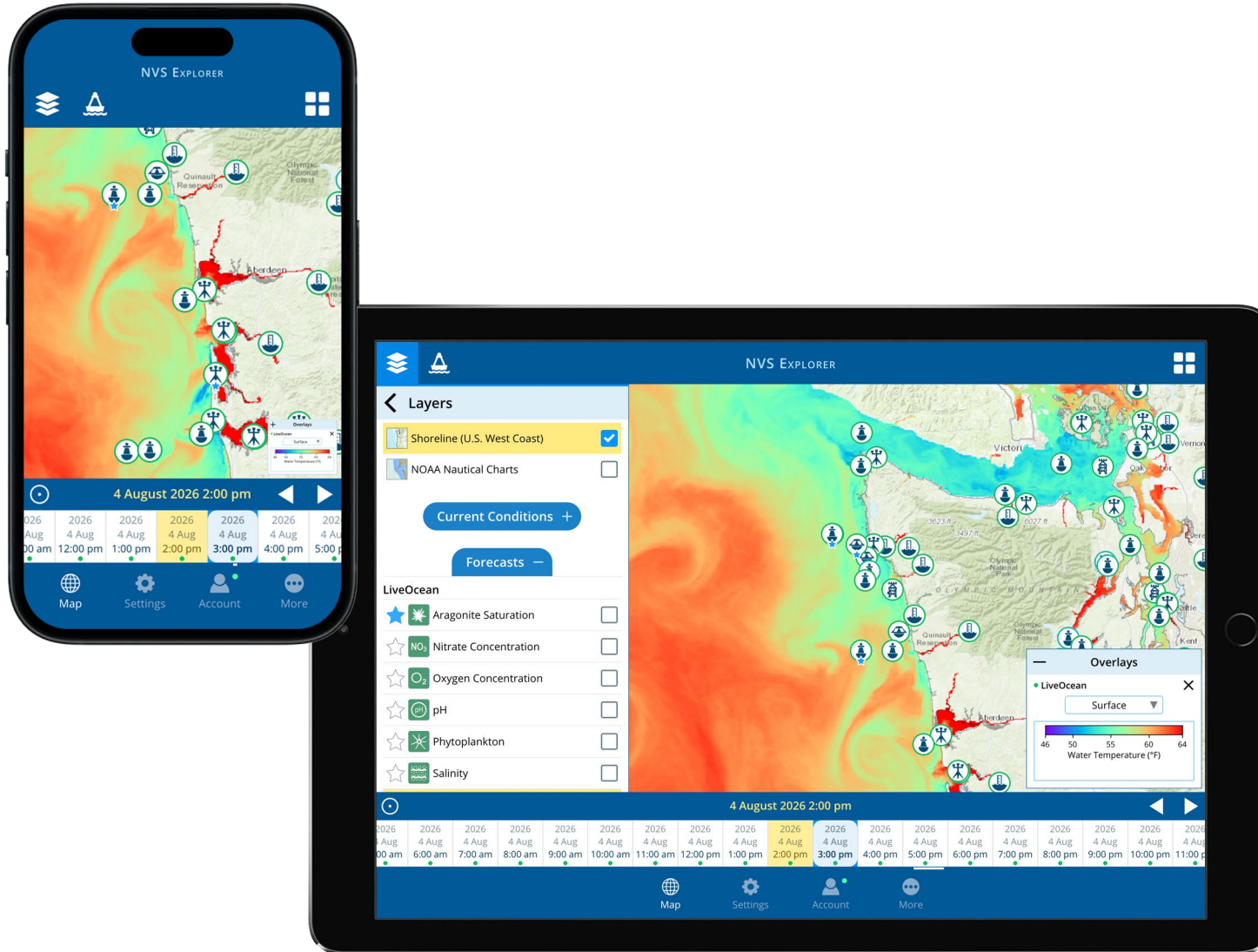
- OSU Yaquina
- Quileute Landers



# NVS Transects



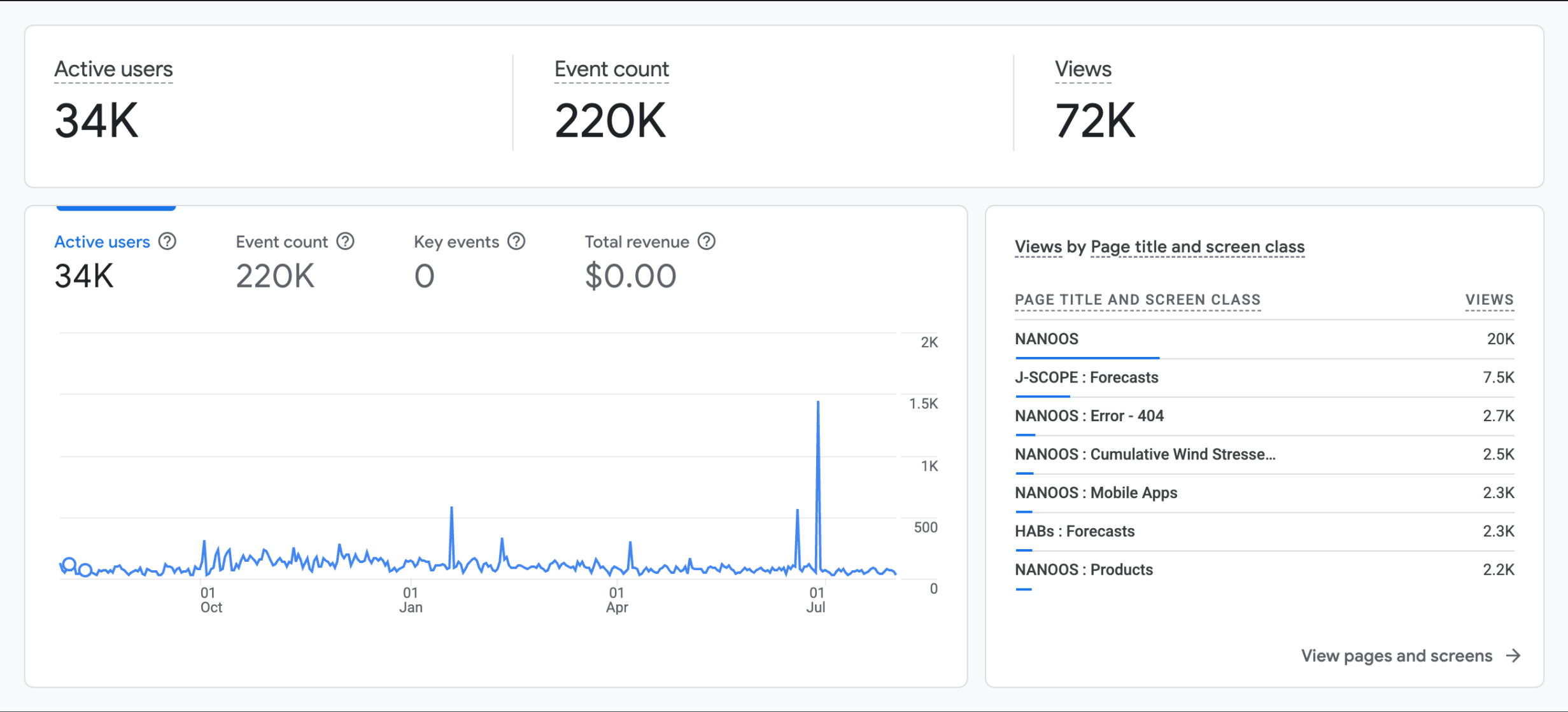
- Preset list of transects available
- Users can create transects and profiles
- Works with specific overlays
  - LiveOcean
  - OSU ROMS
  - We will be adding additional compatible overlays over time
- Mouseover transect plot to view values
- Users can divide plot vertically into two regions
- Users can change:
  - Colormap
  - Colormap direction
  - Colormap range



- Mobile NVS PWA
- iOS, Android, MacOS, Windows, etc.
- Runs in browser, can run as an “App”
  - “Add to Home Screen” to open as an “App”
- Optimized for phones, tablets, laptops
- Simplified version of NVS
- Designed to work with both mouse and touch inputs



# Analytics: NANOOS Website



# Analytics: NVS

Active users

47K

Event count

516K

Views

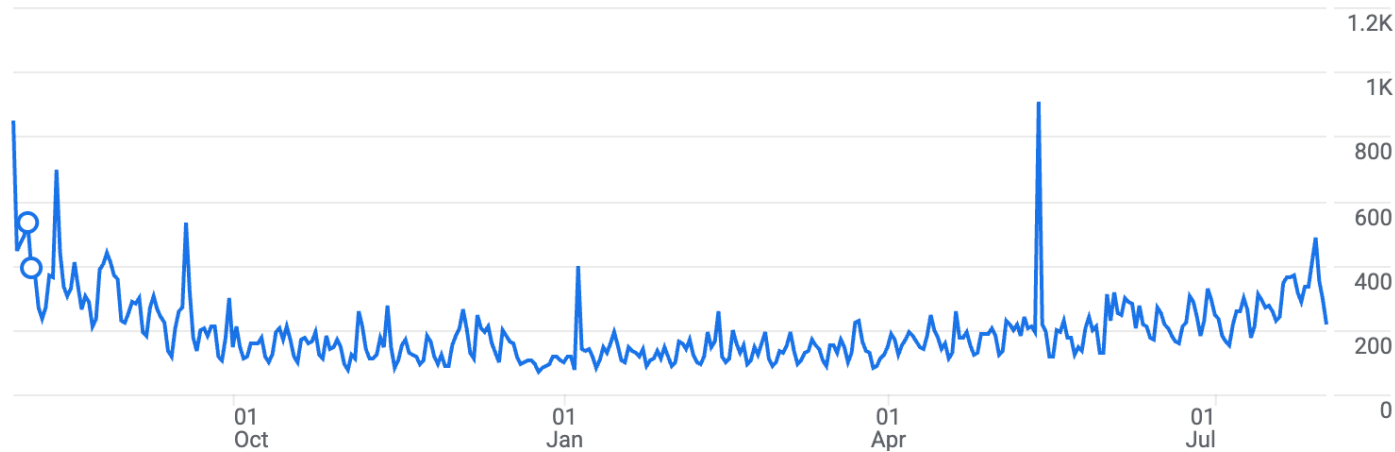
148K

Active users ?

47K

New users ?

46K



Views by Page title and screen class

| PAGE TITLE AND SCREEN CLASS    | VIEWS |
|--------------------------------|-------|
| NVS : Tsunami Evacuation Zones | 47K   |
| NVS : Data Explorer            | 33K   |
| NVS : Fishers                  | 29K   |
| NVS : Apps                     | 17K   |
| NVS : Ways Water Moves         | 6.2K  |
| NVS : Autonomous Vehicles      | 1.5K  |
| NVS : Log In                   | 1.3K  |

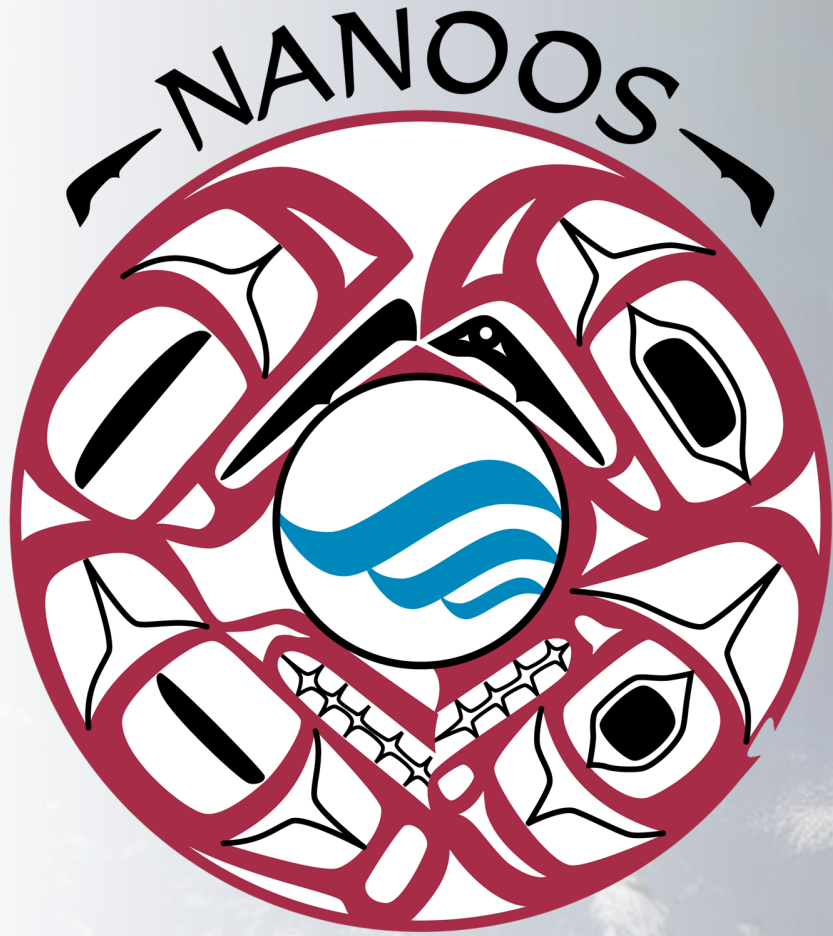
View pages and screens →





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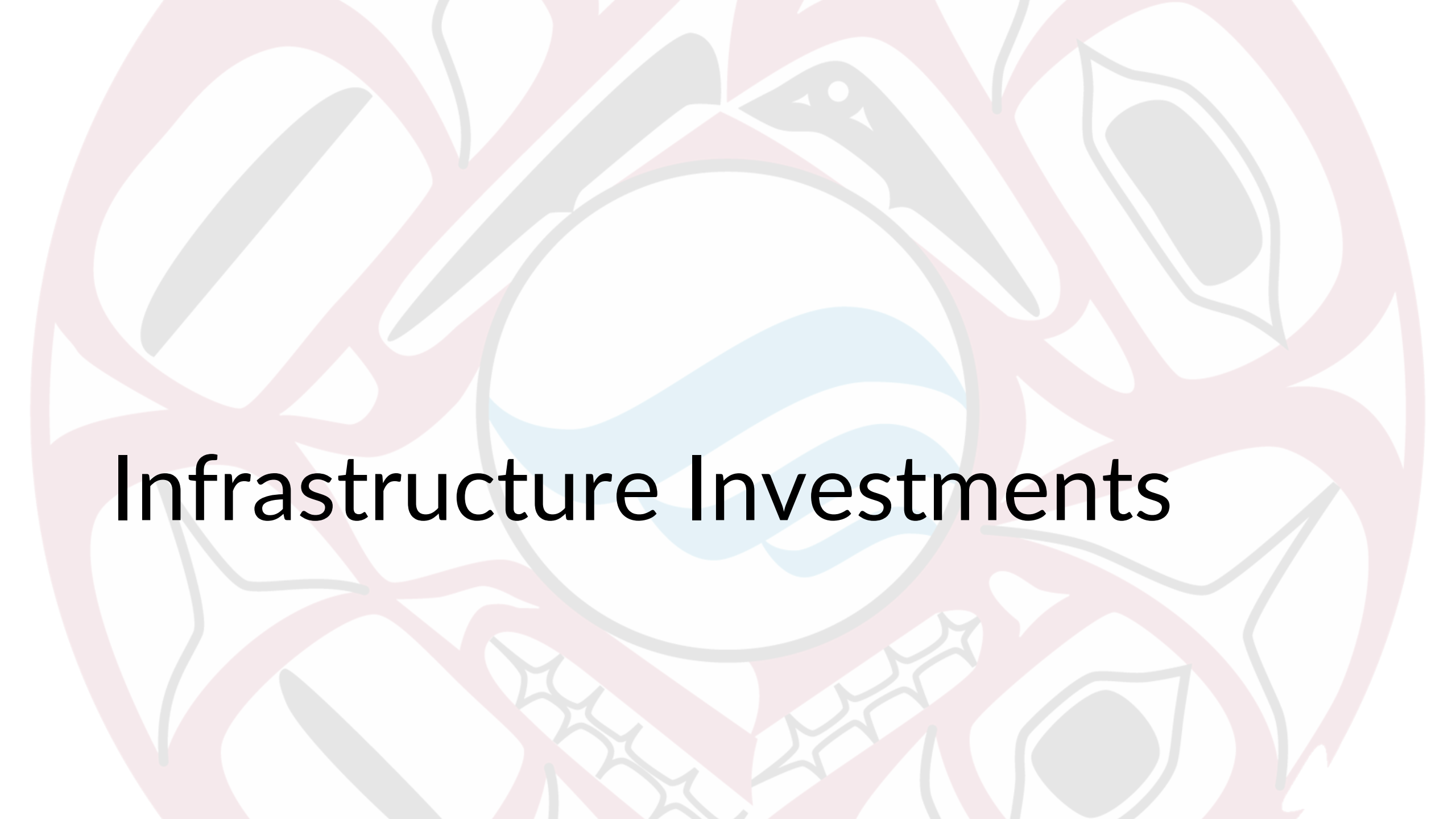




# IIJA & IRA Updates

Roxanne Carini

NANOOS GC/PI Meeting  
06 August 2026



# Infrastructure Investments



# IJA Years 1-2

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## Platforms replaced/modernized:

1. Cha'ba - northern WA shelf buoy
2. CMOP Columbia River plume - shelf buoy
3. CB-06 - southern OR shelf buoy
4. La Push glider - northern WA
5. WA Shelf glider - central WA
6. Trinidad Head glider - southern OR / northern CA
7. ORCA mooring - Puget Sound, Carr Inlet
8. ORCA mooring - Puget Sound, Bellingham Bay
9. CMOP Columbia River buoy - within the estuary



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# IJA Years 1-2

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## Impact to Shelf buoy/mooring program:

NANOOS has invested in three shelf-located buoys, Cha'ba (N WA), Columbia R plume (S WA/N OR), and CB-06 (central OR). These three help us to understand coastal ocean conditions like marine heat waves, hypoxia, and conditions associated with harmful algal blooms. Having the three in the N-S alignment helps scientists and modelers to understand and better predict dynamics, and regional managers to understand when something is critical to their area. *Each buoy was having mid-life crises that would have threatened to take them down in the next year or so. Each buoy now has been modernized to assure a longer life of delivering critical data.* Data are transmitted in near real-time to the NANOOS Visualization System (NVS) and are incorporated into apps, models, forecasts, and bulletins. State and tribal managers use the temperature and oxygen data to assess conditions for Dungeness crab; the data are used in both short term (72 h by LiveOcean) and seasonal (3-6 months by J-SCOPE) forecasting used by these managers. State and tribal departments of health and other managers use the PNW Harmful Algal Bloom Bulletin to assess when or if to open or close beaches to tribal, commercial, or recreational clam harvesters, aiding evaluation of risk for protecting human health and preserving coastal economies. The data from these three buoys are critical to these decision tools.



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# IIJA Years 1-2

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## Impact to Glider program:

NANOOS is finally able to have for each glider line, one glider in the water, one in the shop, and one ready for hot-swap (e.g., La Push). For La Push and Trinidad Head (co-funded with CeNCOOS), which run continuously year-round, we were able to fill out the fleet to 3 gliders each. For the WA Shelf glider, which operates in 2-week missions seasonally, we were able to fill out the fleet to 2 gliders to achieve more reliable observations. ***Previously, if a glider malfunctioned or needed to return to the manufacturer for servicing, that glider line would not get any observations until it was returned.*** Gaps in observations mean that we don't have the full picture of seasonal/annual conditions, and climate level datasets require continuity. These glider data are critical for computing climatologies, detecting and understanding marine heat waves (especially their subsurface expressions), and detecting hypoxia during seasonal upwelling, among other reasons.



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# IJA Years 1-2

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## Impact to Estuary buoy/mooring program:

NANOOS has invested in buoy and fixed mooring assets in critical estuaries such as Puget Sound and the Columbia River estuary. In Puget Sound, the ORCA profiling buoys have been running since the early 2000's. One of these, in Carr Inlet, had *reached its lifecycle and was encountering chronic downtime due to infrastructure failure*. A simpler buoy (not profiling) has been running in Bellingham Bay since 2016 and had similar infrastructure failures. Both *were repaired and other enhancements and upgrades were made* to other ORCA buoys. The Carr Inlet ORCA buoy, like the others, is used for Washington state water quality assessment and its temperature, salinity, and oxygen data have been used to assess ocean acidification status...The Bellingham Bay buoy was actively used by mariners including Lummi tribal fishermen who helped us site the buoy... The CMOP assets in the Columbia River estuary are used for many reasons but one is for salmon management by the Columbia River Inter-Tribal Fish Commission and the states of Oregon and Washington departments of fisheries. All these assets, in waters affected by oceanic, watershed, and human influences, relay data used by many stakeholders and rightsholders in the Pacific Northwest to help make decisions for the stability of resources like shellfish and salmon so central to regional economy, health, and identity.



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# IIJA Years 3-4

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## In Progress:

1. Shoreline Monitoring Equipment – WA
2. Shoreline Monitoring Equipment – OR
3. Bathymetry Mapping Equipment – WA/OR
4. CMOP Columbia River sensors & lateral bay buoy rebuild
5. ORCA controllers & met stations – Puget Sound
6. Cha'ba controllers & sensors & deployment safety systems – WA Shelf
7. CB-06 sensor upgrades - southern OR shelf buoy
8. X-band radar – Port of Newport
9. WA Shelf glider platform & PAM- central WA
10. Trinidad Head glider PAM - southern OR / northern CA



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# IRA Topic 1

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## In Progress:

1. Cha'ba redesign & NEMO recap – WA Shelf
2. CB-06 recap - southern OR shelf buoy
3. SSNERR recap – Coos Bay, OR
4. PNW Coast HABs equipment (Tribes, etc.)
5. Harden model infrastructure: LiveOcean, OSU ROMS, Virtual Columbia River



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# Strategic Expansion/Development



# IRA Topic 1

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- Fill spatial gaps in HAB observing: Roving IFCB, SoundToxins
- Expand, modernize, improve Shoreline Monitoring in OR & WA
- Develop new Waves & Currents forecasting capability at Columbia River mouth
- NVS Developments
- Expanded OR Outreach & Engagement



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# Pan-regional/ National Efforts

# IRA Topic 2

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## Water levels, Waves, & Webcams

- **Working Groups:**
  - Standard operating procedures and community capacity-building resources
  - Data management and data tools/user products
- **Workshops:**
  - WL Workshop Apr 2026 in Denver, CO
  - WebCOOS Workshop Jul 2026 in La Jolla, CA
  - *Waves Workshop Feb 2027 in Seattle, WA – Roxanne on Steering Committee*



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# IRA Topic 2

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## Ecosystem Observations

- **Workshops:**
  - Plankton Workshop Apr 2026 in La Jolla, CA
  - *PAM Workshop Apr 2027 in Denver, CO*
- **Other Activities:**
  - Plankton Office Hours: Dig into the technical questions, get help with data management
  - EcoObs Dialogues: Webinar examples of “How an RA works with an entity”
    - #1: GCOOS and NMFS Protected Species work together on CETACEAN efforts & discussion
    - Soliciting ideas for future EcoObs Dialogues



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NANOOS PI Meeting 5 Aug 2026





NANOOS GC- PI Meeting 6 Aug 2026







# NANOOOS Governance

# NANOOS Governing Council business

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- Executive Committee
- NANOOS Congressional Outreach
- NANOOS non-federal support



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## NANOOS Executive Committee

- Governing Council Board
  - Representational, elected
  - Attend bi-monthly zoom meetings
- Standing Committee Chairs
  - Attend weekly 'tag-ups' (aka Tri-Comm)
- Executive Director
- NANOOS Executive Committee shall have such duties and responsibilities as designated by the full Governing Council

### NANOOS MOA:

#### NANOOS Executive Committee:

##### **Governing Council Board** (4-year terms)

*Provides sector representation*

##### Academic

1. University of Washington
2. Oregon State University
3. Open Seat

##### State

4. Washington state agency
5. Oregon state agency

##### Tribes

- 6.
- 7.

##### Tribal Support Organizations

- 8.
- 9.

##### Federal

10. Washington regional office
11. Oregon regional office

##### Industry

- 12.
- 13.

##### Non-Governmental Organizations

- 14.
- 15.

##### At-large Members

- 16.
- 17.

##### **Standing Committee Chairs**

*Provides functional representation*

- Chair of the Data Management and Communications Committee
- Chair of the User Products Committee
- Chair of the Education and Outreach Committee

##### **Staff** (no term limit)

*Provides operational representation*  
NANOOS Executive Director

Figure 1. Composition of the NANOOS Executive Committee



# NANOOS GC Board 2025-2026



## Academia:

- Parker MacCready, UW, Governing Council Board Member for UW
- Mike Kosro, OSU, Governing Council Board Member for OSU (**VICE CHAIR**)
- Misty Peacock, Northwest Indian College, Governing Council Member for Academia

## State:

- Casey Dennehy, Ecology, Governing Council Board Member for Washington State Agencies
- Jon Allan, DOGAMI, Governing Council Board Member for Oregon State Agencies

## Tribes:

- Khadijah Homolka, Port Gamble S'Klallam Tribe, Governing Council Board Member for Tribes
- Joe Schumacker, Quinault Indian Nation, Governing Council Board Member for Tribes

## Tribal Support Organization:

- Elaine Harvey, Columbia River Inter-Tribal Fish Commission, Governing Council Board Member for Tribal Support Org.
- Osa Odum, Northwest Indian Fisheries Commission, Governing Council Board Member for Tribal Support Org.

## Federal:

- Stephanie Moore, NOAA NWFSC, Governing Council Board Member for Washington Federal Offices
- Andy Lanier, Governing Council Board Member for Oregon Federal Offices

## Industry:

- Margaret Pilaro, PCSGA, Governing Council Board Member for Industry
- Rob Ellison, Sea-Bird Scientific, Governing Council Board Member for Industry

## NGO:

- Rachel Aronson, Maritime Blue, Governing Council Board Member for Non-Governmental Organizations
- Peter Steelquist, Surfrider, Governing Council Board Member for Non-Governmental Organizations

## At Large:

- Kate Litle, WA Sea Grant, Governing Council Board Member At-Large
- Andrew Barnard, OSU, Governing Council Board Member At-Large (**CHAIR**)

# NANOOS GC Board 2026-2027



## Academia:

- John Mickett, UW, Governing Council Board Member for UW
- Jack Barth, acting for Mike Kosro, OSU, Governing Council Board Member for OSU
- Misty Peacock, Northwest Indian College, Governing Council Member for Academia

## State:

- Casey Dennehy, Ecology, Governing Council Board Member for Washington State Agencies
- Jon Allan, DOGAMI, Governing Council Board Member for Oregon State Agencies

## Tribes:

- Khadijah Homolka, Port Gamble S'Klallam Tribe, Governing Council Board Member for Tribes
- Joe Schumacker, Quinault Indian Nation, Governing Council Board Member for Tribes

## Tribal Support Organization:

- Elaine Harvey, Columbia River Inter-Tribal Fish Commission, Governing Council Board Member for Tribal Support Org.
- Veronica Pagowski, Northwest Indian Fisheries Commission, Governing Council Board Member for Tribal Support Org.

## Federal:

- Stephanie Moore, NOAA NWFSC, Governing Council Board Member for Washington Federal Offices
- Andy Lanier, Governing Council Board Member for Oregon Federal Offices

## Industry:

- Margaret Pilaro, PCSGA, Governing Council Board Member for Industry
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- Rachel Aronson, Maritime Blue, Governing Council Board Member for Non-Governmental Organizations
- Peter Steelquist, Surfrider, Governing Council Board Member for Non-Governmental Organizations

## At Large:

- Kate Litle, WA Sea Grant, Governing Council Board Member At-Large
- Andrew Barnard, OSU, Governing Council Board Member At-Large (**CHAIR**)



# Congressional Outreach



## NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS

Enhancing health, safety and economic prosperity in the Pacific Northwest

### Coastal Hazard Risk Reduction

"As a coastal community deeply committed to emergency preparedness, we find the new tsunami application to be a critical tool. It is easy and flexible to use and allows access to and clear designation of evacuation zones, allowing you to understand your risk and how to get to safety quickly after an earthquake. Access to accurate information is so important to our citizens and, as a destination location, to our visitors as well. We are proud to market our region as the most prepared on the Oregon coast and the tsunami software has become an important and useful tool!"

— Linda Koslowski, President, Emergency Volunteer Corp of Nahalem Bay

"NANOOS is an invaluable partner and asset to the State of Oregon. The beach and shoreline monitoring data supports evidence-based efforts to maintain resilient and healthy communities through comprehensive coastal hazard mapping, understanding dynamic coastal systems, and sound planning practices."

— Lisa Phipps, Coastal Program Manager, Oregon Department of Land Conservation and Development

### Recreation Safety

"For Pacific Northwest boaters crossing the Strait of Juan de Fuca or the Strait of Georgia, real time data on wave heights, wind speeds, and other meteorological information can be invaluable. To time such passages optimally and safely requires a knowledge of the sea conditions actually present at the time of the decision to set sail. A VHF weather broadcast, which is hours old can be inadequate when compared to the immediacy of the data available through the NANOOS NVS system."

— Captain Lincoln Kuttler, S/V Sejal

"The NANOOS surfer application provides the most comprehensive assemblage of ocean and coastal data on water quality, swell direction/height, winds, tides, and beach cameras that is currently available for the Pacific Northwest. Having access to these current conditions and forecasting models is crucial for decision making on where and when to recreate, which aids in trip planning and safe ocean enjoyment."

— Gus Gates, Washington Policy Manager, Surfrider Foundation

### Education

"The NANOOS apps provide direct and easy access to data about Puget Sound and the Washington Coast, allowing students to develop a better understanding of the world they live in. Students used the Shellfish Growers App to learn about the oceanic conditions in which shellfish live and how climate change might impact the organisms and the people who depend on them for food. The site was easy to navigate and use, even for first time users and supported students in asking their own questions and looking for answers."

— Roxalind Eckols, Seattle Maritime High School

"Students in the Native Environmental Sciences program were introduced to the NVS/NANOOS platform as part of a lesson that included learning how to access datasets online for a GIS/Remote Sensing course. Students were introduced to the NANOOS network and the NVS portal to access data that they used to compare with remote sensing. In a course on Biostatistics, students were tasked with finding an online dataset, which included data available for download from NVS."

— Misty Peacock, Northwest Indian College

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IOOS in the Pacific Northwest



Jan Newton | NANOOS Executive Director | 206-543-9152 | janewton@uw.edu



## NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS

Enhancing health, safety and economic prosperity in the Pacific Northwest

### Fisheries Science and Commerce

"I start my work day every day by visiting the NVS data explorer for the latest real time data and modelling forecasts. NANOOS and the NVS data explorer have become a routine resource and are an incredible benefit to the management and mitigation of harmful algal blooms along Washington's outer coast for ORHAB. One stop shopping to open-access mooring data, satellite imagery, and UW's LiveOcean model have been instrumental in advancing ORHAB's understanding of ocean processes and harmful algal bloom development along Washington's outer coast."

— Anthony Odell, Research Analyst Lead, Olympic Region Harmful Algal Bloom (ORHAB) Monitoring Partnership — University of Washington Olympic Natural Resources Center

"The NANOOS Visualization System is an essential tool for the shellfish industry and provides critical real time data to aid in decisions surrounding harvests, food safety and hatchery operations. Having immediate access to this information throughout the summer allows us to ensure the highest degree of confidence that our forecasting and harvest schedules are in accordance with the best practices and state vibrio control plans. As an industry, we'd greatly benefit from an expansion of the program and increase in monitoring sites to help us utilize this technology for safe and profitable resource use."

— Justin Stang, Wholesale Manager, Hana Hana Company

"I just wanted to let everyone know that the real time data from the various buoys are incredibly helpful for those of us in the Marine Fish Science Unit at WDFW. We use this information to assist us with planning our field sampling on a daily and weekly basis; wind speeds and directions, as well as temperatures, help us determine the feasibility of our sampling routine. We hope this network stays funded to provide long-term data that we can use to help understand the dynamics of forage fish and their trophic interactions in the southern Salish Sea and beyond!"

— Todd Sandell, Senior Forage Fish Specialist, Washington Department of Fish and Wildlife

"Your team has made this a very solid and valuable tool for our tuna fishing business. Some of my favorite features are trip planning and creating routes; identifying sea surface temperatures — current and forecasted; combining chlorophyll locations with warm water currents; understanding current flow so I can estimate the direction and distance we will drift at night; and wave and wind forecasting. This application is helping us enjoy safer trips, find the fish easier and save on fuel usage. Thank you for the great job you're doing, we appreciate it very much."

— Gary and Julia Palmer, Fishing Oregon Podcast

"As an ocean sport fisherman, I want to give a huge shout out to the team at NANOOS. The NVS Tuna Fisher application has given me and other sport boats the ability to narrow our search area for the fish we seek. As a sport halibut fisherman, wave height, wind and current direction are very important in how far we travel offshore as well as set up for fishing. Your tools provide us the ability to glimpse hours out into the day before I leave the dock to ensure I have the best knowledge possible on where to go, but more importantly, whether or not to go. As a new albacore fisherman, I read the information provided on your site discussing chlorophyll and what it meant for tuna. I was then able to use your chlorophyll and sea surface temperature maps to target an area I thought may be productive. The education I have received from your tools has paid off greatly, saving us time and money. Lower fuel consumption is good for all of us. We love your toolset. Keep up the great work."

— Wallace Coon, P/V Kimberlie Marie, Oregon Resident

"The Swinomish Indian Tribal Community is concerned about the impacts climate change is expected to have on our shellfish resources. As a coastal tribe shellfish provide an important economic resource for our people and are culturally significant, having been used for ceremonial purposes and subsistence harvest since time immemorial. NANOOS is one of the tools that tribes are interested in learning from, and can help improve our understanding of ocean acidification and enable adaptation by shellfish growers and co-managers."

— Lorraine Loomis, Fisheries Manager, Swinomish Indian Tribal Community



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## NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS

Providing up-to-date 24/7 data on the Pacific Northwest

### Strengthening Regional Science

"Without NANOOS assets, our ability to effectively monitor the development and effects of ocean acidification in Pacific Northwest coastal waters would be significantly curtailed... we cannot overstate the importance of maintaining NANOOS's infrastructural, data management, and outreach assets for the successful development of NOAA's West Coast and national ocean acidification monitoring networks and information products."

— Richard Feely, Senior Fellow, NOAA Pacific Marine Environmental Laboratory

"The treaty Indian tribes in western Washington are resource managers and acknowledge the positive partnerships that the NANOOS program has worked to build and maintain with tribal governments and programs, and the benefits that this is providing. The tools and products provided by NANOOS, especially the NVS Data Explorer and climatology apps, are an essential tool in my work to support the Tribes. The ease of access to data and data products from a range of different platforms and sources greatly simplifies the process of assessing the current state of the marine environment, while tools such as J-SCOPE provide a valuable resource for planning ahead."

— Tommy Moore, Oceanographer, Northwest Indian Fisheries Commission

"As Superintendent of Olympic Coast National Marine Sanctuary (OCNMS), I enthusiastically endorse the valuable data and services provided by the Northwest Association of Networked Ocean Observing Systems (NANOOS), many of which greatly enhance our understanding of ocean ecosystem dynamics influencing conditions within OCNMS. Thank you for your continued dedication to serving the community of resource managers and users in our region so effectively and collaboratively."

— Carol Bernthal, Superintendent, Olympic Coast National Marine Sanctuary

"The West Coast Ocean Data Portal (WCODP) seeks to increase access to and discovery of critical ocean and coastal data for resource managers and policymakers on the West Coast. The ocean observing information provided by NANOOS are important resources for us to highlight in our data catalog, so that our users (namely the state, tribal and federal agencies represented in the West Coast Ocean Alliance, or WCOA) can access the most up-to-date data and models to inform their decision-making at local and regional levels."

— Andy Lanier and Stephen B. Weisberg, Co-Chairs, West Coast Ocean Data Portal

"I anticipate my group will continue to use NANOOS' LiveOcean model in collaboration with several colleagues, as we seek to expand seafloor pressure geodesy studies in Cascadia to search for shallow slow slip earthquakes. The availability of a good long-lived regional oceanographic circulation model is essential for supporting these studies, which are likely to require at least a decade of observations. The geodesic work is critical for improving our understanding of the fault mechanics of the Cascadia megathrust and its tectonogenic potential."

— William S.D. Wilcock, Jerome M. Pecos Endowed Chair in Sensor Networks, University of Washington

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Jan Newton | NANOOS Executive Director | 206-543-9152 | janewton@uw.edu



# NANOOS takes DC ! March Hill Visits







# NANOOS FUNDING AT RISK

Here's how it could affect you

The Northwest Association of Networked Ocean Observing Systems (NANOOS) provides critical coastal forecast and data that support national security, mariner and public safety, economic stability, international competitiveness, and public health. Eliminating or reducing funding would have far-reaching consequences to our community and economy.

## WHAT IS AT STAKE?

### SAVING LIVES & TAXPAYER DOLLARS

SAFETY AT SEA

NANOOS funds coastal radars tracking surface currents that can increase the efficiency and accuracy of search and rescue operations as well as identify and guide safe routes for navigation. "I look at it every time I go out and depend on the information to get me where I need to go and get me back safely."

TSUNAMI EVACUATION

NANOOS works with state agencies in Oregon and Washington to provide our publicly available tsunami evacuation route web and smartphone apps, a life-saving planning tool. "By using the app we're improving our preparedness for evacuation routes and without it, we'd be a step behind."

NAVIGATION + PORTS

NANOOS funds models and real-time wave data at ports and off our dangerous coasts, aiding bar pilots and all mariners for safe and informed passage, reducing risk. "We rely on forecasts, real time buoy data, and wave and current models. NANOOS provides an excellent location for us to see and compare all the available data."

### PROTECTING JOBS & ECONOMIC GROWTH

SEAFOOD COMPETITIVENESS

NANOOS' network of real-time sensors and forecast models informs shellfish growers when most favorable growing conditions occur, working with the industry to get them the data they need. This protects jobs and hardens U.S. seafood markets from international competition. "This current generation of shellfish farmer is reliant upon data and services from NANOOS."

FISHING COMMERCE SUPPORT

NANOOS funded models and real-time buoy data are combined into an app that easily shows information for both vessel safety and favorable fish conditions. "This excellent product benefits sport and commercial anglers directly, letting us be more effective and safe at the same time. This is what good government looks like and we need to protect these services."

TECHNOLOGICAL INNOVATION

NANOOS partners with industries to enhance the effectiveness of technologies, thus increasing their marketability. We worked to adapt an autonomous device to remotely sample water for analysis to warn against shellfish harvest in the presence of toxins, and we are creating an expanded market for lower cost sensors to warn fishermen of low oxygen that could kill crab.

### PROTECTING HEALTH & COASTAL COMMUNITIES

PUBLIC HEALTH SAFEGUARDING

NANOOS partners with and funds networks to sample, analyze for algal toxins, and post a bulletin to warn managers and public health officials who are responsible for issuing shellfish harvesting closures. Accuracy is vital: a non-closure can cost lives; a closure costs economic vitality. "Early warning of risk allows us to adjust sampling and better protect the health of coastal residents."

RECREATIONAL SAFETY ON THE WATER

NANOOS funds forecast models and real-time buoys, and aggregates data from federal and other partners, combining these in user friendly apps for boaters, surfers, and beachgoers. "NANOOS addresses a critical gap in recreational boater safety. I'm confident that it will save lives."

SHORELINE PROTECTION

NANOOS data are used by state agencies in Oregon and Washington for coastal flood hazard maps, monitoring coastal erosion, and preparedness. "Coastal erosion is a major threat in our county. The monitoring supported by NANOOS has helped us solve many of our immediate erosion and flooding threats, adding greater resilience."

NANOOS is 1 of the 11 Regional Associations of IOOS serving the USA

The quotes above are excerpted from online document [https://www.nanoos.org/documents/key/nanoos\\_legislative\\_fact\\_sheet\\_2025.pdf](https://www.nanoos.org/documents/key/nanoos_legislative_fact_sheet_2025.pdf), including attributions.

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<https://ioosassociation.org/>

## IOOS: Supporting the Restoration of America's Maritime Dominance

Strategic Ocean Intelligence for a Stronger Maritime Nation

The United States is reclaiming its leadership on seas by strengthening maritime security, revital maritime commerce, and investing in resilient infrastructure.

The U.S. Integrated Ocean Observing System (IOOS) is a key national asset advancing these priorities by delivering critical, real-time data that enhance maritime domain awareness, supports safe and efficient port operations, and ensures U.S. readiness in Great Lakes, coastal, and offshore waters. A public-private partnership, IOOS operates through federally certified regional associations nationwide.

### Economic Power through Maritime Commerce

By supporting safe navigation and reducing delays, IOOS helps protect over \$1.5 trillion in annual maritime trade, and 2.4 million jobs, fueling America's economic growth and global competitiveness. By providing real-time, reliable ocean data to port and bar pilots, IOOS helps ensure the safe, efficient movement of vessels through America's ports, reinforcing U.S. leadership in maritime commerce and operational excellence. The IOOS network supports national objectives in regions with limited resources, such as the Arctic, where the Alaska regional IOOS system is instrumental in building out capabilities and services that promote a safer, secure, and efficient maritime transportation system.

Restoring America's maritime dominance requires precision and innovation. IOOS data provides U.S. maritime forces, industry, and communities with the ocean intelligence they need to lead the way into the future of seafood.



More info at  
<https://ioos.org>

## IOOS: Supporting the Restoration of America's Seafood Competitiveness

A Smart Investment for a Competitive Seafood Future

The United States is revitalizing its seafood economy by strengthening domestic fisheries, expanding aquaculture, and investing in sustainable resource management for the ocean and the Great Lakes.

U.S. fisheries and aquaculture contribute more than \$200 billion annually to the economy and support over 1.7 million jobs. The U.S. Integrated Ocean Observing System (IOOS) is America's vital ocean intelligence network, leveraging innovation and advancing emerging, cost-effective technologies to deliver real-time data on regional scales. A public-private partnership, IOOS operates through 11 federally certified regional associations nationwide. This information feeds directly into fisheries assessments and decision-support tools, strengthening our nation's waterfronts, fueling seafood industries coast to coast, and driving economic growth nationwide.



Restoring America's seafood competitiveness requires precision and innovation. IOOS data provides U.S. seafood producers, coastal managers, and communities with the ocean intelligence they need to lead the way into the future of seafood.

### Strengthening Aquaculture Growth

Aquaculture is the fastest-growing food sector in America. IOOS supports this growth by delivering the environmental data essential for site selection and continuous monitoring of water quality, harmful algal blooms, and other ocean conditions. Aquaculture operators depend on this information to ensure the health and productivity of shellfish and finfish stocks.

### Supporting Coastal Economies

Fisheries underpin the economic vitality and nutritional security of America's coastal communities. By supplying real-time data on water quality, currents, and ecosystem health, IOOS equips local managers and small businesses with the insights needed to optimize harvests and maintain safe supply chains for marine and freshwater fisheries. This data-driven support sustains millions of jobs and billions in economic output nationwide.

### Future-Ready Fisheries & Harvests

IOOS delivers real-time ocean and Great Lakes data, helping commercial and recreational fishers make informed decisions. By monitoring when and where fish are most likely to occur, IOOS helps maximize the economic potential of U.S. fisheries today and in the future.



More info at  
<https://ioosassociation.org/>



FIND US ON LINKEDIN 



# Honoring Congresswoman Bonamici

## Award for Bipartisan Leadership in Ocean Observing: June 2026



Representative Bonamici has been serving Oregon's first district since 2012, and she has been a proud supporter of our coasts ever since.

She serves on the ***House Committee on Science, Space, and Technology***, where she advocates for science-based solutions addressing coastal issues. She also serves as ***co-chair of the bipartisan ocean caucus***, improving the stewardship of our ocean resources. In her time as chair, she has led resolutions celebrating our oceans and introduced new legislation to protect and understand them.

She cosponsored the bill for the ***reauthorization of IOOS*** with Representative Don Young (AK) in 2020, and stepped up to this role again in 2025 with Representative Mike Ezell (MS). Representative Bonamici understands the importance of the work done at NANOOS and IOOS, and she continues to support our organization, ensuring that our systems for ocean monitoring will thrive for years to come.

***She is a true ocean champion!***





## IOOS Association Dues

NANOOS pays annual \$1000 non-federal dues to the IOOS Association; additional was requested

For last year, we had two come forth:

- PCSGA
- RBR

**THANK YOU!!!**



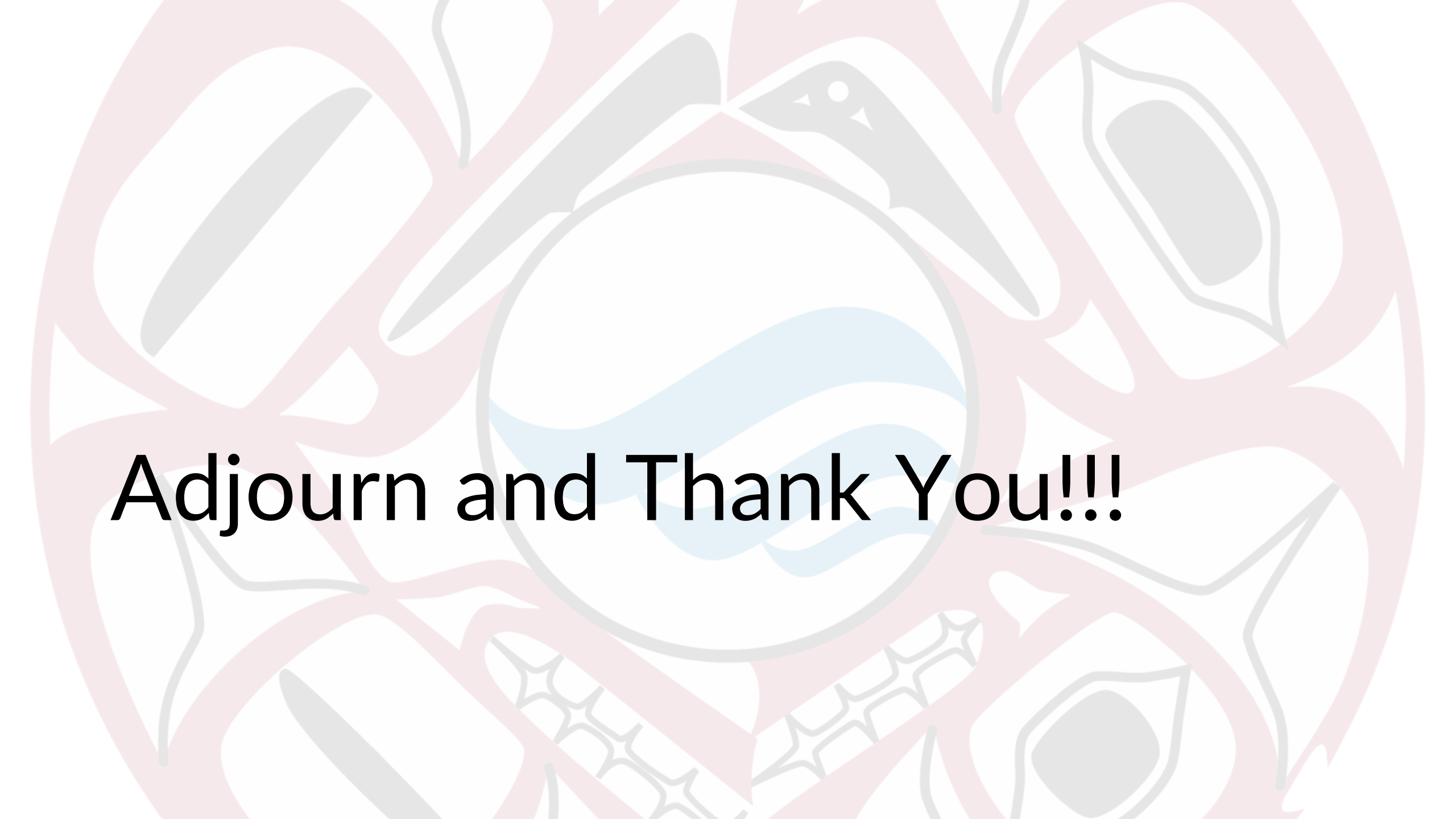
# NANOOS Funding Priorities





## Y1 of new 5-y award

- We anticipate an enhancement to our core funding
- Hard to scope without knowledge of scale
- Info from PIs on pinch spots
- Director-level assessment
- Recommendations to Executive Committee for approval or modification



Adjourn and Thank You!!!