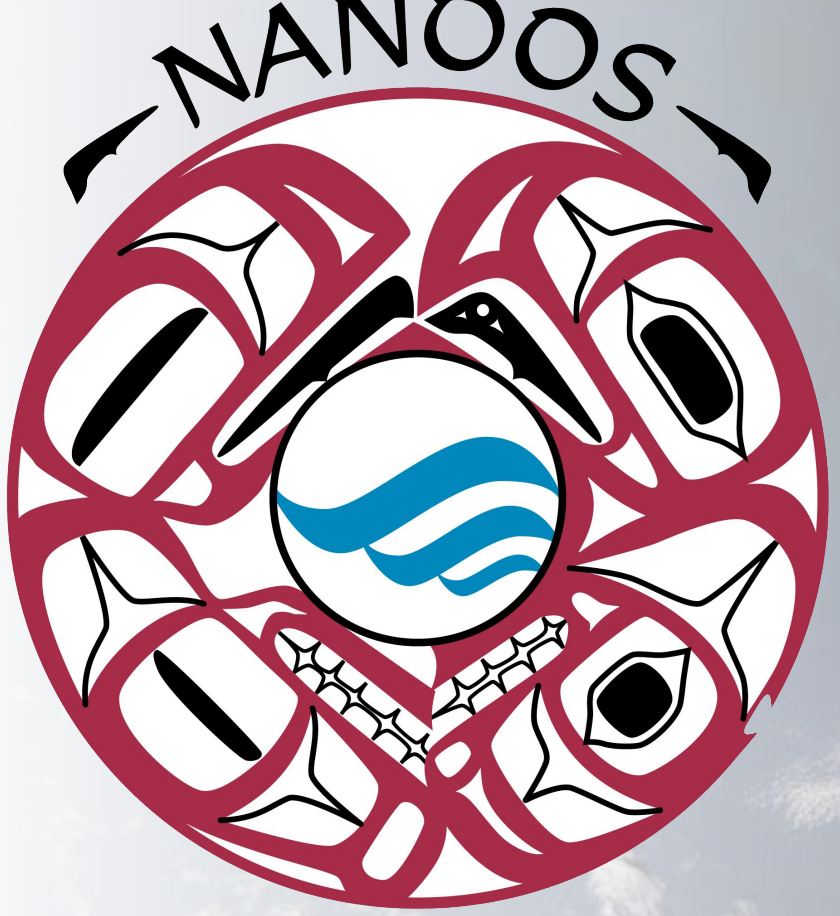

Governing Council & Principal Investigators Annual Meeting

14 August 2024

Vancouver, WA

IOOS

Welcome, Introductions, & Call to Order

Jan Newton, NANOOS Executive Director

Andrew Barnard, NANOOS Governing Council Board Chair

Time	Agenda Topic	Lead
9:00	Call to Order, Introductions, & Overview	J. Newton, NANOOS Executive Director A. Barnard, NANOOS Governing Council Board Chair
9:15	NANOOS Updates • NANOOS Director updates • Education, Engagement, & Outreach • DMAC • User Products	J. Newton, R. Wold, NANOOS EEO R. Carini & S. Travis NANOOS DMAC T. Tanner, NANOOS UPC
10:45	**Break**	
11:00	"Tell me your problem."	T. Tanner, NANOOS UPC
11:30	Snapshot Tool Demonstration	R. Wold, NANOOS EEO
12:00	**Lunch (provided)**	
1:00	Member Updates from the Floor	All
2:00	IOOS & IOOS Association Updates	D. Snowden IOOS PO K. Yarincik, IOOS Assn
2:30	NANOOS Core Funding, BIL, & IRA Summary	R. Carini, NANOOS Deputy Director
3:00	**Adjourn**	

NANOOS Update

NANOOS

Northwest Association of Networked Ocean Observing Systems

IOOS

Governing Council *last updated: August 2024*

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

KEY: Tribal | Industry | NGO | Academia/Research | Federal/State/Local Government

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, tsunami
Hazards: search and rescue, national security
Educators: formal, informal, research
Marine recreation: boating, surfing, diving, fishing

NANOOS Objectives for Y4 / FY2024 funds

1. Maintain NANOOS as the U.S. IOOS **PNW Regional Association**
2. Maintain **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 multidisciplinary observational capabilities in PNW **estuaries and the nearshore,** in coordination with local and regional programs
5. Maintain core elements of **beach and shoreline** observing
6. Provide sustained support to a community of complementary re**gional numerical models**
7. Maintain, harden, and enhance NANOOS' **Data Management and Cyberinfrastructure** (DMAC) system for routine operational distribution of data and information
8. Continue to deliver existing and, to the extent possible, create innovative and transformative **user-defined products and services** for PNW stakeholders
9. Sustain and diversify NANOOS **engagement** to the extent possible

NANOOS BY THE NUMBERS

10 ISSUES

- Harmful Algal Blooms
- Ecosystem Assessment
- Ocean Acidification
- Tsunami Evacuation/Preparedness
- Maritime Operations/Safety
- Hypoxia
- Marine Heat Waves
- Biodiversity
- Climate/Weather
- Coastal Hazards/Erosion

77 MEMBER ORGANIZATIONS

- 12 Academia
- 16 Federal/State/Local
- 21 Industry
- 17 NGO
- 5 Research Institutes
- 3 Tribes
- 3 Tribal Organizations

232 ASSETS SERVED ON NVS

- 5 Cruises
- 65 buoys
- 7 Gliders
- 2 Ferry-boxes
- 38 River Gauges
- 6 Regional Models
- 98 Fixed Shore Stations
- 11 HF Radar

1334 DATA STREAMS ACCESSIBLE ON NVS INFORM 47 DATA PRODUCTS

13 USER-SPECIFIC NANOOS APPS

- Tsunami Evacuation Zones
- Beach & Shoreline Changes
- Boaters
- Beach View
- Climatology
- Tuna Fishers
- Surfers
- Shellfish Growers
- SeaCast
- Data Explorer
- Gliders
- Cruises
- Maritime Operations

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 - S3,932,271**
($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

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FY24 (Year 4 of Current Award) Details

- $ **4,482,669** total
  - $3,091,136 core
  - National HAB-ON $430k: PNW HAB Bulletin, SoundToxins, etc.
  - HFR re-tune $203k: to update items built in “last century”
  - NOAA OAP support $408k: OA measurements on Cha’ba & CB-06
  - NOS Modeling $350k: modeling projects by CRITFC & OSU

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NANOOS Funding Streams

- **Core**
- **Non-core add-ons**
- BIL Y1-2; Y3-5
- IRA (5y funding, all awarded in Y1)
  - Topic 1 NANOOS directed
  - Topic 2 national and pan-regional:
    - Water levels, waves, webcams
    - Ecosystem change
    - Equitable service delivery

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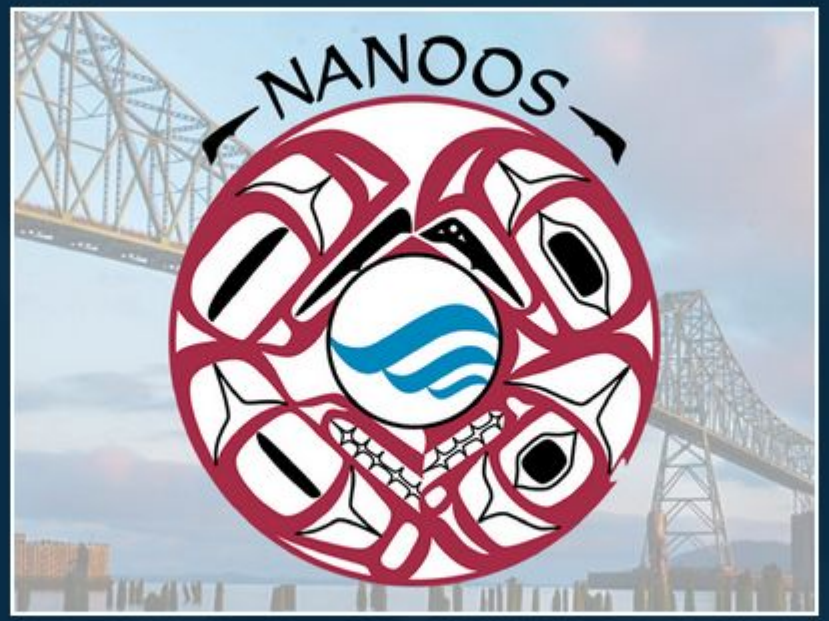
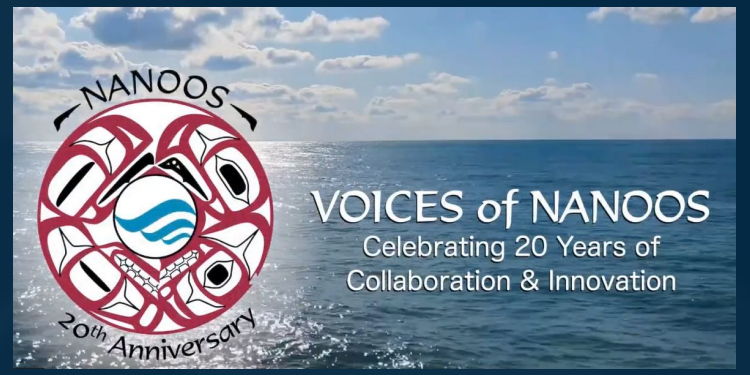
2023-2024 Highlights

We turned 20!!!





NANOOS celebrated its 20th anniversary with a series of events:

2008 2023

BIL funds are making a difference!

The Bipartisan Infrastructure Law of 2022 set aside funds to IOOS that NANOOS is using to replace aging observing asset parts and to assure continuation of these vital data streams used to assess safety and protect economic and ecological benefits from the sea.

With these funds, buoys and gliders that have served many years are being either **replaced or revitalized, and equipped with newer tech sensors**.

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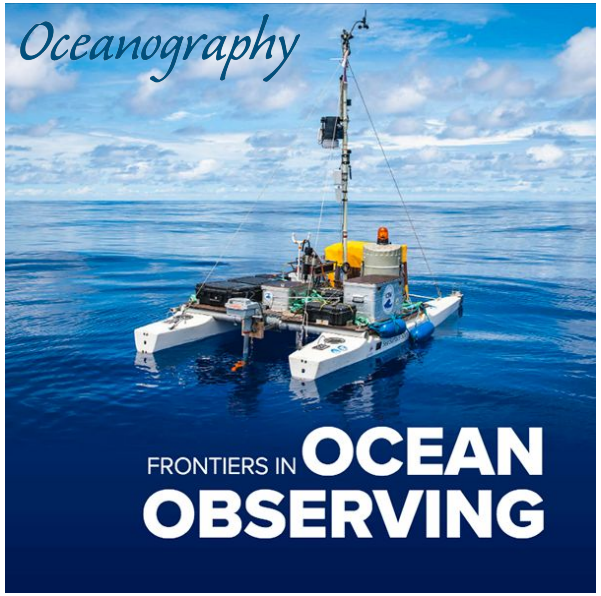
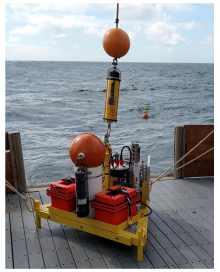
IOOS



Multi-Stressor Observations and Modeling to Build Understanding of and Resilience to the Coastal Impacts of Climate Change

Newton et al. (10 co!), 2022

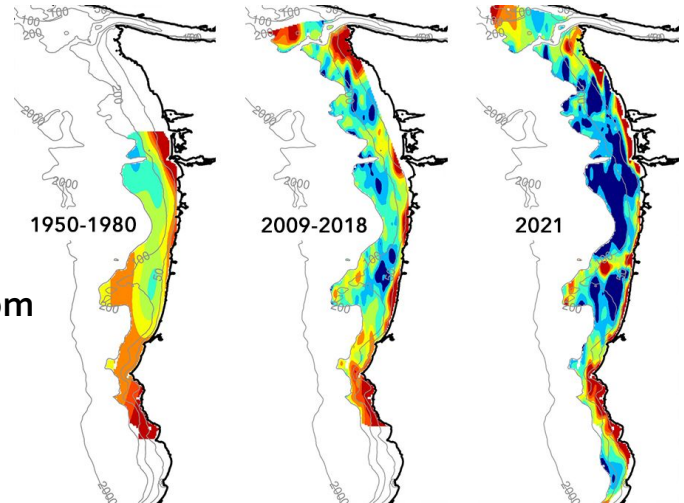


Imperiled by ocean acidification: How US Pacific shellfish farms are coping:

N America's battle to save the oyster industry from climate change can inform a similar fight in Senegal

Widespread and increasing near-bottom hypoxia in the coastal ocean off the United States Pacific Northwest

Barth et al., 2024



NANOOS partners are leaders in science, how science is done, and how to make advances together

These articles are recent examples of important discoveries about hypoxia, an emphasis on observing multi-stressors in diverse partnerships, and how the PNW shellfish example of working together on observing data and knowledge sharing is setting an example informing shellfish farmers in Senegal, and the world.

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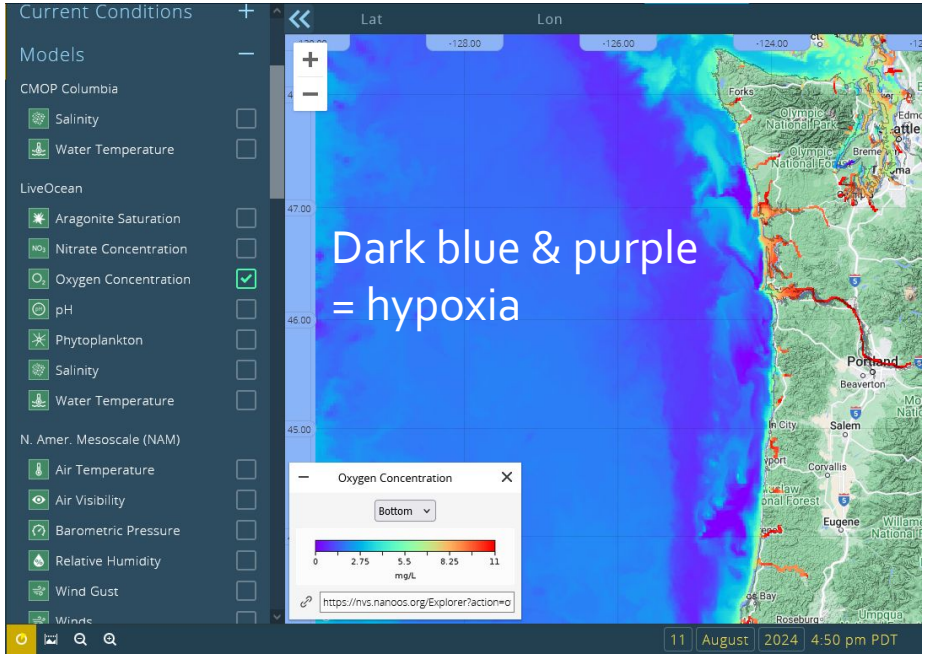
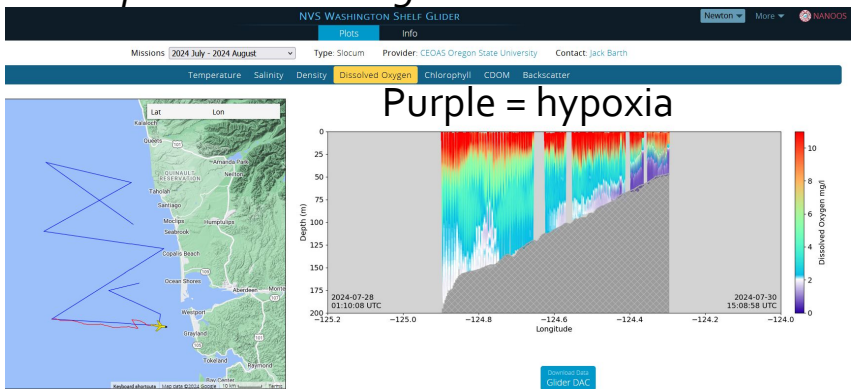
Hypoxia Watch:

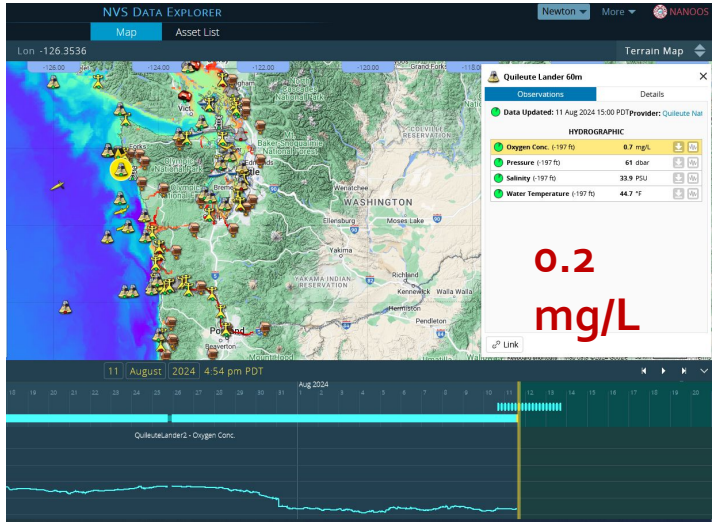
UW Ocean "LiveOcean" model



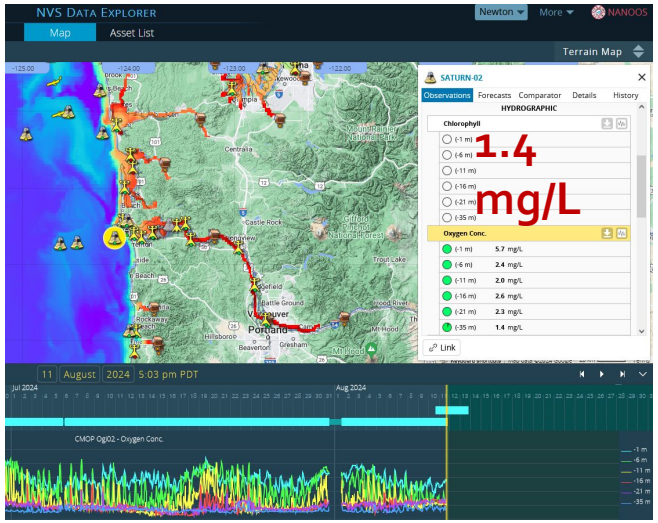
OSU operated CRITFC glider



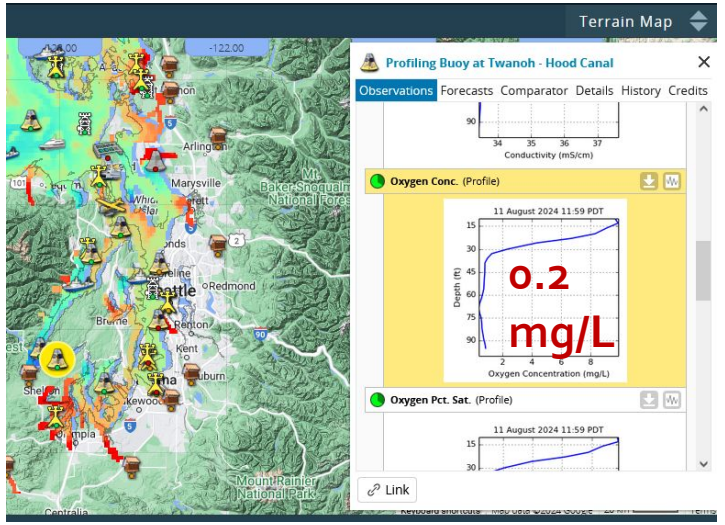
*Quileute Tribe mooring**



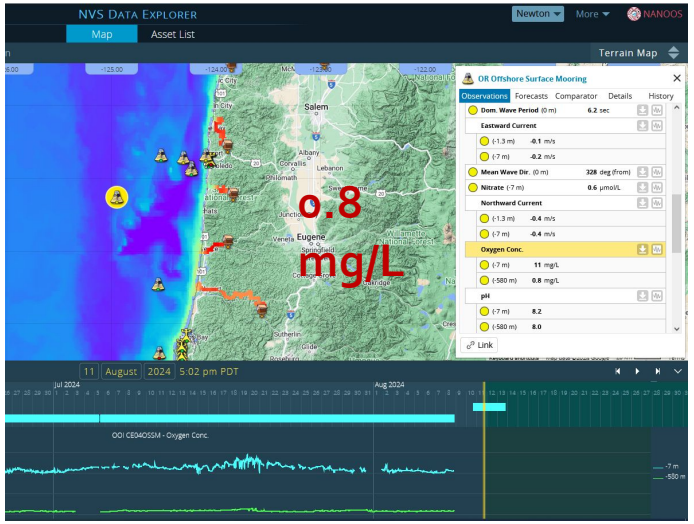
CRITFC SATURN mooring



UW-APL ORCA mooring



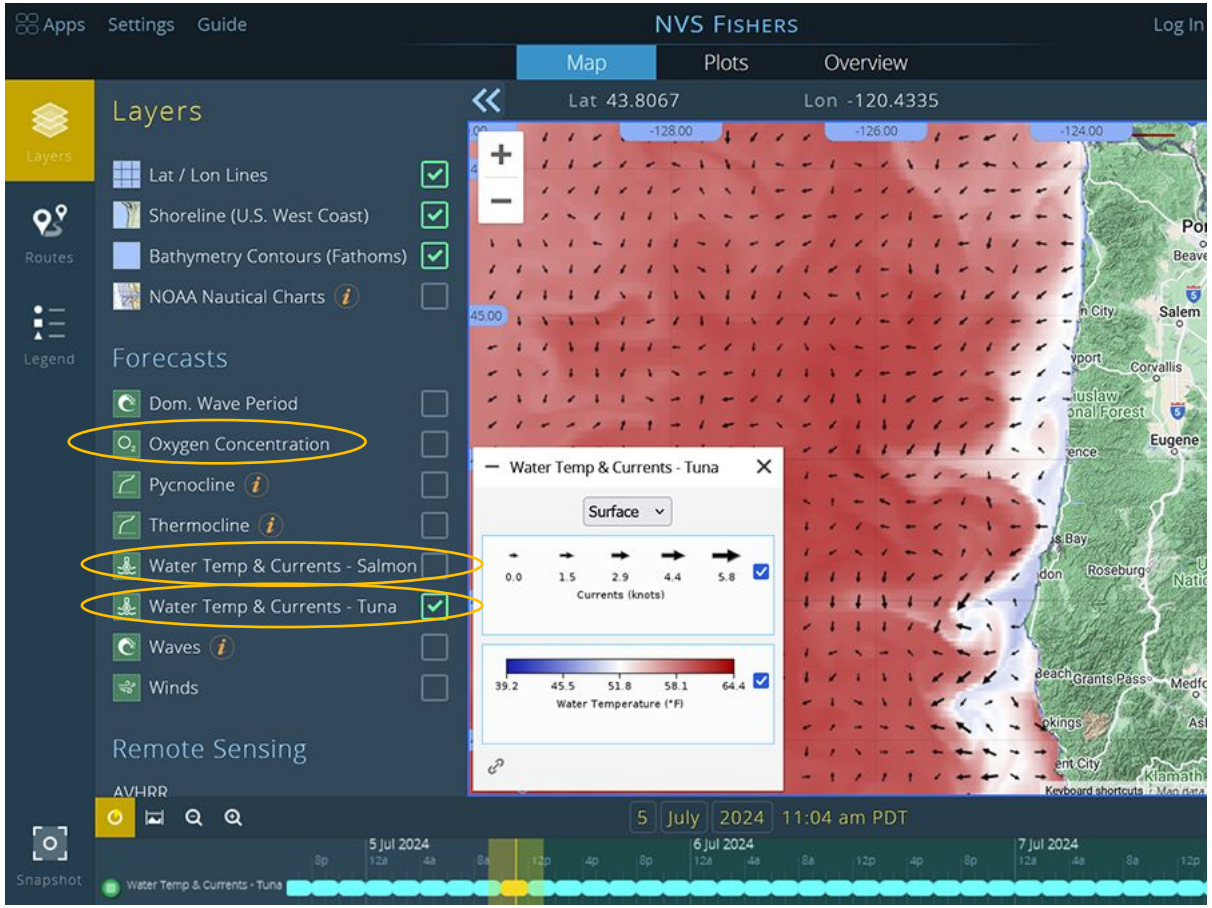
*NSF OOI mooring – OSU operated**



Sharing expertise and information

- During a UW-APL deployment cruise off La Push, WA, for Cha'ba, NEMO-Subsurface, and ESP moorings, a field team from CRITFC joined. This was a valuable training opportunity for CRITFC staff, who gained knowledge on topics including rigging, boat operations, buoy design, AIS systems, ESP prep, and troubleshooting. The experience also strengthened bonds between these two NANOOS partners.

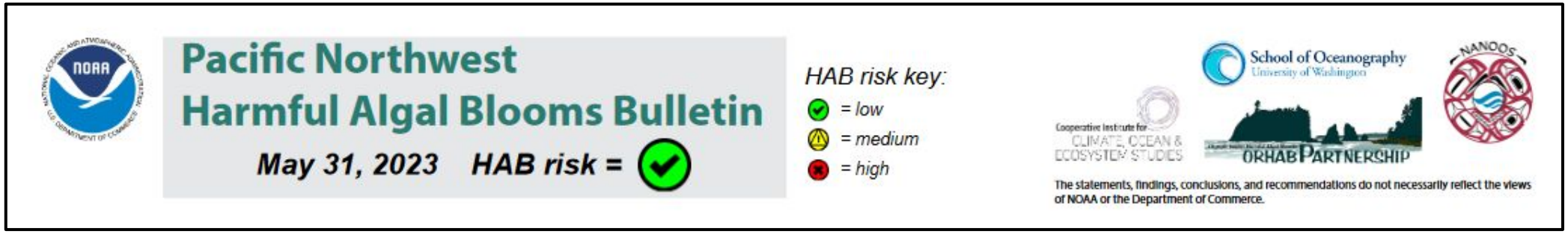
- Seth Travis, UW buoy data manager, presented a webinar on how to access, subset, and download the Puget Sound data. He showed how the group developed a data workflow to integrate across multiple oceanographic sensors and apply a suite of quality control protocols. Links to the slides, ERDDAP data server, and data manual are on-line. NANOOS is sharing this expertise to other buoy operators.

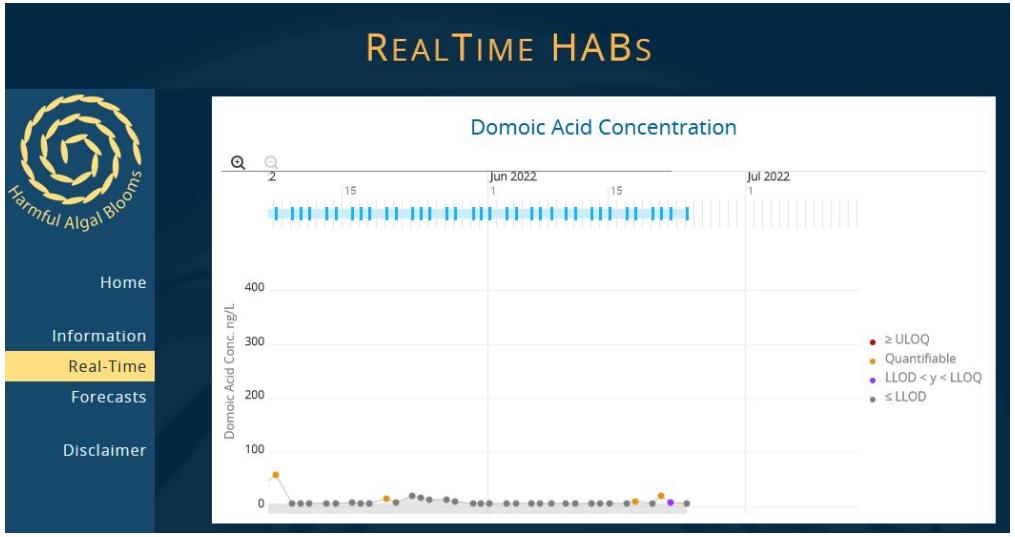


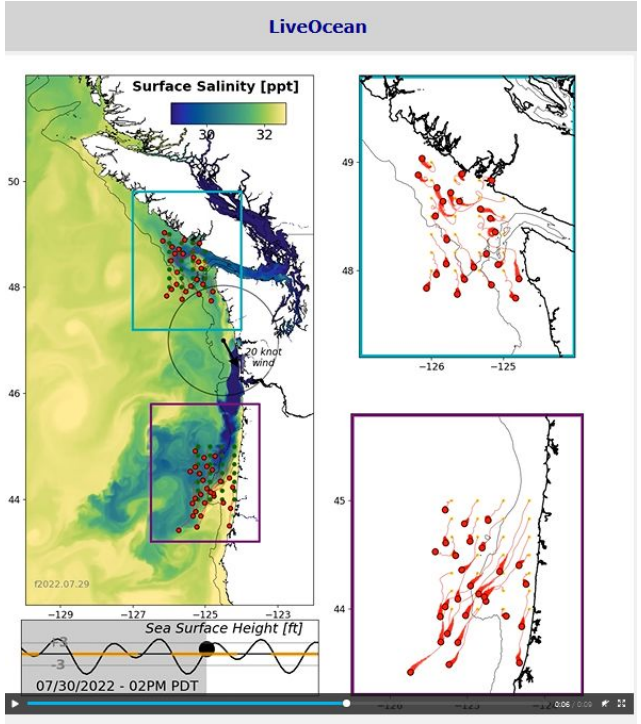
Assuring products are usable by our users: Video tutorial for Tuna Fishers (Fishers)

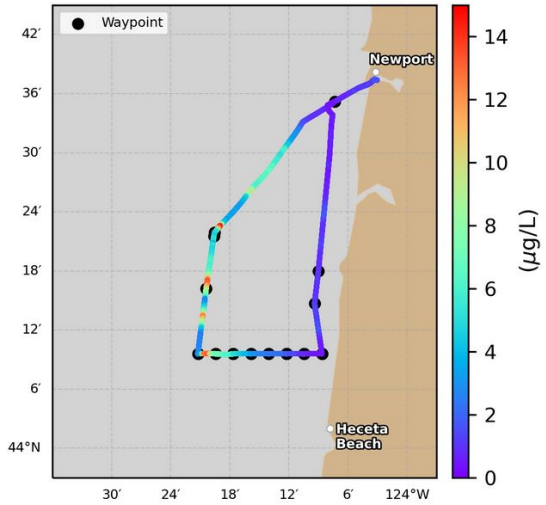
NANOOS developed a brief video tutorial that walks users through various data products developed to help visualize where ideal and safe fishing conditions occur, including combined SST and surface currents, pycnocline, and thermocline forecasts.

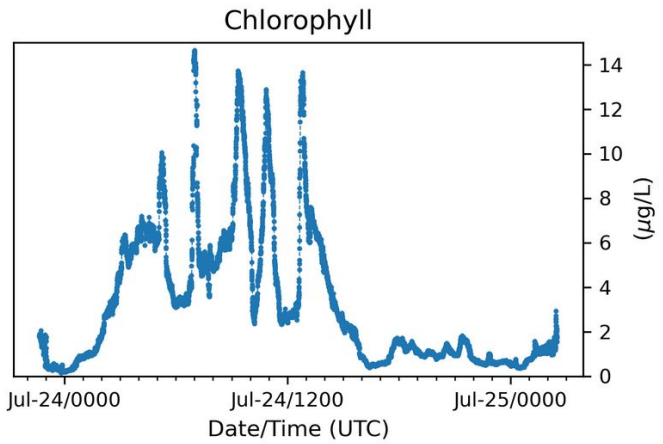
HABs in the PNW: NHABON











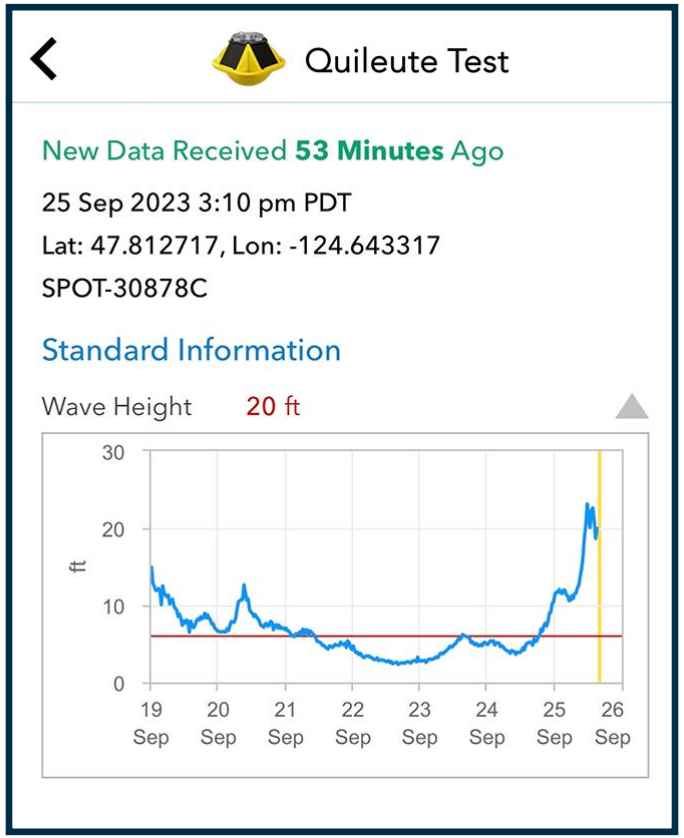
This work is possible by funding from both the IOOS Ocean Technology Transition Program and NANOOS HAB-ON program.

NANOOS Lightfish Completes First Offshore HABs Mission

NANOOS and partners are using a combination of new technologies to improve the frequency and coverage of offshore HAB observations in the Pacific Northwest and better inform public health officials and marine resource managers of HAB risk.

A SeaSats Lightfish, a solar-charged autonomous surface vehicle, augmented with a water sampling system designed and built by APL-UW had its first successful operational mission: a 60-mile trackline out of Newport, OR, collecting 15 water samples near Heceta Head and rapidly returning them to the OSU Hatfield lab shore-side lab for analysis of for plankton abundance, species composition and levels of domoic acid, the HAB toxin that causes amnesic shellfish poisoning.

BACKYARD BUOYS



Quileute and Quinault deploy Backyard Buoys

Not only did buoys go in the waters offshore each tribe, but one withstood 20' waves during a fall storm, as shown by the BB app.

The focus this year will be three buoys at each site deployed by tribal vessels and captains.

IRA funds will extend and expand the program.

Your vision guided IRA & BIL proposals

- We consistently heard that our NANOOS GC wants us to stay the course on NANOOS investments.
- We used the meetings in Astoria to kick off how we sustainably grow NANOOS for opportunities from new funding from the Inflation Reduction Act.
- Sustaining our data streams and products continue to be our highest priority.
- Our level of innovation and improvement is strong.

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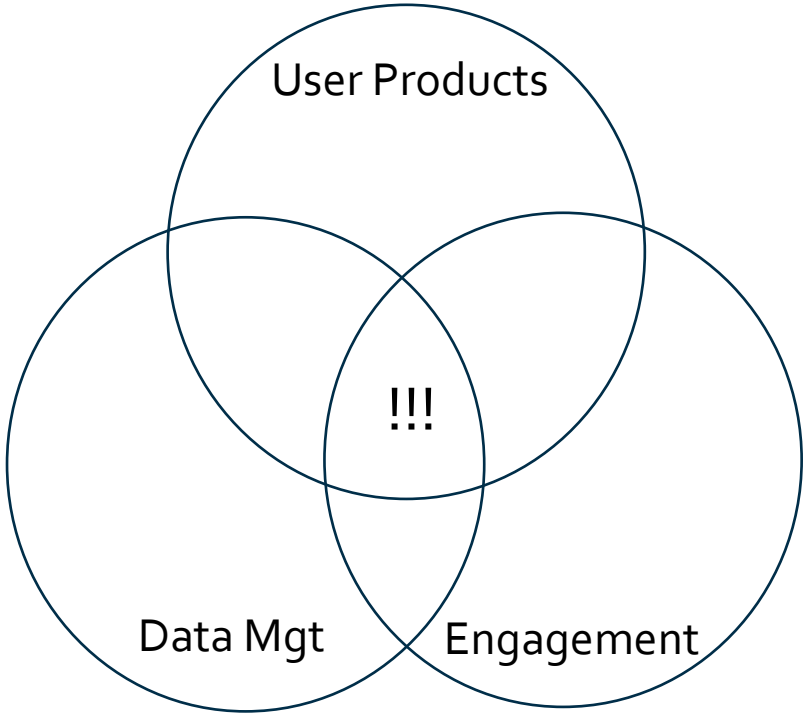
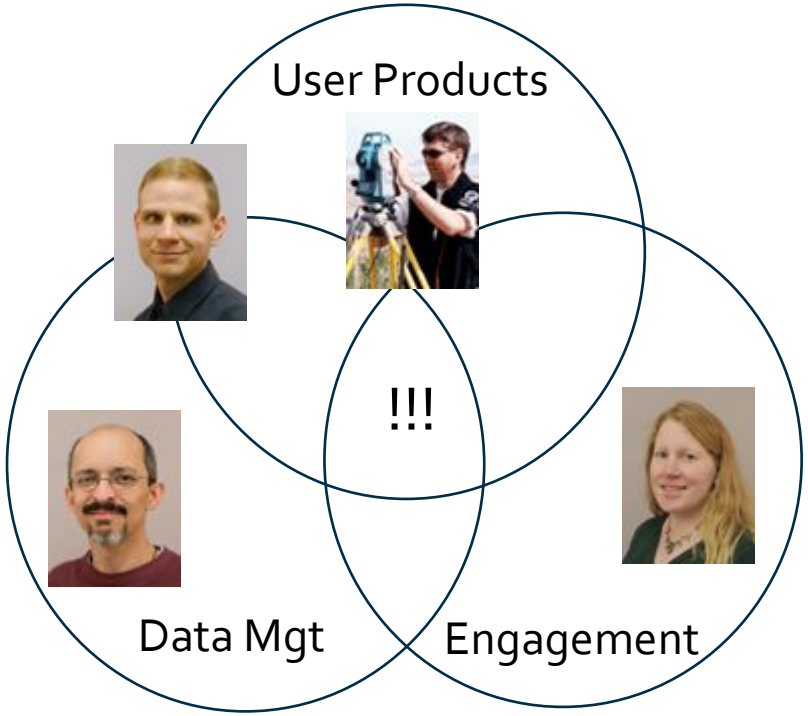
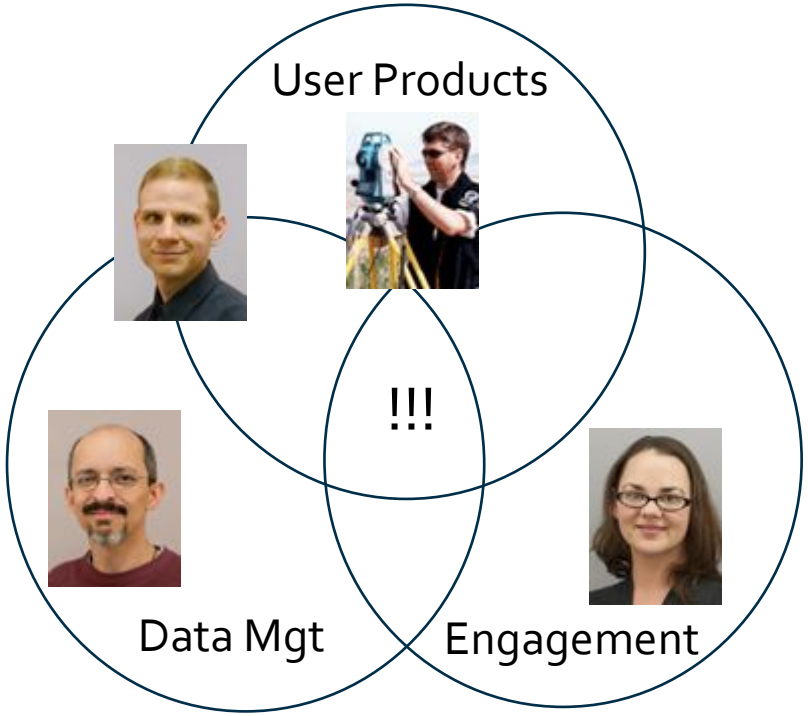
NANOOS Tri-Committee



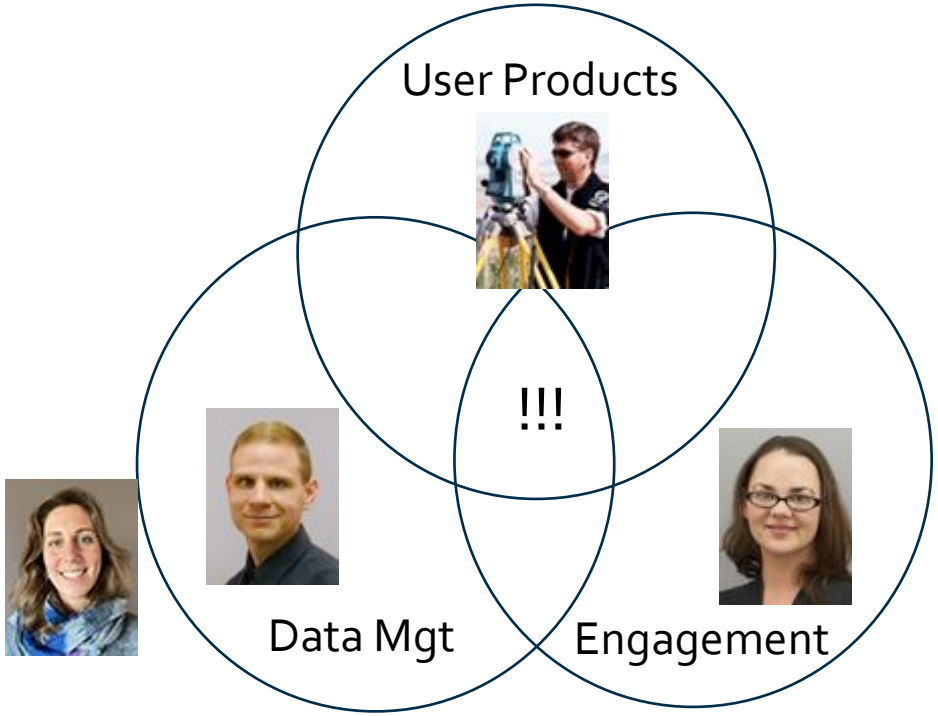
NANOOS Tri-Committee



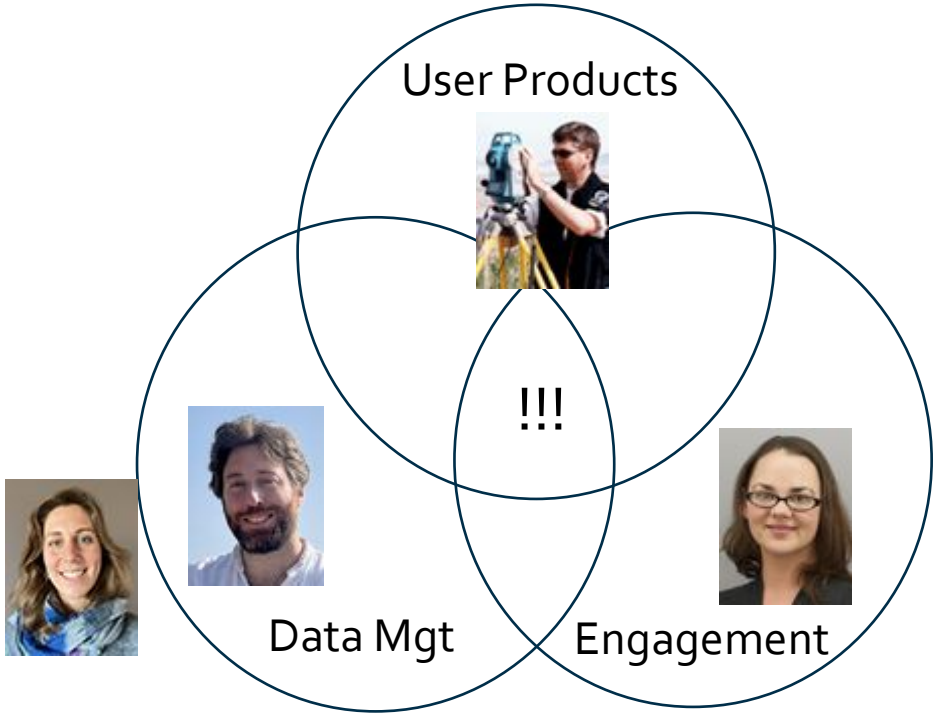
NANOOS Tri-Committee



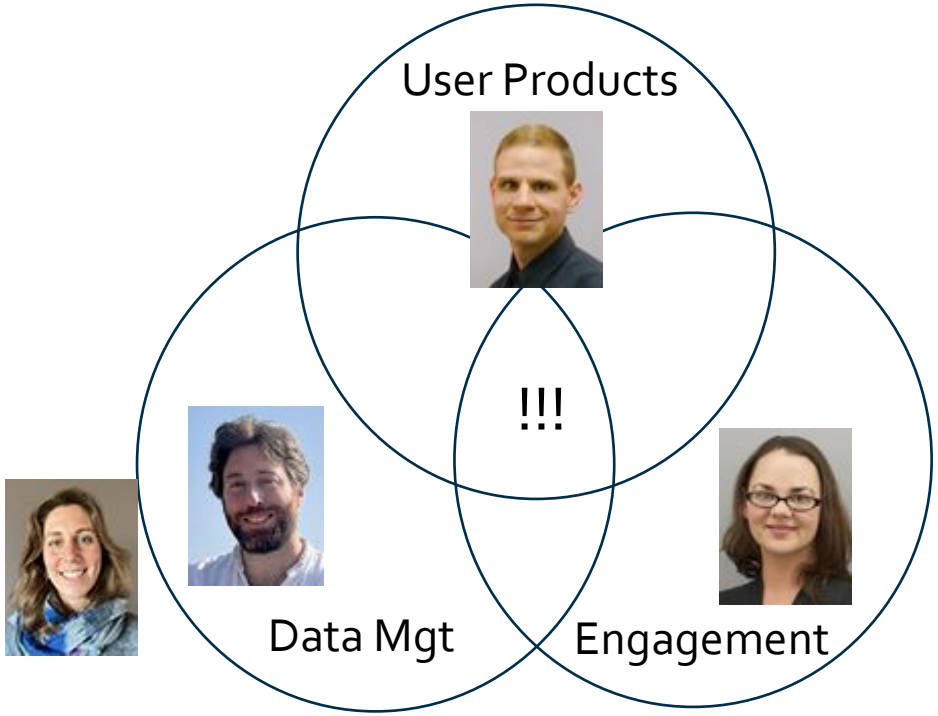
NANOOS Tri-Committee



NANOOS Tri-Committee



NANOOS Tri-Committee



NANOOS Thanks Dr. Jonathan Allan!!!

20 years as NANOOS User Products Chair

NANOOS Tri-Com Updates

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

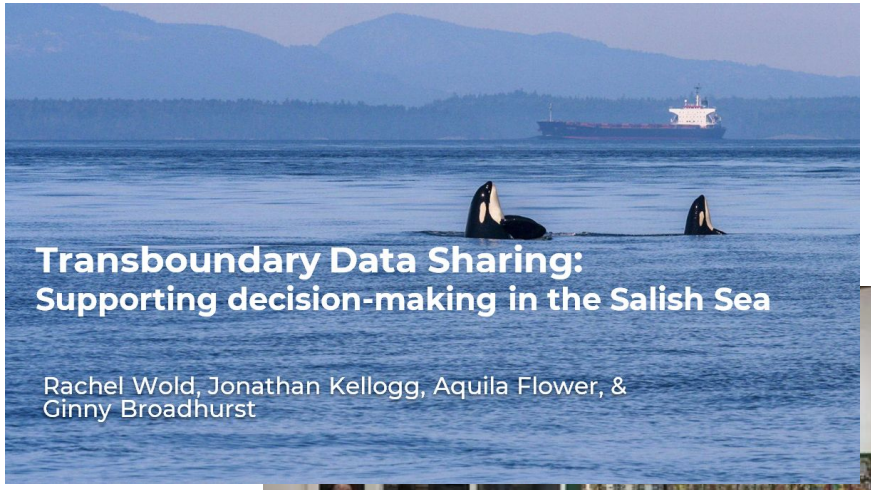
Outreach, Education, and Engagement Updates

Rachel Wold, OEE Chair

Outreach and Engagement:
Increasing awareness and connecting with users

Engagement with general public, scientists, and targeted user groups

- Transport Canada Salish Sea Symposium
- Sound Waters University
- Science Conferences (PCSGA, MRC, etc.)
- Recreational and commercial fishers, boaters, surfers in PNW
    - Collect and utilize user feedback



Active participation with external groups

- IOOS Outreach Committee
- IOOS DEIA Committee
- UW Applied Physics Lab DEIA

SALTWATER SPORTSMEN'S SHOW

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Education: Increasing ocean literacy

Whidbey School District
- Student buoy program
- Teacher training

Lesson plans online
- New OA lesson plans developed b
  EarthLab Ocean Literacy Interns

NANOOS Enabling Change Activities
- Middle school, High school and
  Undergraduate

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Enabling Change Working Group:
Diversity, Equity, and Inclusion

Middle school
- TAF Stem Expo
- TAF@Saghalie OA presentation
- CRITFC Salmon Camp

High school
- MHS Career Expo
- MHS Mentorship Program
  - With Sea Potential
- MATE ROV in Forks

Undergraduate
- Interns (EarthLab, DINOSIP, NOAA, etc.)
- NANOOS/NOAA Intern Brainstorm
  - EPP/MSI and Hollings

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Enabling Change Working Group:
Diversity, Equity, and Inclusion

Members: NANOOS, CRITFC, OSU, MRV Systems, NOAA PMEL, NOAA West Coast Regional Office, OCNMS, IOOS Office

Purpose: Coordinate, highlight, and expand on existing efforts and throughout NANOOS and make space for new opportunities.

Join us!

Monthly meetings, usually 4th Friday at 1pm

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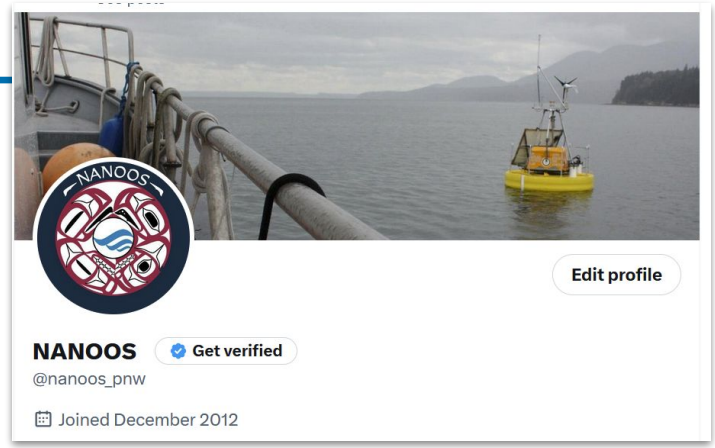
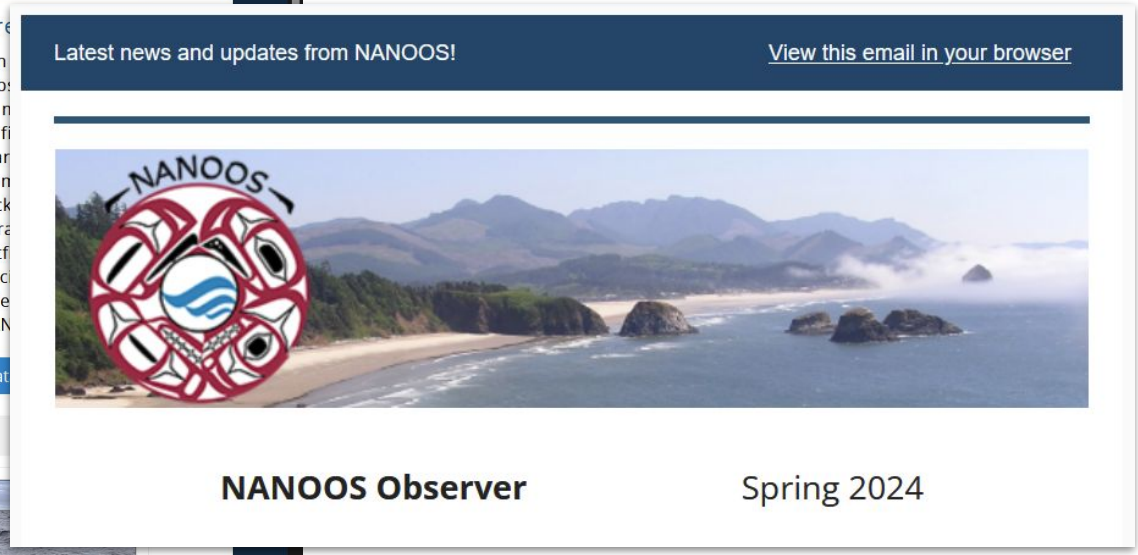
Online Presence





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Plans for the upcoming year

Expand on Enabling Change endeavors

- Everyone is invited to participate in monthly calls!
- Utilize the NANOOS GC/PI network
  - What opportunities are available in your organization or region?
  - What efforts can we support or highlight?
- NOAA EPP/MSI and Hollings proposal

Increase awareness and use within member organizations

- Workshops, webinars?

NANOOS
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DMAC Updates

Roxanne Carini & Seth Travis, DMAC

BlueHarvest: Updated & New Data Streams

Ćháʔba·

ORCA

- Carr Inlet, Dabob Bay, Hansville, Hoodsport, Point Wells, Twanoh

Quileute Lander 40m, Quileute Lander 60m

Friday Harbor Labs

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Northwest Association of Networked Ocean Observing Systems

ERDDAP Advances

- ERDDAP services set up for a number of platforms, including:
  - Puget Sound ORCA moorings
  - Cha'Ba Coastal Mooring
  - Quileute Landers - CTD & ADCP
  - Backyard Buoys program in development
- Useful as a way to get out near-real time data, as well as a historical data repository

ERDDAP Advances

- ERDDAP creates data URLs which can be used to download data

- By understanding the format of these URLs, they can be manipulated to download the data of your choosing

- Example Download From TableDap:

https://nwem.apl.washington.edu/erddap/tabledap/orca2_L1_profiles.csv?cast_number%2Ctime%2Csample_time%2Csea_water_pressure%2Csea_water_temperature&time%3E=2023-10-24T19%3A00%3A08Z&sea_water_temperature_qc_agg%3C=3

ERDDAP Advances

- TableDAP: Deconstruct the Example:

https://nwem.apl.washington.edu/erddap/tabledap/orca2_L1_profiles.csv?cast_number%2Csample_time%2Csea_water_pressure%2Csea_water_temperature&time%3E=2023-10-24T19%3A00%3A08Z&sea_water_temperature_qc_agg%3C=3

- Base url: https://nwem.apl.washington.edu/erddap
- ERDDAP Data Type: tabledap
- dataset_id: orca2_L1_profiles
- Desired file format: csv
- Selected Variables:

{cast_number, sample_time, sea_water_pressure, sea_water_temperature}

- Constraints:

{time%3E=2023-10-24T19%3A00%3A08Z, sea_water_temperature_qc_agg%3C=3}

NANOOS | Northwest Association of Networked Ocean Observing Systems

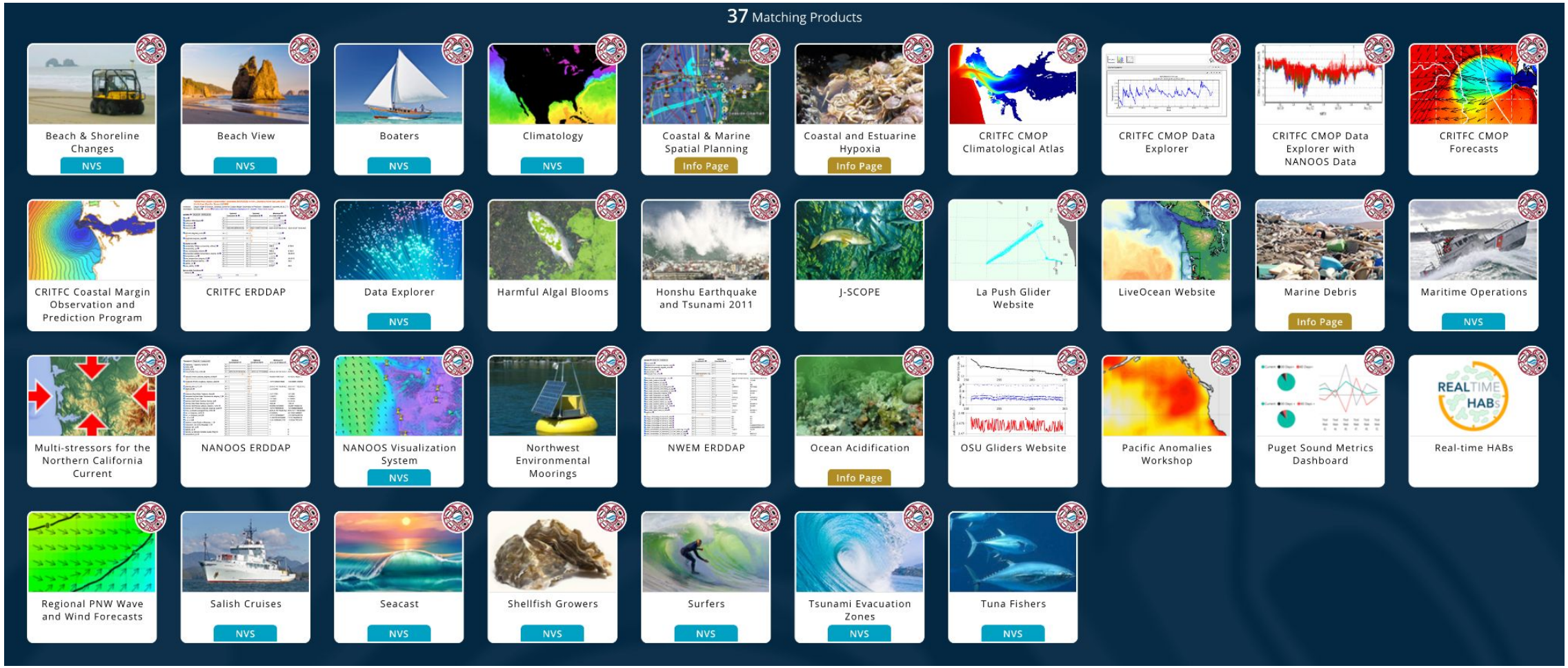
ERDDAP Advances

- Where appropriate, platforms are sending data to NOAA NDBC for GTS ingestion - working on adding more
  - ORCA Moorings: Meteorological stations being ingested, will eventually include ocean profile data
  - Backyard Buoys: each station will acquire a wmo code for ingestion

User Products Updates

Troy Tanner, UP Chair

Products Overview



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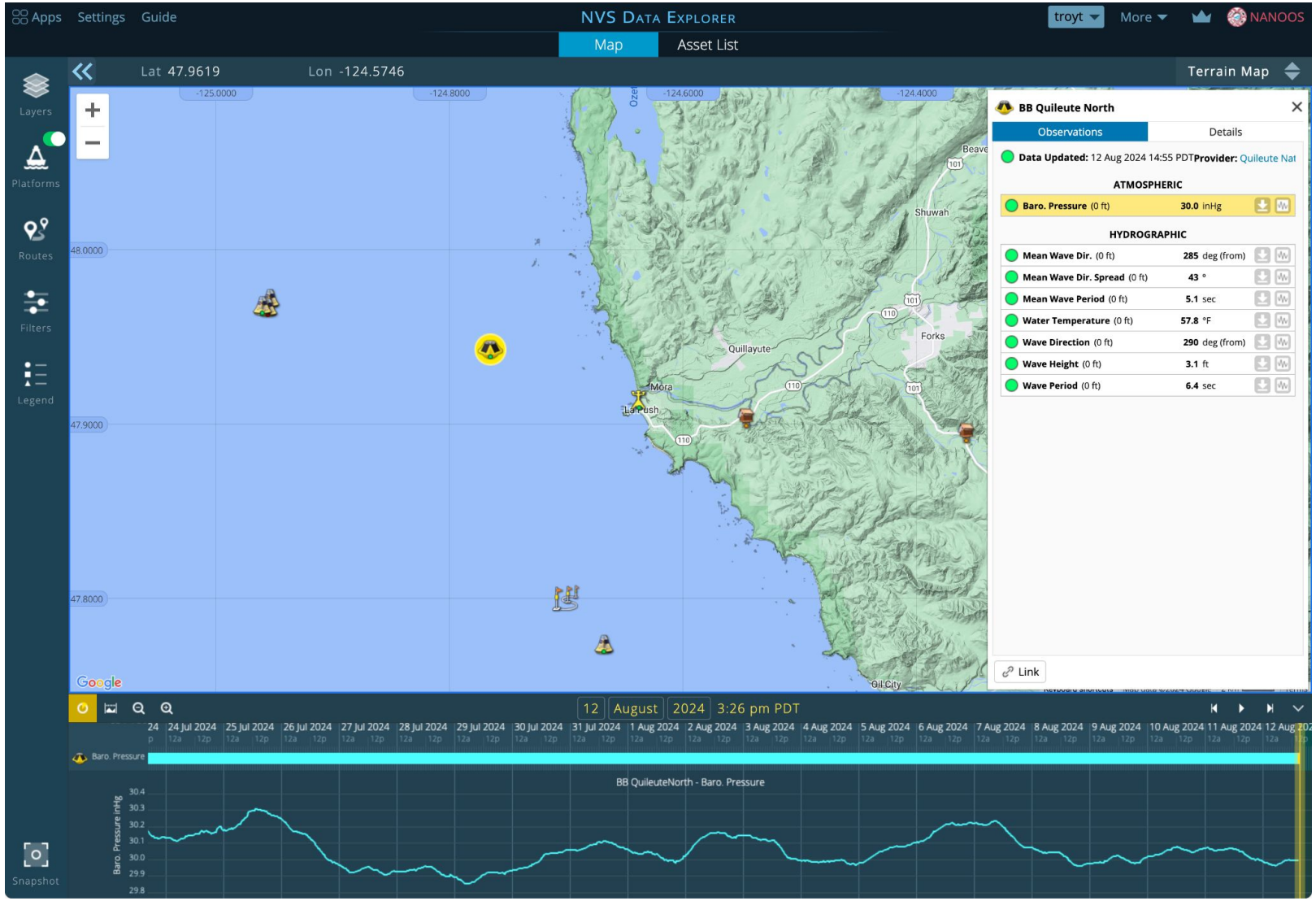
Updated: NVS Platforms



- Quileute Spotter
- Updated various other platforms

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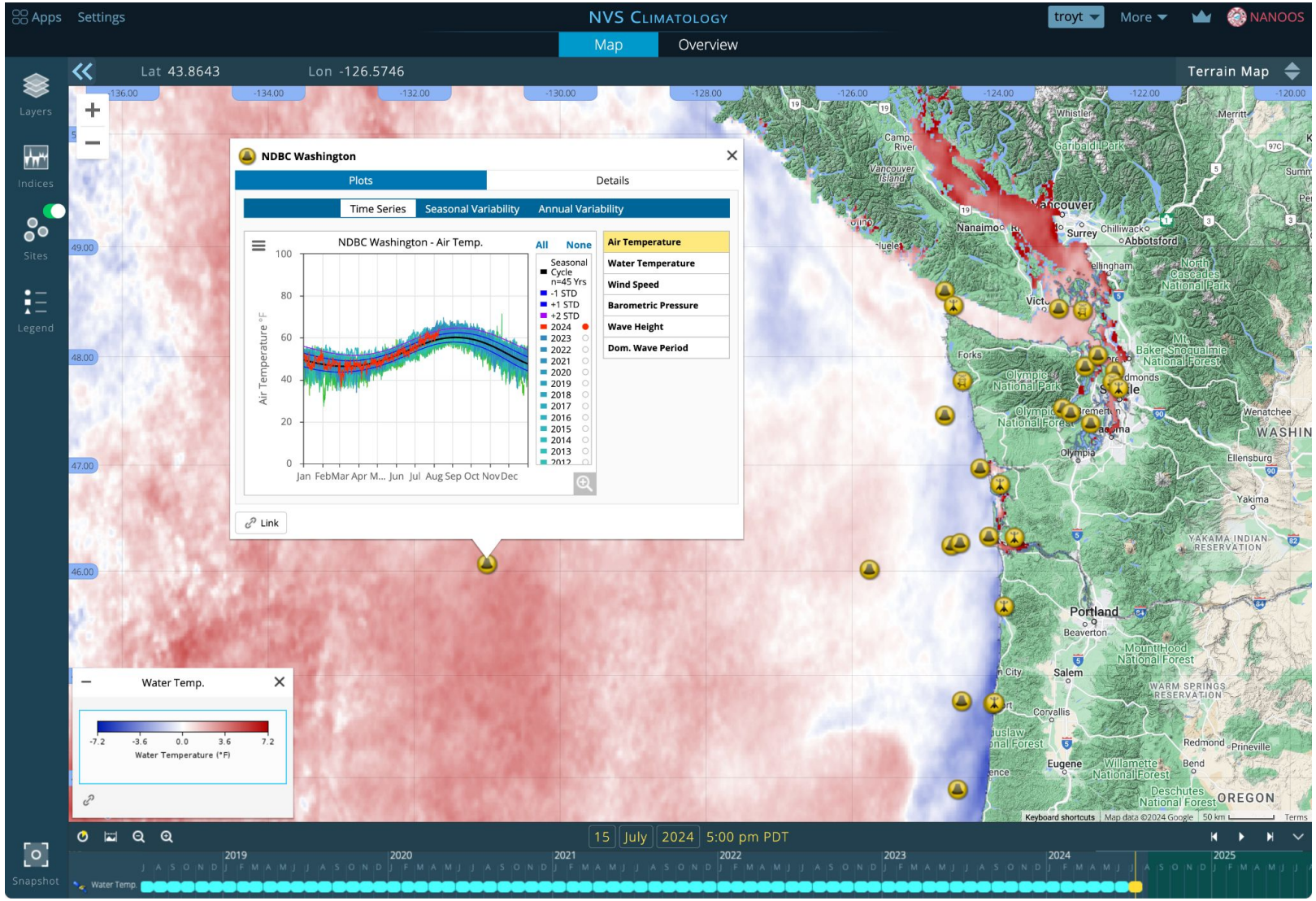
Updated: NVS Climatologies



- Updated monthly mean and anomaly overlays
- Updated time series plots at select locations

NANOOS

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Updated: Puget Sound Metrics

- Updated Plots
- Plots made available by John Mickett and Seth Travis

NANOOS
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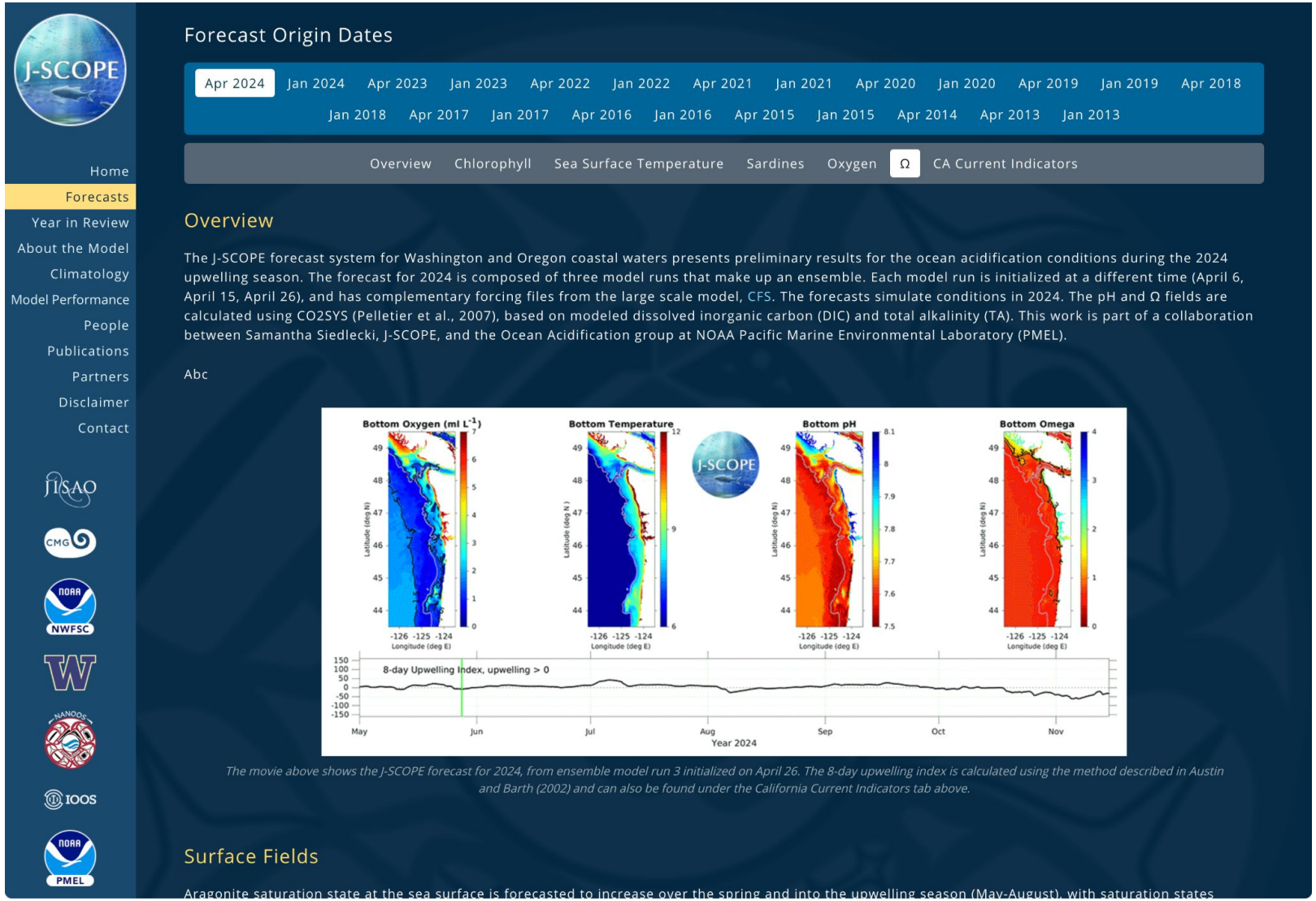
Updated: J-SCOPE



- Forecasts for January and April 2024
- Forecasts created by Samantha Siedlecki

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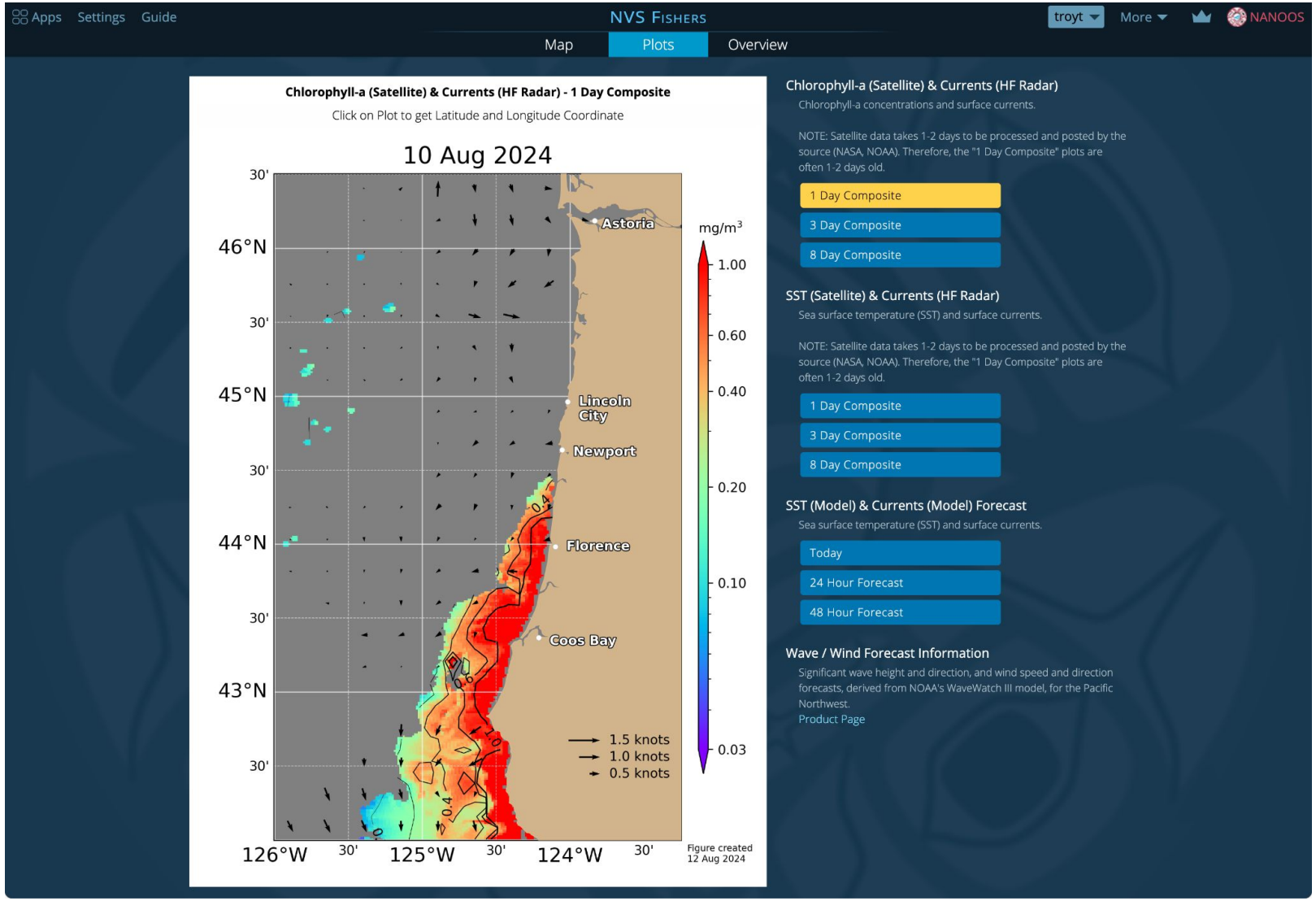
Updated: NVS Fishers App



- New plots
- Created by Seth Travis
- Improved communication of data availability
- Update coordinate feature

NANOOS
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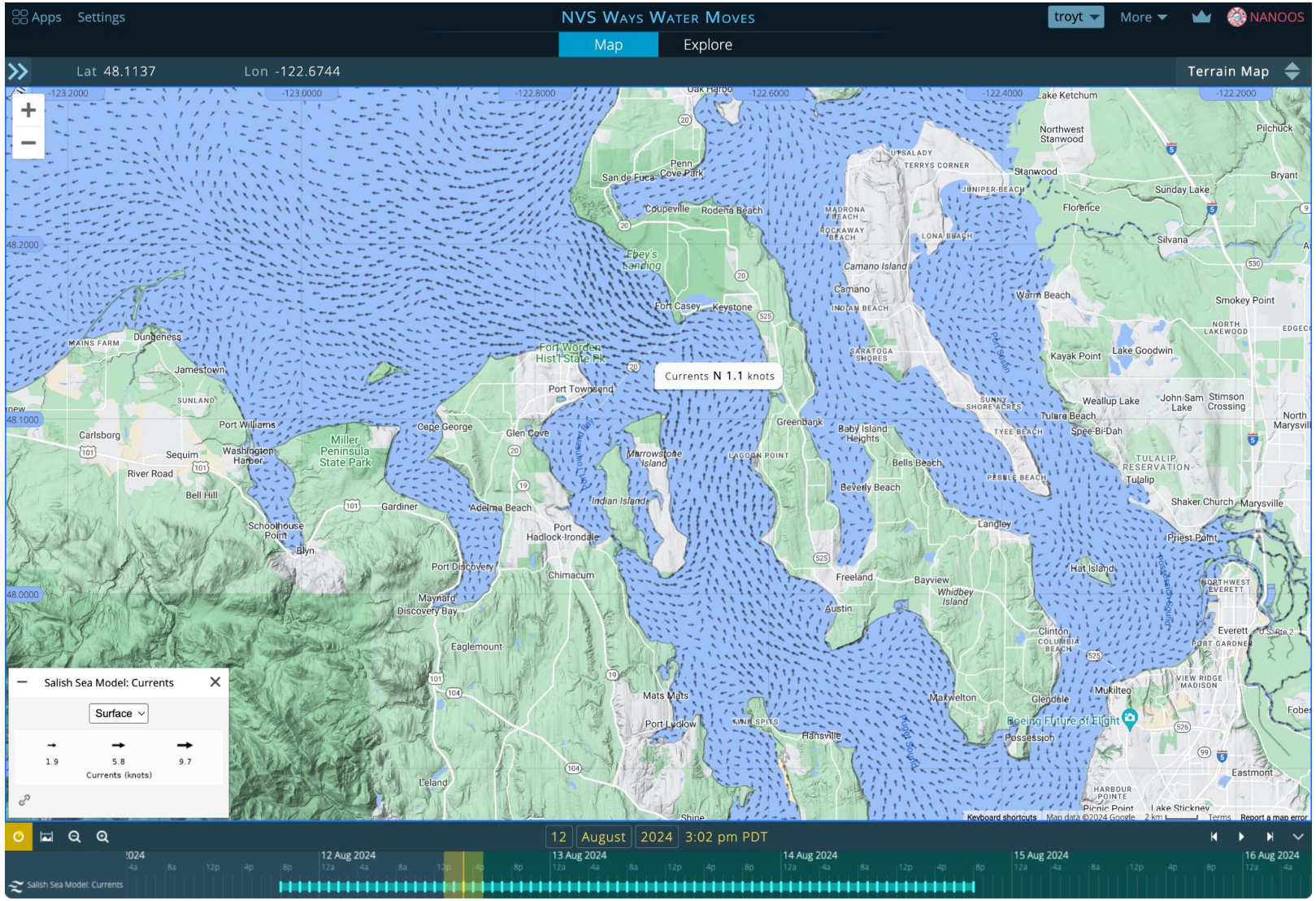
Updated: NVS Ways Water Moves App



- Initial site with basic information at this time
- Model developed by Tarang Khangaonkar

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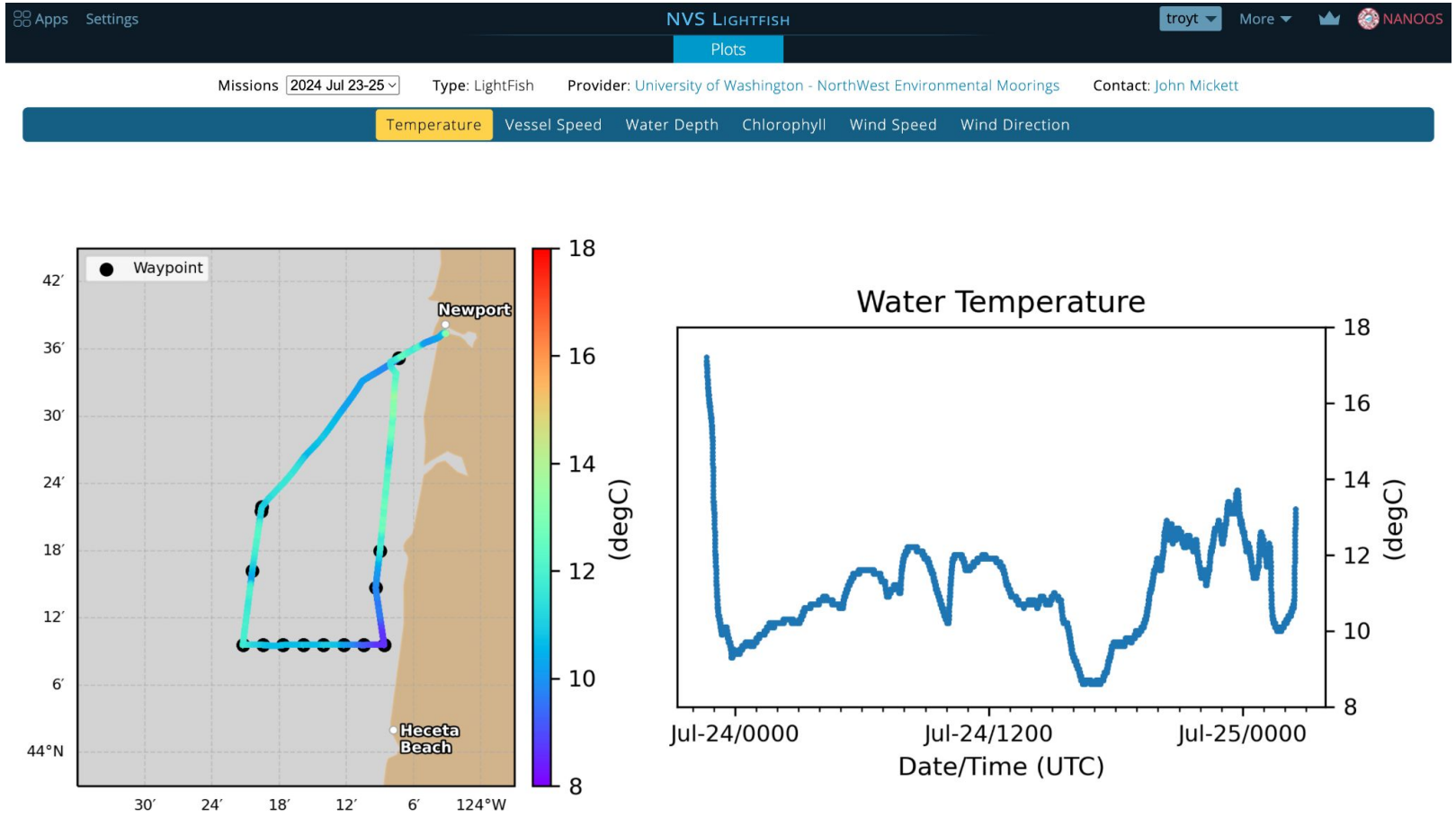
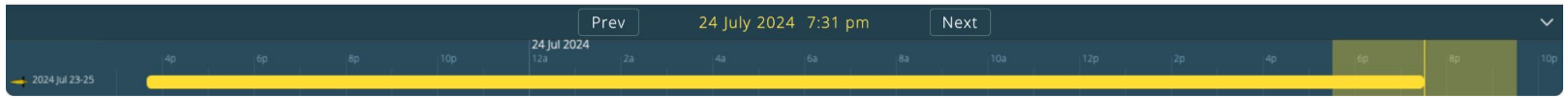
Other Updated Products

- Harmful Algal Blooms
- NANOOS ERDDAP
- NVS (Platforms, Overlays, etc.)
- NVS: Salish Cruises
- NVS: Glider Apps - Updated processing

New: NVS Lightfish App





- New app for Lightfish autonomous vehicle
- Minor evolution of NVS glider apps
- Plots provided by John Mickett and Seth Travis

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New: Multi-stressors for California Current

- Initial site with basic information at this time

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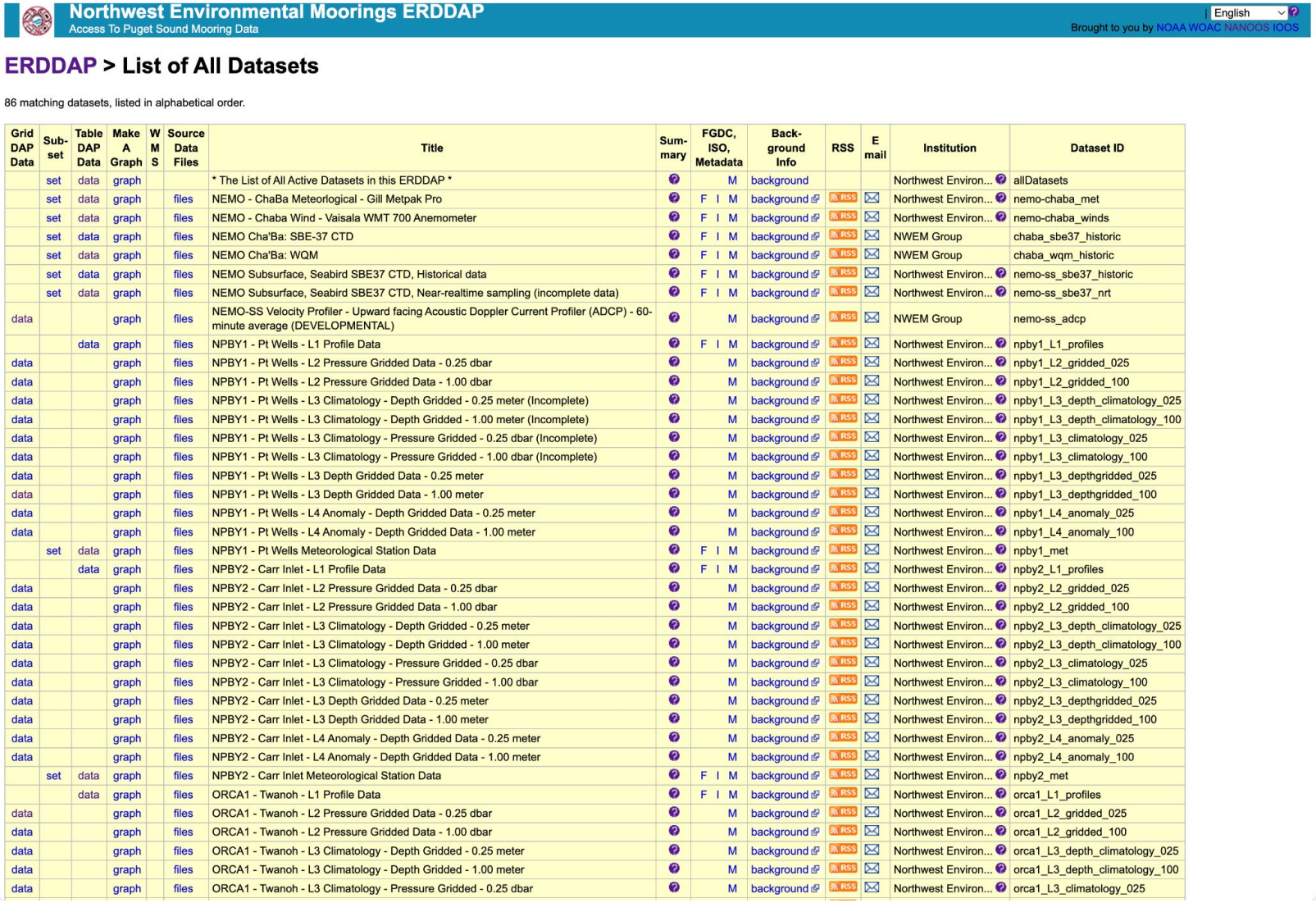
NVS: NWEM ERDDAP



Northwest Environmental Moorings ERDDAP
Access To Puget Sound Mooring Data

English

Brought to you by NOAA WOAC NANOOS IOOS

ERDDAP > List of All Datasets

86 matching datasets, listed in alphabetical order.

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	WMS	Source Data Files	Title	Sum-mary	FGDC, ISO, Metadata	Back-ground Info	RSS	E mail	Institution	Dataset ID
	set	data	graph			* The List of All Active Datasets in this ERDDAP *		M	background			Northwest Environ...	allDatasets
	set	data	graph		files	NEMO - ChaBa Meteorlogical - Gill Metpak Pro		F I M	background	RSS		Northwest Environ...	nemo-chaba_met
	set	data	graph		files	NEMO - Chaba Wind - Vaisala WMT 700 Anemometer		F I M	background	RSS		Northwest Environ...	nemo-chaba_winds
	set	data	graph		files	NEMO Cha'Ba: SBE-37 CTD		F I M	background	RSS		NWEM Group	chaba_sbe37_historic
	set	data	graph		files	NEMO Cha'Ba: WQM		F I M	background	RSS		NWEM Group	chaba_wqm_historic
	set	data	graph		files	NEMO Subsurface, Seabird SBE37 CTD, Historical data		F I M	background	RSS		Northwest Environ...	nemo-ss_sbe37_historic
	set	data	graph		files	NEMO Subsurface, Seabird SBE37 CTD, Near-realtime sampling (incomplete data)		F I M	background	RSS		Northwest Environ...	nemo-ss_sbe37_nrt
data			graph		files	NEMO-SS Velocity Profiler - Upward facing Acoustic Doppler Current Profiler (ADCP) - 60-minute average (DEVELOPMENTAL)		M	background	RSS		NWEM Group	nemo-ss_adcp
		data	graph		files	NPBY1 - Pt Wells - L1 Profile Data		F I M	background	RSS		Northwest Environ...	npby1_L1_profiles
data			graph		files	NPBY1 - Pt Wells - L2 Pressure Gridded Data - 0.25 dbar		M	background	RSS		Northwest Environ...	npby1_L2_gridded_025
data			graph		files	NPBY1 - Pt Wells - L2 Pressure Gridded Data - 1.00 dbar		M	background	RSS		Northwest Environ...	npby1_L2_gridded_100
data			graph		files	NPBY1 - Pt Wells - L3 Climatology - Depth Gridded - 0.25 meter (Incomplete)		M	background	RSS		Northwest Environ...	npby1_L3_depth_climatology_025
data			graph		files	NPBY1 - Pt Wells - L3 Climatology - Depth Gridded - 1.00 meter (Incomplete)		M	background	RSS		Northwest Environ...	npby1_L3_depth_climatology_100
data			graph		files	NPBY1 - Pt Wells - L3 Climatology - Pressure Gridded - 0.25 dbar (Incomplete)		M	background	RSS		Northwest Environ...	npby1_L3_climatology_025
data			graph		files	NPBY1 - Pt Wells - L3 Climatology - Pressure Gridded - 1.00 dbar (Incomplete)		M	background	RSS		Northwest Environ...	npby1_L3_climatology_100
data			graph		files	NPBY1 - Pt Wells - L3 Depth Gridded Data - 0.25 meter		M	background	RSS		Northwest Environ...	npby1_L3_depthgridded_025
data			graph		files	NPBY1 - Pt Wells - L3 Depth Gridded Data - 1.00 meter		M	background	RSS		Northwest Environ...	npby1_L3_depthgridded_100
data			graph		files	NPBY1 - Pt Wells - L4 Anomaly - Depth Gridded Data - 0.25 meter		M	background	RSS		Northwest Environ...	npby1_L4_anomaly_025
data			graph		files	NPBY1 - Pt Wells - L4 Anomaly - Depth Gridded Data - 1.00 meter		M	background	RSS		Northwest Environ...	npby1_L4_anomaly_100
	set	data	graph		files	NPBY1 - Pt Wells Meteorological Station Data		F I M	background	RSS		Northwest Environ...	npby1_met
		data	graph		files	NPBY2 - Carr Inlet - L1 Profile Data		F I M	background	RSS		Northwest Environ...	npby2_L1_profiles
data			graph		files	NPBY2 - Carr Inlet - L2 Pressure Gridded Data - 0.25 dbar		M	background	RSS		Northwest Environ...	npby2_L2_gridded_025
data			graph		files	NPBY2 - Carr Inlet - L2 Pressure Gridded Data - 1.00 dbar		M	background	RSS		Northwest Environ...	npby2_L2_gridded_100
data			graph		files	NPBY2 - Carr Inlet - L3 Climatology - Depth Gridded - 0.25 meter		M	background	RSS		Northwest Environ...	npby2_L3_depth_climatology_025
data			graph		files	NPBY2 - Carr Inlet - L3 Climatology - Depth Gridded - 1.00 meter		M	background	RSS		Northwest Environ...	npby2_L3_depth_climatology_100
data			graph		files	NPBY2 - Carr Inlet - L3 Climatology - Pressure Gridded - 0.25 dbar		M	background	RSS		Northwest Environ...	npby2_L3_climatology_025
data			graph		files	NPBY2 - Carr Inlet - L3 Climatology - Pressure Gridded - 1.00 dbar		M	background	RSS		Northwest Environ...	npby2_L3_climatology_100
data			graph		files	NPBY2 - Carr Inlet - L3 Depth Gridded Data - 0.25 meter		M	background	RSS		Northwest Environ...	npby2_L3_depthgridded_025
data			graph		files	NPBY2 - Carr Inlet - L3 Depth Gridded Data - 1.00 meter		M	background	RSS		Northwest Environ...	npby2_L3_depthgridded_100
data			graph		files	NPBY2 - Carr Inlet - L4 Anomaly - Depth Gridded Data - 0.25 meter		M	background	RSS		Northwest Environ...	npby2_L4_anomaly_025
data			graph		files	NPBY2 - Carr Inlet - L4 Anomaly - Depth Gridded Data - 1.00 meter		M	background	RSS		Northwest Environ...	npby2_L4_anomaly_100
	set	data	graph		files	NPBY2 - Carr Inlet Meteorological Station Data		F I M	background	RSS		Northwest Environ...	npby2_met
		data	graph		files	ORCA1 - Twanoh - L1 Profile Data		F I M	background	RSS		Northwest Environ...	orca1_L1_profiles
data			graph		files	ORCA1 - Twanoh - L2 Pressure Gridded Data - 0.25 dbar		M	background	RSS		Northwest Environ...	orca1_L2_gridded_025
data			graph		files	ORCA1 - Twanoh - L2 Pressure Gridded Data - 1.00 dbar		M	background	RSS		Northwest Environ...	orca1_L2_gridded_100
data			graph		files	ORCA1 - Twanoh - L3 Climatology - Depth Gridded - 0.25 meter		M	background	RSS		Northwest Environ...	orca1_L3_depth_climatology_025
data			graph		files	ORCA1 - Twanoh - L3 Climatology - Depth Gridded - 1.00 meter		M	background	RSS		Northwest Environ...	orca1_L3_depth_climatology_100
data			graph		files	ORCA1 - Twanoh - L3 Climatology - Pressure Gridded - 0.25 dbar		M	background	RSS		Northwest Environ...	orca1_L3_climatology_025

- Data available in common format (CSV, JSON, etc.)
- Managed by Seth Travis

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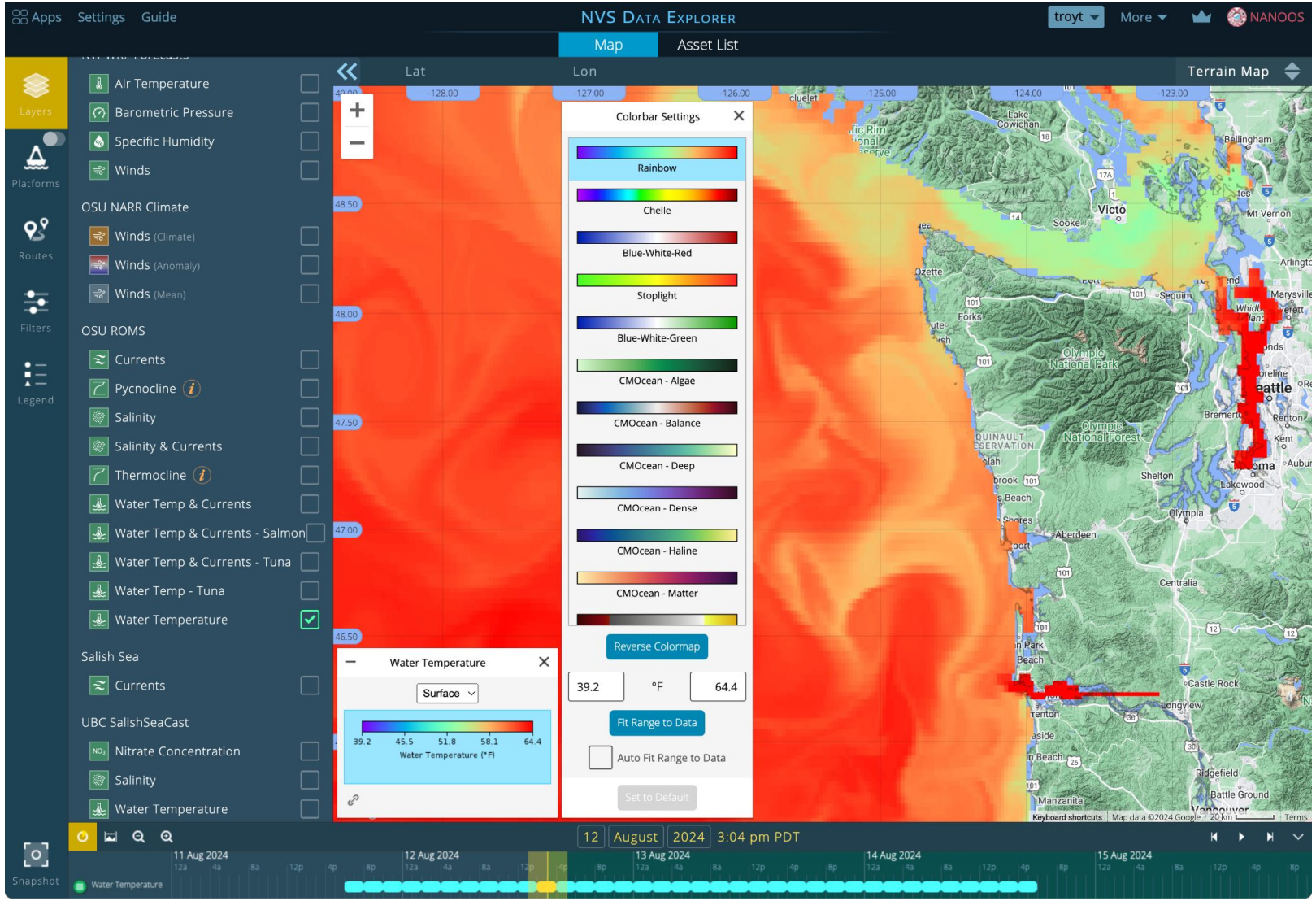
Highlight: NVS Dynamic Overlays



- Customize overlay color ranges
- Changes are automatically saved to your account
- Available for select overlays - indicated with blue outline around legend

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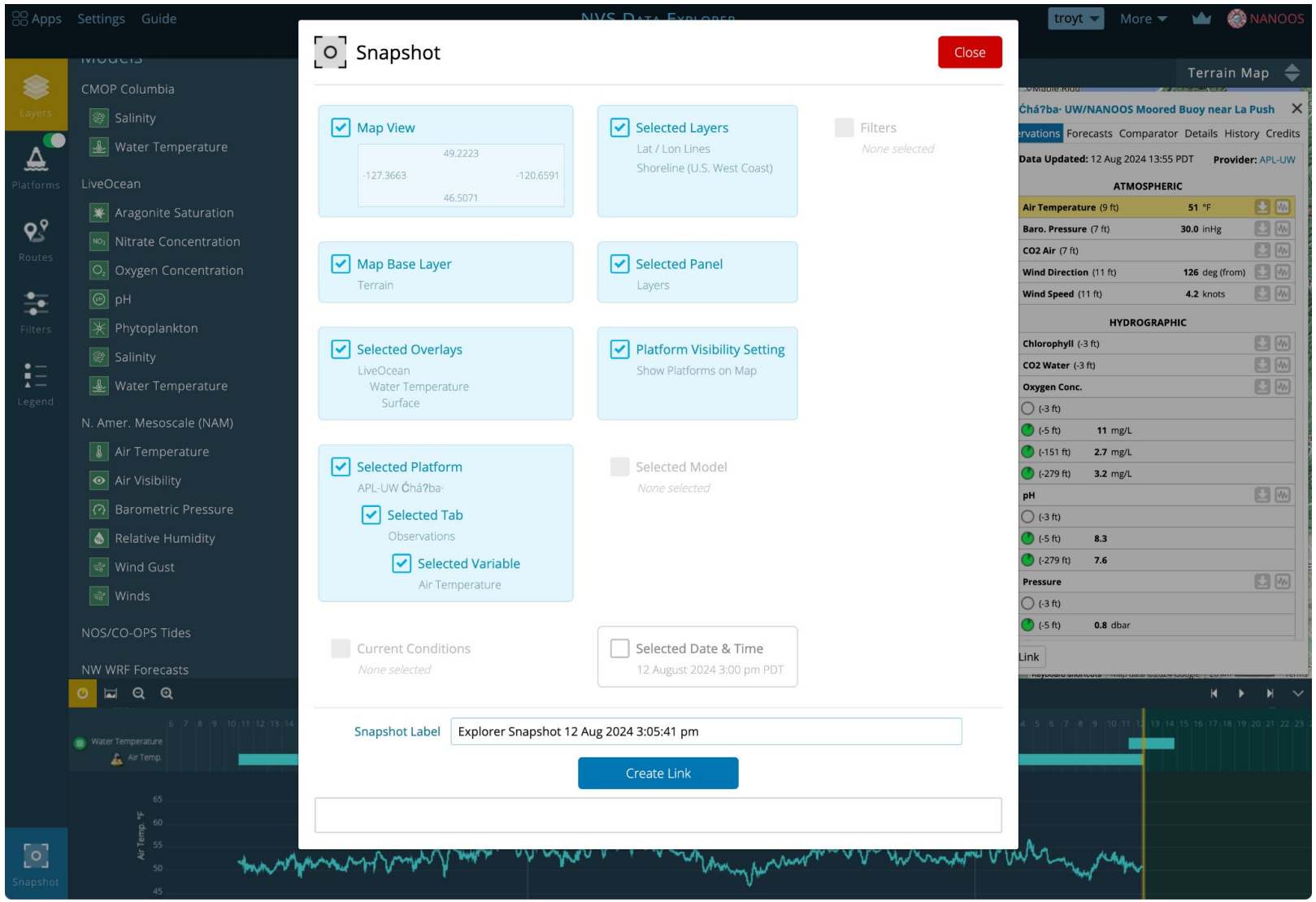
Highlight: NVS Snapshot



- Create custom views of most NVS apps
- Snapshots are automatically saved to your account
- Can share link with others

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Tell Me Your Problems …

"No, I don't think you're crazy. Like most of us, you're just a victim of bad programming."

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Member updates

NANOOS Governing Council business

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

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NANOOS Executive Committee

- Representational, elected, bi-monthly zoom meetings
- No terms up at this year, but we have had one resignation.
- Will be advertising for one NGO representative.

NANOOS GC Board 2023-2024

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:

- Julianna Sullivan, 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.
- Tommy Moore, Northwest Indian Fisheries Commission, Governing Council Board Member for Tribal Support Org.

Federal:

- Kevin Werner, 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
- Dan Nelson, RBR, Ltd, Governing Council Board Member for Industry

NGO:

- Fritz Stahr, OIP, 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 Kozlowski, President, Emergency Volunteer Corp of Nehalem 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 Rutter, S/V Sajal

"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."

– Rosalind Echols, 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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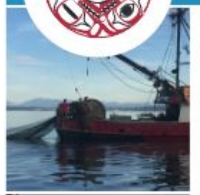
IOOS in the Pacific Northwest

IOOS Integrated Ocean Observing System

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, Hama Hama 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 Julie 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, F/V Kimberlie Maria, 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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IOOS in the Pacific Northwest

IOOS Integrated Ocean Observing System

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

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 geodetic work is critical for improving our understanding the fault mechanics of the Cascadia megathrust and its tsunamigenic potential."

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

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

IOOS Association Dues

NANOOS pays annual $1000 non-federal dues to the IOOS Association

For last year, this was paid by:

- RBR, Ltd

THANK YOU!!!

NANOOS non-federal funds

Thank you:

- RBR, Ltd
- UW APL Ocean Physics Dept

Hurray !!!

U.S. IOOS Office Updates

Derrick Snowden
Operations Division Chief, U.S. IOOS Office

August 14, 2024

IOOS | EYES ON THE OCEAN™

Derrick's Role

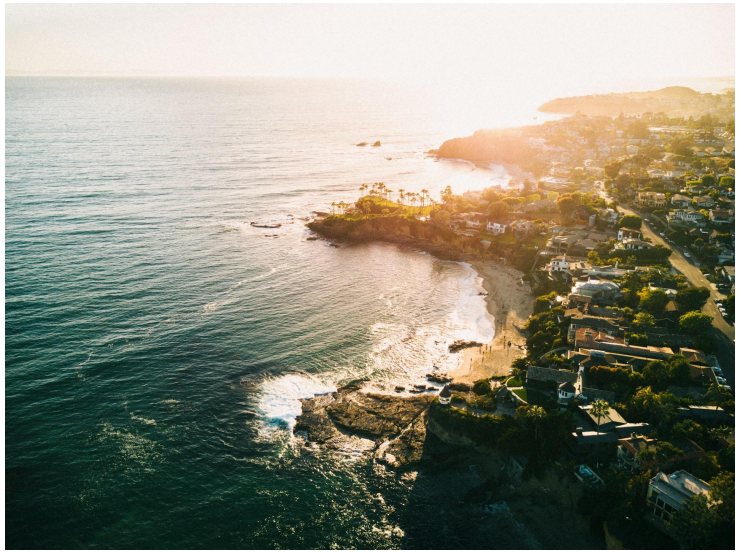
Operations Division Chief

- One of two divisions in the IOOS Office (w/Regions, Budget, and Policy)
- 18 staff in a blended workforce (Federal, Contractor, NOAA Corps)
- Observations and Predictions | | Data and Products

What does the Operations Division do?

- **Manage Competitive Awards:** COMT, OTT, Marine Life, DMAC, certain aspects of the RA Awards. (400 individual lines in our FY2024 budget)
- **Liaise and advocate** between IOOS and NOS, NOAA, Interagency partners → all the meetings. e.g. NOPP Marine Life Program
- **Integrate into a national view:**
  - Research to Operations (sensors, platforms, models): e.g. Salish Sea (SSCOFS), West Coast WCOFS
  - Cross regional efficiencies esp. for DMAC: e.g. ERDDAP
- **Data, data, DATA:** Build the ocean data community, innovate when needed, sustain what we have as technology shifts
  - Code sprints/Hackathons, Data Assembly Centers, Open Source Software → Open Science

NOS FY24–28 Strategic Goals



Increase U.S. Coastal Resilience

Make Equity Central to Our Mission

Accelerate Growth of Ocean Enterprise and Blue Economy

Conserve, Restore, and Connect Healthy Coastal and Marine Ecosystems

Link

Program Highlights and Priorities

Continue 20+ years of progress to build and implement IOOS across the enterprise

- **HFR**: HFRNet DAC; HFRs to telemeter surface wave measurements at test sites
- **Gliders**: MOA for Navy/IOOS hurricane glider collaboration; Sep. UG2 Workshop
- **COMT**: Awardees notified in June, awards will start in FY25
- **Modeling/Cloud Computing**: Coastal coupling applications in the NOAA Cloud community platform
- **NHABON FY24 $3.5M:** Awardees selected and RAs notified
- **OTT**: 13 projects funded, three are directly NANOOS related
- **NOPP Marine Life**: 10 projects funded from 2022 announcement, 5 of them from IRA

Biden-Harris Administration invests $16.7 million for marine technology innovation through the Inflation Reduction Act

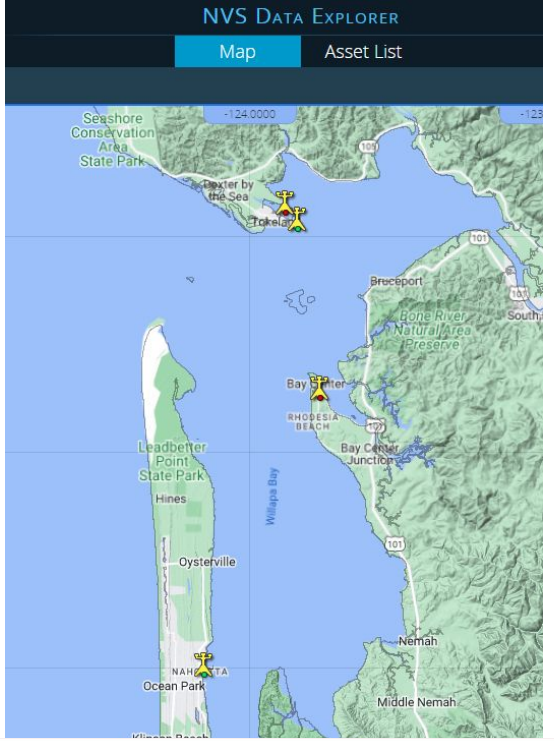
Funding will support NOAA's efforts to provide communities with decision-making tools and information necessary for coastal resilience

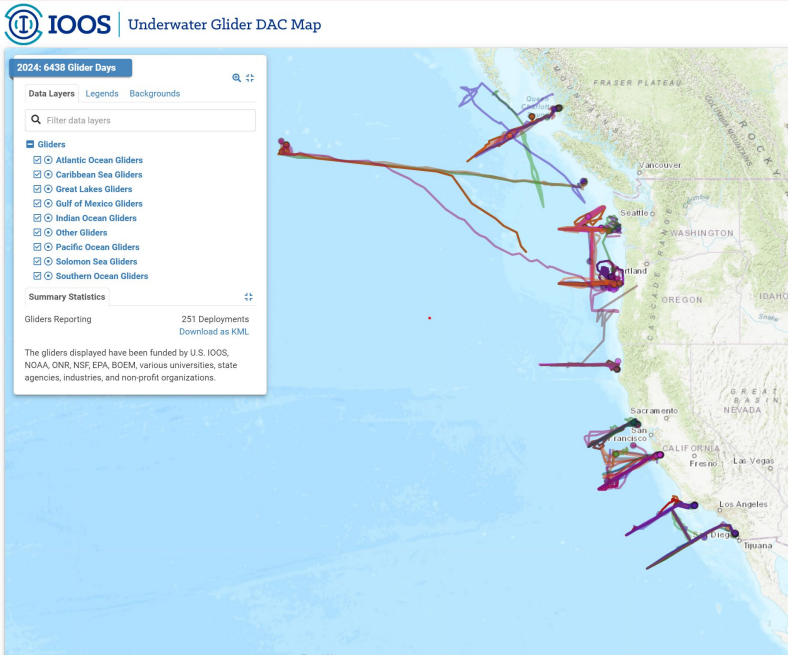
INFLATION REDUCTION ACT:
COASTAL RESILIENCE SERVICE DELIVERY

- **Improve coastal ocean observing** systems performance, reliability, coverage, and accuracy.
- **Strengthen the delivery of data and predictions** to provide more equitable services that address coastal resilience needs; and
- **Enhance partnerships** that deliver services and products to a wide range of users for lasting impacts.

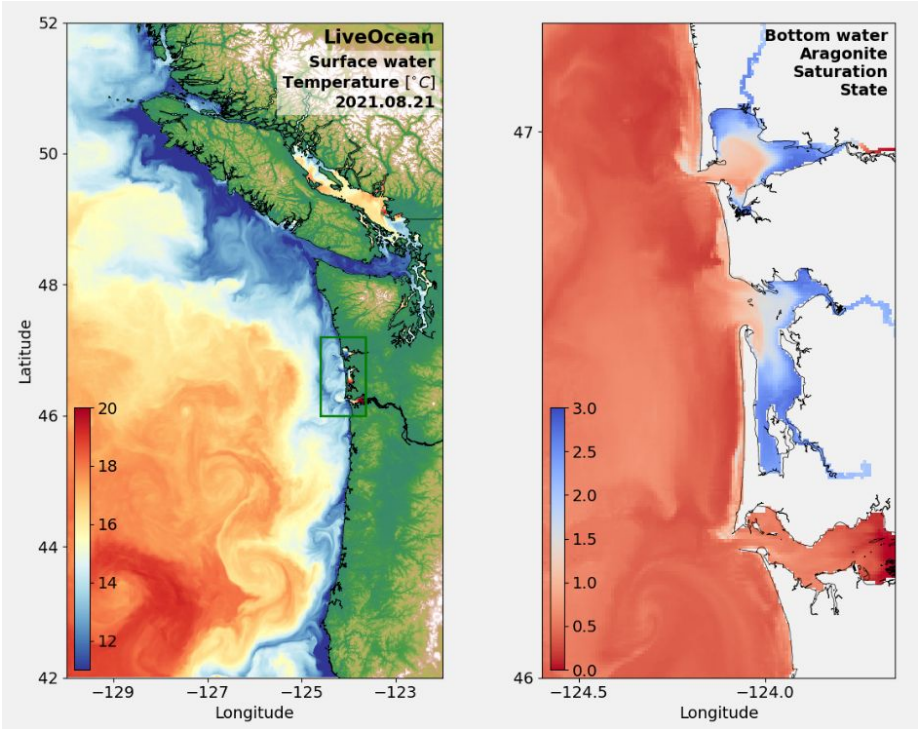
Congrats to NANOOS for:

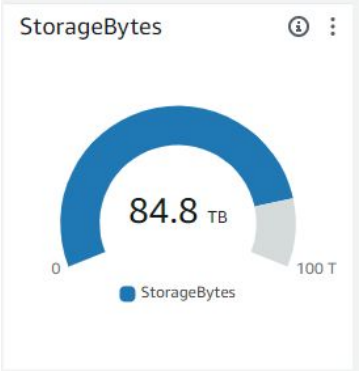
- **Submission** of IRA proposals.
- **HFR**:
  - Working with NPS on permission to install a new long-range SeaSonde® in Fall 2024 in Olympic National Park, to extend West Coast coverage to the NW corner of the U.S. and, in cooperation with Canadian partners. Kudos to OSU PI Mike Kosro and tech Matthew Sroufe!
- **OTT**:
  - Fishing for Hypoxia: An Academic-Industry-Tribal Partnership to Observe the Coastal Ocean—Jessica Garwood, OSU
  - A Proposal to Scale from a Regional to a National Webcam Coastal Observation System (WebCOOS)—Jan Newton NANOOS
  - Institutionalizing Long-term Offshore ESP Monitoring in the Pacific Northwest—John Mickett UW
- **Marine Life projects**: 5 new projects in FY24, 1 led by OSU/Maria Kavanaugh working with NANOOS, NMFS, and Olympic Coast NMS
- Providing critical **buoy data** for the recent PSP response
- Leadership in the national **glider** network

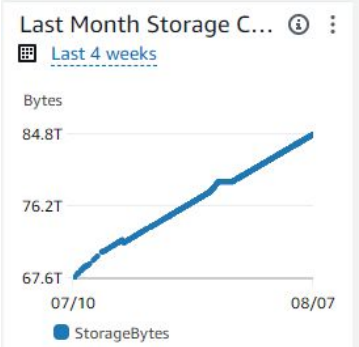


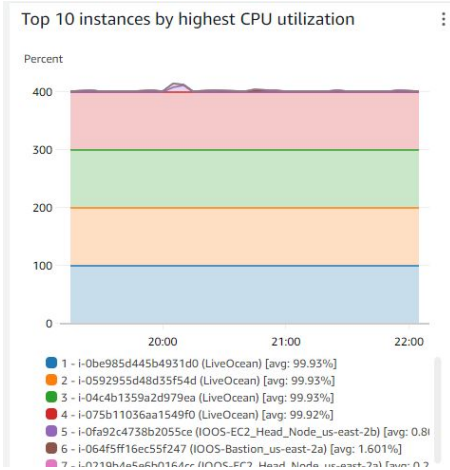


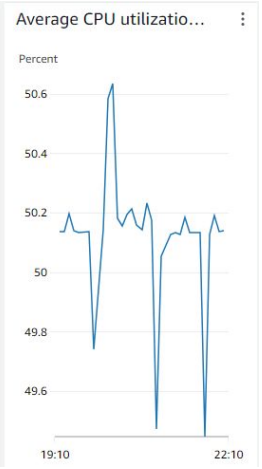
- The NOS Sandbox is a cloud-based platform with up to 24,000 on-demand HPC vCPUs & 8 exabytes of data storage available for collaboration
- LiveOcean - 12 year hindcast
- Compute time:
    - 1 yr ~ 10 days
    - 12 yrs ~ 4 months
- Data generated:
    - 1 yr ~ 800 GB
    - 12 yrs ~ 100 TB
- Once verified, final output will go to NOAA Open Data Dissemination (NODD)







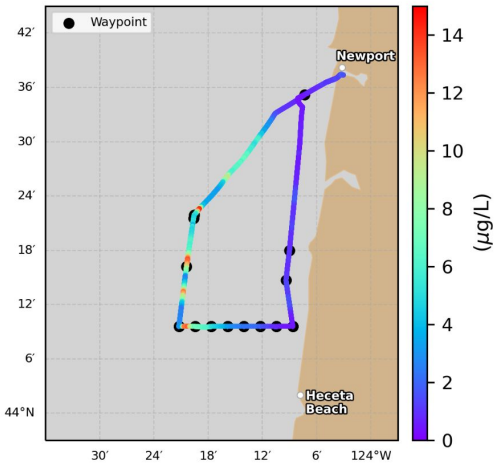


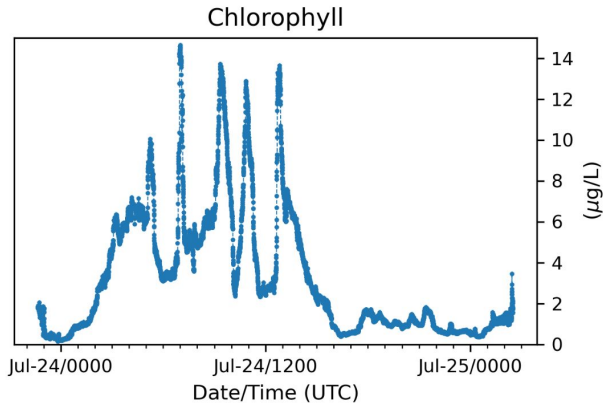


Recent successful Lightfish ASV mission to gather HAB samples:

The Lightfish, without aid and under its own power, completed a ~60 nautical mile, 27-hour loop to the south from Newport, collecting 8 whole water and 7 filtered samples along the route.

“This mission undoubtedly represents a significant leap forward in the ability to quickly collect critical offshore HAB information, supporting timely and informed public safety and resource management decisions.” - John Mickett






Lincoln County Leader

Wednesday, August 7, 2024

Autonomous watercraft collects ocean samples

Building

Submit Your

Latest News

Derrick Snowden
Operations Division Chief
U.S. Integrated Ocean Observing System
derrick.snowden@noaa.gov | 240-778-9129

Image: NANOOS

NANOOS Annual Meeting
August 14, 2024

Kristen Yarincik
Executive Director

What is the IOOS Association?

- Membership of all 11 IOOS Regional Associations
- Facilitates communication and coordination across IOOS regions, NOAA, and the broader enterprise
- Promotes the value and increase visibility of IOOS and coastal observing
- Advocates for IOOS funding and other policy supportive of IOOS and ocean, coastal, and Great Lakes observation

IOOS Association

Appropriations at a glance

IOOS Regional Observations line; Amounts in millions of dollars.

	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Authorization Level	such sums	such sums	such sums	48	50	52	54	56
President's Budget	29.4	19.4	19.4	19.4	69.5	40.5	42.5	10
House Approps	31	37.5	40.5	40.5	50	44	41	56
Senate Approps	33.7	37	39.5	40	47	46	42.5	43.5
Enacted	35	37	39	40.5	41	42.5	42.5	?
IA request	35.9	42	23.7	45.25	56.5	75.3	80.5	56

FY25

- President's Budget = $10M for IOOS Regional (↓ $32.5M or 76%)
- House = $56M (↑ $13.5M or 32%)
- Senate = $43.5M (↑ $1M or 2.3%)

ESP advisors

IOOS Association FY25 Request

- **FY25 Request: $56M**
  - $50M core funding
  - $6M for innovation, priority initiatives, and competitive grants (e.g., NHABON, OTT, COMT)
- **Considerations**
  - Core + Projects = FY25 authorized level ($56M)
  - Justify increase over FY24 as addressing inflation & asset depreciation in annual request (versus previous “repair & prepare campaign”)
  - Start to socialize IRA capacity & projects that are tangible and resonate with Congress; prepare for cliff
- **Additionally… $13M for Program Office** (Congress does not currently direct specific funding to IOOS national)

ESP advisors

FY25 Appropriations Strategy

Massive grassroots effort at regional level

- Programmatic requests, office visits

Dear Colleague Letters

- **House** → supports $56M request
  - Pingree (D-ME), Carbajal (D-CA), Posey (R-FL)
  - **85 signatures → 11 Rs**
- **Senate** → support "at authorized level" ($56M)
  - Cantwell (D-WA), Wicker (R-MS)
  - **27 signatures → 3 Rs**

FY25 Written Testimony

- IOOS Association
- NOS Roundtable, Friends of NOAA, OAR/NOS/CI coalition

ESP advisors

Response to FY25 President's Budget

- **Letter to Secretary of Commerce** (widely circulated to Hill by IA and RAs)

- **Activated our networks - Sign on Letters!**
  - Letter explicitly opposing PB request and advocating for specific funding level → to be attached to our written testimony
    - 655 signatures
  - Letter appropriate for federal partners (non-lobbying) to demonstrate support for IOOS
  - Encourage individual stakeholder letters to Congress (template available)
    - 429 signatures

- **CNN Article**

ESP advisors

FY25 Appropriations Where we are now

House and Senate bills:

- **House → $56M for IOOS Regions**
  - Passed subcommittee June 26; full committee July 9
  - Not yet passed full chamber
- **Senate → $43.5 for IOOS Regions**
  - Passed full appropriations committee July 25
  - Not yet passed full chamber

Consensus bill:

- Most predicting continuing resolution(s) will be necessary
- Could be a long process (FY24 budget passed in March)
- Election year!?!
- House/Senate bills = good signal that IOOS regional funding will be ok (at least flat, possibly increased)

ESP advisors

Updating communications strategy

- **Step 1: Communications Audit (Completed Jan 2024)**
  - Target audience for IA communications: Congress & federal agencies
  - Audit findings / recommendations:
    - Best practices to reach audience
    - Website refresh!!!
    - Quarterly congressionally-focused newsletter
    - Social media presence
- **Step 2: Communications Roadmap (Completed Mar 2024)**
  - Toward implementing recommendations: streamlined process w/ current capacity in mind
- **Step 3: Phased implementation based on capacity & resources (underway)**
  - Starting with website refresh → to be completed ~end Sep 2024

Thank you!

www.ioosassociation.org
kristen@ioosassociation.org

What does NANOOS Core funding support and where have/will BIL and IRA funding make a difference?

NANOOS systems support…

- Climate & Weather
- Ecosystem Assessment (HABs, Hypoxia, OA, MHW)
- Maritime Operations
- Coastal Hazards
- Fisheries & Biodiversity

Gliders

sustain

- Continuous ops on La Push line
- Seasonal ops on WA Shelf line
- Continuous ops on Trinidad Head line
- *Display data on NVS from OOI lines*

expand

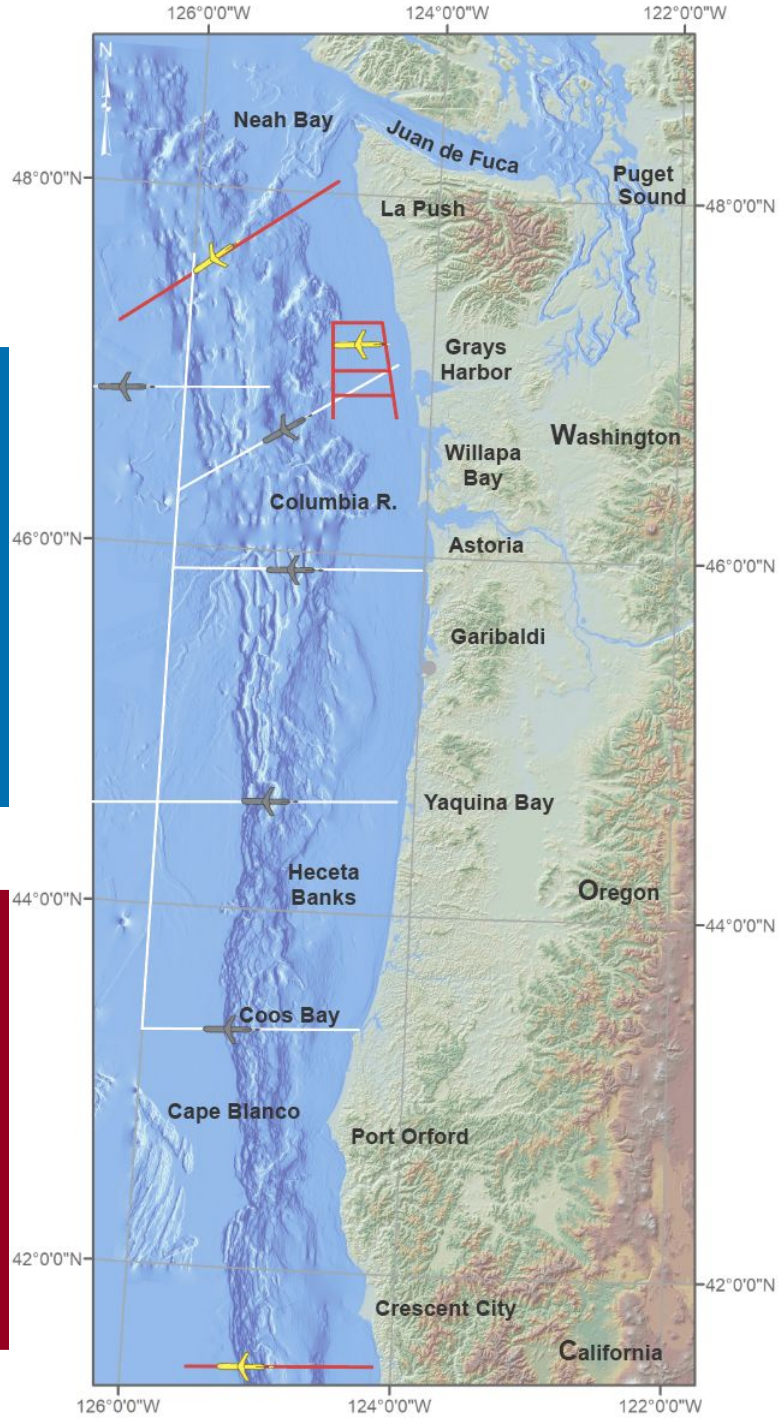
- N/A

improve

- New gliders for all lines (BIL)
  - At end, we will have:
    3 gliders for La Push
    2 gliders for WA Shelf
    2 gliders for Trinidad Head

new

- pH and nitrate on La Push and TH (IRA)
- Acoustic tag receiver on WA Shelf (IRA)
- Passive acoustic monitoring on TH and WA Shelf (BIL)
- Acoustic tag data wrangler for west



High Frequency Radars

sustain

- 13 coastal HFRs in OR and WA
  - 8 long-range
  - 5 short-range

expand

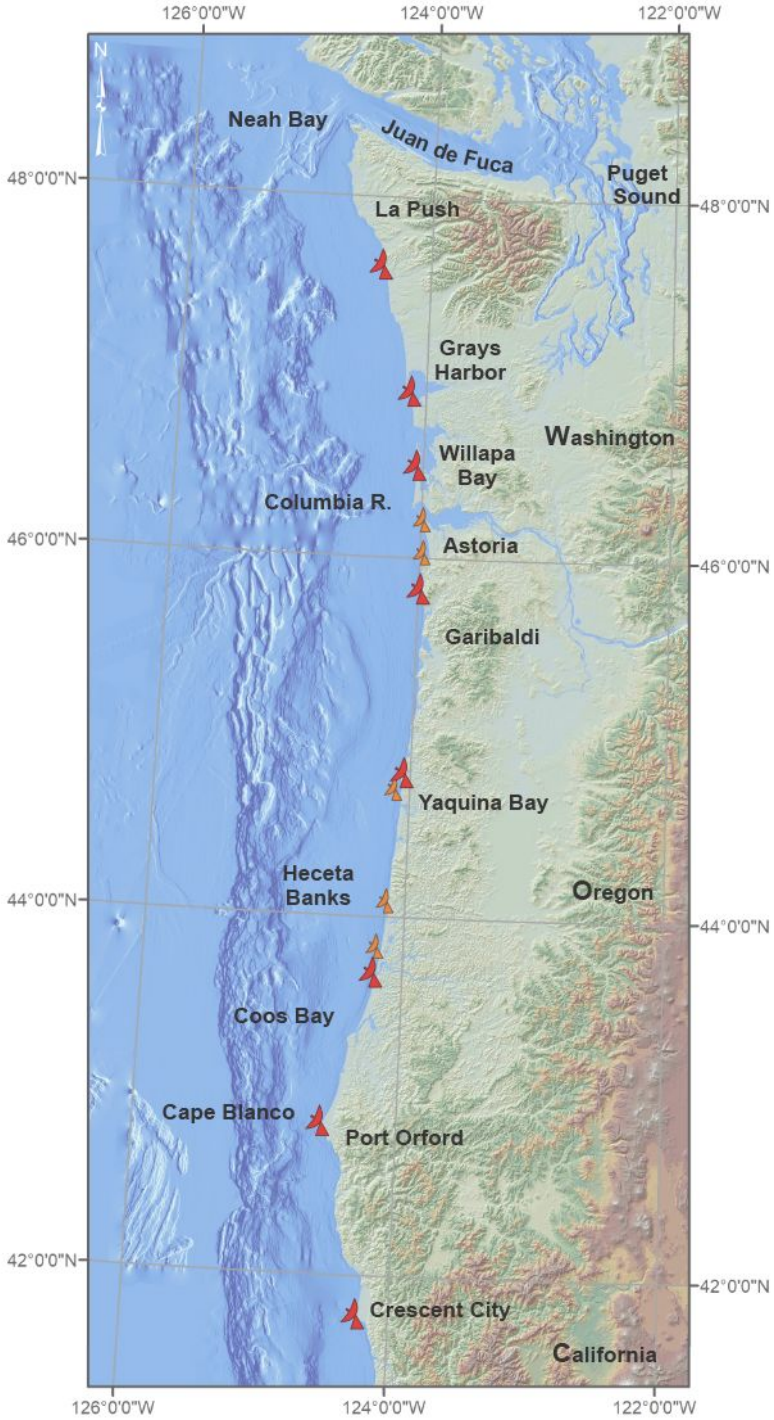
- Strait of Juan de Fuca (TBD)
- *"13" includes 1 new station at Westport, WA and 1 pending station at Kalaloch, WA*

improve

- Replacing old systems/parts with new (non-core and BIL)

new

- Estimating significant wave heights from HFR data (TBD)



Waves Assets

sustain

- X-band radar at Port of Newport, OR
- Existing Backyard Buoys sites (NSF)
- *Display NDBC and CDIP buoys on NVS*
- *Display OOI wave assets on NVS*

expand

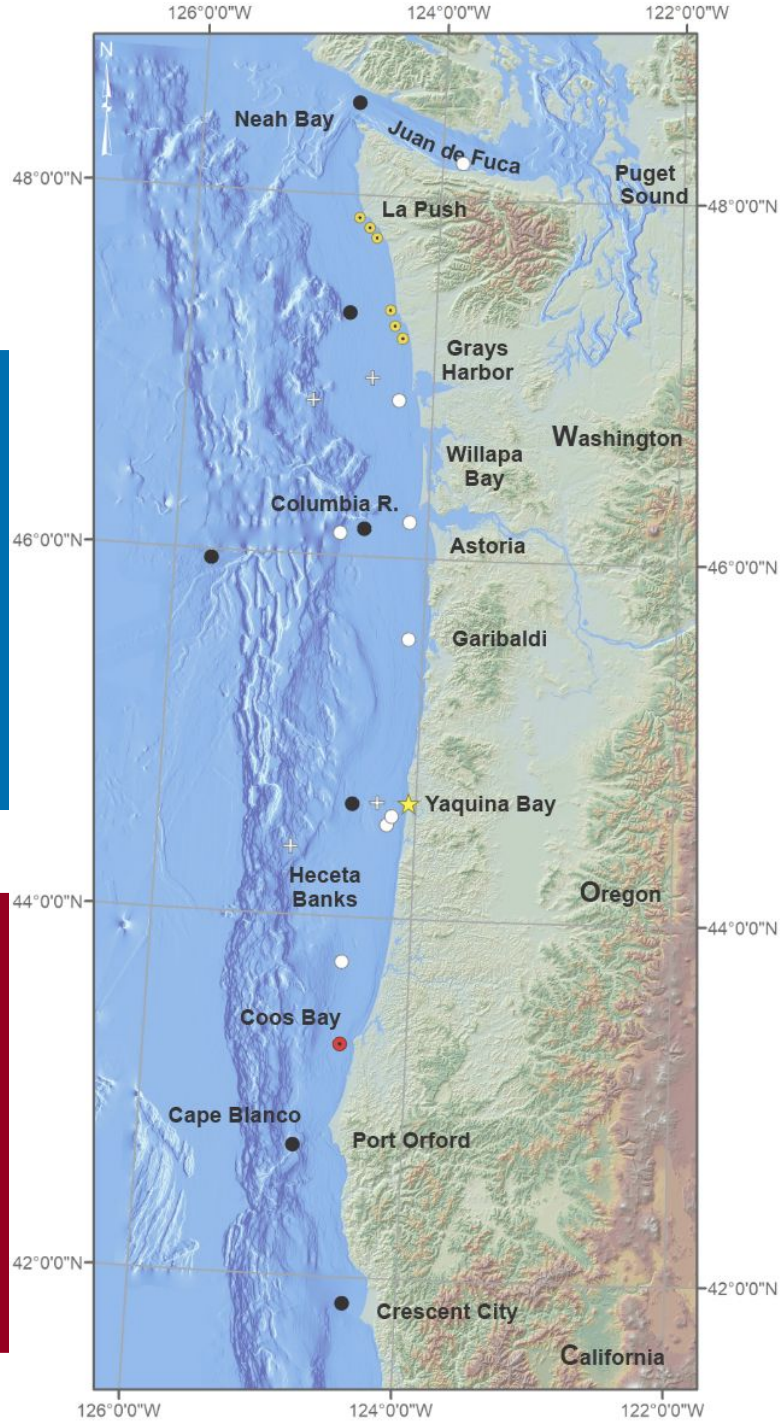
- N/A

improve

- Upgrade X-band radar system (BIL)
- Display more X-band radar data products on NVS (Core, PI-initiative)

new

- Add wave sensor to CB-06 (BIL)
- New Backyard Buoys sites (IRA)



Coastal Environmental Assets

sustain

- Cha'ba and NEMO subsurface, WA
- CB-06, OR
- Offshore of Columbia River (CMOP)
- HABs Cooperative Fisheries Research in OR
- ONRC and ODFW HABs monitoring support
- WSG SoundToxins
- *Lightfish for offshore HAB monitoring in WA (OTT and HAB-ON)*
- *Display SST from NDBC and CDIP on NVS*

expand

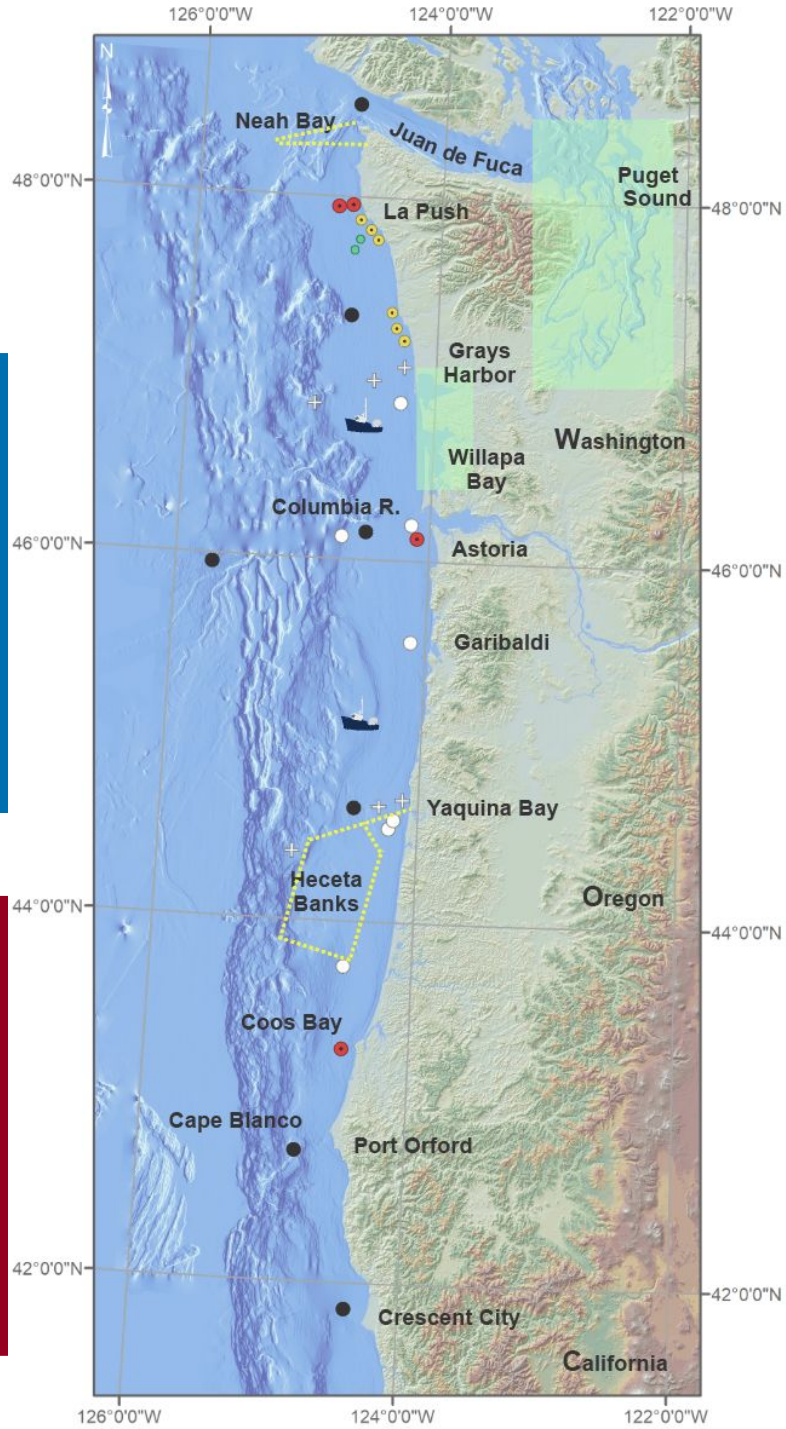
- HABs Cooperative Fisheries Research in WA (IRA)
- Lightfish for offshore HAB monitoring in OR (IRA)
- *Display Quileute landers on NVS*
- *Display OOI assets on NVS*

improve

- More real-time data transmission from winter Cha'ba (IRA)
- Improve recovery operations for Cha'ba/NEMO (BIL)
- Restore and upgrade wind sensor on CB-06 (BIL)

new

- WSG SoundToxins sampling on the coast (IRA)



Beach, Shoreline, Bathymetry Surveys

sustain

- Beach and shoreline surveys in OR, WA
- Bathymetry surveys in OR, WA

expand

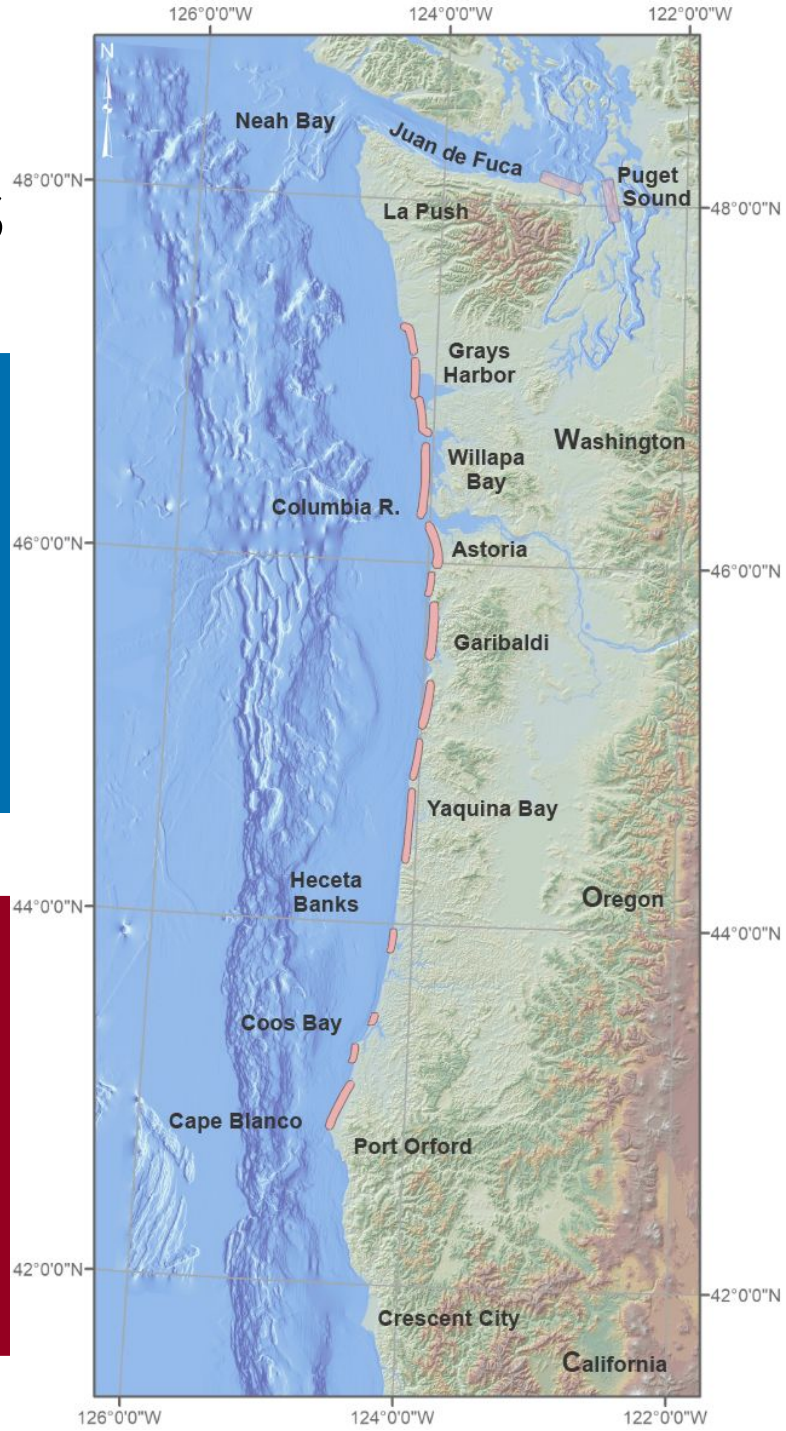
- Revisit sites that have not been served for years due to lack of funding (IRA)

improve

- Replace old survey equipment (BIL)
- Update datums (IRA)
- Improve NVS Beach & Shoreline App (IRA)

new

- Modernize survey equipment (e.g., drone-based lidar) (IRA)



Estuarine Assets

sustain

- Puget Sound moorings
- Columbia River buoys and dock-based stations
- South Slough NERRS, Coos Bay
- WSG Sound Toxins sampling

expand

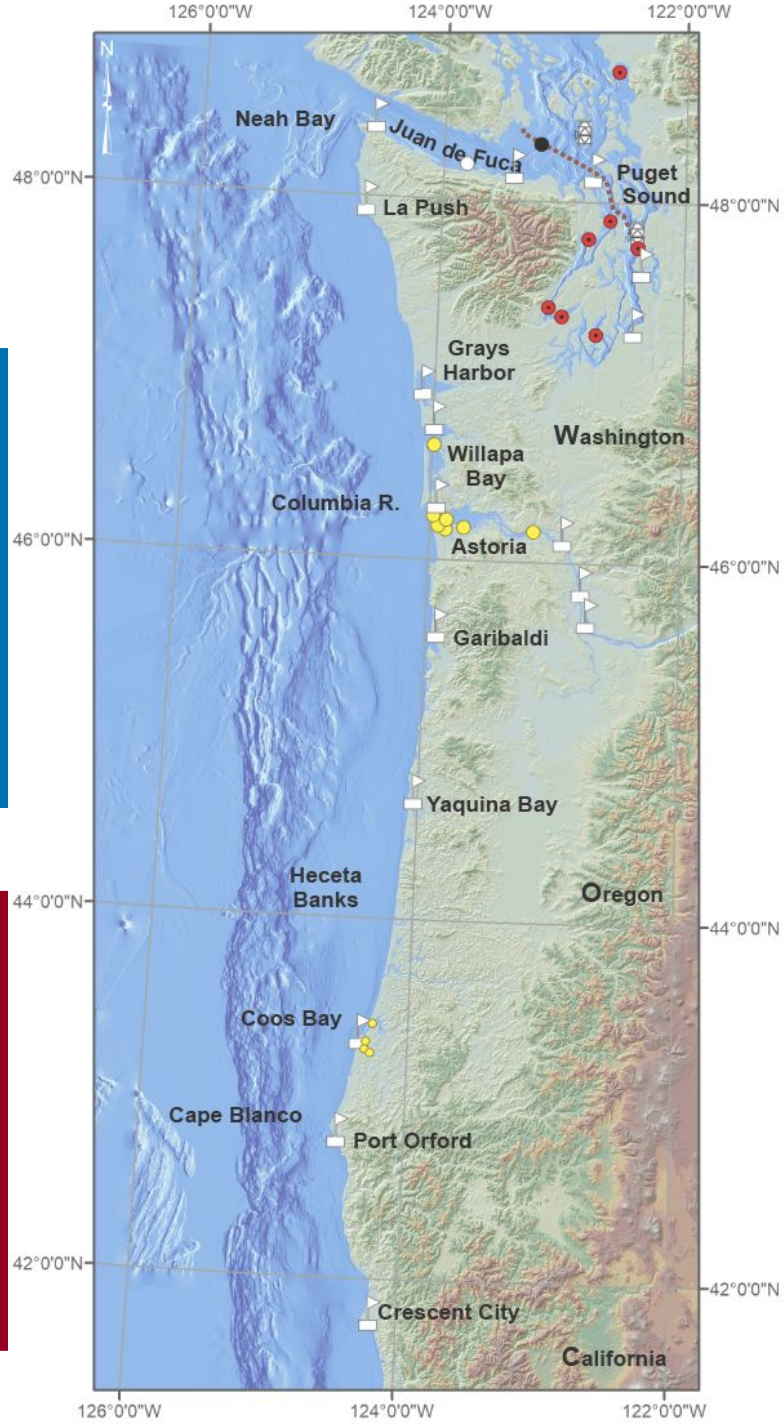
- N/A

improve

- Upgrade sensors, systems, and mooring components for all systems (BIL, IRA)

new

- IFCB in Puget Sound (IRA)



Forecast Models

sustain

- LiveOcean
- OSU ROMS
- Virtual Columbia River

expand

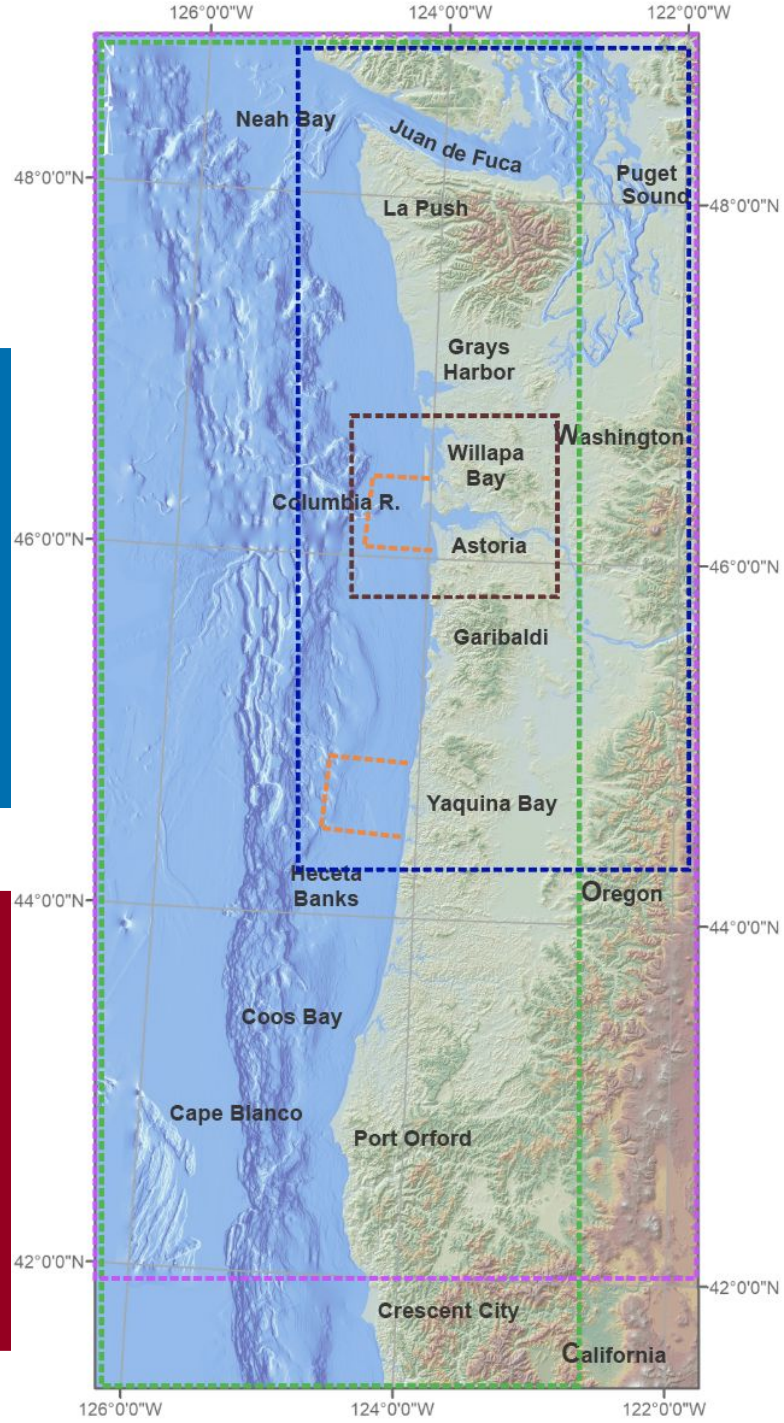
- *Display SSCOFS forecasts on NVS*

improve

- Hardware and storage for Virtual Columbia River and LiveOcean (IRA)
- Postdoc for new product development from OSU ROMS (IRA)

new

- New waves and currents at ports and harbors model (IRA)



Data Management and Cyberinfrastructure (DMAC)

sustain

- NANOOS ERDDAP
- NVS Database

expand

- Backyard Buoys (IRA)

improve

- Improved QC protocols

new

- New DMAC Chair (IRA)

User Products Development

sustain

- NVS Apps
- Tsunami Evac smartphone app

expand

- Support updated product development from PIs (IRA)
- Backyard Buoys on NVS and smartphone app (NSF, IRA)

improve

- Ongoing improvements based on user feedback
- Beaches & Shorelines App (IRA)

new

- New User Products Chair
- Support new displays for new model outputs (IRA)
- NVS smartphone app (IRA)

Education, Engagement, Outreach

sustain

- Participation in diverse stakeholder events to bring NANOOS to user groups and collect feedback
- Engagement with schools
- Host undergraduate summer interns

expand

- Co-hosted NANOOS interns, partnering with NOAA

improve

- N/A

new

- New EEO personnel to reach new communities (IRA)

Governance, Management

sustain

- Administer, oversee, and report on NANOOS Core activities
- Connect NANOOS with IOOS RAs, IOOS Program Office, and IOOS Association

expand

- BIL Y1-2, BIL Y3-5, and IRA!

improve

- Teamwork provided by larger staff
- Regularly working groups on a variety of observation topics across RAs (IRA)

new

- RFA for technician professional development (BIL)
- RFA for contingency funds (BIL)
- NANOOS-wide calibration workshops for specific variables (BIL)

Questions?