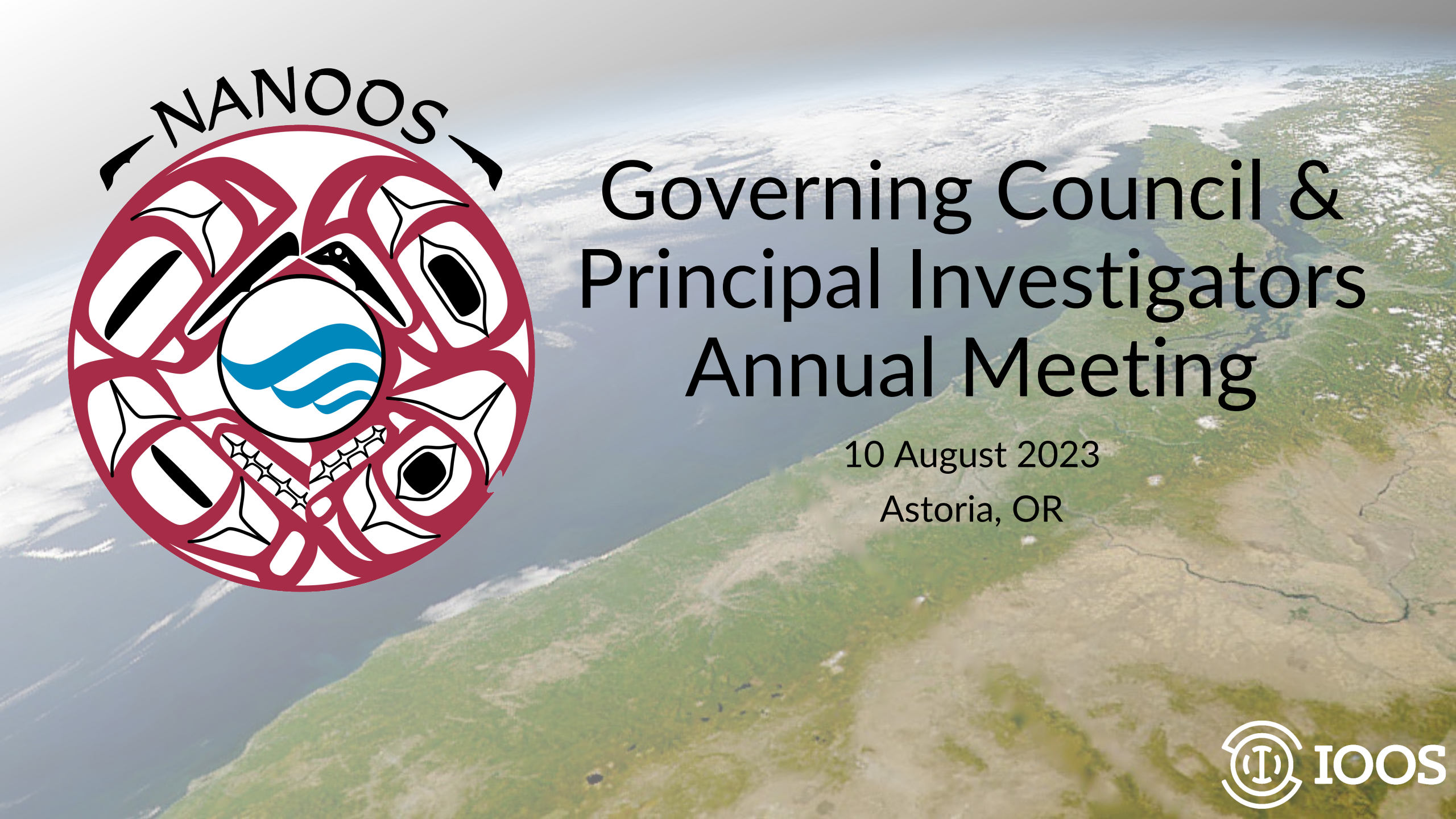


Governing Council & Principal Investigators Annual Meeting

10 August 2023

Astoria, OR

Call to Order & Overview

- Celebrate our first in-person meeting since 2019 !
- Call to order by NANOOS Board Chair Andrew Barnard
- Introductions: name and affiliation
- Order of the day
  - Community Event
  - NANOOS 20th Anniversary Reception
- Goals for the day
  - Updates: NANOOS, beyond NANOOS
  - Discussion: NANOOS priorities in context of opportunity from new funding

Time	Agenda Topic	Lead
8:00	**Gather (Breakfast Provided)**	
9:00	Call to Order & Overview	J. Newton, A. Barnard
9:15	NANOOS Accomplishments & Vision Panel • NANOOS Director and Committee Chairs	J. Newton, R. Wold, J. Allan, T. Tanner, R. Carini
10:15	National and International Panel: • IOOS Program Office • IOOS Association • CIOOS-Pacific (Canada) • CRITFC	C. Gouldman G. Kuska B. de Young A. DeCoteau
11:00	Inflation Reduction Act (IRA) • IRA guidance • Options from PIs, 5-y unfunded, etc. • GC input on priorities	J. Newton R. Carini N. Rome
12:00	Member Updates from the Floor	All
12:30	**Adjourn (Lunch Provided)**	

NANOOS Accomplishments & Vision

- Panel of NANOOS Director and Standing Committee Chairs
  - NANOOS Updates: J. Newton
  - DMAC Updates: R. Carini & T. Tanner
  - User Products Updates: J. Allan
  - Education, Engagement, & Outreach Updates: R. Wold
  - Q&A

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

Northwest Association of Networked Ocean Observing Systems

IOOS

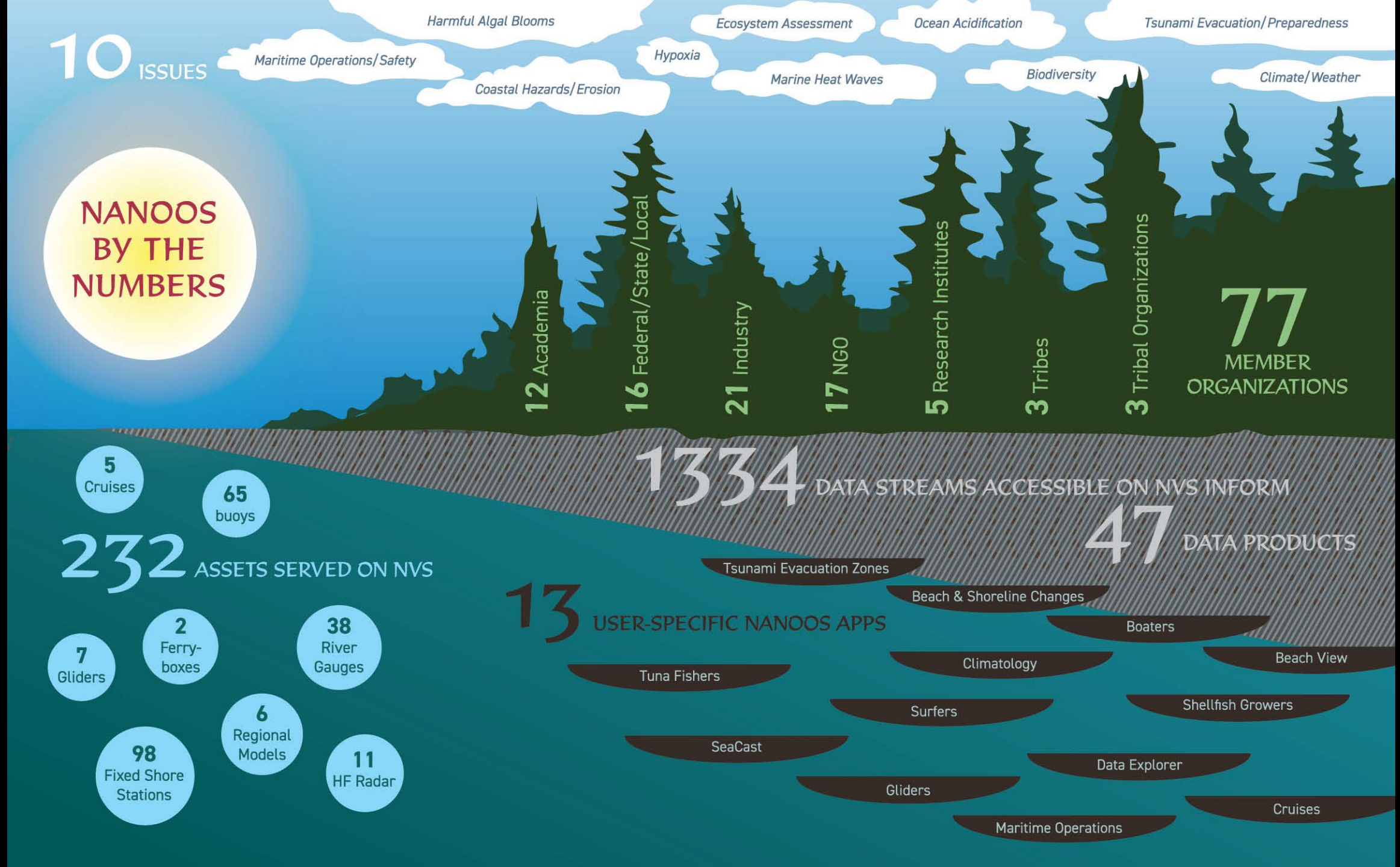
Governing Council *last updated: 4/24/23*

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 Fisherman'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

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

NANOOS Objectives for Y3 / FY2023 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


10 ISSUES
Harmful Algal Blooms
Ecosystem Assessment
Ocean Acidification
Tsunami Evacuation/Preparedness
Maritime Operations/Safety
Hypoxia
Biodiversity
Coastal Hazards/Erosion
Marine Heat Waves
Climate/Weather
NANOOS BY THE NUMBERS
12 Academia
16 Federal/State/Local
21 Industry
17 NGO
5 Research Institutes
3 Tribes
3 Tribal Organizations
77 MEMBER ORGANIZATIONS
5 Cruises
65 buoys
232 ASSETS SERVED ON NVS
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
Climatology
Beach View
Tuna Fishers
Surfers
Shellfish Growers
SeaCast
Data Explorer
Gliders
Cruises
Maritime Operations

FY23 (Year 3 of Current Award) Details

- $4,231,964 total
  - $3,041,136 core + $50k one-time add
  - National HAB-ON: $460k + $80k OTT for HAB sampler
  - HFR 1-time re-tune: $205k
  - NOAA OAP support: $381k
  - Ocean-Hack Week: $15k

NANOOS
Northwest Association of Networked Ocean Observing Systems

2022-2023 Highlights

Glider Deployment and Engagement

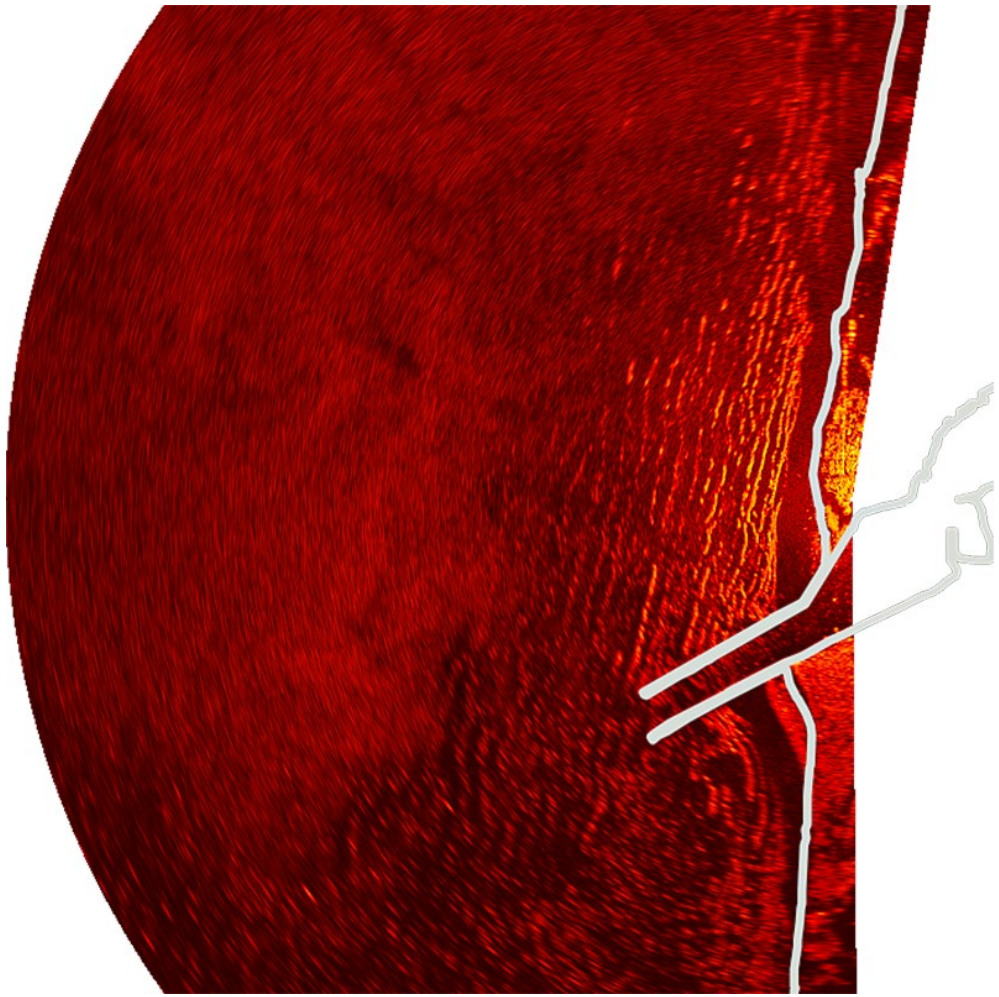
The WA Shelf glider, a collaboration between the Columbia River Inter-Tribal Fish Commission (CRITFC), Oregon State University (OSU), and the Quinault Indian Nation (QIN) was deployed from 1-16 September 2022. The data revealed information on hypoxia that is very valuable for informing tribal crab harvests.

Additionally, Jack Barth (OSU) coordinated with Joe Schumacker (QIN) to visit the Taholah school to interact with QIN students. Jack brought along the glider that had been just recovered, giving an interactive talk on gliders, data, and NANOOS. *Photo credit: Quinault Indian Nation*

NANOOS/NERRS Data Used in South Slough Student Research

Water quality and weather data collected as part of NANOOS/NERRS System Wide Monitoring Program is being used in graduate student research, including projects on HAB prediction by the South Slough Reserve's Graduate Fellow and eelgrass communities by the Margaret Davidson Fellow.

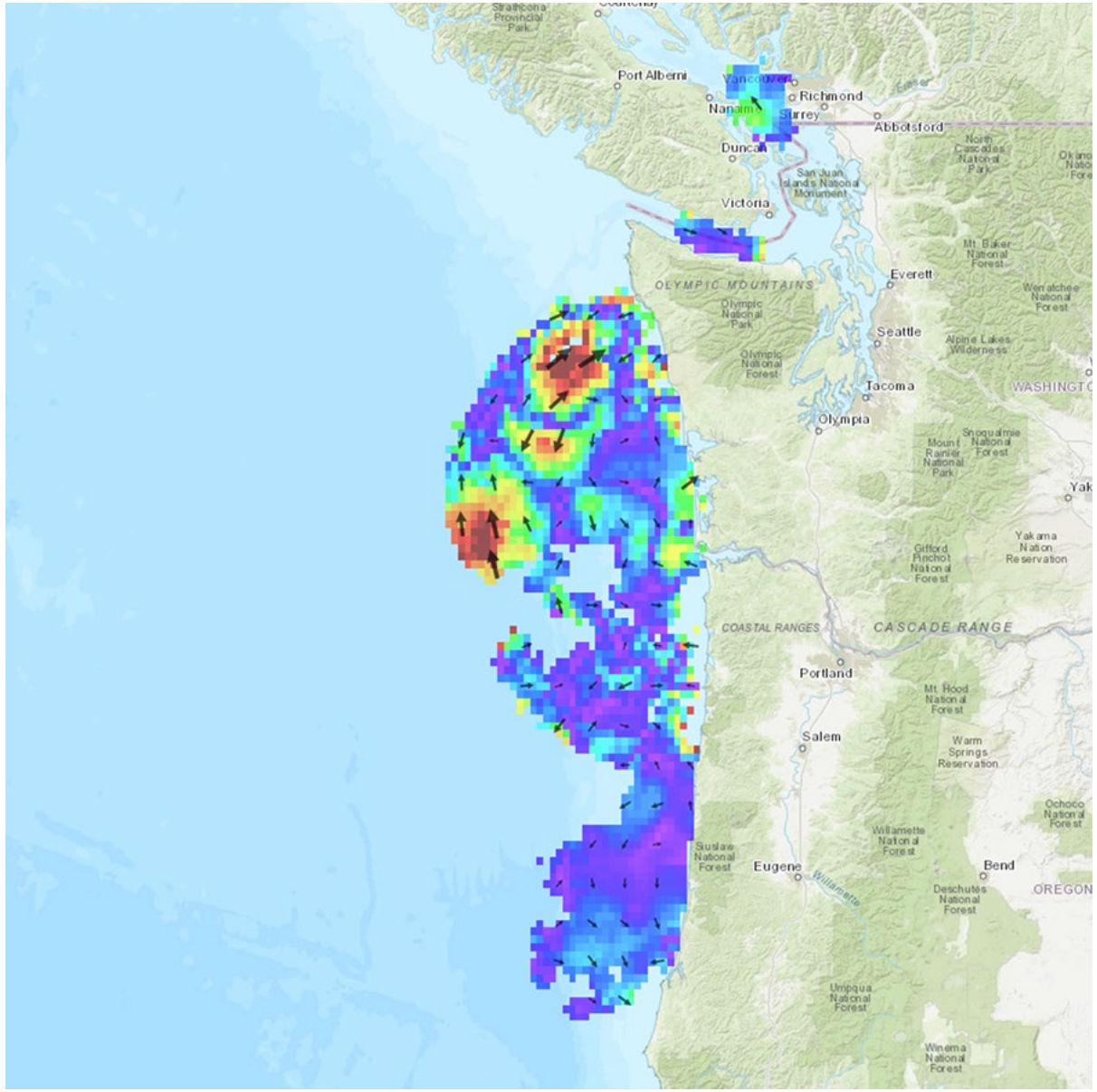
Additionally, the South Slough Reserve's education and science programs are using the water quality datasets for tidal marsh metrics that can be used to evaluate wetland resilience to sea level rise, which will be exhibited at the Reserve's Visitor Center.



NANOOS Radar Data Helps USACE Improve Nearshore Storm Modeling

OSU-NANOOS data are supporting the US Army Corps of Engineers' development of a high-resolution nearshore storm modeling system for the West Coast. Data from the OSU X-band radar station on the USCG Yaquina Bay watchtower provides wave predictions and bottom bathymetry data useful to the model development.

Additionally, OSU deployed four Sofar Spotter wave buoys with bottom-mounted pressure sensors last fall, ~1 km offshore Nye Beach in Newport, OR, within the operational radar footprint. The wave buoy data will be used as a ground-truth check on the radar-derived data products and also directly to support and evaluate the storm modeling system.



New Washington HFR Measuring Surface Currents!

NANOOS is pleased to announce that OSU has completed installation of a new High Frequency Radar at Westport State Park, WA near Point Chehalis. The team led by Dr. Mike Kosro has released the data to the national network as well as to NANOOS NVS.

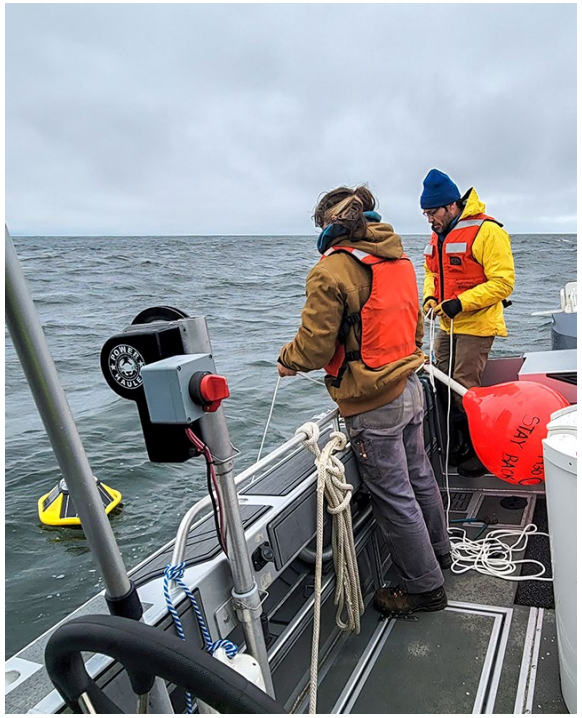
2008 2023

Thank you, Congress!

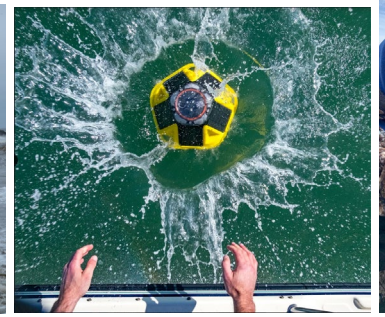
The Bipartisan Infrastructure Law of 2022 set aside funds to IOOS that NANOOS is using to replace aging observing asset parts and to assure continuation of these vital data streams used to assess safety and protect economic and ecological benefits from the sea. With these funds, buoys and gliders that have served many years are being either replaced or revitalized, and equipped with newer tech sensors.

Backyard Buoys

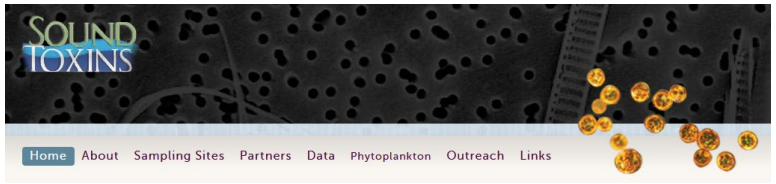
BACKYARD BUOYS

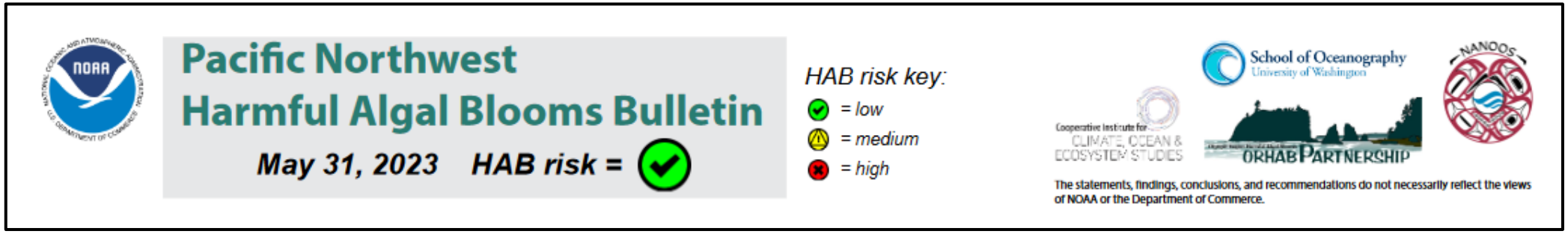


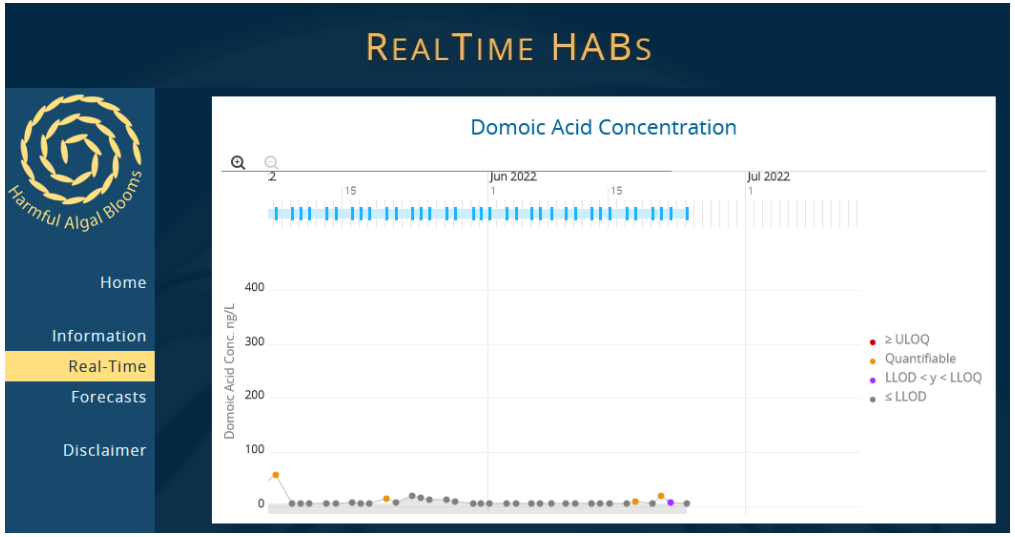
Our first buoy was deployed off La Push, WA, by the Quileute Tribe on 3 May 2023. This buoy will be out for a short deployment to test mooring design and data collection modes. Backyard Buoys is funded by the National Science Foundation Convergence Accelerator program, and involves NANOOS, PacIOOS, and AOOS with their partners.

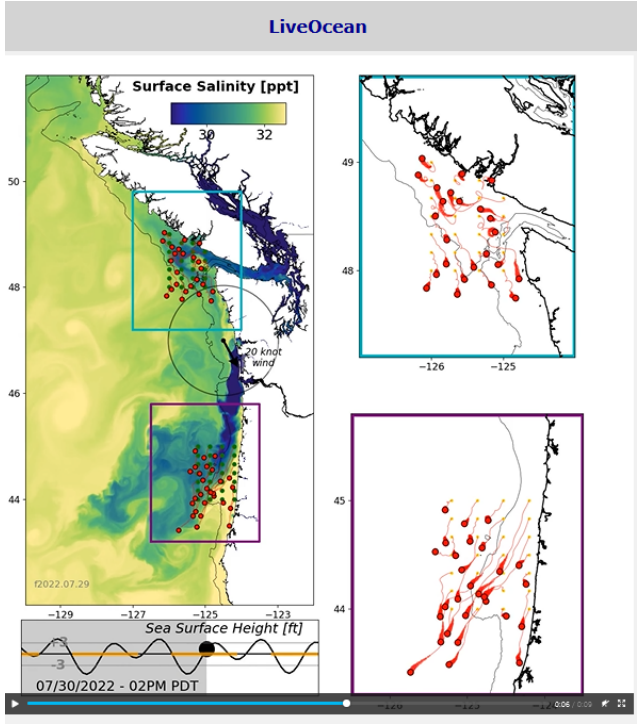


HABs in the PNW: NHABON









Cooperative Fisheries Plankton Research

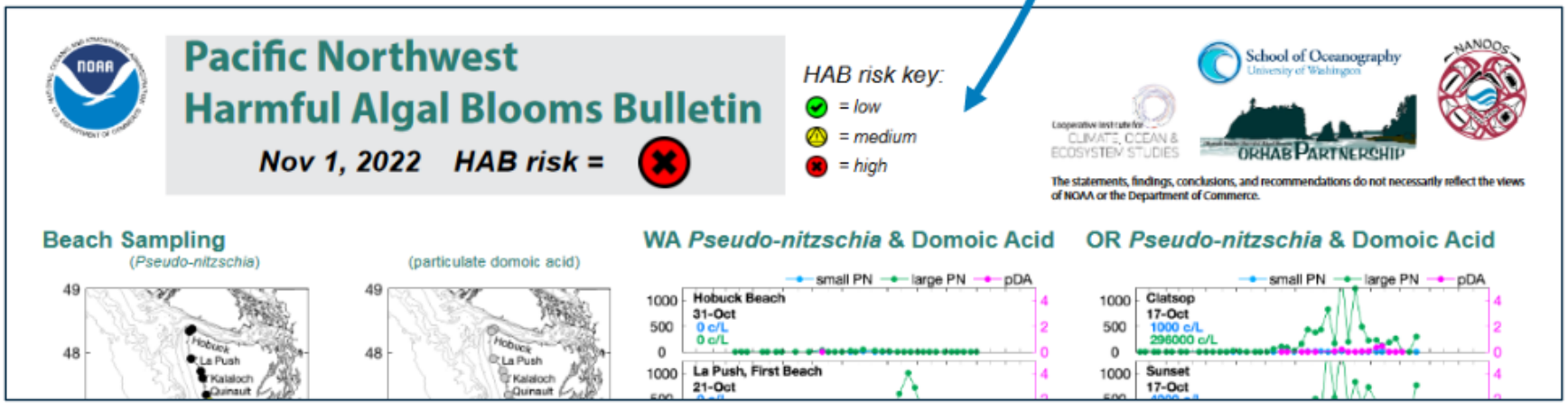
Off coastal Oregon, commercial fishermen are trained to collect seawater samples that are preserved and frozen for lab analyses. In the lab, utilize imaging flow cytometry to rapidly assess plankton community composition, including *Pseudo-nitzschia* abundance.

NANOOS

Northwest Association of Networked Ocean Observing Systems

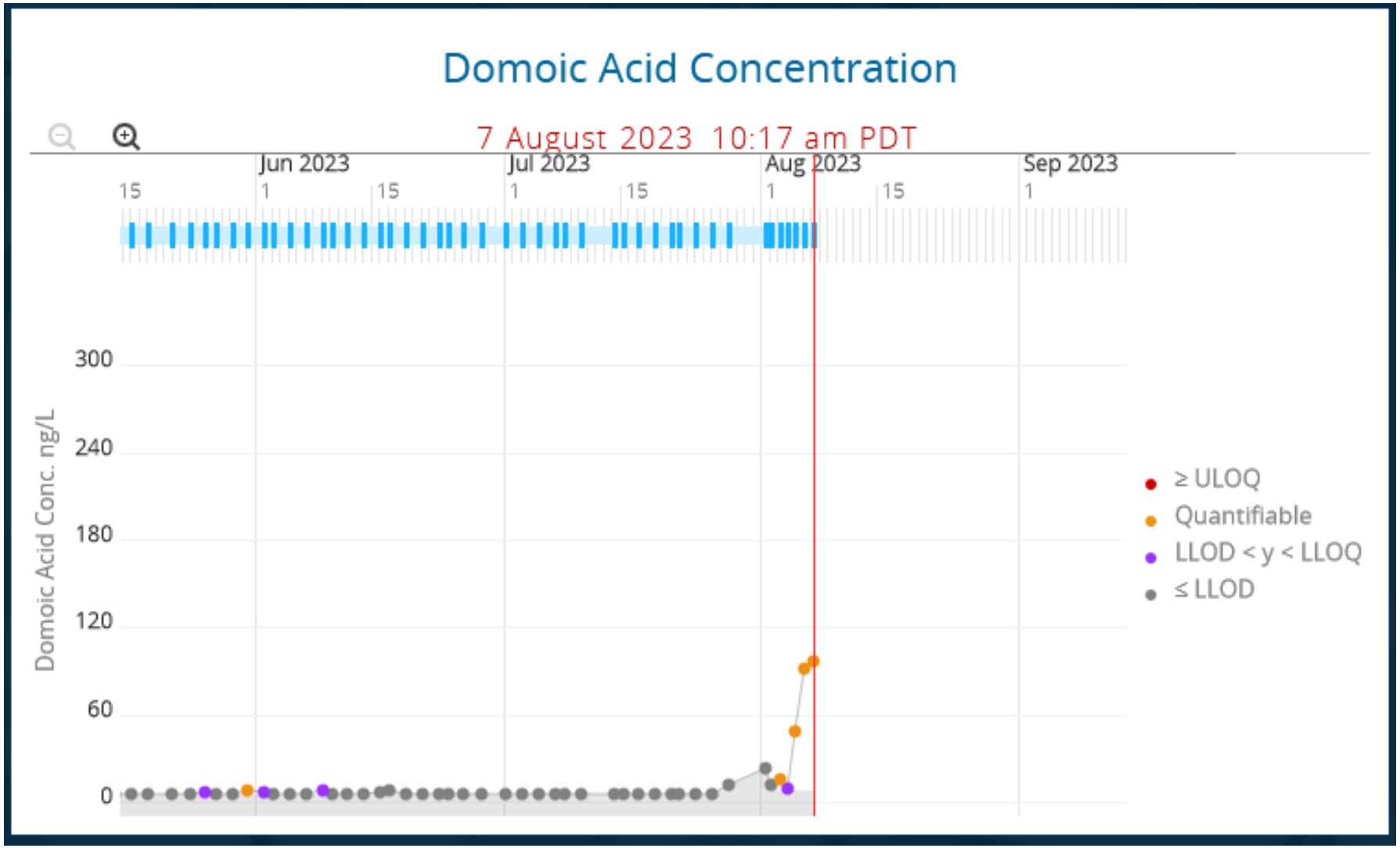
IOOS

Tribal and state resource managers have online access to the **PNW HAB Bulletin** and seasonal real-time measurements of toxin as part of the **National HAB-Observing Network**.



REALTIME HABs

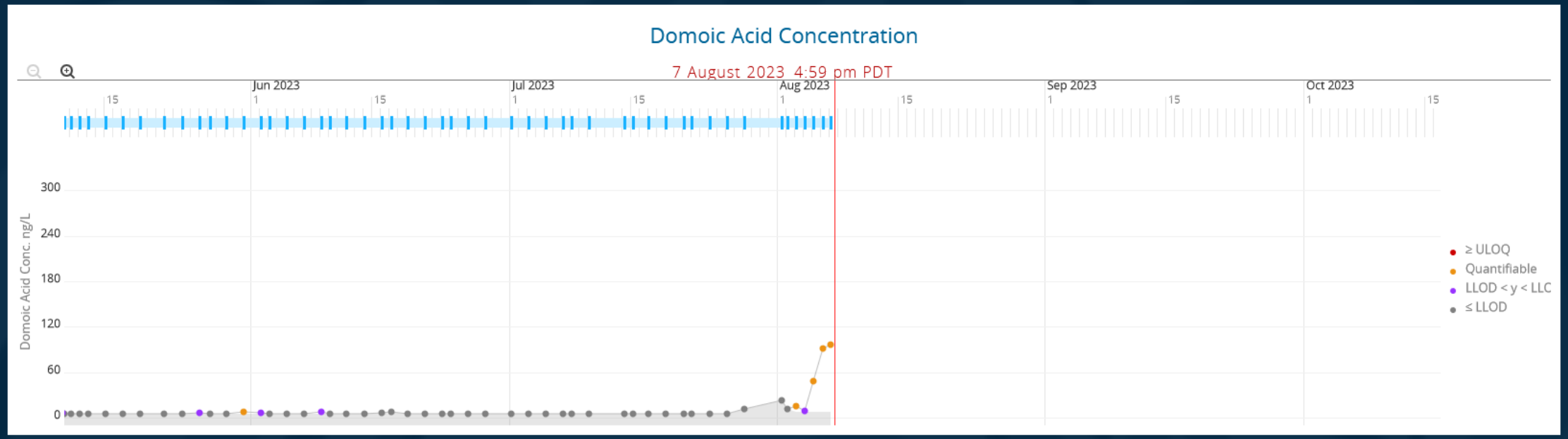
Real-time HABs



RealTime HABs

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

While the Environmental Sample Processor can detect both phytoplankton species and domoic acid, the focus for deployments starting in 2021 will be on detecting toxins. Data (species and toxin) from previous deployments dating back to 2016 are available on request.



Vision

- We consistently hear that our NANOOS GC wants us to stay the course on NANOOS investments.

- We are using these meetings in Astoria to kick off how we sustainably grow NANOOS for the opportunities with new funding from the Inflation Reduction Act.

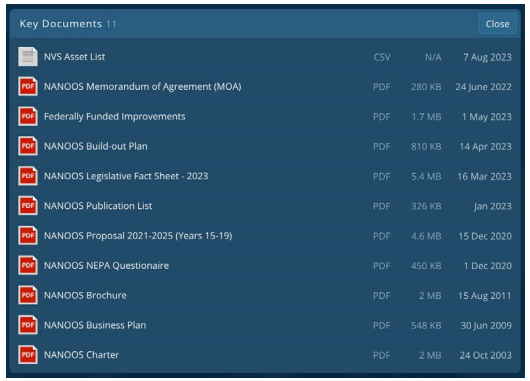
- Sustaining our data streams and products continue to be our highest priority.

NANOOS
Northwest Association of Networked Ocean Observing Systems

DMAC Updates

- We are recertified!

  ...pending final signatures



Key Documents 11 — Close

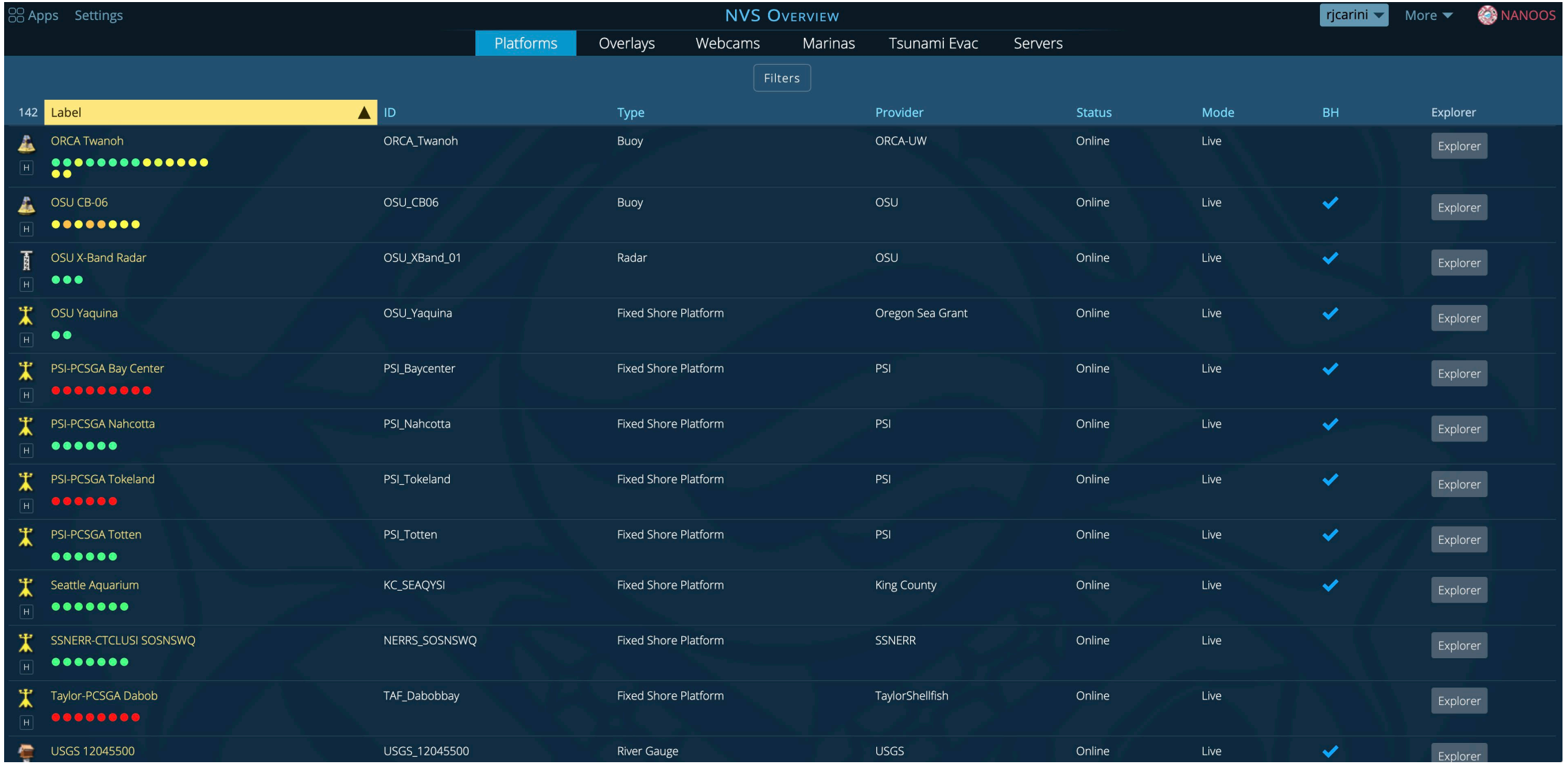
NVS Asset List	CSV	N/A	7 Aug 2023
NANOOS Memorandum of Agreement (MOA)	PDF	280 KB	24 June 2022
Federally Funded Improvements	PDF	1.7 MB	1 May 2023
NANOOS Build-out Plan	PDF	810 KB	14 Apr 2023
NANOOS Legislative Fact Sheet - 2023	PDF	5.4 MB	16 Mar 2023
NANOOS Publication List	PDF	326 KB	Jan 2023
NANOOS Proposal 2021-2025 (Years 15-19)	PDF	4.6 MB	15 Dec 2020
NANOOS NEPA Questionaire	PDF	450 KB	1 Dec 2020
NANOOS Brochure	PDF	2 MB	15 Aug 2011
NANOOS Business Plan	PDF	548 KB	30 Jun 2009
NANOOS Charter	PDF	2 MB	24 Oct 2003

Certification 2023 23 — Close

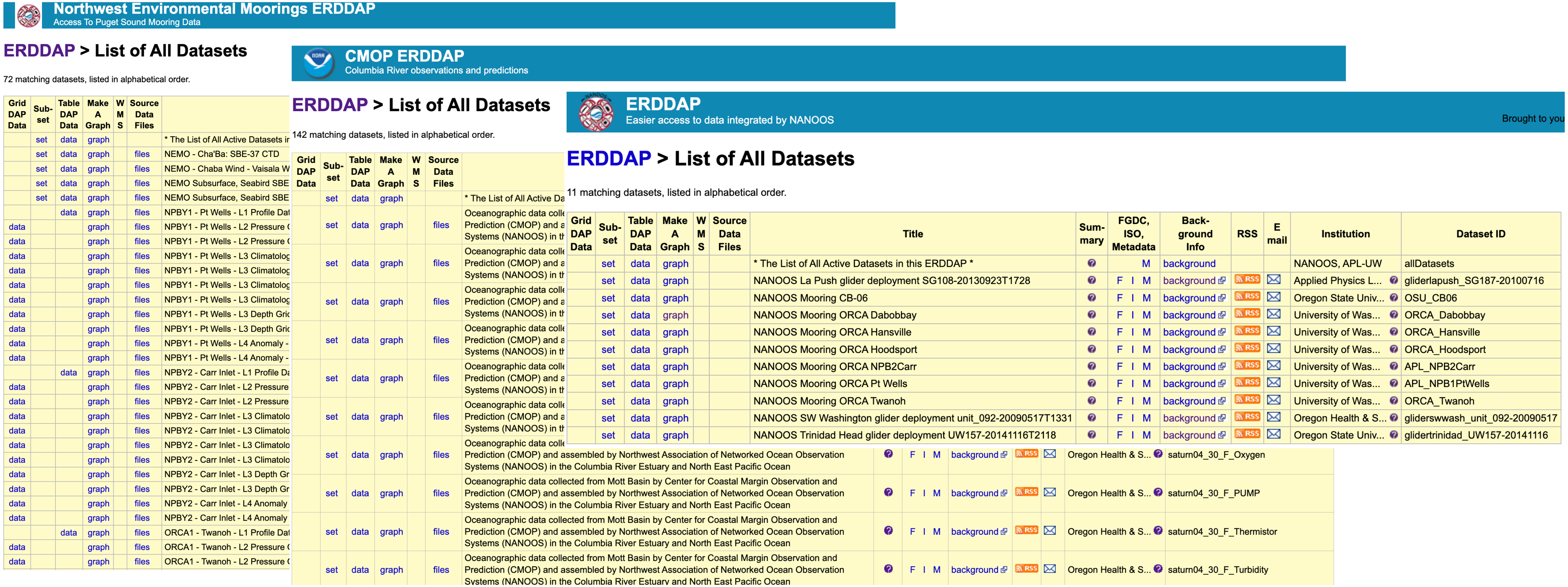
NANOOS Build-out Plan	PDF	810 KB	14 Apr 2023
NANOOS Strategic Operational Plan	PDF	5.2 MB	14 Apr 2023
NANOOS Data Management Plan	PDF	11 KB	13 Apr 2023
NANOOS CVs	PDF	1.6 MB	12 Apr 2023
NANOOS Observing Asset Inventory	XLS	35 KB	6 Apr 2023
NANOOS Descope FY22	PDF	5.9 MB	27 Oct 2022
NANOOS Award Letter FY21-25	PDF	1.5 MB	31 Aug 2021
NANOOS-NCEI Submission Agreement	PDF	16 KB	18 Jul 2017
DMP: HF Radar	PDF	216 KB	14 Apr 2023
DMP: Ports X-Band Radar	PDF	240 KB	14 Apr 2023
DMP: Washington Shelf Buoys	PDF	238 KB	14 Apr 2023
DMP: Oregon Shelf Buoy	PDF	224 KB	14 Apr 2023
DMP: Oregon Shelf Buoy OA Data	PDF	232 KB	14 Apr 2023
DMP: Puget Sound ORCA Buoys	PDF	237 KB	14 Apr 2023
DMP: CMOP Network	PDF	419 KB	14 Apr 2023
DMP: NERR South Slough	PDF	221 KB	14 Apr 2023
DMP: Victoria Clipper Ferrybox	PDF	242 KB	14 Apr 2023
DMP: La Push Glider	PDF	227 KB	14 Apr 2023
DMP: Washington Shelf Glider	PDF	226 KB	14 Apr 2023
DMP: Trinidad Head Glider	PDF	228 KB	14 Apr 2023
DMP: Washington Beach and Shoreline Observations	PDF	76 KB	14 Apr 2023
DMP: Oregon Beach and Shoreline Observations	PDF	251 KB	14 Apr 2023
DMP: Nearshore Bathymetry	PDF	243 KB	14 Apr 2023

NANOOS
Northwest Association of Networked Ocean Observing Systems

DMAC Updates: Harvesting Data



DMAC Updates: Accessing Data



Northwest Environmental Moorings ERDDAP
Access To Puget Sound Mooring Data

ERDDAP > List of All Datasets

72 matching datasets, listed in alphabetical order.

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	W M S	Source Data Files	
	set	data	graph			* The List of All Active Datasets ir
	set	data	graph		files	NEMO - Cha'Ba: SBE-37 CTD
	set	data	graph		files	NEMO - Chaba Wind - Vaisala W
	set	data	graph		files	NEMO Subsurface, Seabird SBE
	set	data	graph		files	NEMO Subsurface, Seabird SBE
		data	graph		files	NPBY1 - Pt Wells - L1 Profile Dat
data			graph		files	NPBY1 - Pt Wells - L2 Pressure (
data			graph		files	NPBY1 - Pt Wells - L2 Pressure (
data			graph		files	NPBY1 - Pt Wells - L3 Climatolog
data			graph		files	NPBY1 - Pt Wells - L3 Climatolog
data			graph		files	NPBY1 - Pt Wells - L3 Climatolog
data			graph		files	NPBY1 - Pt Wells - L3 Climatolog
data			graph		files	NPBY1 - Pt Wells - L3 Depth Gric
data			graph		files	NPBY1 - Pt Wells - L3 Depth Gric
data			graph		files	NPBY1 - Pt Wells - L4 Anomaly -
data			graph		files	NPBY1 - Pt Wells - L4 Anomaly -
		data	graph		files	NPBY2 - Carr Inlet - L1 Profile Da
data			graph		files	NPBY2 - Carr Inlet - L2 Pressure
data			graph		files	NPBY2 - Carr Inlet - L2 Pressure
data			graph		files	NPBY2 - Carr Inlet - L3 Climatolo
data			graph		files	NPBY2 - Carr Inlet - L3 Climatolo
data			graph		files	NPBY2 - Carr Inlet - L3 Climatolo
data			graph		files	NPBY2 - Carr Inlet - L3 Climatolo
data			graph		files	NPBY2 - Carr Inlet - L3 Depth Gr
data			graph		files	NPBY2 - Carr Inlet - L3 Depth Gr
data			graph		files	NPBY2 - Carr Inlet - L4 Anomaly
data			graph		files	NPBY2 - Carr Inlet - L4 Anomaly
		data	graph		files	ORCA1 - Twanoh - L1 Profile Dat
data			graph		files	ORCA1 - Twanoh - L2 Pressure (
data			graph		files	ORCA1 - Twanoh - L2 Pressure (

CMOP ERDDAP
Columbia River observations and predictions

ERDDAP > List of All Datasets

142 matching datasets, listed in alphabetical order.

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	W M S	Source Data Files								
	set	data	graph			* The List of All Active Da							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and a Systems (NANOOS) in th							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and a Systems (NANOOS) in th							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and a Systems (NANOOS) in th							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and a Systems (NANOOS) in th							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and a Systems (NANOOS) in th							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and a Systems (NANOOS) in th							
	set	data	graph		files	Oceanographic data colle Prediction (CMOP) and assembled by Northwest Association of Networked Ocean Observation Systems (NANOOS) in the Columbia River Estuary and North East Pacific Ocean	?	F I M	background	RSS		Oregon Health & S... ?	saturn04_30_F_Oxygen
	set	data	graph		files	Oceanographic data collected from Mott Basin by Center for Coastal Margin Observation and Prediction (CMOP) and assembled by Northwest Association of Networked Ocean Observation Systems (NANOOS) in the Columbia River Estuary and North East Pacific Ocean	?	F I M	background	RSS		Oregon Health & S... ?	saturn04_30_F_PUMP
	set	data	graph		files	Oceanographic data collected from Mott Basin by Center for Coastal Margin Observation and Prediction (CMOP) and assembled by Northwest Association of Networked Ocean Observation Systems (NANOOS) in the Columbia River Estuary and North East Pacific Ocean	?	F I M	background	RSS		Oregon Health & S... ?	saturn04_30_F_Thermistor
	set	data	graph		files	Oceanographic data collected from Mott Basin by Center for Coastal Margin Observation and Prediction (CMOP) and assembled by Northwest Association of Networked Ocean Observation Systems (NANOOS) in the Columbia River Estuary and North East Pacific Ocean	?	F I M	background	RSS		Oregon Health & S... ?	saturn04_30_F_Turbidity

ERDDAP
Easier access to data integrated by NANOOS
Brought to you

ERDDAP > List of All Datasets

11 matching datasets, listed in alphabetical order.

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	W M S	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			NANOOS, APL-UW	allDatasets
	set	data	graph			NANOOS La Push glider deployment SG108-20130923T1728	?	F I M	background	RSS		Applied Physics L... ?	gliderlapush_SG187-20100716
	set	data	graph			NANOOS Mooring CB-06	?	F I M	background	RSS		Oregon State Univ... ?	OSU_CB06
	set	data	graph			NANOOS Mooring ORCA Dabobbay	?	F I M	background	RSS		University of Was... ?	ORCA_Dabobbay
	set	data	graph			NANOOS Mooring ORCA Hansville	?	F I M	background	RSS		University of Was... ?	ORCA_Hansville
	set	data	graph			NANOOS Mooring ORCA Hoodsport	?	F I M	background	RSS		University of Was... ?	ORCA_Hoodsport
	set	data	graph			NANOOS Mooring ORCA NPB2Carr	?	F I M	background	RSS		University of Was... ?	APL_NPB2Carr
	set	data	graph			NANOOS Mooring ORCA Pt Wells	?	F I M	background	RSS		University of Was... ?	APL_NPB1PtWells
	set	data	graph			NANOOS Mooring ORCA Twanoh	?	F I M	background	RSS		University of Was... ?	ORCA_Twanoh
	set	data	graph			NANOOS SW Washington glider deployment unit_092-20090517T1331	?	F I M	background	RSS		Oregon Health & S... ?	gliderswwash_unit_092-20090517
	set	data	graph			NANOOS Trinidad Head glider deployment UW157-20141116T2118	?	F I M	background	RSS		Oregon State Univ... ?	glidertrinidad_UW157-20141116

NANOOS
Northwest Association of Networked Ocean Observing Systems

DMAC Updates: Accessing Data

ERDDAP > griddap > Make A Graph

Dataset Title: **ORCA1 - Twanoh - L3 Depth Gridded Data - 0.25 meter**

Institution: Northwest Environmental Moorings Group at University of Washington - Applied Physical Laboratory (Dataset ID: orca1_L3_depthgridded_025)

Information: Summary | License | Metadata | Background | Data Access Form | Files

Click to see a list of this dataset's variables and the complete list of metadata attributes.

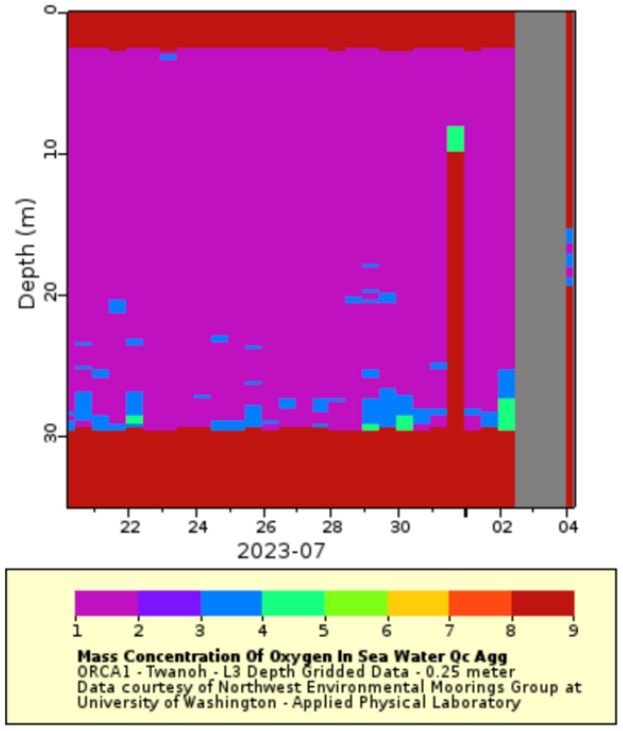
Graph Type: surface
X Axis: cast_start_time
Y Axis: depth
Color: mass_concentration_of_oxygen_in_sea_water_qc_agg

Dimensions **Start** **Stop**
cast_start_time (UTC) 2023-07-20T05:00:27Z 2023-08-04T05:00:29Z
depth (m) 0.0 35.0

Graph Settings
Color Bar: Continuity: Discrete Scale:
Minimum: Maximum: N Sections:
Y Axis Minimum: 0 Maximum: 35 Descending

Redraw the Graph (Please be patient. It may take a while to get the data.)

Optional:
Then set the File Type: .htmlTable (File Type information)
and Download the Data or an Image
or view the URL: https://nwem.apl.washington.edu/erddap/griddap/orca1_L3_depthgrid
(Documentation / Bypass this form)



QC Flag key:
1 = PASS
2 = NOT_EVALUATED
3 = SUSPECT
4 = FAIL
9 = MISSING

NANOOS
Northwest Association of Networked Ocean Observing Systems

DMAC Updates: Archiving Data

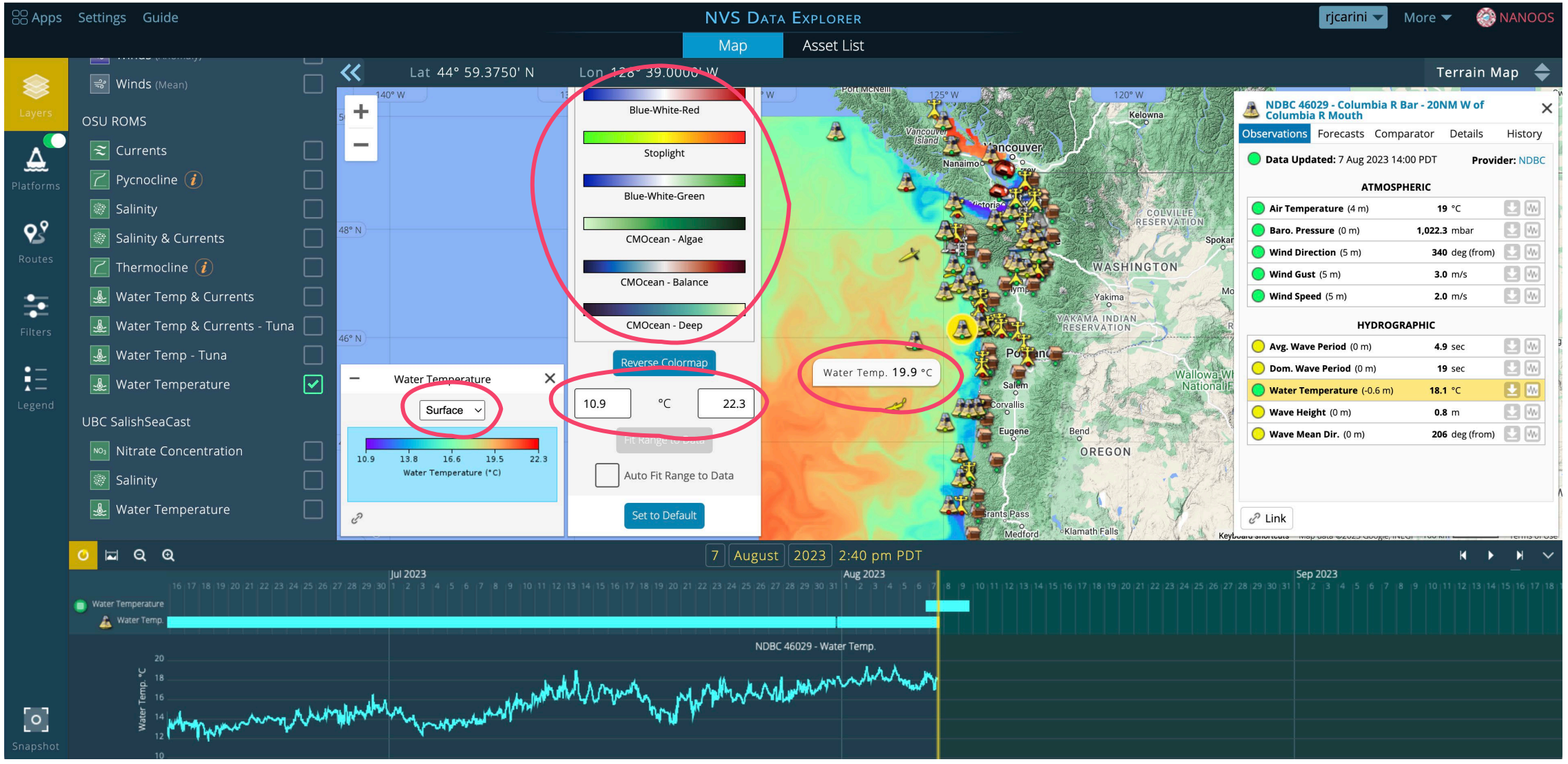
Nationally Archived (with NCEI or other)

- ✓ HF Radar DAC
- ✓ Glider DAC
- ✓ CRITFC SATURN buoys and land-based stations*
- ❑ OSU CB-06 buoy
- ❑ WA Shelf moorings
- ❑ Puget Sound profiling moorings
- ✓ SS NERR Coos Bay stations
  - ✓ according to NERR protocols
- ✓ WA & OR Beaches and Shoreline Surveys
  - ✓ According to State Agency protocols
  - ❖ Attempted NCEI process

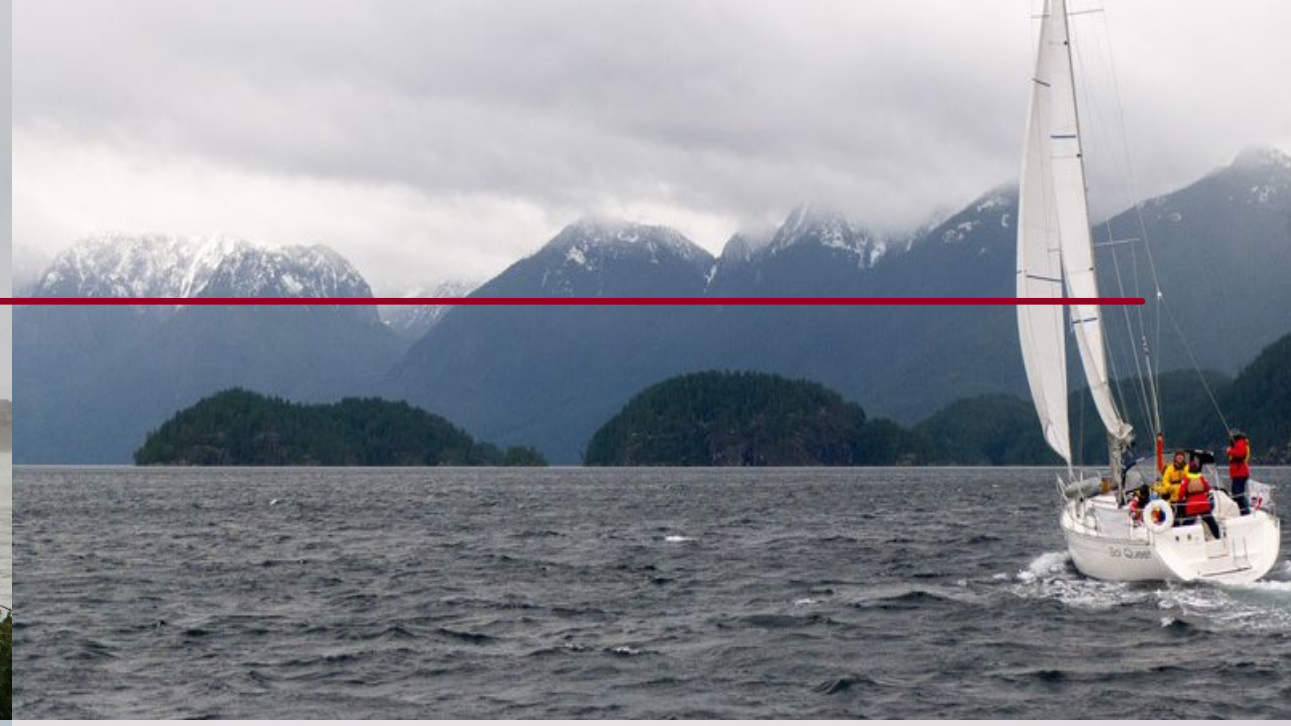
**NCEI Data Submission Agreement with PI Seaton (CRITFC) to be used as template to set up remaining needed pathways for automatic archival with NCEI*

NANOOS
Northwest Association of Networked Ocean Observing Systems

DMAC Updates: Visualizing Data



UPC Updates



NANOOS

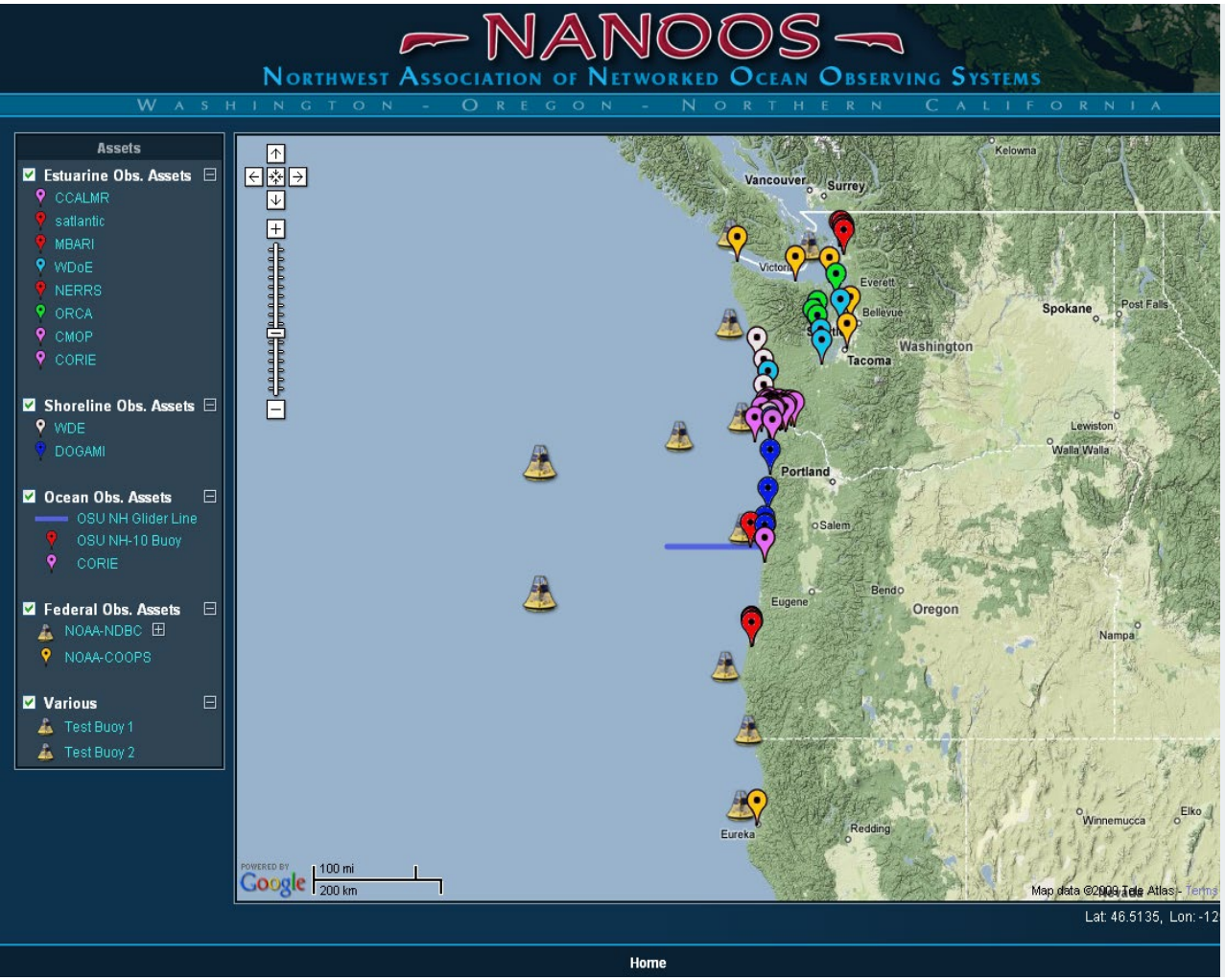
Northwest Association of Networked Ocean Observing Systems

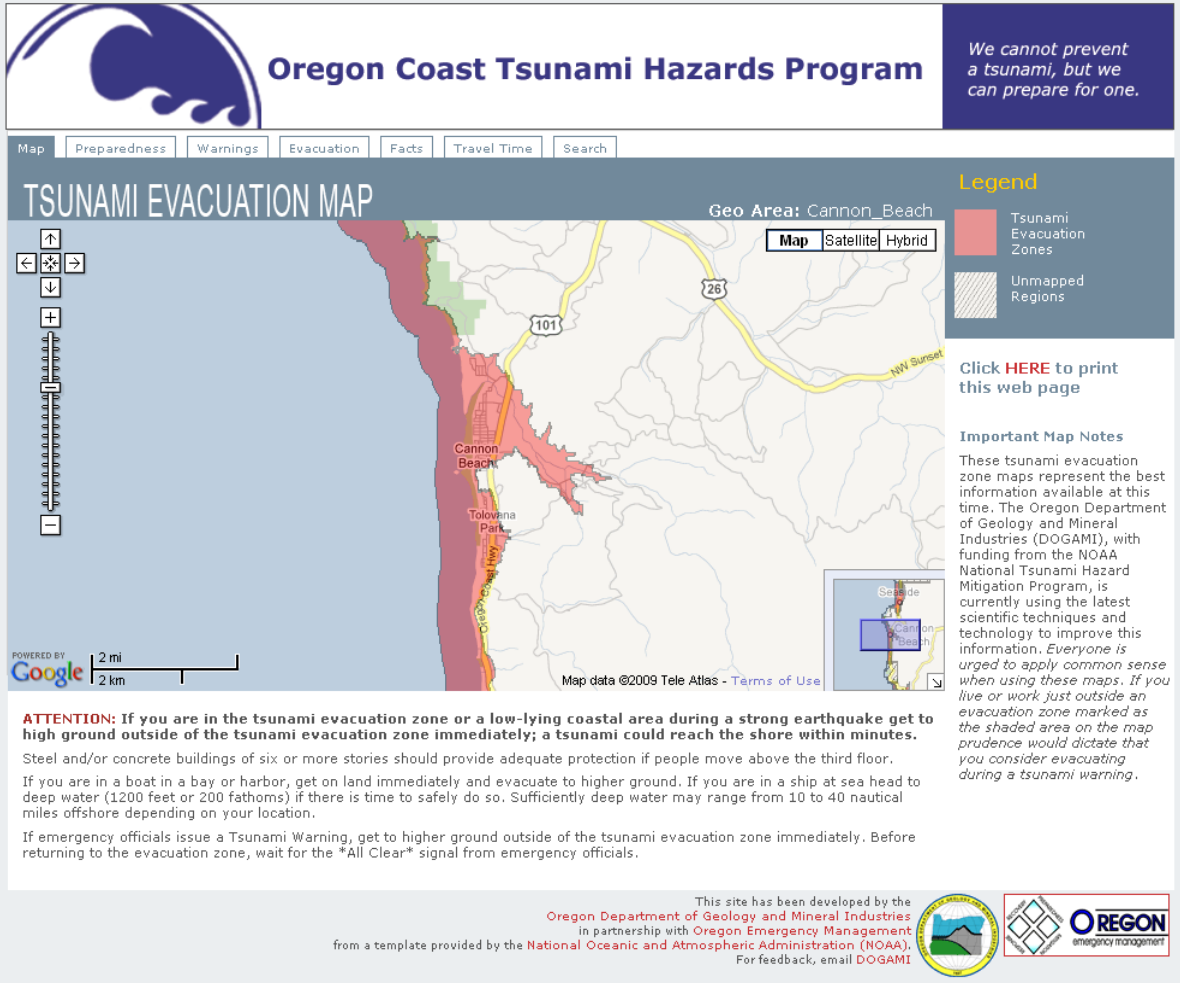
UPC Updates

Recent UPC efforts:

1. Weekly tag-ups
2. Tri-Comm meeting at UW on May 11-12… reviewed existing activities and established goals for the next year
3. Refinements to “Snapshot” tool, to allow for easy sharing of tsunami routes and places
4. Updates to climatology app and various overlays (MODIS, HF Radar, time period averaging)

UPC Updates: NVS in 2009





Apps Settings

NVS Climatology

Log In More NANOOS

Map Overview

Layers Indices Sites Legend Snapshot

Layers

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

Models

OSU NARR Climate

- Winds (Climate)
- Winds (Anomaly)
- Winds (Mean)

WAVEWATCH III Climate

- Wave Height (Climate)
- Wave Height (Anomaly)
- Wave Height (Mean)
- Wave Period (Climate)
- Wave Period (Anomaly)
- Wave Period (Mean)
- Winds (Climate)
- Winds (Anomaly)
- Winds (Mean)

Remote Sensing

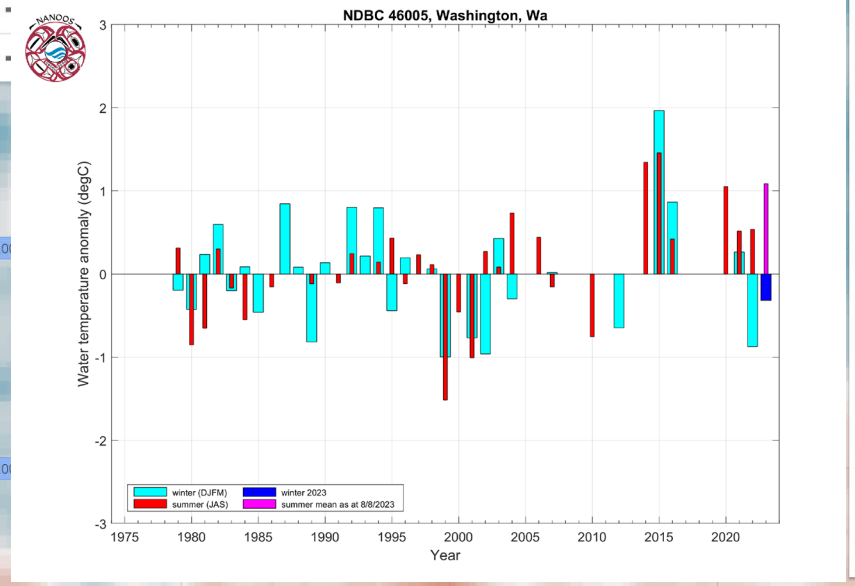
NCEI OI SST 1983-2012

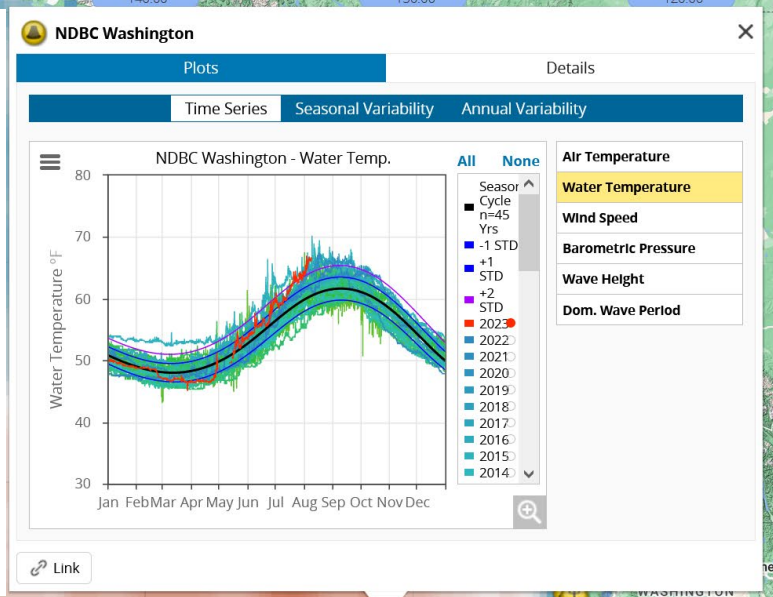
- Water Temp. (Climate)
- Water Temp. (Anomaly)
- Water Temp. (Mean)

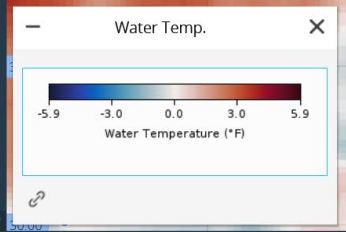
NCEI OI SST 1993-2022

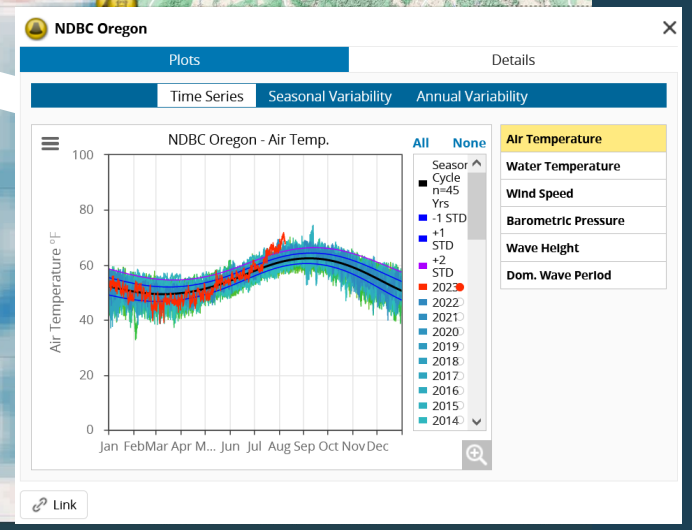
- Water Temp. (Climate)
- Water Temp. (Anomaly)
- Water Temp. (Mean)

Lat Lon Terrain Map









15 June 2023 4:59 pm PDT

2019 2020 2021 2022

Water Temp.

UPC Updates

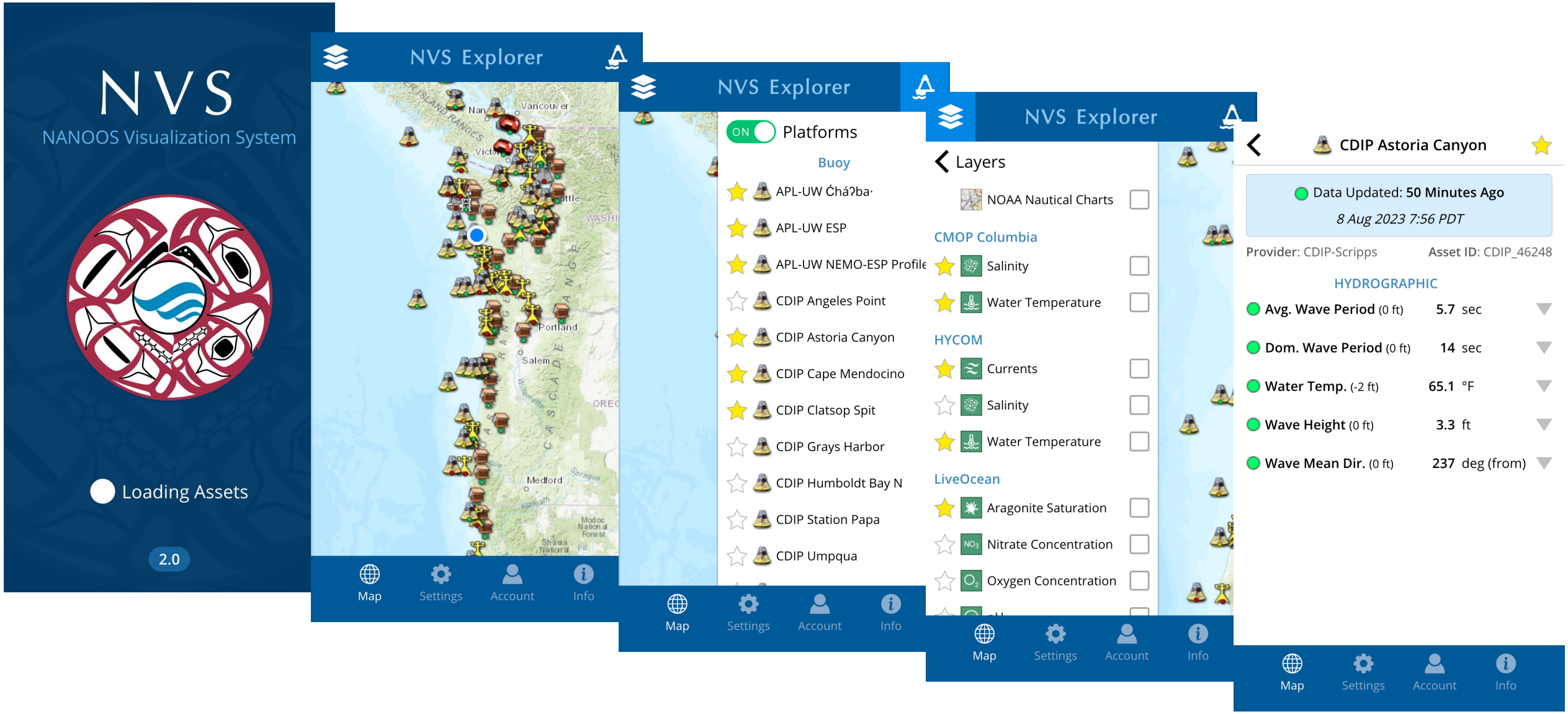
Focus for next 12 months:

1. Updates to climatologies (updated averaging periods: <2012 & full range)
2. Updates to the NVS and Tsunami smartphone apps
    - Map view
    - Favorite assets
    - Evacuation routing capabilities
3. Particle Tracking
4. Cross-section tool
5. Continue to update overlays to include dynamic capability (user selectable color overlay options and ranges; point & click querying and dynamic overlays)
6. Complete development of a unified glider app
7. QUARTOD dashboard tool
8. Alerting capability for platforms/sensors that are offline.
9. Incorporate NOS sea level rise estimates for the region; AVISO sea level rise overlay product.

Challenges:

1. Migrating OSU processing to a centralized system at UW
2. Adapting to new google analytics environment

NANOOS
Northwest Association of Networked Ocean Observing Systems



NANOOS
Northwest Association of Networked Ocean Observing Systems

CDIP Astoria Canyon

Data Updated: **50 Minutes Ago**

8 Aug 2023 7:56 PDT

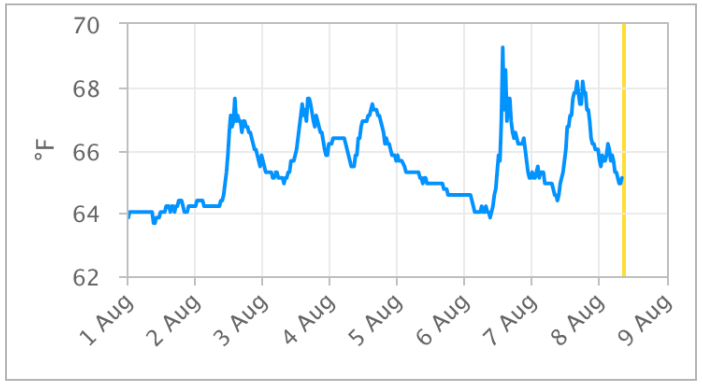
Provider: CDIP-Scripps **Asset ID**: CDIP_46248

HYDROGRAPHIC

Avg. Wave Period (0 ft) **5.7** sec

Dom. Wave Period (0 ft) **14** sec

Water Temp. (-2 ft) **65.1** °F



Wave Height (0 ft) **3.3** ft

Wave Mean Dir. (0 ft) **237** deg (from)

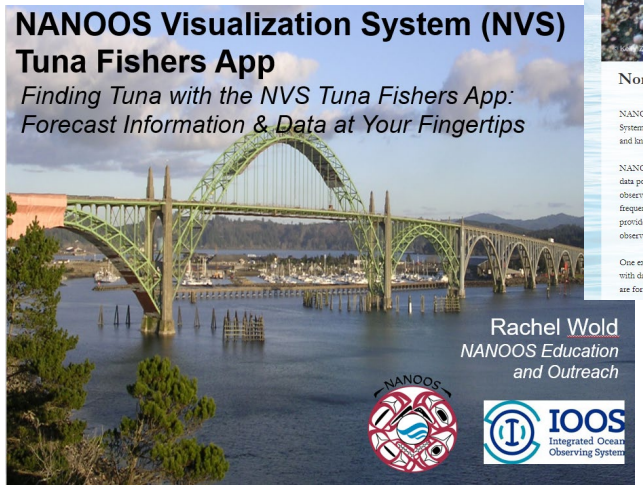
Map Settings Account Info

NANOOS Northwest Association of Networked Ocean Observing Systems

Education, Engagement, & Outreach Updates

Outreach and Engagement:
Increasing awareness and connecting with users

- ***Engagement with general public, scientists, and targeted user groups:***
  - Recreational and commercial fishers, boaters, surfers in PNW
    - Collect and utilize user feedback
  - Industry partner events
  - Public events
    - "Sound Waters: A One Day University for All"
- ***Increasingly active with external groups:***
  - IOOS Outreach Committee
  - IOOS DEIA Working Group
  - Applied Physics Lab DEI Work Group

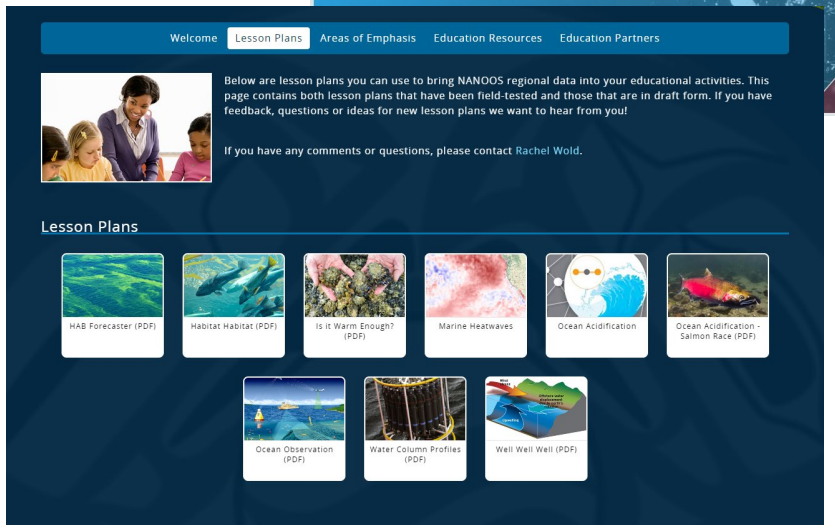


NANOOS | Northwest Association of Networked Ocean Observing Systems

Education, Engagement, & Outreach Updates

Education: Increasing ocean literacy

- ***National Marine Educators Association***
  - Annual conference hosted by NAME
- ***Lesson plans online***
  - New OA curriculum developed by EarthLab Ocean Literacy Intern
- ***South Whidbey Middle School***
  - Student buoy program
- ***NANOOS Enabling Change Activities***
  - Middle school, High school and Undergraduate



NANOOS | Northwest Association of Networked Ocean Observing Systems

Education, Engagement, & Outreach Updates

Enabling Change Working Group: *Diversity, Equity, and Inclusion*

- ***Members***: NANOOS, OSU, MRV Systems, CRITFC, NOAA PMEL, NOAA West Coast Regional Office, OCNMS, IOOS Office
- ***Activities***:
  - **Middle School** – Technology Access Foundation
  - **High School** – Seattle Maritime High School
    - Shellfish and OA demo
    - NVS in the Classroom
    - Lab and ship tours
  - **Undergraduate** – EarthLab, PMEL, OCNMS Summer Interns
    - Developing a growing cohort

NANOOS
Northwest Association of Networked Ocean Observing Systems

Education, Engagement, & Outreach Updates

Online Presence

NANOOS | Northwest Association of Networked Ocean Observing Systems

Education, Engagement, & Outreach Updates

Plans for the upcoming year

- ***Return of more in-person opportunities***
  - Tradeshows, conferences, meeting
  - Also continue exploring virtual capabilities
- ***Expand on Enabling Change endeavors***
  - Utilize the NANOOS GC/PI network
    - What opportunities are available in your organization or region?
    - What efforts can we support or highlight?
- ***Increase awareness and use within member organizations***
  - What opportunities might you have?

NANOOS
Northwest Association of Networked Ocean Observing Systems

National and International Panel

- IOOS Program Office: C. Gouldman
- IOOS Association: G. Kuska
- CIOOS – Pacific (Canada): B. de Young *(virtual)*
- CRITFC: Aja DeCoteau

- Q&A

U.S. IOOS Office Updates

Carl Gouldman
Director, U.S. IOOS Office

August 10, 2023

IOOS | EYES ON THE OCEAN™

NOAA FY22-26 **STRATEGIC GOALS**

01

BUILD A CLIMATE READY NATION

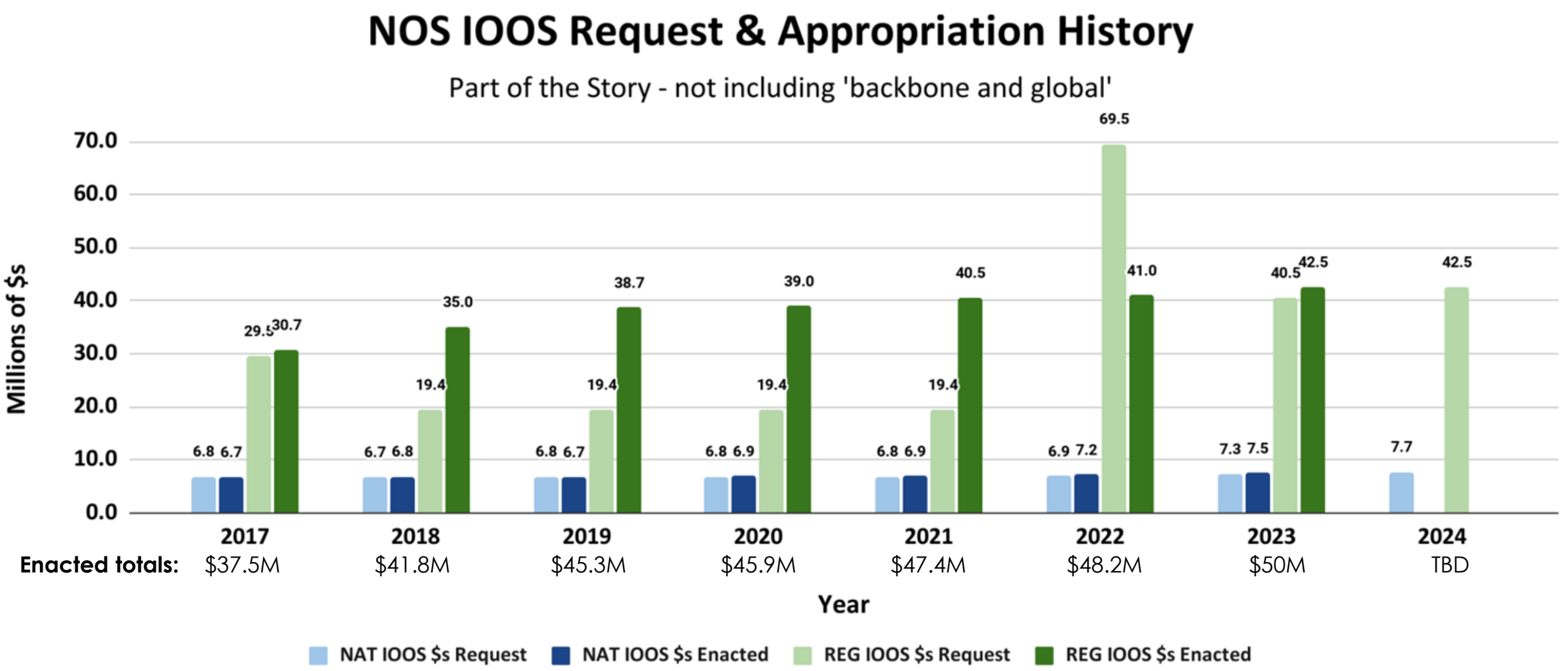
02

MAKE EQUITY CENTRAL TO NOAA'S MISSION

03

ACCELERATE GROWTH IN AN INFORMATION-BASED BLUE ECONOMY

U.S. IOOS Enacted and President's Budgets FY17–24



NOAA National Ocean Service - Navigation, Observations, and Positioning:
'National IOOS' & 'Regional IOOS Observations'

- Estimated Enacted levels are 'post rescission' totals for each year
- 'Request' = the President's Budget Request

Next Steps - Budget

FY23 Appropriations

- **Regional Observations** = $42.5M
- **National IOOS** = $7.5M

FY22 & FY23–26 Bipartisan Infrastructure Law (BIL; formerly IIJA)

- **Prov 3:** Flood Inundation Mapping = $4.5M
- **Prov 11:** Coastal and Ocean Observations = $7.3M
- **Prov 12:** Regional Ocean Partnerships= $1.8M

FY23 Community Special Project (congressionally directed)

- **Six total projects administered by IOOS**

FY23–26 Inflation Reduction Act

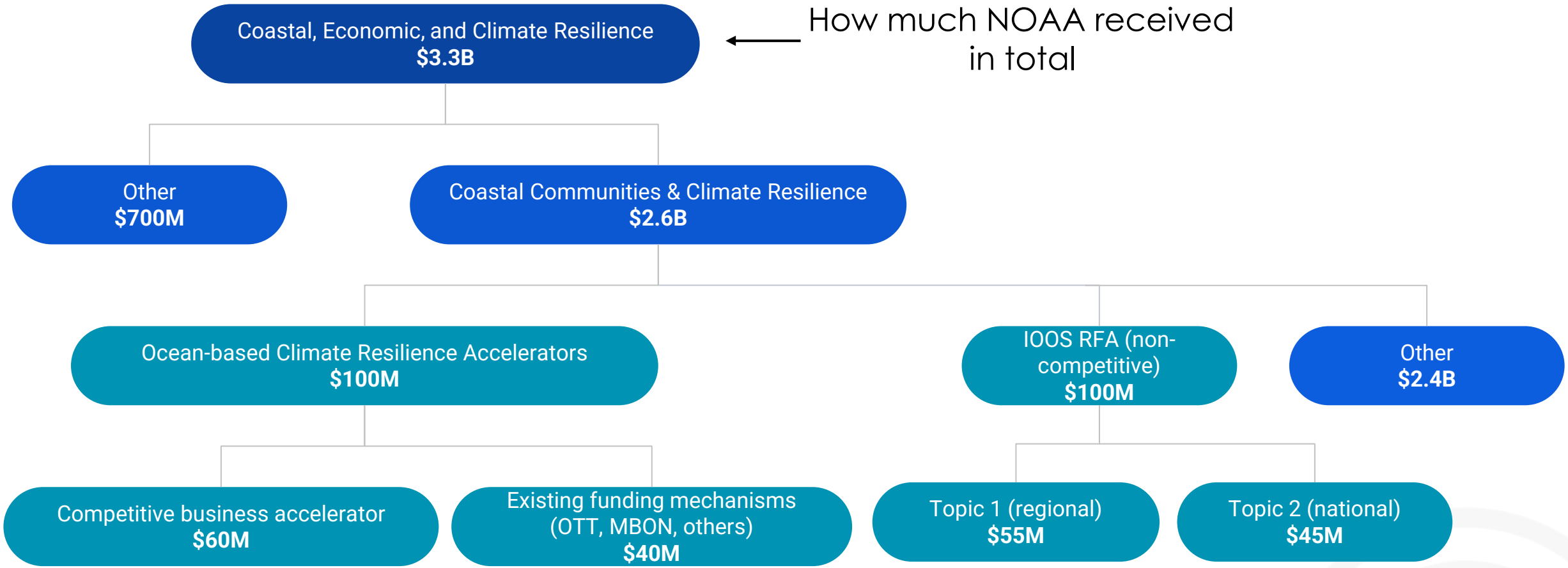
- **Coastal, Economic, and Climate Resilience** = $3.3B for NOAA over 4 years
  - Coastal Communities & Climate Resilience = $2.6B for NOAA

Next Steps - Budget

FY23–26 Inflation Reduction Act

- **Coastal, Economic, and Climate Resilience** = $3.3B for NOAA over 4 years
  - Coastal Communities & Climate Resilience = $2.6B
    - Enable coastal communities to prepare for extreme storms and other changing climate conditions
    - Support natural resources that sustain coastal and marine resource dependent communities
    - Support marine fishery and marine mammal stock assessments

IRA Funding Breakdown



= IOOS involvement

IOOS Office and Inflation Reduction Act Planning

Eligible IOOS uses of funds within Sec. 40001 RA include:

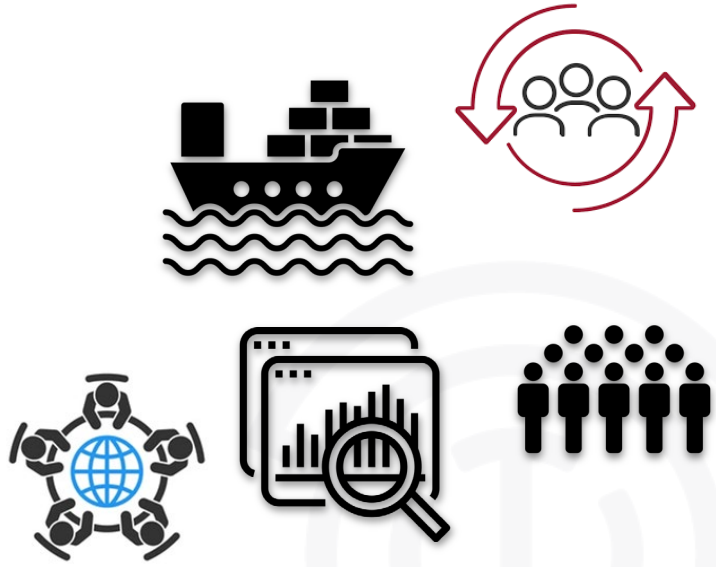
- **~ $215 million w/in Climate Ready Coasts and Communities**
  - IOOS RAs and partners
  - Ocean-based Climate Resilience Accelerators, &
  - Technical Assistance and Mgt & Admin.

Funding Mechanisms include:

- Non-competitive Request for Applications for IOOS RAs and partners - Cooperative Agreements up to 5 years
- New NOFO Ocean-based Climate Resilience Accelerators up to 4-5 years
- Technical Assistance and Mgt & Admin.

Timing

- 4 Year Funding has to be all obligated by end of FY26 and priority is being made implement grants as soon as reasonable.



IOOS Coastal Climate Resilience

Eligible uses of funds include:

- **$100 million** on new projects with 11 IOOS Regional Associations
- Up to 5 year awards across two topic areas to address coastal climate resilience needs and priorities

Two Topic Areas:

- improving coastal resilience and advancing equitable service delivery at regional scale
- address coastal resilience and benefit users at the national and/or pan-regional scales
- **Encouraged Foci**
  - Stakeholder Engagement
  - New Partnerships
  - Equitable Service Delivery

U.S. INTEGRATED OCEAN OBSERVING SYSTEM
CERTIFIED
REGIONAL ASSOCIATION

IOOS | EYES ON THE OCEAN™

Ocean-based Climate Resilience Accelerators (Tentative schedule)

$60M new Notice of Funding Opportunity

Eligible uses of funds include:

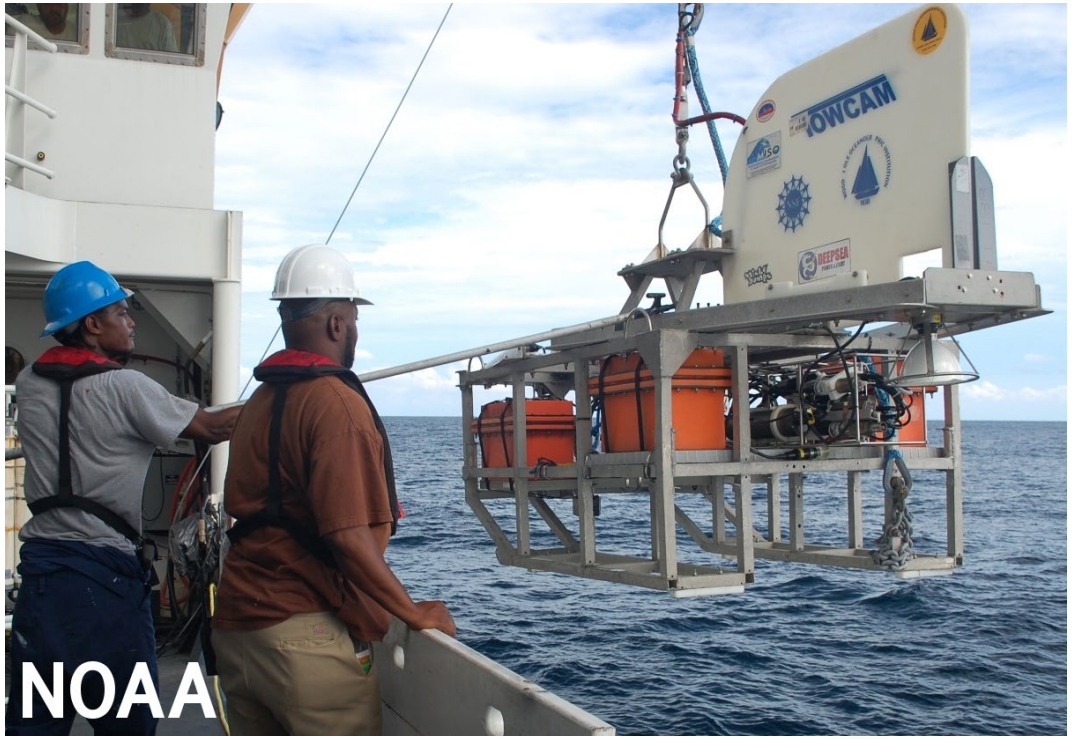
- **Phase 1**- Staff support, resources,design of climate resilience accelerator programs aligned with priorities.
- **Phase 2**- Full implementation of accelerator programming over multiple years/cohorts, including subawards to participating businesses.

Entities eligible to apply:

- Corporations, joint ventures, academic institutions and cooperative institutes, not-for-profit organizations, state/local governmental entities, tribal governments or entities

Important dates:

- NOFO publication: *July 10*
- Phase One applications due 60 days later : ***Sept. 11***
- Phase Two applications ~ Feb ‘24-July ‘24

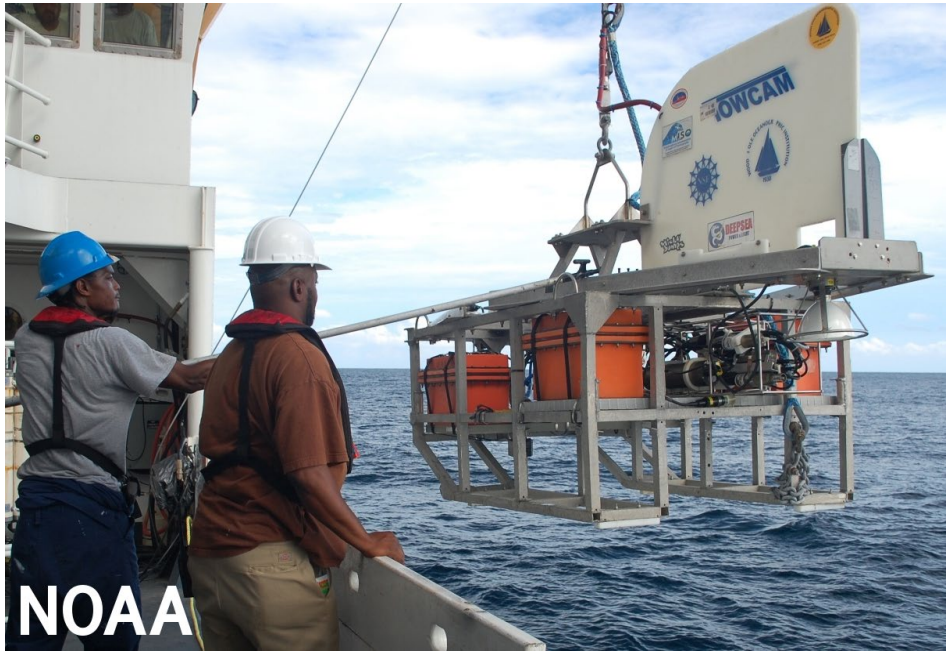


Ocean-based Climate Resilience Accelerators (Themes)

Proposed Theme Areas

- Ocean Renewable Energy
- Coastal and Ocean Carbon Sequestration Monitoring and Accounting
- Hazard Mitigation and Coastal Resilience
- Ecosystems Services, Including Change Detection, Change Analysis, and Change Adaptation/Mitigation
- Other theme areas as determined by the applicant.

Note that “ocean” is inclusive of ocean, coastal, and Great Lakes areas.



Climate Resilience Accelerators IOOS website: https://ioos.noaa.gov/about/governance-and-management/inflation-reduction-act/accelerators/

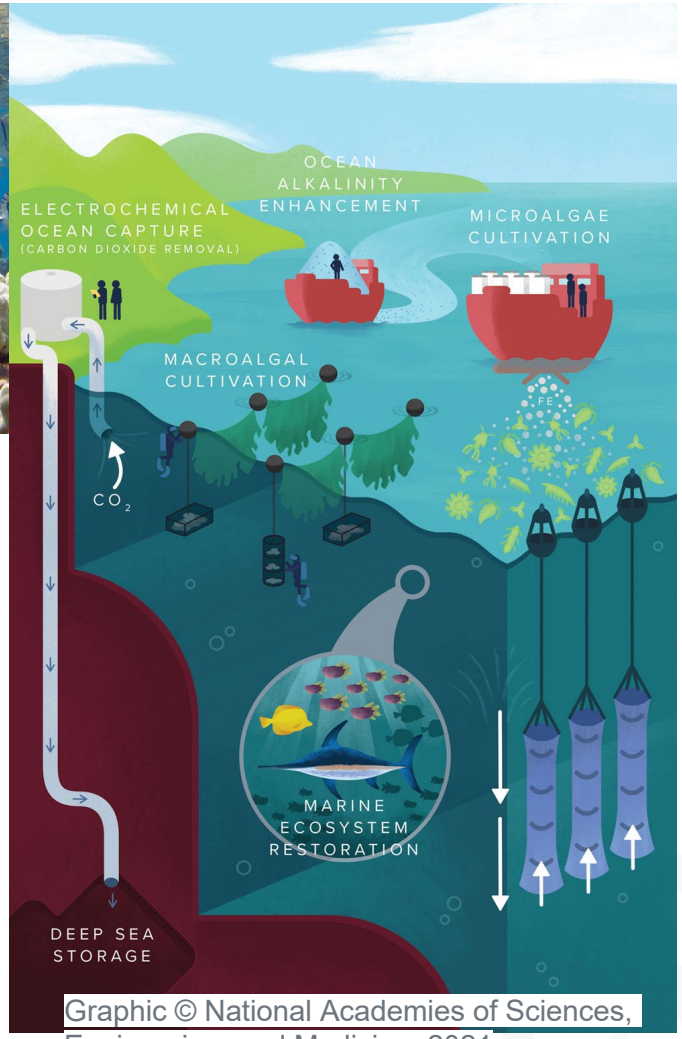
Ocean-based Climate Resilience Accelerators (partner projects)

Eligible uses of funds include:

- **$40 million** for NOAA partner projects

NOAA competitive funding programs:

- National Oceanographic Partnership Program opportunities for
  - **U.S. Marine Life Observations**
  - **Marine Carbon Dioxide Removal**
- **Ocean Technology Transition**
- **Effects of Sea Level Rise**
- **Climate Impacts in Marine Sanctuaries to Support Management**
- Convening and engagement support through NOAA BAA proposal - TBD by September



Graphic © National Academies of Sciences, Engineering, and Medicine. 2021

Thank you!

Questions?

Coastal Resilience Role for IOOS?

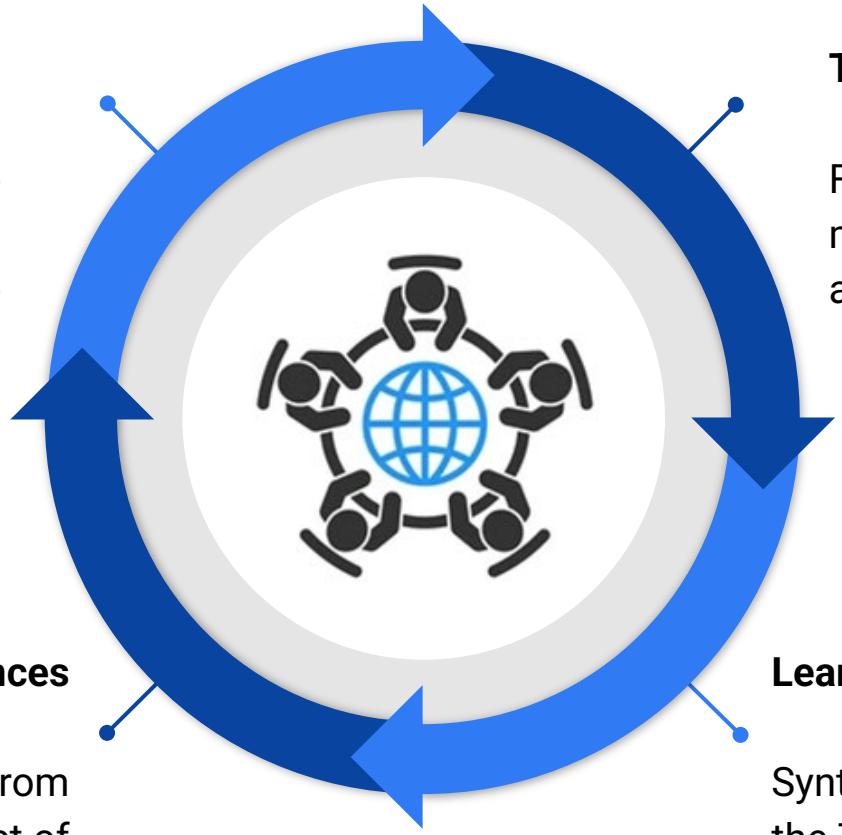
"Coastal resilience is the ability of populations, ecosystems, and economies to **prepare for, absorb, respond to, recover from, and successfully adapt to** the impacts of natural and human-caused hazards, such as hurricanes and oil spills, and long-term environmental change, such as habitat loss and sea level rise."

(National Ocean Service: draft definition March 2023)

Establishing IOOS (Ocean Enterprise) repeatable engagement process

Learning

Synthesize the information collected at the ocean-related conferences and sketch out the questions to bring back to the technical workshops



Technical Workshops

Focused on exchanging requirements, market opportunities, and needs assessments

Ocean-related Conferences

Test the outcomes and outputs generated from the Technical Workshops with a broader set of stakeholders

Learning

Synthesize the information collected from the Technical Workshops and sketch out new/improved tools and services

Workforce Development

Based on the recently completed Dialogues with Industry and input from participants at Oceanology International Americas, NOAA and NSF are developing a workshop focused on growing the ocean technical workforce.

The goal is to conduct workforce development sessions later this year at OCEANS'23 and next year at the ASLO Ocean Sciences Meeting.

IOOS ASSOCIATION

Dr. Gerhard Kuska
Chair of the Board

Kristen Yarincik
Executive Director

IOOS Association Update

NANOOS Meeting

August 10, 2023

Vision for the IOOS Association

Increase impact through strategic initiatives & focus areas that align with policy priorities

Promote greater interagency participation in IOOS and strategic observing strategies that elevates and improves sustainability of the observing enterprise

Grow capacity to support collaboration across IOOS regions

Increase visibility through greater emphasis on a variety of communications

Participate in workforce development and other initiatives that meet IOOS DEIA mission & vision

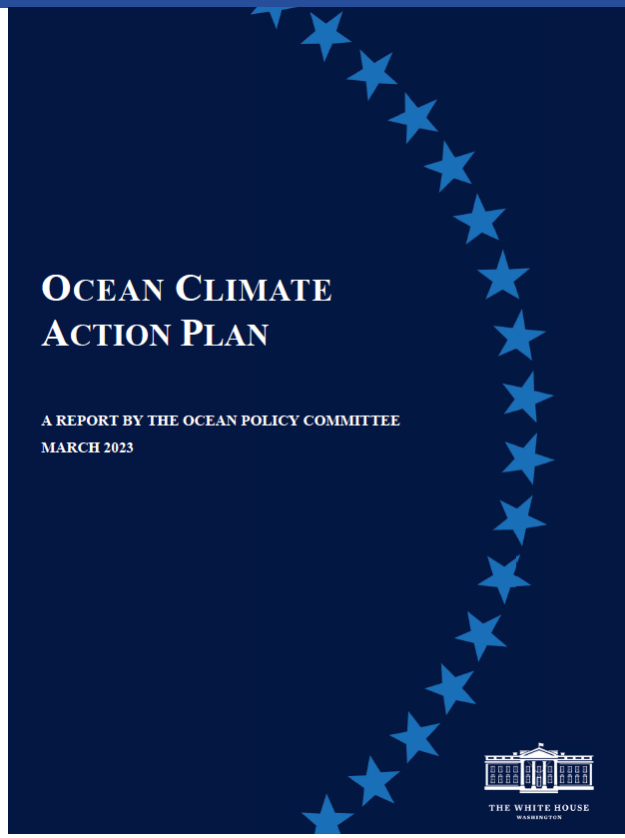
→ **Increase funding & opportunities for IOOS**

IOOS Association

Advancing Observing in Support of Policy Priorities

- **Offshore Wind Committee**
  - Share lessons learned; communication strategy, interagency & energy sector engagement
  - Goal: to best position the IOOS regions for collaboration as OSW expands around the country
  - Panel session at MTS / IEEE Oceans 2023, Biloxi, MS

- **Marine Carbon Dioxide Removal (mCDR)**
  - NOPP proposal (UCAR led - not funded, next steps TBD)
  - Goal: articulate IOOS role; leverage IOOS for mCDR environmental baselines and impact monitoring



IOOS ASSOCIATION

Advancing Observing in Support of Policy Priorities

- **NOPP Ocean Life Forum**, Aug 9-10, Edgewater, MD
  - IOOSA co-sponsoring
  - Review the recs from the 2010 NOPP workshop on Attaining an Operational MBON
  - Recommend:
    - Priorities and actions for national strategic coordination and advancement of marine biodiversity science and technology
    - Steps to establish and sustain private-public partnerships for the production and delivery of marine biodiversity information
    - Steps towards a framework to advance community coordination and action that can be endorsed at the High-Level Biodiversity Summit (being planned for 2024)
- **National HAB Observing Network (NHABON)**
  - Approps Report language: FY20: $1M; FY21: $2.5M; FY22: $2.5M; FY23: $3M
  - Projects involving all 11 regions
  - Facilitate steering committee, implementation plan, webinars

IOOS Association

Advancing Observing in Support of Policy Priorities

Inflation Reduction Act – Association role

- Convene and support RAs in pan-regional / national project development
  - IOOS RFA Topic 2 – $45M available over 5 years
  - Aug 11 “retreat” to advance project concepts
- Provide pan-regional / national project implementation support as appropriate; e.g., convening and connecting
- Support partnership building related to other IRA opportunities (e.g., competitive NOFOs) as possible / appropriate
- Communications strategy to convey the IOOS regional work, success stories, and impacts made possible by IRA funding
- Consider lessons learned to inform potential I.A. services for similar pan-reg’l/ nat’l opportunities in future (proposal development, grant mgt)

IOOS Association

Appropriations at a glance

	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Authorization Level (P.L. 116-271)	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	?
House Approps	*31*	*37.5*	*40.5*	*40.5*	*50*	*44*	**41*	*?*
Senate Approps	*33.7*	*37*	*39.5*	*40*	*47*	*46*	*42.5*	*?*
Enacted	35	38.5	39	40.5	41	42.5	?	?
IA request	35.9	42	43.7	45.25	56.5	75.3	80.5	?

IOOS Regional line; Amounts in millions of dollars. IOOS Appropriations are tracked by ESP Advisors in a shared document

*** House Subcommittee number (not publicly released)**

As of August recess, House Appropriations Committee has not marked up CJS bill.
In Senate, CJS bill has gone through full committee markup.

ESP advisors

IOOS Association

Appropriations: FY24 Landscape

- **Debt limit deal**
  - Fund FY24 at current levels; limit growth in FY25
  - House v. Senate interpretations (i.e., deal = ceiling v. target)
- **FY24 approps bills in progress**
  - IOOS Regions faring pretty well (table prev. page)
  - TBD: Conferenced bill (enacted level)
- **Non-zero chance of a Government shut-down**
  - House still has bills (incl CJS) to markup in September (after recess)
  - Hard right politics

ESP advisors IOOS Association

CARAID Award: March 21, Washington, D.C.

The word “Caraid” is a Scottish Gaelic word, meaning “care" or "love” and is pronounced like “courage.”

The attributes of Caraid - caring and the courage to do what matters - is what makes IOOS work.

Nominations for the 2024 Caraid Award open in September!

IOOS Association

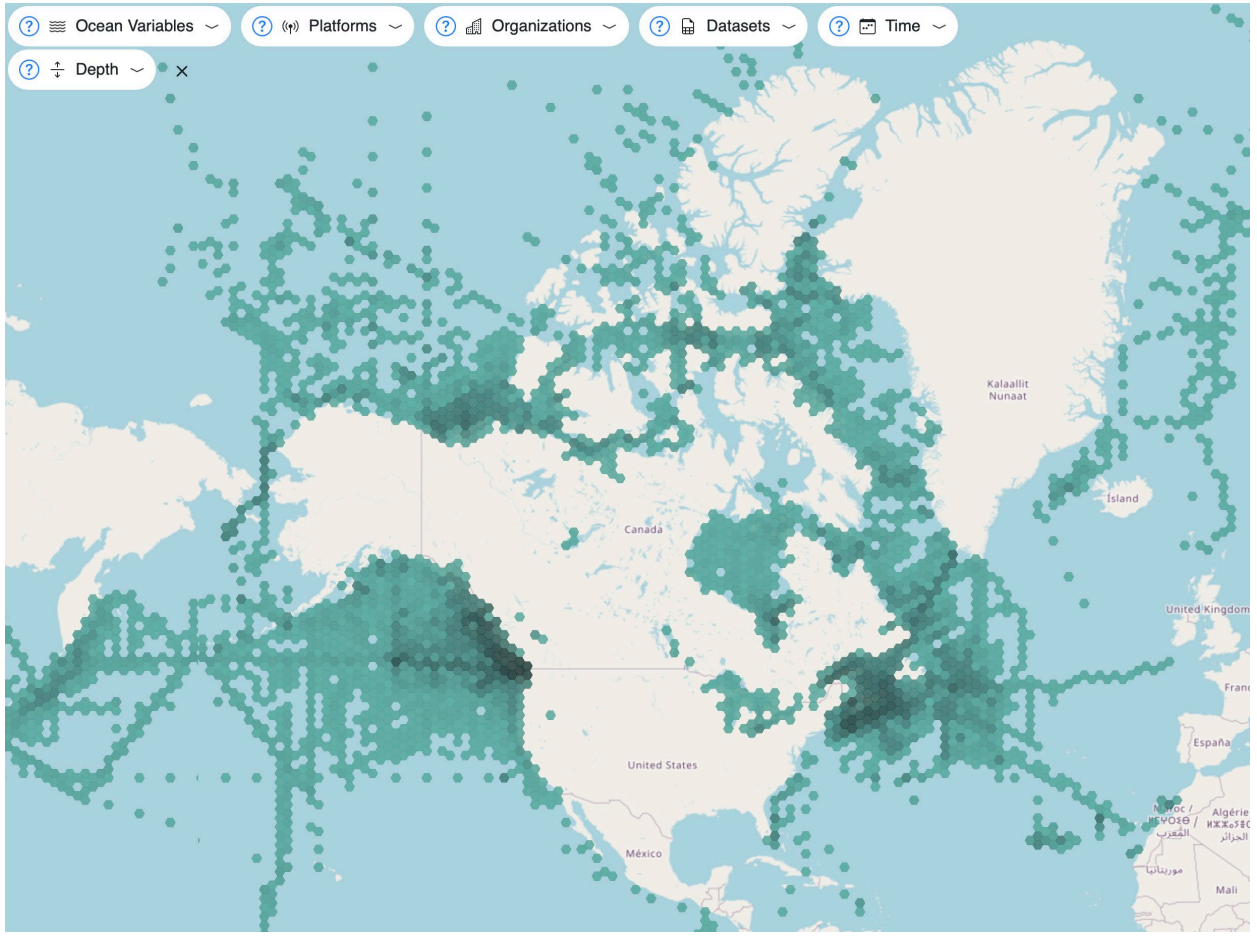
Thank You

IQOS Association

CIOOS Pacific
New Things Happening

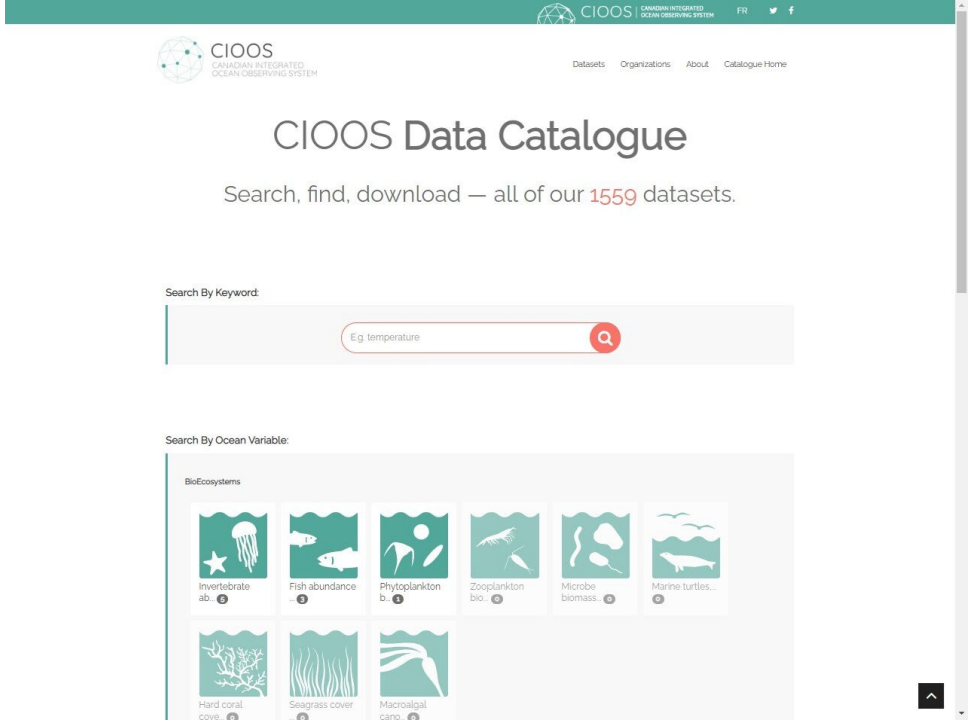
CIOOS PACIFIC
REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM

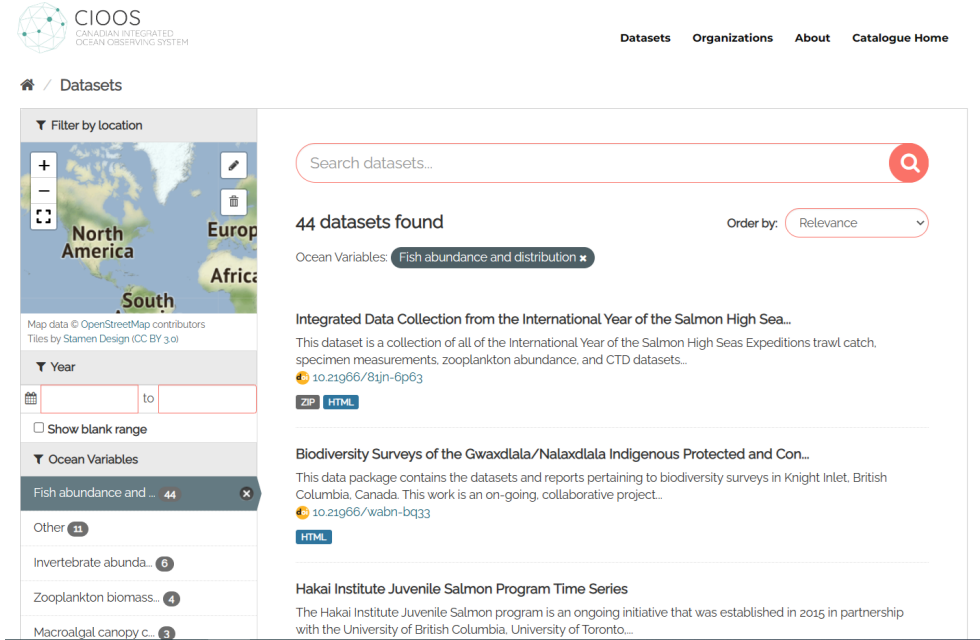
Brad deYoung
Executive Director



Data Catalogue

- Search, find and download 1532 datasets
- Ocean variables categories :
  - BioEcosystems
  - Biogeochemical
  - Cross-disciplinary
  - Physical
- Built on the CKAN web platform
- Organizations section
- Recent changes





Data Explorer

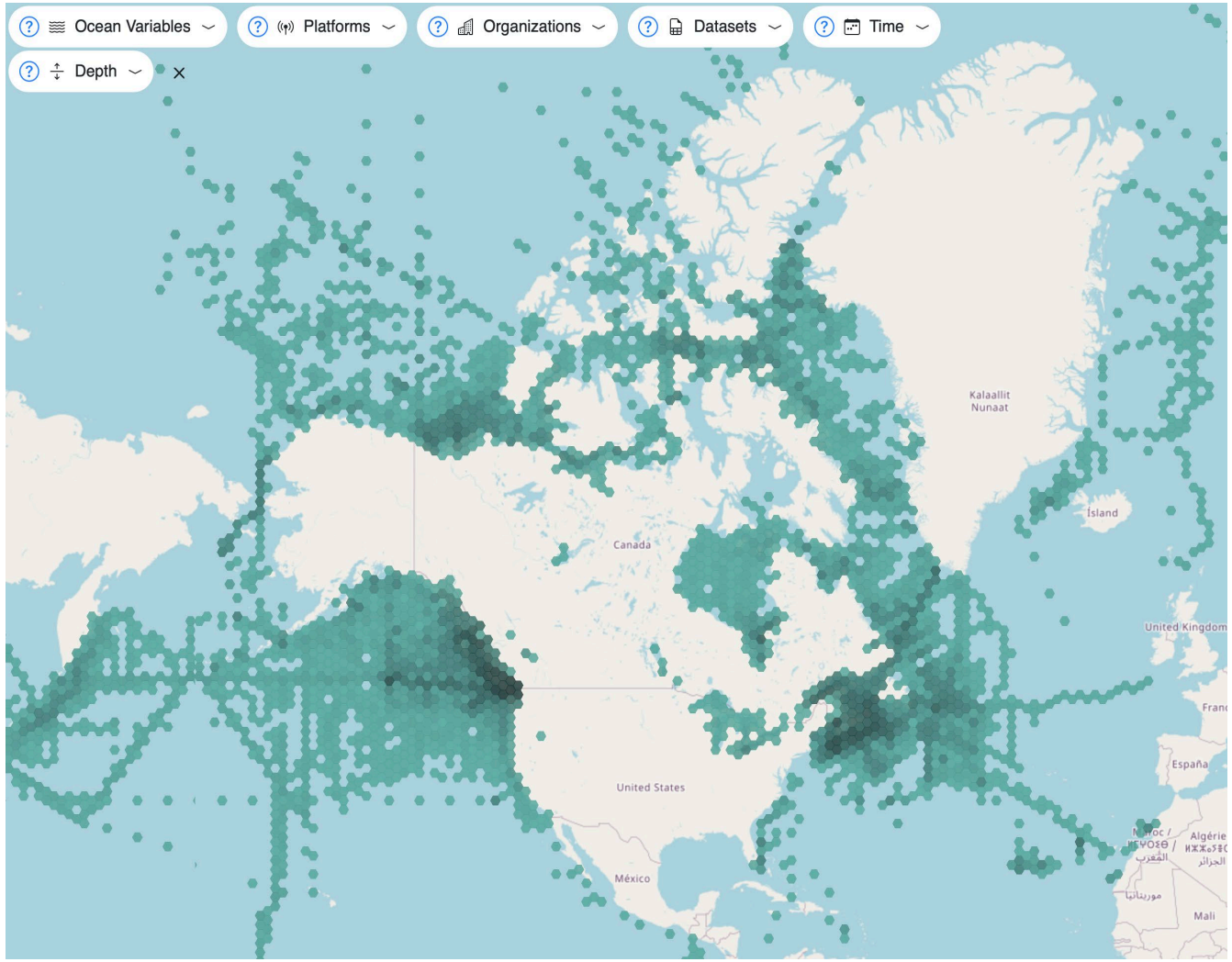
"Providing an intuitive map-based interface for exploring and downloading ocean data"

Map
- New platform/time presentation of points
- Hover any dataset to highlight data on map

Filters
- All data accessible on load
- Easy quick-select, searchable filters
- Whole-app metadata filters inside datasets

Data
- More data: > 15 TB across >1400 datasets
- Data is searchable and sortable
- Dataset table and plot previews for records

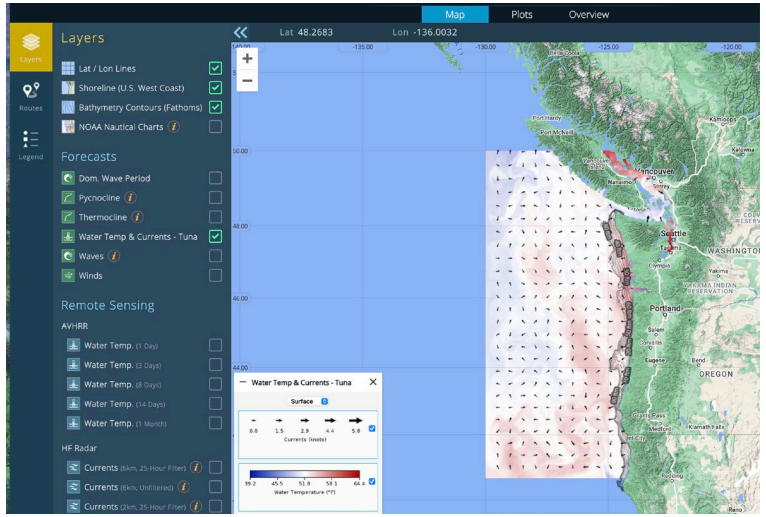
Download
- Filtered downloading for datasets <= 1GB
- Quick links to ERDDAP for dataset > 1GB



Present Information Services - Examples

- Lots of different services for weather information
- Most offer free entry with fee for ‘premium’ service
- Commercial apps often have limited ocean data, and often at low resolution
- Ocean data services still developing

Windy

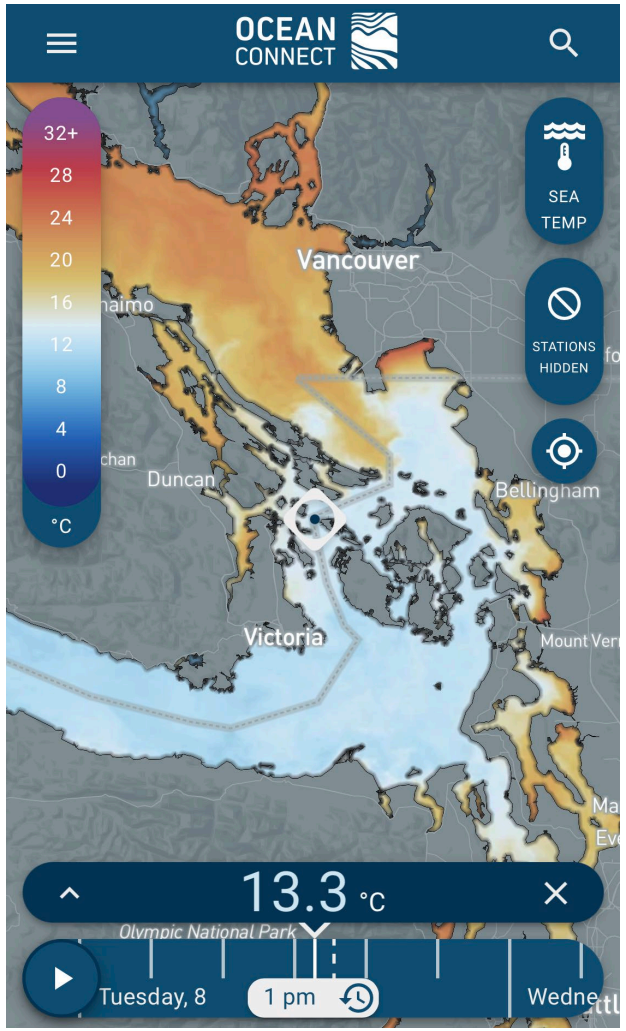


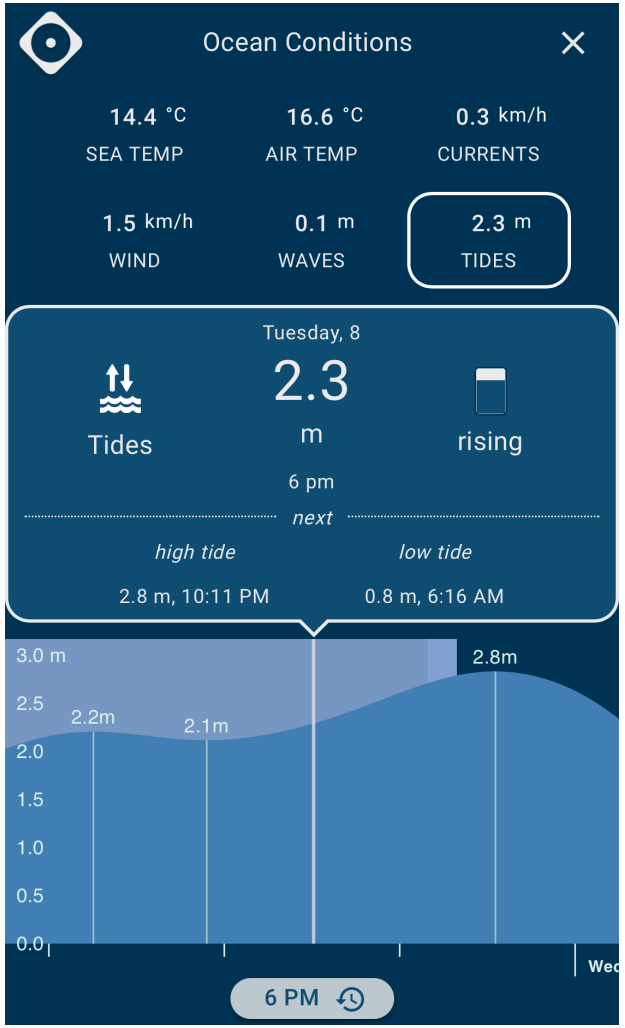
NANOOS - TunaFisher

Seagull - GLOS

CIOOS PACIFIC
REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM

Ocean Connect
New Information Service

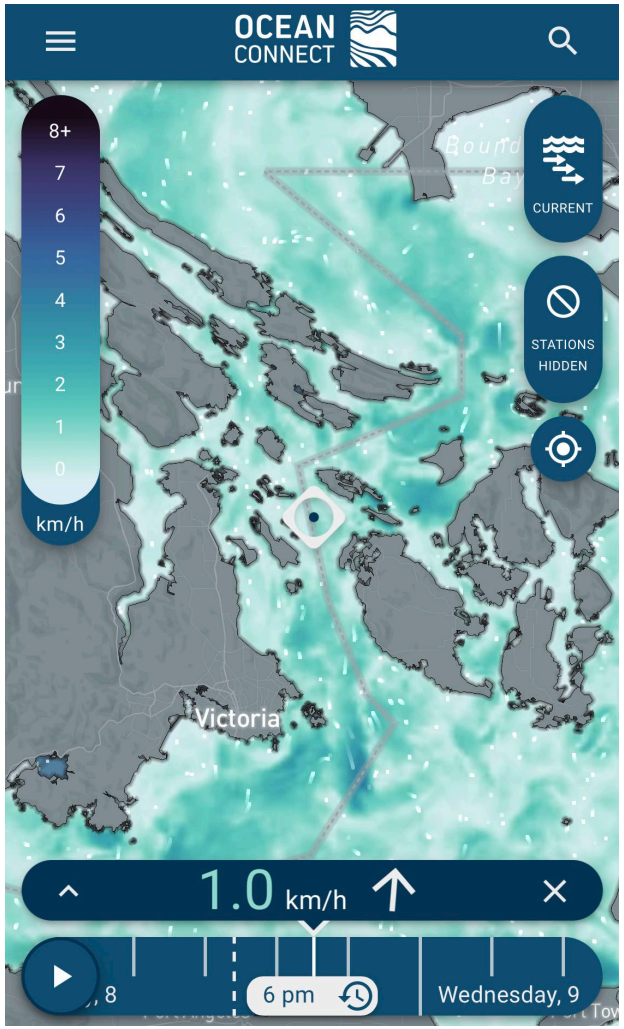


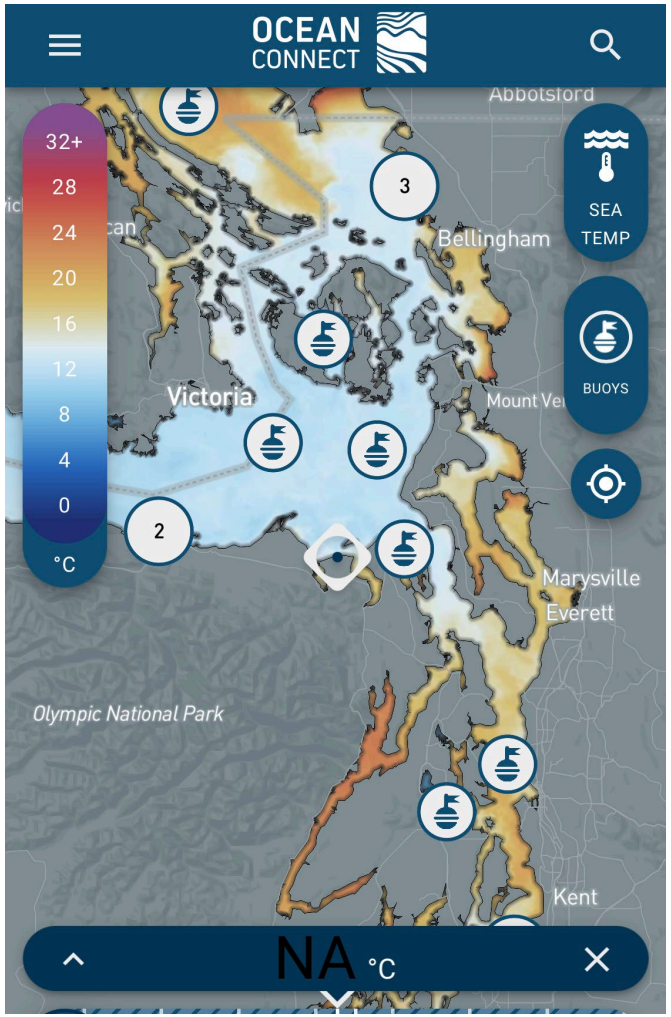


- Provide information, not just data, to non expert users e.g. boaters, fishers, coastal communities, …
- Information provided through a graphical interface, focus on phone users - simple and easy
- Offer layers of data - model, historical and station data
- Focus on ocean and atmosphere, new access to model data
- Initial focus on the Salish Sea

CIOOS PACIFIC
REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM

Key components of Ocean Connect





- Builds upon machinery of OceanGNS glider interface (Memorial University)
- SalishSeaCast NEMO Model – UBC-ECCC – S. Allen
- ECCC weather forecast models
- Provides access to real-time coastal wind, ocean data
- Provides access to real-time camera video from around the Salish Sea

Some questions and challenges

CIOOS PACIFIC

REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM

- How do we build the user base for these new services?
- How we do help new users to work with and benefit from the applications?
- Do we need to tailor these applications towards specific groups of users?
- What other data/model streams should we connect with?
- Should these become commercial services?

Aja DeCoteau
Executive Director
Columbia River Inter-Tribal Fish Commission

NANOOS GC/PI Meeting

August 10, 2023

Wy-kan-ush-pum (Salmon People)

salmon [spiritual or ceremonial usage]

people of

This gift of salmon has defined the region’s cultures since time immemorial.

Sovereign Nations

Tribes are sovereign nations with treaty rights including the right to fish for salmon. Courts recognize this to include the right to ensure that salmon continue to return to the rivers.

The four treaty tribes of the Columbia River formed CRITFC in 1977 with the goal of putting fish back in the river.

NANOOS also includes the Quinault Indian Nation, Quileute Tribe, Port Gamble S'Klallam, and 17 other tribes through NWIFC.

Wy-kan-ush-mi Wa-kish-wit

salmon [spiritual or ceremonial usage]

spirit

In 1995, the four tribes released the tribal restoration plan Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon).

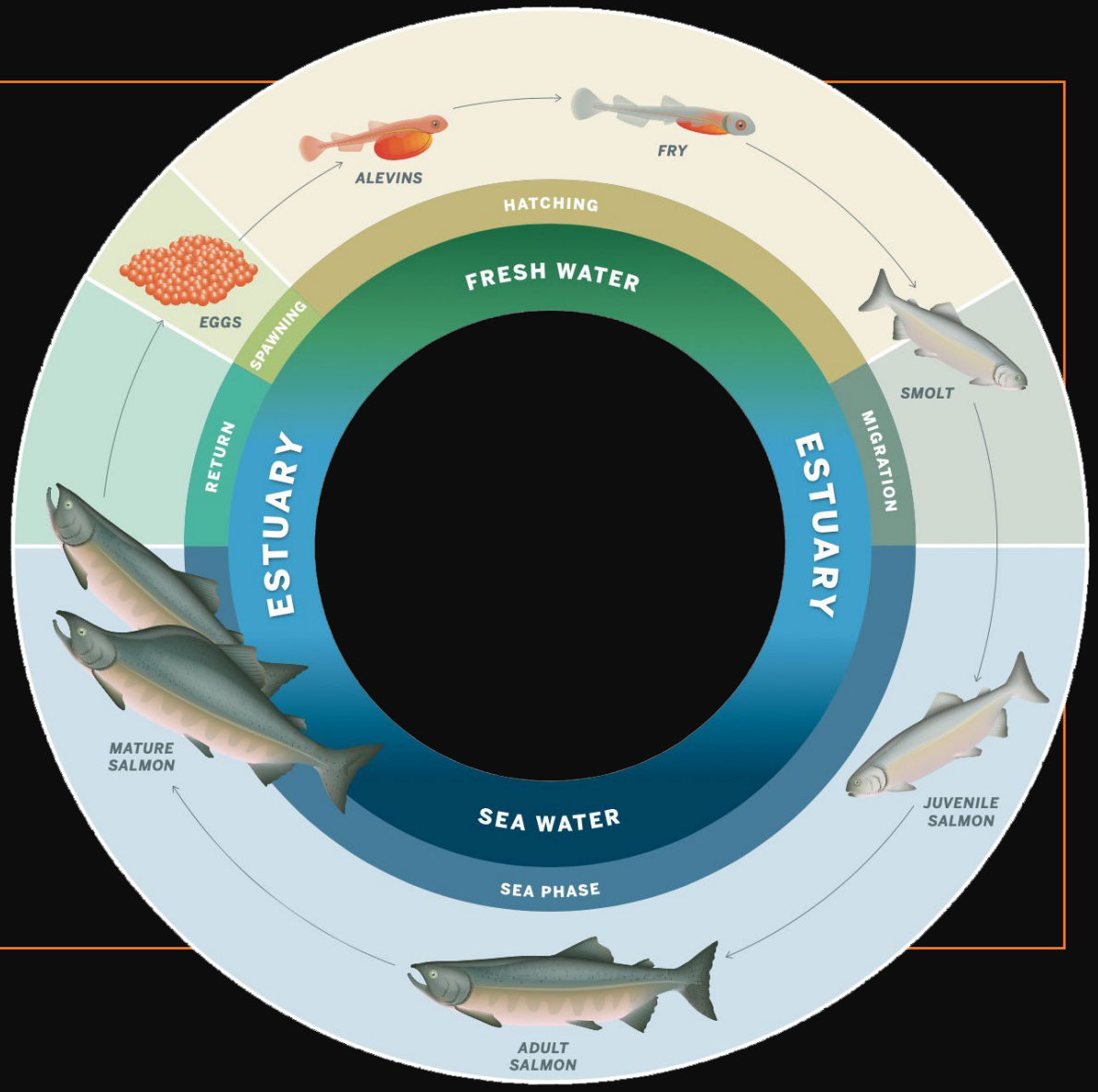
This holistic restoration plan addresses impacts salmon face throughout their lifecycle, from headwaters to mainstem to estuary to ocean.

In its first 25 years, tribal restoration efforts focused on the mainstem and watersheds of the Columbia.

Completing the Circle

Tribes have reiterated the importance of addressing the **estuary and ocean connection** in the face of climate change

CRITFC acquired the CMOP portion of NANOOS to strengthen its work on this side of the salmon life cycle.



Preparing for Future Changes

The four tribes recognize NANOOS and IOOS as important tools for monitoring ocean and coastal conditions that matter to salmon.

More data are needed connecting ocean conditions to the salmon food web.

We view the future development of NANOOS as an opportunity to strengthen biological and ecosystem monitoring in the estuaries and coastal Pacific.

My Strength is From the Fish

Strengthening monitoring of the rich, complex, and dynamic Columbia River estuary system and of the coastal Pacific Ocean has far-reaching impacts and helps us in the goal of protecting and restoring salmon that nourish the entire region.

Inflation Reduction Act (IRA) Opportunity

FY23–26 Inflation Reduction Act
● **Coastal, Economic, and Climate Resilience** = $3.3B for NOAA over 4 years ○ Coastal Communities & Climate Resilience = $2.6B ○ Enable coastal communities to prepare for extreme storms and other changing climate conditions ○ Support natural resources that sustain coastal and marine resource dependent communities ○ Support marine fishery and marine mammal stock assessments

IRA RFA Basics

- **Project duration:** Up to 5 years
- **Funding:** Total available $100M
- **Mechanism:** Cooperative agreements
- **Topic Area 1**: Work with regional-specific outcomes, $55M
  - Improve coastal resilience
  - Advance equitable service delivery
  - Span within the regional geography
- **Topic Area 2:** Work with shared outcomes, nationally or among multiple RAs
  - Address national or pan-regional coastal resilience priorities
  - Advance equitable service delivery
  - Bring RAs to work together
  - Span across multiple/all regional geographies

Coastal Resilience Role for IOOS?

"Coastal resilience is the ability of populations, ecosystems, and economies to **prepare for, absorb, respond to, recover from, and successfully adapt to** the impacts of natural and human-caused hazards, such as hurricanes and oil spills, and long-term environmental change, such as habitat loss and sea level rise."

(National Ocean Service: draft definition March 2023)

IRA Planning

Core Capacity	Unfunded Tier 2	Product Development	Capability/System Enhancement

Inflation Reduction Act (IRA)

- QR code to survey
- Paper copies at sign-in table, if desired

Other Items to Discuss

- Nominations for IOOS Advisory Council
  - 10 of the 15 members will rotate off in Sep 2024
  - Broad solicitation
- NANOOS Executive Committee

NANOOS GC Board 2022-2023

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:

- Aja deCotreau, 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:

- Kim Thompson, 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 (*Interim*), Surfrider, Governing Council Board Member for Non-Governmental Organizations

At Large:

- Kate Litle (*Interim*), 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

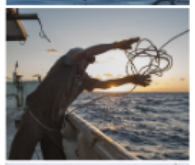
nanoos.org
IOOS in the Pacific Northwest

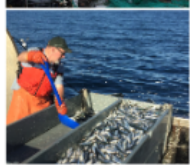
IOOS Integrated Ocean Observing System

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 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

nanoos.org
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!!!

Member Updates from the Floor

Survey QR Code:

Adjourn & Lunch