

NANOOS Governing Council & Principal Investigators Meeting

01-02 August 2022

Northwest Association of Networked Ocean Observing Systems
Integrated Ocean Observing System (IOOS)
Regional Association for the Pacific NW

www.nanoos.org

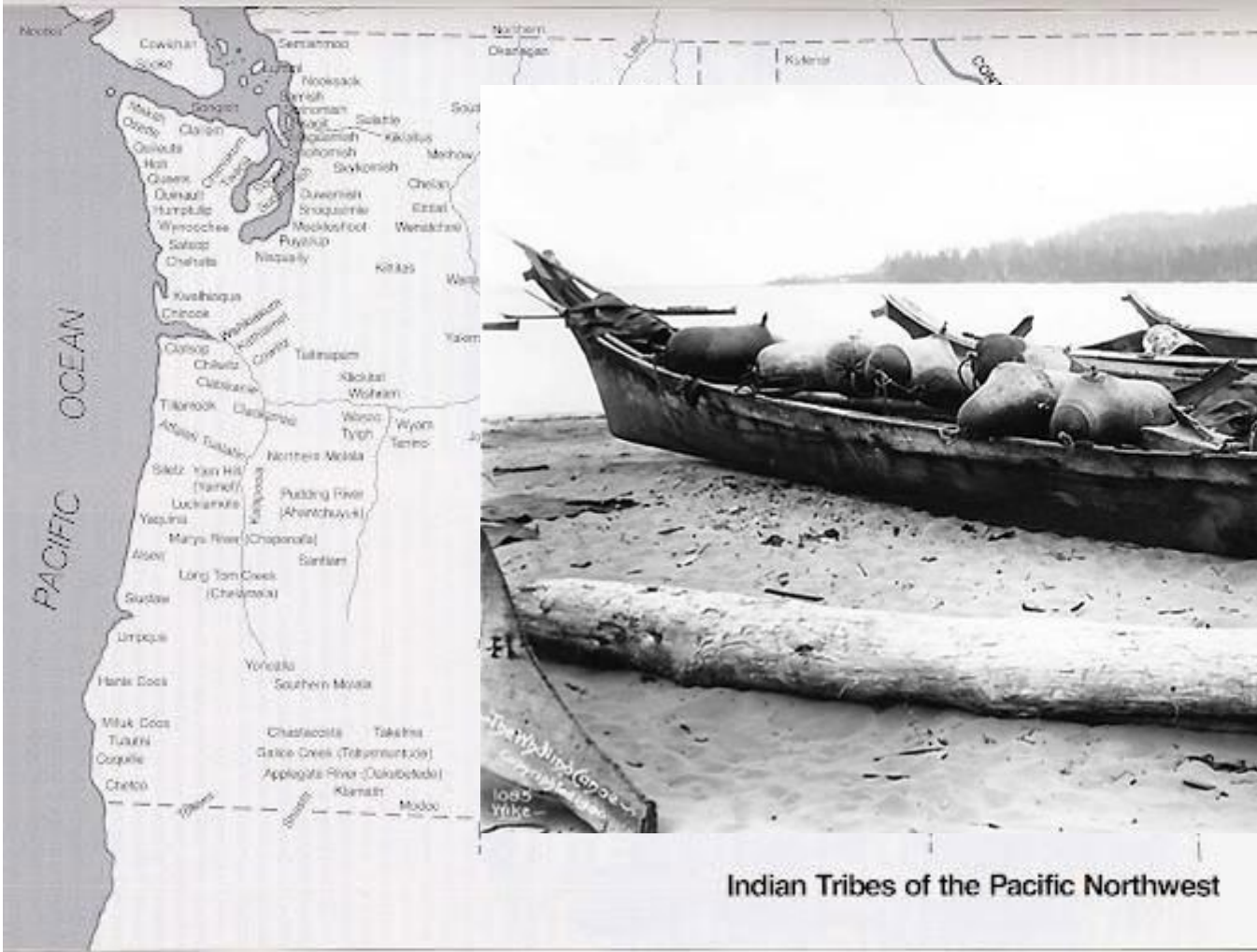




Welcome !

Jan Newton, NANOOS Executive Director

Acknowledgment



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Northwest Association
of Networked Ocean
Observing Systems

Introductions

- Please share your name and who you represent in the chat
- We will have mini-breakouts to connect with people



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of Networked Ocean
Observing Systems

GC-PI Agenda: 01 August 2022

| TIME | TOPIC |
|-------|---|
| 10:05 | Virtual Meet and Greet (Mini Breakouts) |
| 10:15 | Call to Order |
| 10:20 | NANOOS Accomplishments & Vision & Q/A |
| 10:55 | IOOS Program Office Updates & Q/A |
| 11:15 | IOOS Association Recap & Q/A |
| 11:35 | Special Recognition |
| 11:40 | Member Updates from the Floor |
| 12:00 | Lunch (Optional Networking Breakouts) |
| 1:00 | NANOOS Tri-Comm Chairs Updates & Q/A |
| 1:40 | Moderated Discussion <ul style="list-style-type: none">● General Feedback● Workshop Recap● Marketing Needs● Webinar Series |
| 2:50 | Recap & Action Item review |



Call to Order

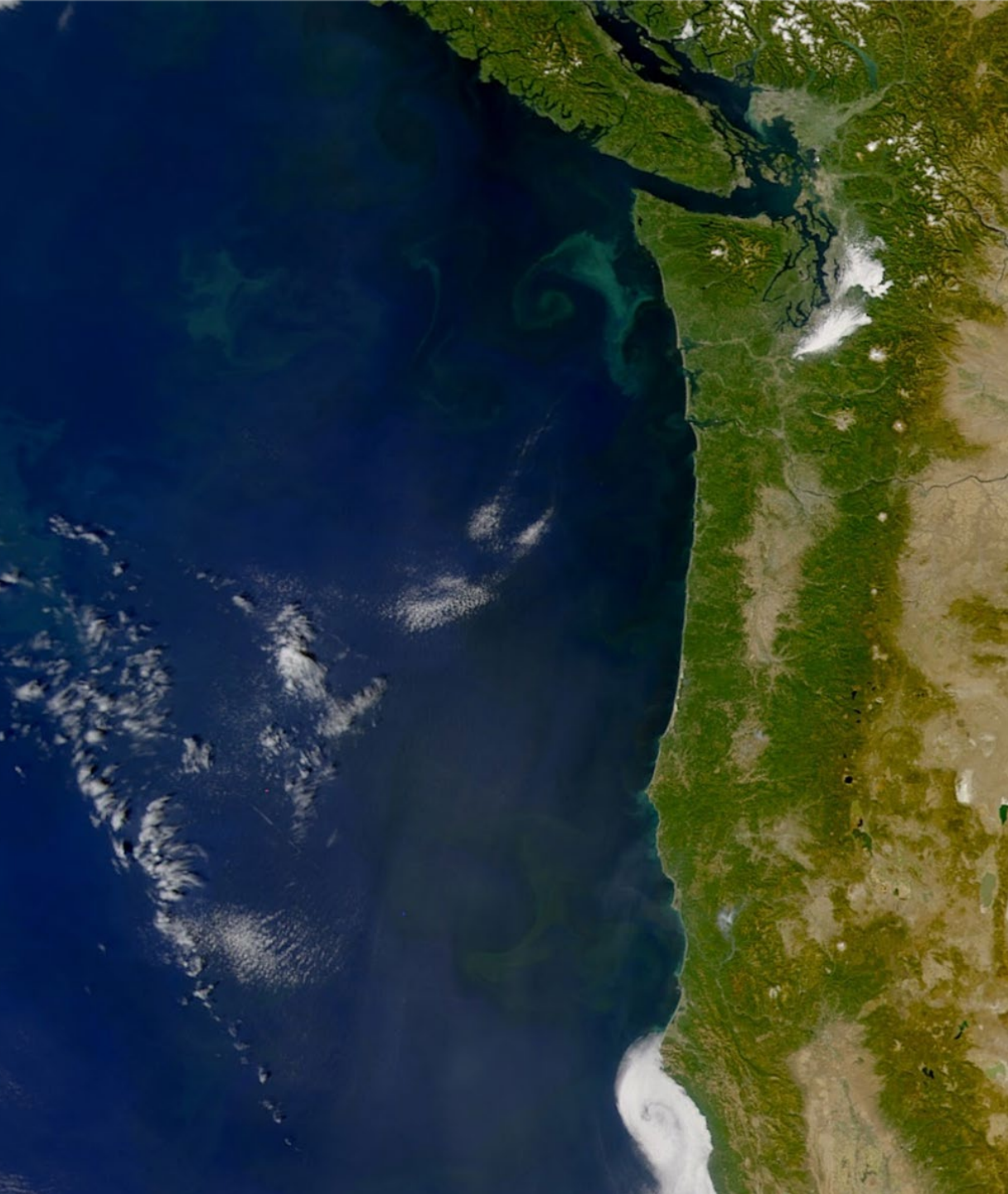
Andrew Barnard, NANOOS GC Board Chair



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Accomplishments & Vision

Jan Newton, NANOOS Executive Director



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 WC)
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
- Shoreline: erosion, inundation
- Hazards: Search and rescue, national security
- Educators: formal, informal, research
- Marine recreation: boating, surfing, diving



Governing Council 8/2022

- 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. Say Yes to Life Swims
- 61. NOAA PMEL
- 62. Hakai Institute
- 63. Salish Sea Expeditions
- 64. Aquatic Innovations Research
- 65. Long Live the Kings
- 66. Rockland Scientific
- 67. Northwest Indian College
- 68. Pacific Shellfish Institute
- 69. Weatherflow
- 70. Oceans Blue Corp
- 71. Columbia River Inter-Tribal Fish Commission
- 72. World Ocean Council
- 73. Ocean Aero
- 74. RBR Ltd
- 75. Scoot Science



NANOOS Objectives for Y2 / FY2022 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 **regional 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 Budget Over Time

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

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

FY11: **\$2,087,500** (*w/ new start date*)

FY12: **\$2,428,291** (\$2,288,000 base; ~\$140K for DMAC, OA workshops)

FY13: **\$3,089,477** (\$2,392,136 base; ~\$700K for OTT on OA plus OAP)

FY14: **\$2,818,441** (\$2,442,136 base; \$109K HF; \$217K OAP; \$50K glider)

FY15: **\$2,771,890** (\$2,462,136 base; \$309K OAP)

FY16: **\$2,848,900** (\$2,452,552 base; \$317K OAP; \$79K adds)

Year 10 or 1 of new 5-y award

FY17: **\$3,216,463** (\$2,457,136 base; \$360K HFR; \$282K OAP; \$117K adds)

Year 11 or 2

FY18: **\$3,264,472** (\$2,462,136 base; \$180K HFR; \$330K OAP; \$291K adds)

Year 12 or 3

FY19: **\$3,485,217** (\$2,462,136 base; \$375K obs; \$379K OA; \$269K adds)

Year 13 or 4

FY 20: **\$3,923,322** (\$2,462,136 base; \$546K add to base; \$373K OA; \$250K HABs; \$292K adds)

Year 14 or 5

FY 21: **\$3,932,271** (\$2,462,136 base; \$546K add to base; \$33k increase; \$409K OA; \$298K HABs; \$184K adds)

Year 15 or 1 of new award

FY22: **\$4,034,112** (\$3,076,136 core (1st three above + \$35k); \$430k HABs; \$29k HFR; \$459k OA; \$40k adds)

Year 16 or 2 of new award

FY22 (Year 2 of New Award) Details

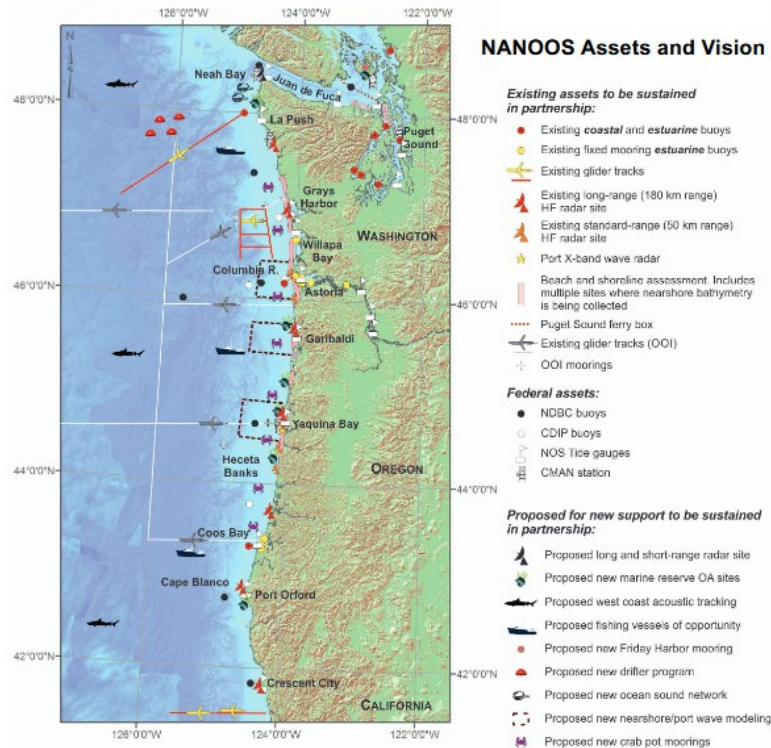
- **\$4,034,112** total
- \$3,076,136 core + \$35k increase
- National HAB-ON: \$430k
- HFR 1-time re-tune: \$29k
- NOAA OAP support: \$459k
- Pass throughs: MERHAB ship-time, \$32k
- Ocean-Hack Week: \$7.5k



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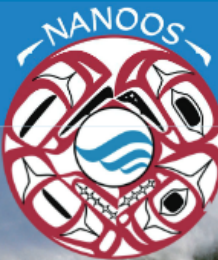
Growing NANOOS' 5-y proposal




- Continued funding
- Strong Congressional support:

“The Committee notes the importance of the IOOS network that provides marine information used in disaster response, weather forecasting and hurricane prediction, forecasting of freshwater and marine water quality, detection of harmful algal blooms [HABs], and safe maritime operations.”

Congressional Outreach



NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS
NANOOS enhances 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






"This app is great for homeowners on the coast as well as visitors who are planning trips. Knowing where you are in the tsunami zone means you will be better prepared should a tsunami occur. You can bookmark places and save or print a unique evacuation map centered on your home, workplace, hotel or even campsite. Users can then determine their nearest point of high ground outside the evacuation zone and develop a plan for how to get there."
— Jon Allan, Coastal Geomorphologist, Oregon Department of Geology and Mineral Industries

"The beach and shoreline monitoring data supported by NANOOS has been instrumental in helping to support [Oregon state] requirements, such as completing new FEMA regulatory maps, updating the science for fore-dune management planning purposes, developing coastal hazard zone maps to guide development, and monitoring dynamic revetments used for mitigating the effects of coastal erosion."
— Patty Snow, 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

nanoos.org
IOOS in the Pacific Northwest

NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS
NANOOS assets provide 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 of 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

nanoos.org
IOOS in the Pacific Northwest





IOOS Association Dues

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

For last year, this was split by:

- Seabird Scientific
- Pacific Coast Shellfish Growers Association

THANK YOU!!!

NANOOS GC Board 2020-2021



Academic:

- Parker MacCready, UW, Governing Council Board Member for UW
- Mike Kosro, OSU, Governing Council Board Member for OSU (**VICE CHAIR**)
- **OPEN**

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:

- **OPEN**
- **OPEN**

Federal:

- Kevin Werner, NOAA NWFSC, Governing Council Board Member for Washington Federal Offices
- Andy Lanier, Governing Council Board Member for Oregon Federal Offices

Industry:

- Dawn Smart, PCSGA, Governing Council Board Member for Industry
- **OPEN**

NGO:

- Fritz Stahr, OIP, Governing Council Board Member for Non-Governmental Organizations
- Gus Gates, Surfrider, Governing Council Board Member for Non-Governmental Organizations

At Large:

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



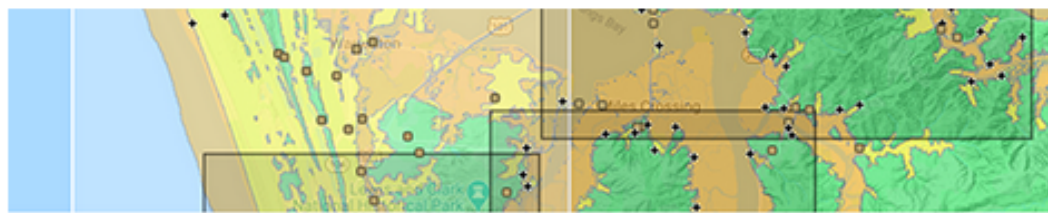
2021-2022 highlights:

- Community Workshop
- Enabling Change Working Group
- Oceanography “Multi-stressor observations and modeling”
- Backyard Buoys NSF award
- HABs
- Collaborations with Canada
- NANOOS as a NEXUS organization
- UN Decade Stakeholder Workshop
- UN Ocean Conference



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• **NANOOS Workshop** •



March 25, 2022



NANOOS Community Workshop 2022

NANOOS held its virtual community workshop on 25 March 2022 and we would like to thank all those who participated! We had exceptional presentations from our users on Fisheries, Coastal Hazards, and Maritime Safety. The day was filled with rich conversation about how we can improve NANOOS services and how we can expand the reach of NANOOS within and beyond existing user communities. For more information and to watch the proceedings, please visit the workshop page.

[Workshop Site](#)

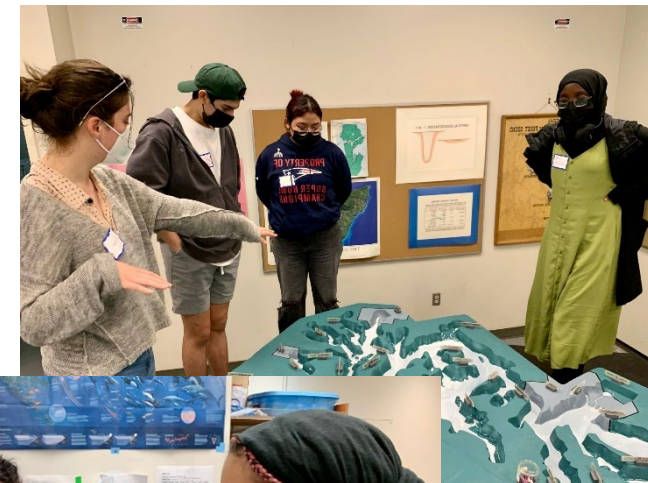


Enabling Change

NANOOS efforts supporting Diversity, Equity, Inclusion

- NANOOS Enabling Change Workgroup
 - Initial activity in WA (test-bed)
 - Expand efforts throughout NANOOS

**Join Rachel Wold in the
“Enabling Change Brainstorm”
Breakout Session at Lunch**





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Multi-Stressor Observations and Modeling

NANOOS and partners have published an article on the importance of working in partnership to observe and model ecosystem multi-stressors in a recent supplement to *Oceanography*, "Frontiers in Ocean Observing: Documenting Ecosystems, Understanding Environmental Changes, Forecasting Hazards". The article led by and involving many NANOOS PIs, "Multi-Stressor Observations and Modeling to Build Understanding of and Resilience to the Coastal Impacts of Climate Change", describes how ocean observing systems and collaborations can help the Pacific Northwest region face challenges presented by climate change.

[Read the Article](#)

Oceanography

THE OFFICIAL MAGAZINE OF THE OCEANOGRAPHY SOCIETY

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OPEN ACCESS

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

[Jan Newton](#) [Parker MacCready](#) [Samantha Siedlecki](#) [Dana Manalang](#) [John Mickett](#) [Simone Alin](#) [Ervin "Joe" Schumacker](#) [Jennifer Hagen](#) [Stephanie Moore](#) [Adrienne Sutton](#) [Roxanne Carini](#)

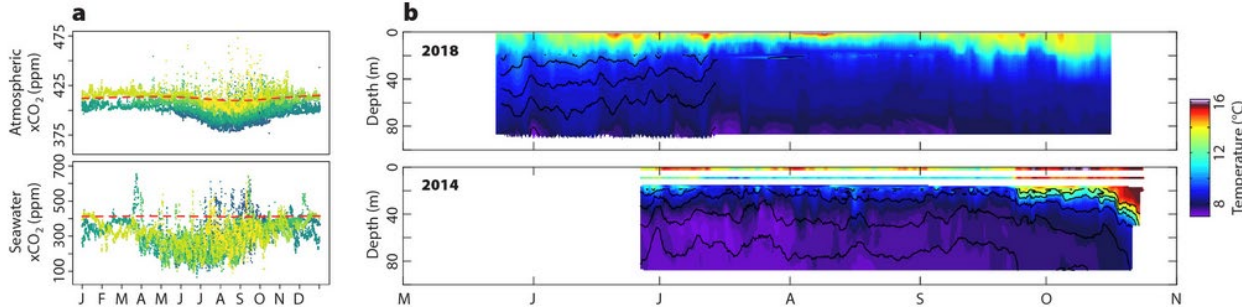
Published Online: January 7, 2022

Export Article Citation: [BibTeX](#) | [Reference Manager](#)

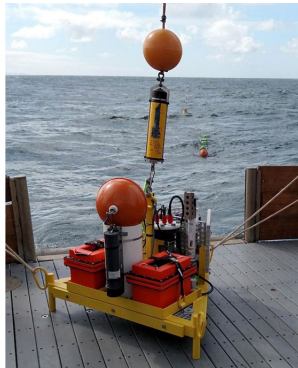
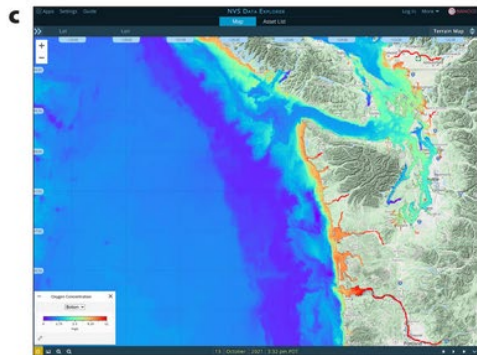
<https://doi.org/10.5670/oceanog.2021.supplement.02-31>

Share

Full Article: [PDF](#)



“The need for reliable and timely ocean information is strongly felt by coastal communities to ensure their safety, livelihood, and provisioning. Partnerships and integrated multi-use data and models offer diverse user groups the information they need for enhancing resilience to climate change. ***We conclude that through two human qualities—the willingness to partner and the dedication of scientific investigators and technicians (as evidenced by buoy servicing throughout the COVID pandemic)—solutions are being found that increase our collective ability to face these challenges.*** NANOOS and sister IOOS ocean observing systems were designed to meet society’s needs for coastal resilience based on a strong scientific foundation and technology development. ***Such partnerships, founded on mutual respect and inclusion, must be sustained into the future.***”





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Northwest Association of Networked Ocean Observing Systems



Empowering Coastal Indigenous Communities

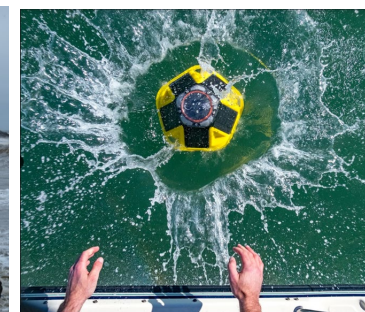
NANOOS, AOOOS, and PacIOOS are collaborating with Sofar Ocean Technologies and coastal Indigenous partners in each region on a community-led ocean observing project funded by the NFS Convergence Accelerator program. Backyard Buoys uses simple and affordable instruments, called "Spotters", to put access to and stewardship of ocean data in the hands of those most affected by climate change on the coast.



BACKYARD BUOYS

[Read About the Project](#)

[Watch the Video](#)





HABs in the PNW



Pacific Northwest Harmful Algal Blooms Bulletin

May 26, 2022 HAB risk =

HAB risk key:

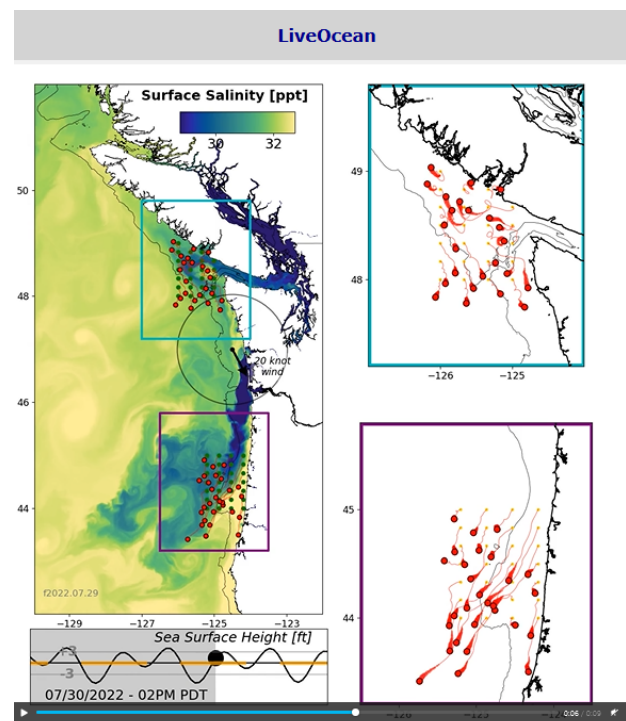
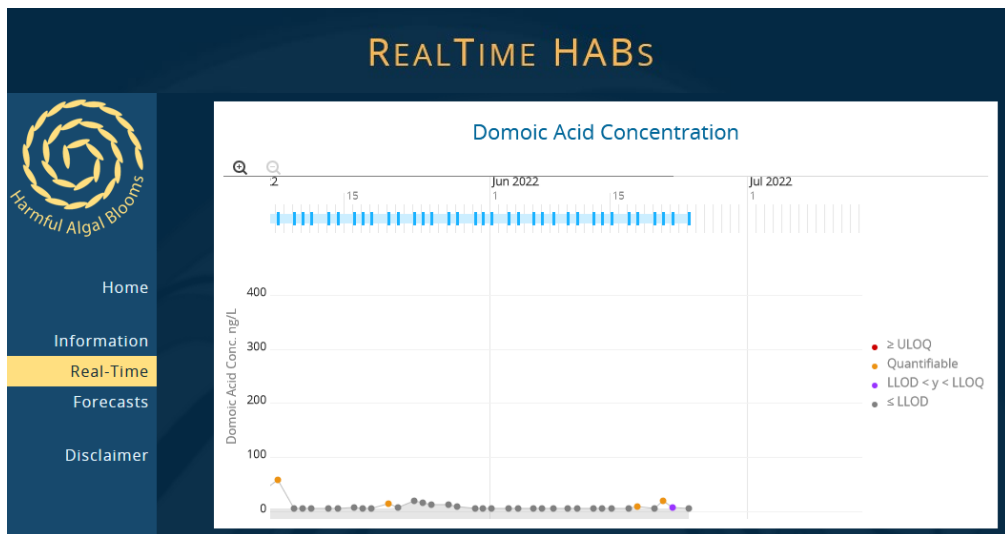
- = low
- = medium
- = high

School of Oceanography University of Washington

Cooperative Institute for CLIMATE, OCEAN & ECOSYSTEM STUDIES

ORHAB PARTNERSHIP

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



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.

Canadian partners

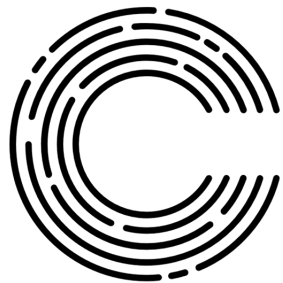


The Marine Environmental Observation, Prediction and Response Network (MEOPAR) is a national Network of Centres of Excellence linking top marine researchers and highly qualified personnel across Canada with partner organizations and communities.



CIOOS PACIFIC

REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM



COAST

The Centre for Ocean Applied Sustainable Technologies (COAST) is a collaborative call to action from our region's ocean and marine sector, including entrepreneurs, corporations, academia, investors and government, to strengthen our position in the immense and emerging blue economy.

**"Global Ocean Observation -
Opportunities for Pacific Canada"**
23 March 2022



Ocean Decade Collaborative Center Northeast Pacific

The UN Decade of Ocean Science for Sustainable Development (2021-2030) will catalyze ocean science solutions for sustainable development, connecting people and our ocean.

The Ocean Decade Collaborative Center for the Northeast Pacific will make the UN Ocean Decade a success by providing support for:

- co-design and co-production of scientific projects
- identifying collaboration opportunities and connecting to global programmes
- engaging scientists, knowledge-holders, students, policy-makers and decision-makers, industry groups and community members
- technical and scientific capacities to support Decade Actions

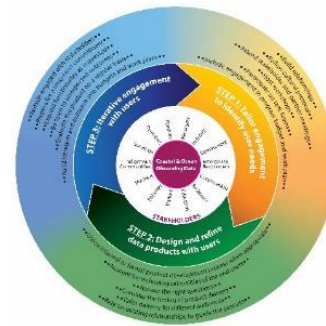
"Co-designing applied ocean models to support community decision making in the NE Pacific" 13 May 2022

UN Decade of Ocean Science for Sustainable Development



As a Nexus Organization, NANOOS can ‘connect the dots’ of regional issues within a global framework.

- We offer a platform for engaging local stakeholders into the Decade
- And strive to connect the broader user community across all of the Decade programs.



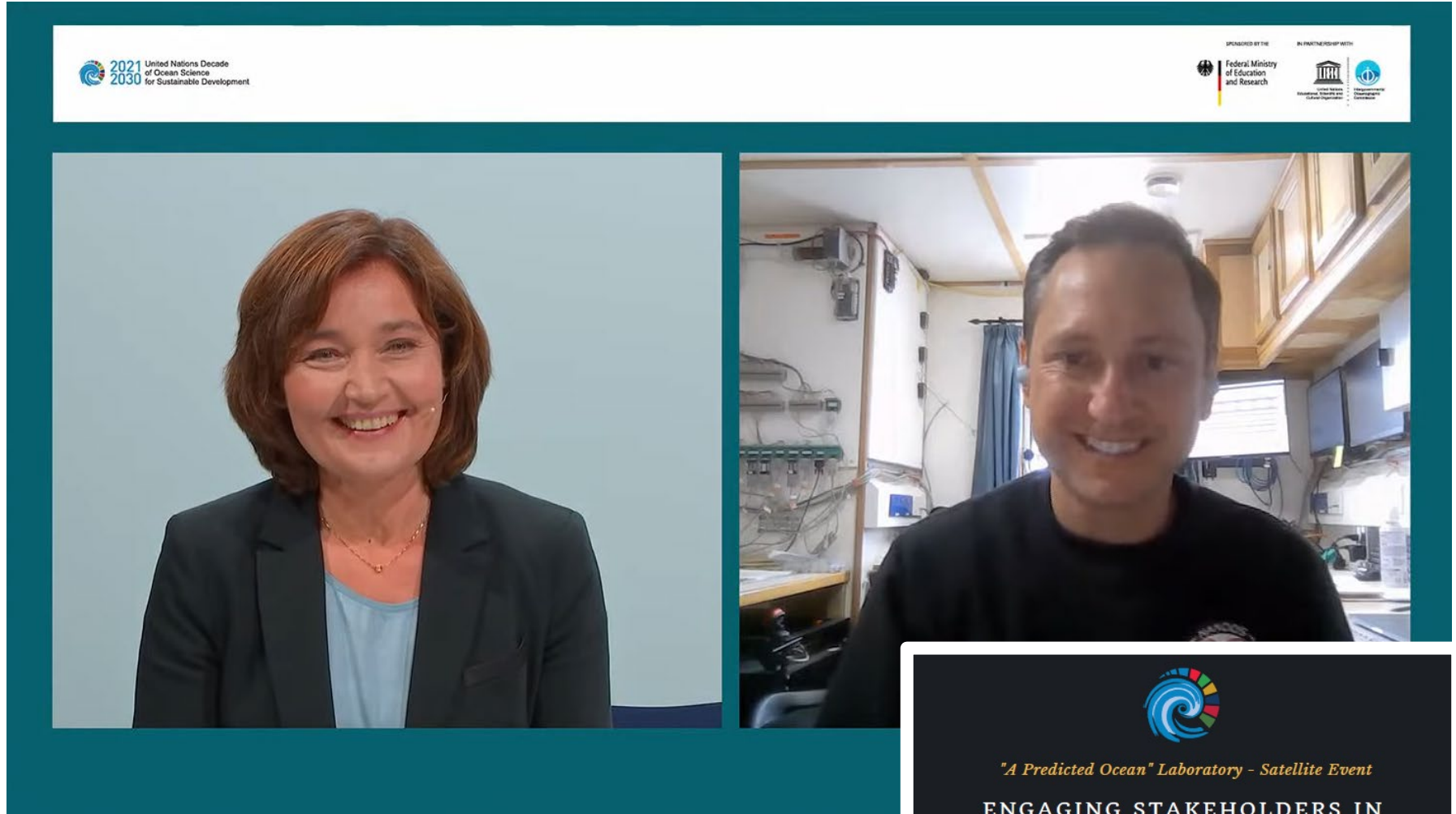
Engaging Stakeholder In Decade Programs

A Predicted Ocean Laboratory

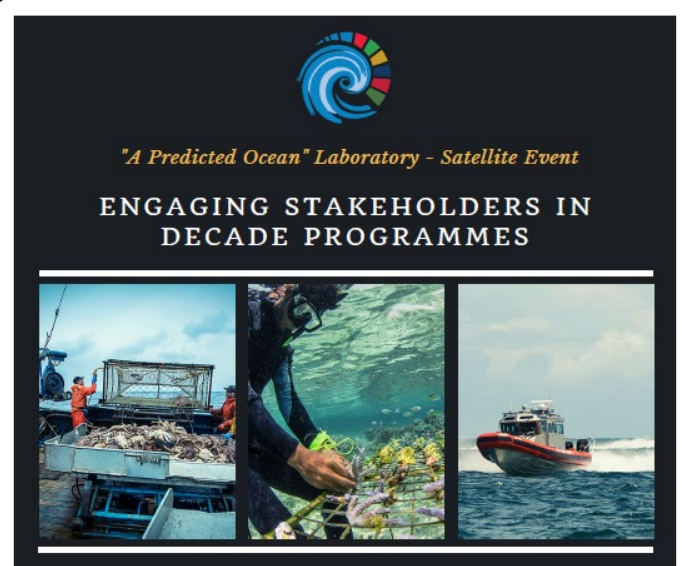
September 16th
7-11PM CEST

Wrap Up Interview:

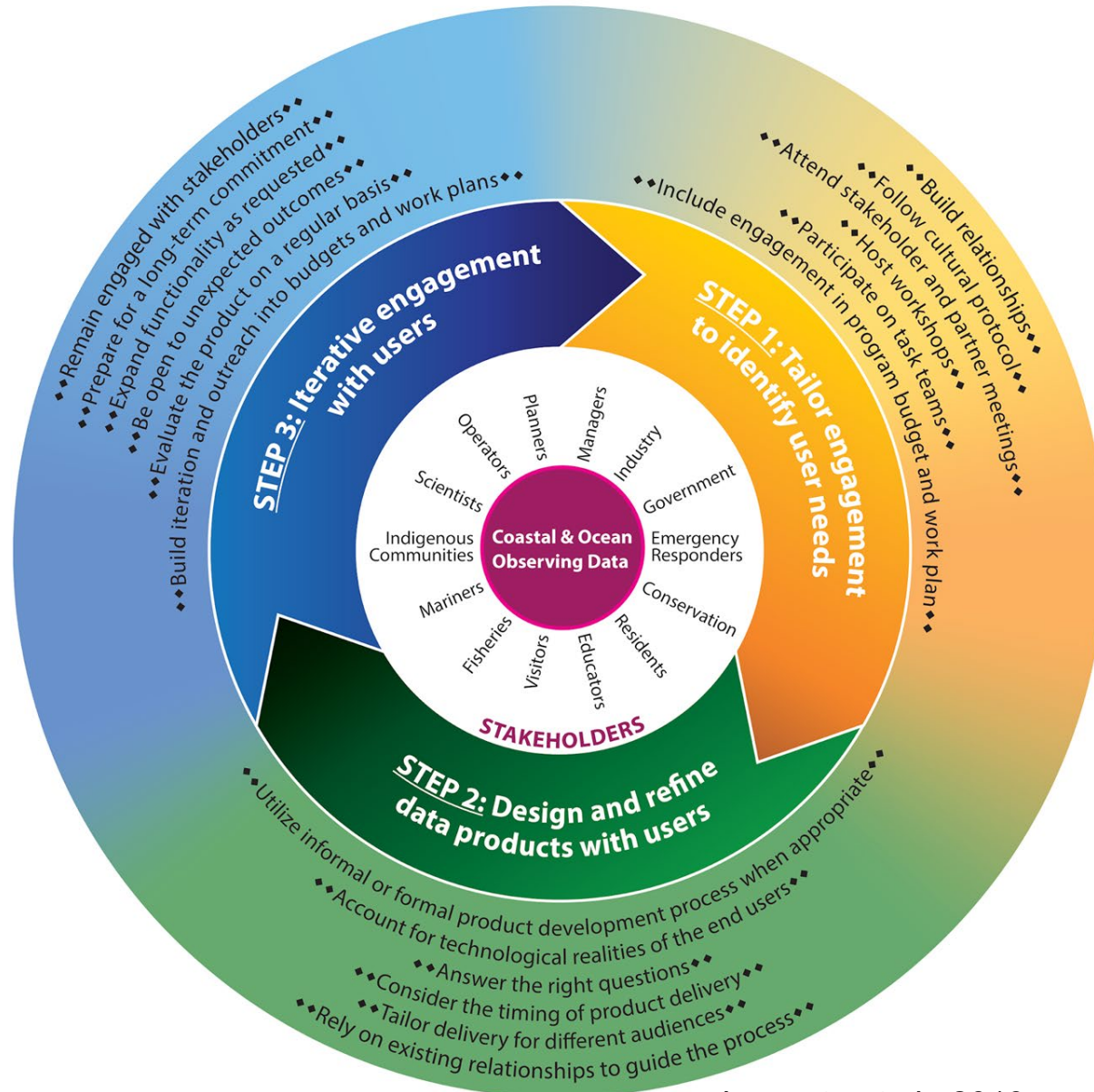
<https://youtu.be/taVtR2W4haU?t=5321>



2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development



Stakeholder-driven Process to Develop Tailored Data Products



Iwamoto et al., 2019



United Nations Ocean Conference



Increasing scientific knowledge and developing research capacity and transfer of marine technology

Sylvia Earle – Mission Blue

Vladimir Ryabinin – UNESCO

Meghan Cronin – NOAA PMEL

Benjamin Horton – Earth Observatory of Singapore

Ana Colaco – University of the Azores, Portugal

Jan Newton – University of Washington



IOOS Program Office Updates

Krisa Arzayus, U.S. IOOS Director

U.S. IOOS Office Updates

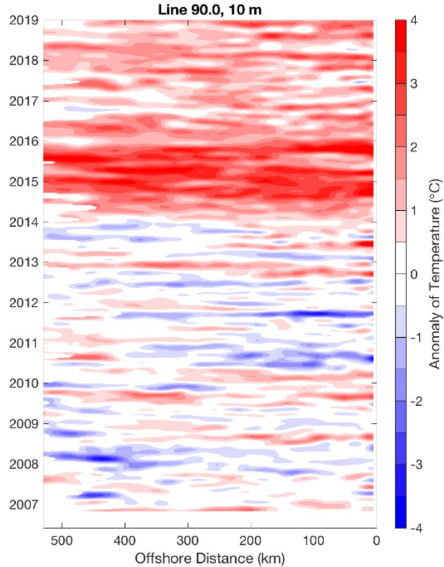
Krisa Arzayus
August 1, 2022



FY 2022 IOOS Office Priorities

Coastal, Ocean, & Great Lakes Observing, Predicting, and Informing
Continue delivering, diversifying, enhancing, and increasing accessibility of IOOS products and services for all Americans to meet customer needs

Climate Data & Services



Improved Coastal Resilience including coastal modeling/predictions



Economic Development



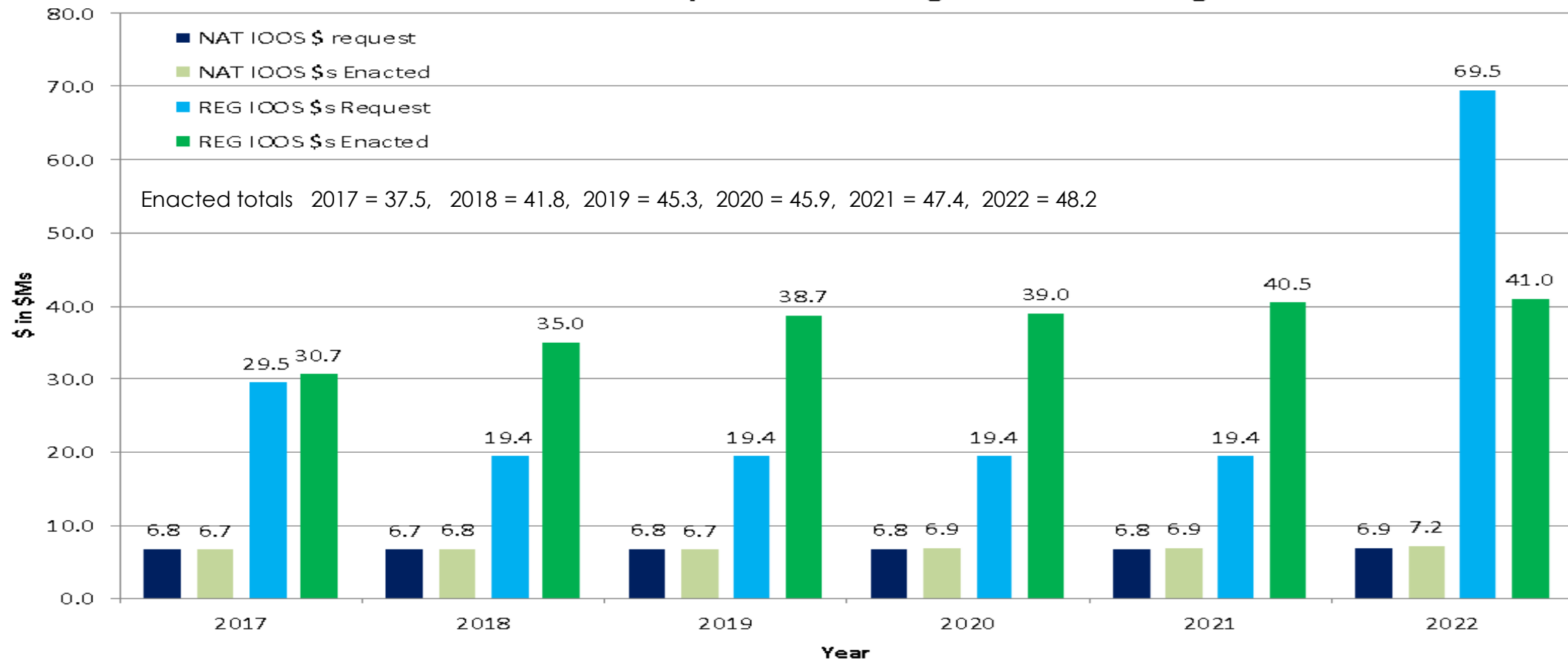
Detecting the climate signal at the coast, understanding its manifestations, and helping to prepare a **Climate Ready Nation**.

Enhance ecological forecasting supported by observing, science, and **equitable service delivery**.

A healthy blue economy and growing **“new blue economy”** and services in the face of coastal hazards—including workforce development.

U.S. IOOS Enacted and President's Budgets FY17-22

NOS IOOS Request & Appropriation History
Part of the Story – not including 'backbone and global'



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



FY22 Appropriations

- Regional Observations = \$41M
- National IOOS = ~\$7.2M



FY22 Infrastructure, Investment, and Jobs Act (\$13.5M in FY22)

- Prov 3: Flood Inundation Mapping
- Prov 11: Coastal and Ocean Observations
- Prov 12: Regional Ocean Partnerships

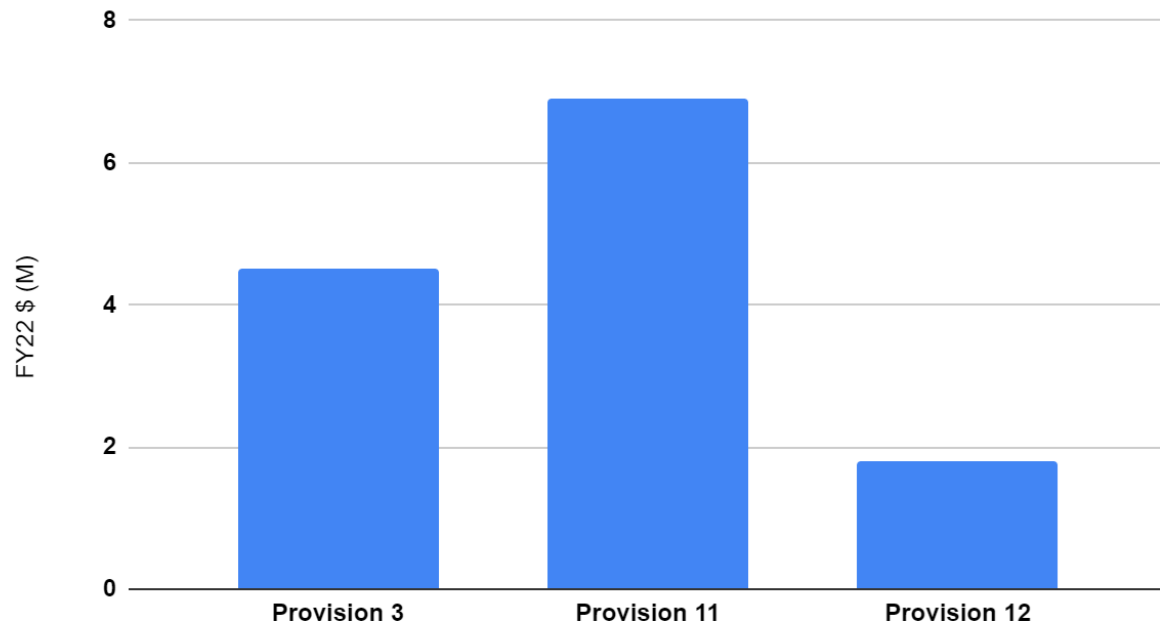


FY23 House and Senate Marks/reports

- House Mark: \$44M (+\$3M over FY'22)
- Senate report: \$46M (+5M over FY'22)

Bipartisan Infrastructure Law Funding

FY22 Bipartisan Infrastructure Law \$ (M)

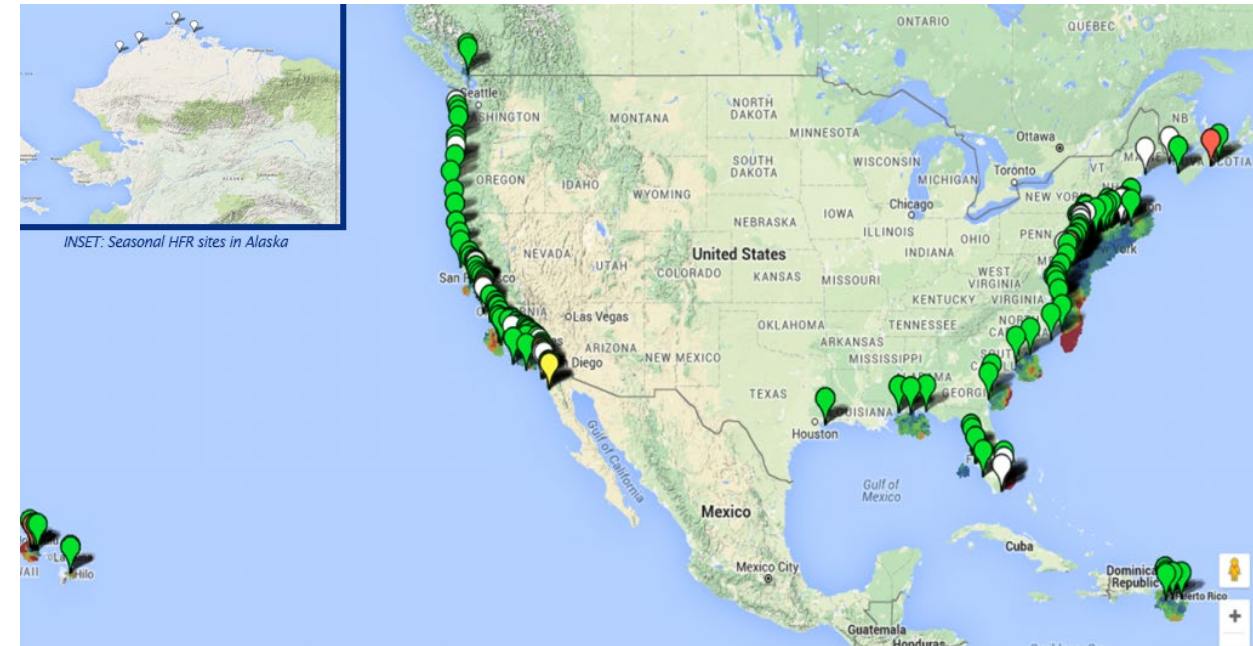


- Also known as Infrastructure Investment and Jobs Act
- \$6.9M for high-priority infrastructure refresh needs in the regional network
- \$1.7M supporting the National Water Model predictions on the East Coast and Gulf of Mexico
- \$2.8M to develop a cloud computing environment for community coastal coupling
- \$1.8M for Regional Ocean Partnership RAs

Surface Currents Program: HF Radar Network

FY 2021:

- **Nationwide expansion of high-frequency radar modeling for U.S. Coast Guard search and rescue**
- **Fill-the-Gaps** New HFR stations
 - San Clemente Island, CA
 - Delaware Bay in Lewes Beach, DE
 - Straits of Mackinac in Michigan
 - Massachusetts Bay
 - Canaveral National Seashore
 - Gulfport, MS
- **Offshore wind turbine radar interference mitigation**
 - Software development stage on tool to correct interference in real time.
- **Improved data availability**, including “rawer” measurements (e.g., radials, spectra, range series)



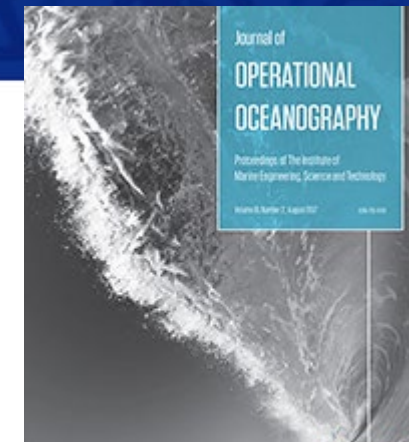
FY 2022:

<https://hfradar.ioos.us/>

- “Version 1” testing of Wind Turbine Interference mitigation software and continued software development.
- NANOOS HFR stations at Westport and Kalaloch, WA: Westport installed and FCC operational licenses granted
- Continued siting for new HF Radar installations and NEPA reviews.
- Wave measurement testing – CeNCOOS, MARACOOS, and CariCOOS to be testbeds; SCCOOS CORDC HFRNet as DAC. Following testing, HFR wave data to be collected by other RAs, including NANOOS.

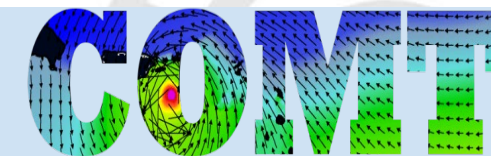
Coastal and Ocean Modeling

- **Community Modeling Strategy 2017** - [Journal of Operational Oceanography](#)
- **NOS Vision established 2021**- [2 Pager](#)
- **Community Modeling Workshop October 2021**
- **NOS Modeling Strategy - 2022**

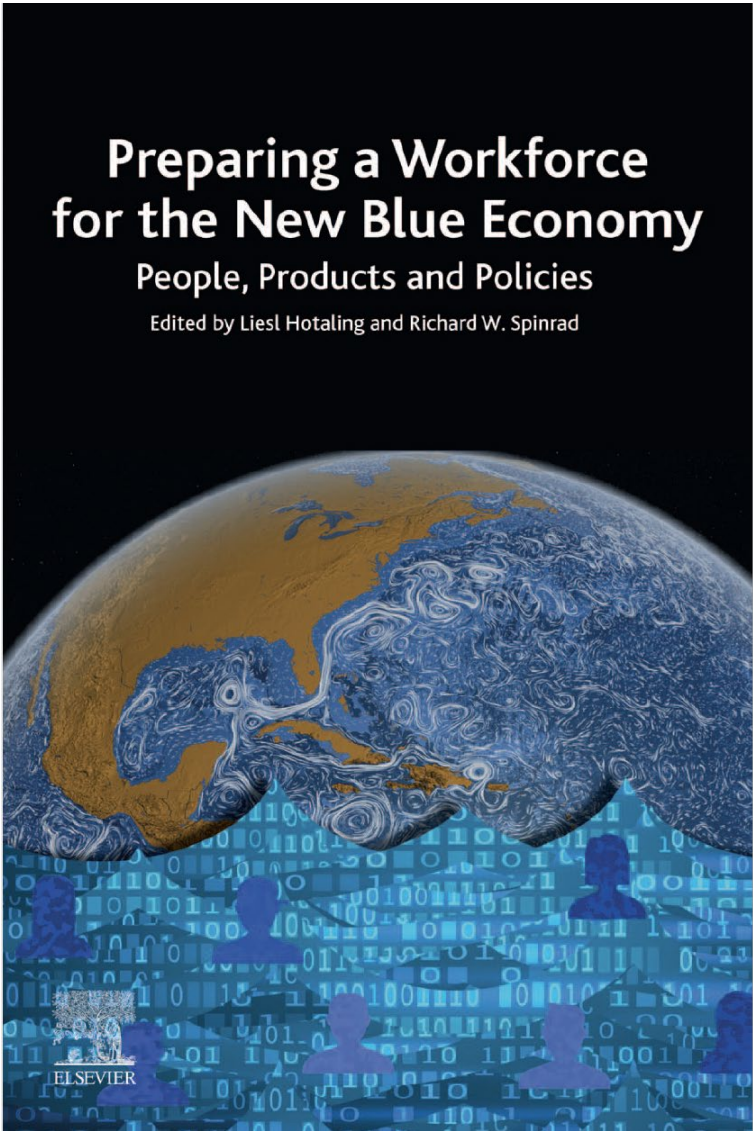


COMT Awards - June 2021

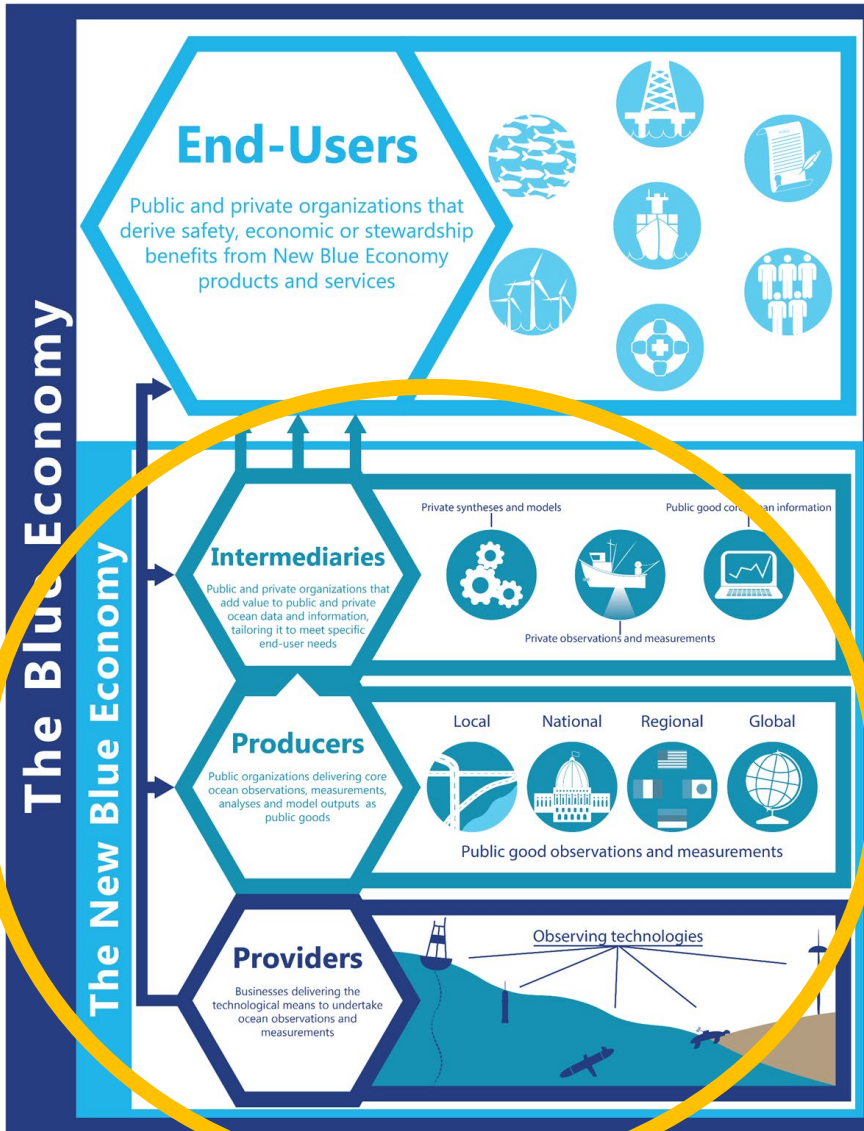
- 5 Awards for 3-year projects that will run 2021–2024
- Max funding per project of \$300K/year and a total of up to \$2M in funding.



The New Blue Economy

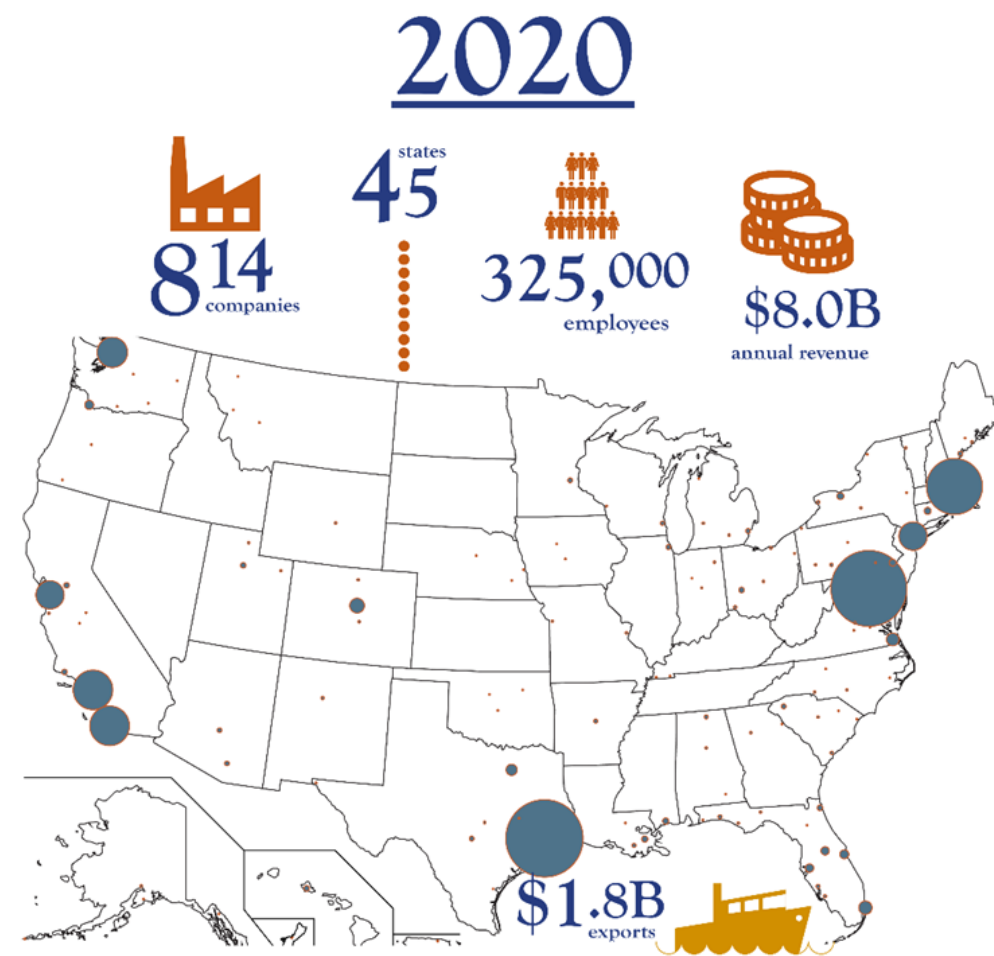
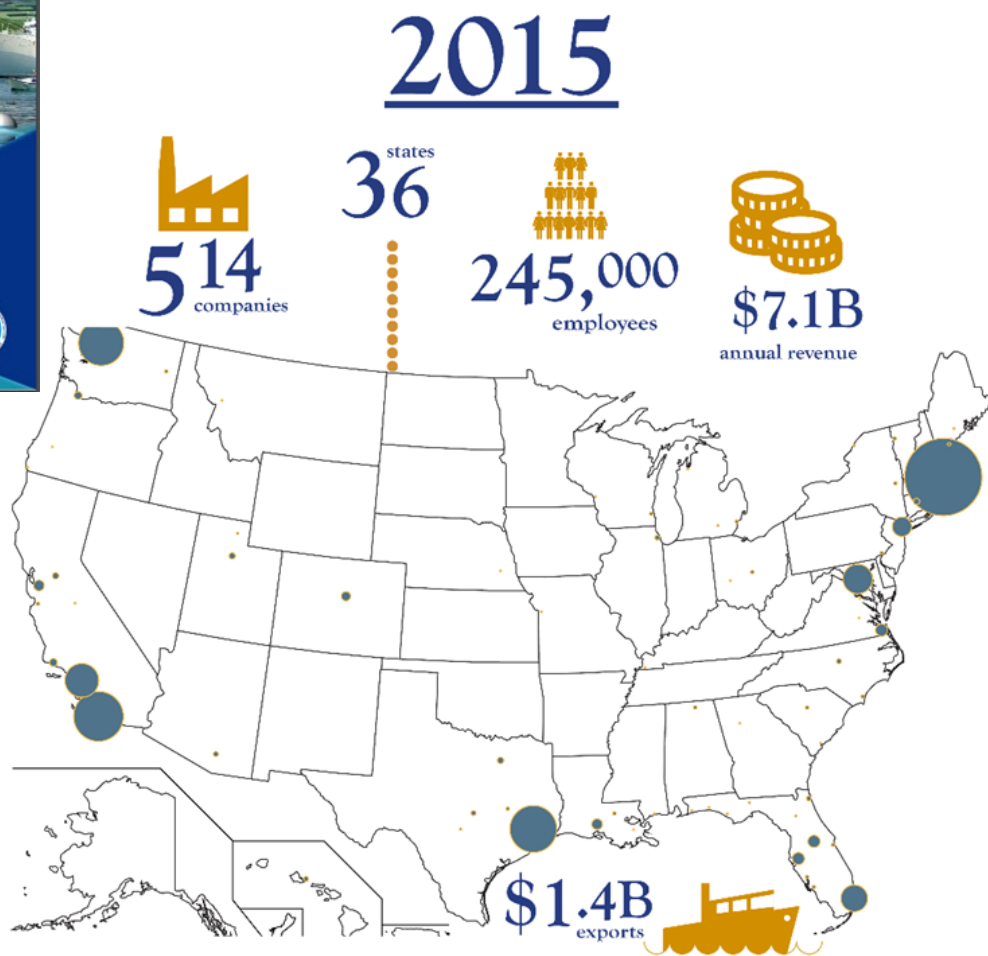


The New Blue Economy is a **knowledge-based economy**, looking to the sea not just for extraction of material goods, but for data and information to **address societal challenges** and to **inspire their solutions**.



The US Ocean Enterprise Study 2015–2020

Objective – Understand the scale and scope of US New Blue Economy business activity and how this has changed since 2015.



Notice of Funding Opportunities

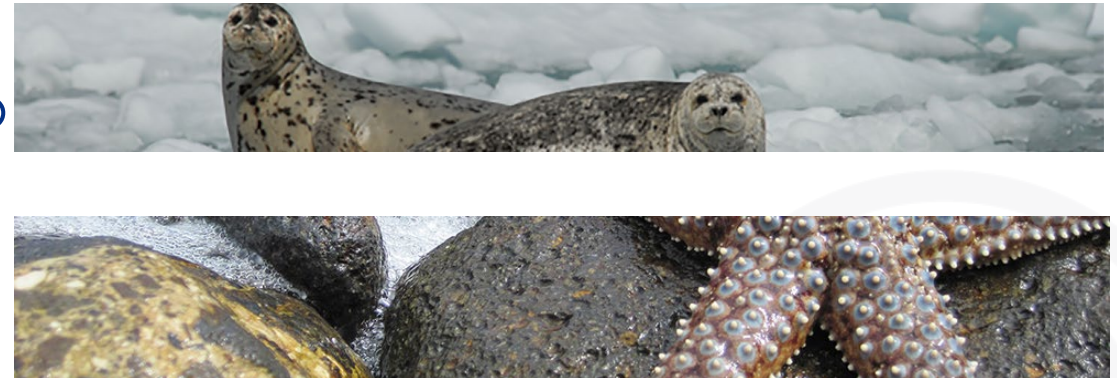
Ocean Technology Transition (OTT) Program:

- NOFO to be published in August 2022
- LOIs due October 21, 2022
- Review Panel Jan-Feb 2023
- Funding Decisions by April 2023



Marine Life Program:

- Interagency competition and funding via National Oceanographic Partnership Program (NASA/BOEM/ONR/NOAA)
- Applicants will receive responses in August
- Projects to be announced soon





IOOS Implementation Approach

The writing team is looking to develop an agile implementation approach that will focus on:

- **Processes.** Repeatable and predictable systems, tools, and processes will be put in place.
- **Cadence.** A consistent and predictable cadence of check-ins that focus on strategic planning and implementation efforts for the period ahead will be put in place.
- **Priorities.** Implementation efforts will be aligned with Office priorities for a more tactical approach and provide opportunities to discuss where limited resources should go.

The IOOS Implementation Approach will be finalized by **Fall, 2022**.

Upcoming Activities and Announcements



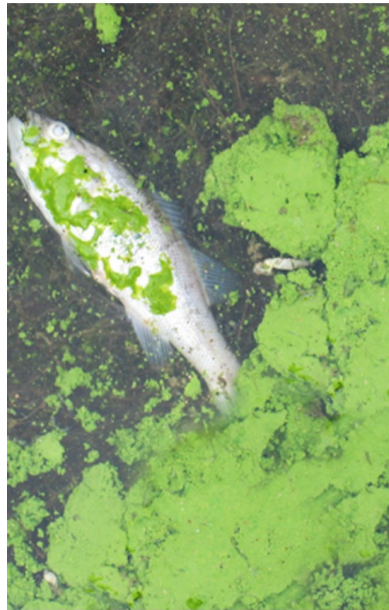
IOOS Strategic Plan Refresh

- Finalize in August, 2022
- Implementation approach, Fall, 2022



IOOS Fall Meeting

- Puerto Rico
- November 2022



National Harmful Algal Bloom Observing Network (NHABON)

- \$2.5M for IOOS pilot projects
- NANOOS awarded \$430k to support the Pacific Northwest HAB Bulletin



Underwater Glider User Group

UG2 Workshop

- Seattle (in-person only)
- September 20-22, 2022
- underwatergliders.org

- Kudos to NANOOS for:
 - **Team Backyard Buoys at NSF Expo:** AOOS, PacIOOS, and NANOOS participation in the NSF Convergence Accelerator Expo 22 virtually Jul 27-28, 2022.
 - The Columbia River Inter-Tribal Fish Commission (**CRITFC**) Coastal Margin Observation & Prediction (CMOP) program's Columbia River Plume **buoy (SATURN-02) deployment**
 - **UN Ocean Conference side event participation:**
 - Ocean Acidification: Co-designing data connections to underserved communities for equitable outcomes
 - Our Changing Ocean: Navigating Observations and Building Research-Driven Solutions

Questions?



IOOS Association Recap

Nick Rome for Josie Quintrell, IOOS Association Executive Director



AOOS
Alaska • aoots.org

NANOOS
Northwest • nanoos.org

CeNCOOS
Central/Northern California • cencoos.org

SCCOOS
Southern California • sccoos.org

PacIOOS
Pacific Islands
pacioos.org

GLOS
Great Lakes • glos.us

IOOS Headquarters ★
(NOAA)

GCOOS
Gulf Coast
gcoos.org

NERACOOS
Northeast • neracoos.org

MARACOOS
Mid-Atlantic • maracoos.org

SECOORA
Southeast • secoora.org

CARICOOS
Caribbean
caricoos.org

NANOOS General Council and PI Meeting

IOOS Association
Josie Quintrell /
Nick Rome
Aug 2, 2022

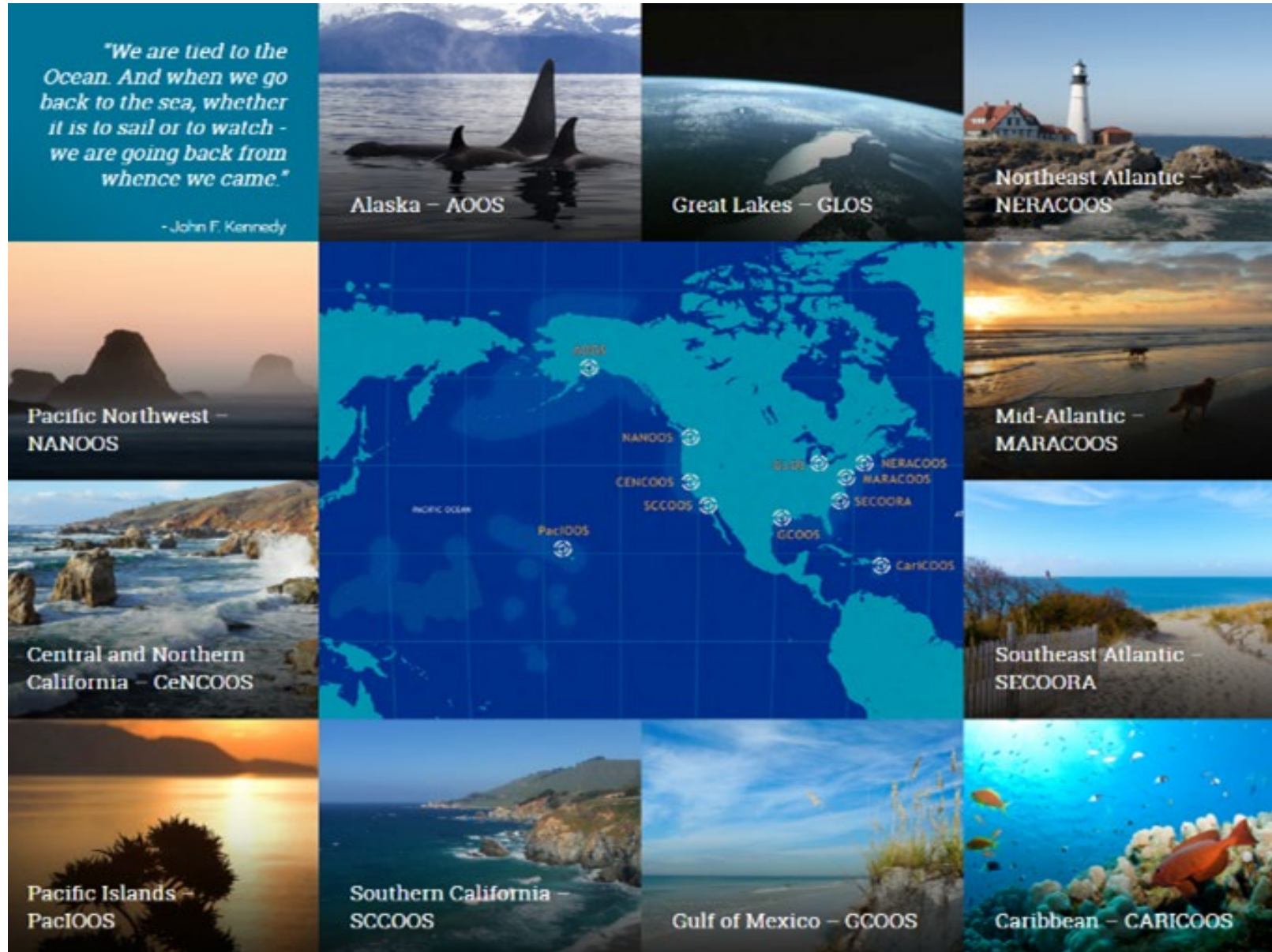
IOOS Association

- **Advocacy**
- **Common Issues**
- **IOOS federal/non-federal partnership**
 - *Administration*
 - *Congress*
 - *National Partners*
- **Emerging Issues**
- **Special Projects**

Board Members from NANOOS:

- **Jan Newton**
- **Andrew Barnard**

*Observing our oceans, coasts and Great Lakes
Providing information to those who need it, when they need it*



Strategic Plan



**STRATEGIC PLAN
2021-2026**

ADOPTED OCT 2020

MISSION

The IOOS Association promotes regional and national ocean, coastal, and Great Lakes observing systems

VISION

The IOOS enterprise has the resources to measure and predict the coast, ocean and Great Lakes to deliver sustained information, support decision making, and bring outstanding value to society.

1

Increase funding for IOOS
by 100 percent

2

Increase ability of IOOS to be
responsive and innovative

3

Increase coordination across
all IOOS agencies & regions

4

Increase diversity and inclusivity
of network and partnerships

5

Increase visibility and reach of
IOOS

6

Ensure the health and sustainability
of IOOS Association



Summary of Regional 5-year needs



INFRASTRUCTURE SPEND PLAN

The Integrated Ocean Observing System (IOOS) enterprise has the resources to measure and predict the coast, ocean and Great Lakes to deliver sustained information, support decision making, and bring outstanding value to society.

| Infrastructure Needs | Cost Estimate | Units |
|----------------------|----------------------|-------|
| HFR | \$27,403,037 | 157 |
| Glider | \$24,538,341 | 101 |
| Moorings | -- | -- |
| Wave | \$10,705,520 | 68 |
| Met ocean | \$5,365,000 | 82 |
| Ecosystem | \$19,690,000 | 129 |
| Animal Sensors | \$7,952,160 | 273 |
| Water level sensors | \$3,825,760 | 282 |
| Cyberinfrastructure | \$13,333,200 | 11 |
| Drones, webcams | \$2,525,050 | 35 |
| Fixed stations | \$10,304,335 | 132 |
| Acoustic Arrays | \$2,710,000 | 56 |
| Other | \$8,567,500 | 45 |
| TOTAL | \$136,919,903 | -- |

Investing in the IOOS regional observing systems will stabilize, modernize and enhance delivery of the data and information necessary to ensure coastal communities have the information they need to prepare and respond to changing coastal conditions, including flooding, increased harmful algal blooms and extreme storms.

Infrastructure

Infrastructure Investment and Jobs Act (passed)



INFRASTRUCTURE INVESTMENT AND JOBS ACT (HR 3684)

ENACTED

- \$150M for coastal and ocean observing systems for the next 5 years
 - \$100 M in Operations, Research and Facilities (ORF)
 - \$50 M in Procurement, Acquisition Construction (PAC)
- IOOS Received ~\$7M/per year (for 5 years)
- Each RA received the RFA:
 - Year 1: \$582K
 - Year 2: \$587K

FY 23 IOOS Association Appropriations Request

Regional IOOS FY 23 Request: \$75.3 million

Increase of \$7.5m over FY22 Pres Bud

- Core Regional Association Support: \$50 million
- Infrastructure repair and modernization: \$20.3 million
- Innovation Competitive Grants: \$5 million



Request for IOOS National Program Office: \$13 million

Same as FY22 Pres Bud request

- develop a biological and marine life observing program
- advance coastal modeling for ecological forecasting and maritime commerce;
- facilitate integration of non-federal efforts with NOAA, and
- provide capacity for system management.

IOOS Appropriations

| | FY 21 Enacted | FY 22 Pres Bud | FY 22 Enacted | FY 23 IA Request | FY 23 Pres Bud | FY 23 House | FY 23 Senate |
|---------------------------------|------------------|----------------------|------------------|------------------------|----------------------|----------------|-----------------|
| Regional IOOS | \$40.5 | \$69.5 | \$ 41 | \$75.3 | \$40.5 | \$44.0 | \$46.0 |
| Regional Core | \$36 | \$65 | | \$50 | | | |
| Infrastructure Modernization | | | | \$20.3 | | | |
| Innovation Comp Grants | \$4.5 | \$4.5 | | \$5 | | | |
| National IOOS | \$6.8 | \$ 13 | \$7.2 | \$ 13 | TBD | TBD | |
| Total | 47.3 | 63.8 | \$48.2 | \$88.3 | TBD | TBD | |

RA Congressional Outreach

Appropriation "Dear Colleague" letters

House - 71 Signers - record!

Senate - 21 Signers

Special Thanks to the NANOOS Team

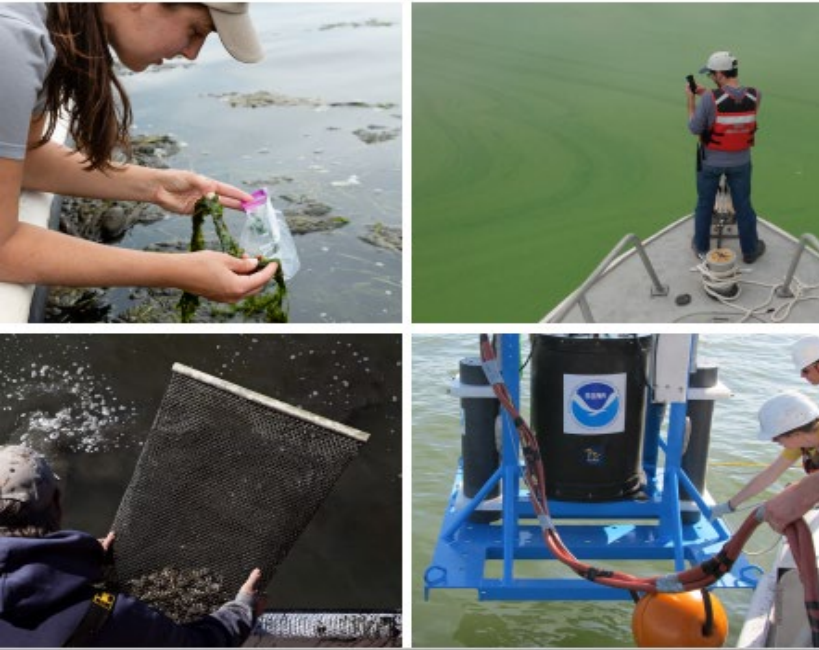
- **Jan Newton -**
 - Vice-Chair (and founding member) of the IOOS Association - Thank you!
 - Member of the Search Committee for Association Director, DEIA Working Group, Coastal Climate Signal
 - Visionary, collaborator, science leader, and passionate advocate for delivering quality information to all
- **Andrew Barnard -**
 - Nominating Committee, Policy Committee, Congressional engagement, keen insights
- **Nick Rome -**
 - Coastal climate signal, IOOC liaison, Fall meeting, tremendous Association support
- **Rachel Wold -**
 - Member of the Outreach Committee, previous Chair of the Committee

And much more!

Harmful Algal Blooms

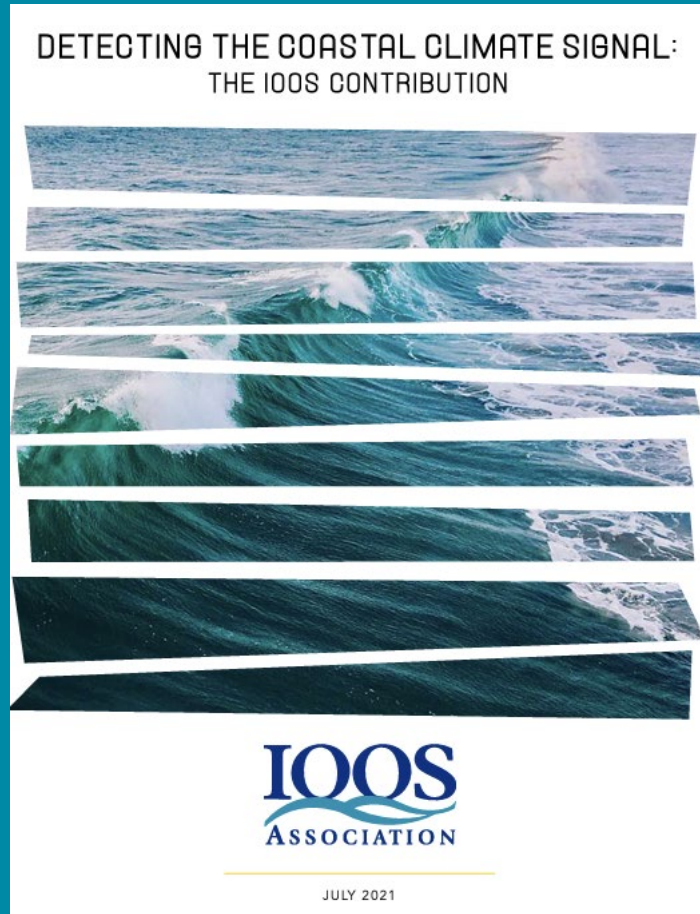
IMPLEMENTATION STRATEGY FOR A NATIONAL HARMFUL ALGAL BLOOM OBSERVING NETWORK (NHABON)

JANUARY 2021



- HAB Observing Network Framework (NCCOS and IOOS) (2019)
- FY 20 - Congress provides \$1M for HAB observing network 5 pilot projects
 - HAB Observing Network Implementation Strategy (2021)
- FY 21 - \$2.5M for HAB observing network 7 pilot projects
- FY 22 - no less than FY21
- HAB Observing Community of Practice
 - Brings together feds, non-feds
 - Webinar series

Detecting the Coastal Climate Signal



- Climate change is global but impacts vary regionally
 - *Sea level, inundation, lake water levels*
 - *HABs, OA, hypoxia*
 - *Heat waves*
 - *Extreme storms*
- 5 broad recommendations:
 - *Expand coastal observations*
 - *Modernize and recap*
 - *Technology innovation*
 - *Data integration*
 - *Equitable services*
- Climate Dialog series (on-going)
 - *Global to coastal (Sept 2021)*
 - *IOOS and fisheries (March 2022)*
 - *Ecological forecasting (TBD)*
 - *Delivering equitable services (TBD)*
- USCLIVAR Workshop Proposal
- IOOC Task Team (proposed)

Diversity, Equity Inclusion and Accessibility

Ashley Peiffer,
2022 IOOS DEIA Fellow



- Joint Association/IOOS Office Project
- Goals
 - Amplify existing and planned efforts to improve DEIA and service equity,
 - Research and recommend best practices for improving service equity, training opportunities for staff, workforce development and support, co-development and other activities
 - Facilitate information sharing, seek partnerships
 - Identify next steps including possible funding opportunities

Welcome New Executive Director



Kristen Yarincik will become the IOOS Association's next Executive Director! Starting on October 17, 2022

"We are so pleased to have Kristen joining the Association as our new Executive Director. She has the experience, integrity, and enthusiasm for ocean, coastal and Great Lakes observing that make her the ideal candidate to lead the Association in the next decade"

Dr. Gerhard Kuska, IOOS Association Board Chair and Chair of the Search Committee

Thank you



IQQS
ASSOCIATION

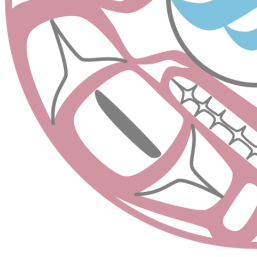
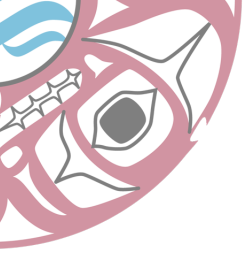
IQQS
ASSOCIATION

**Thank you,
Josie!!!**



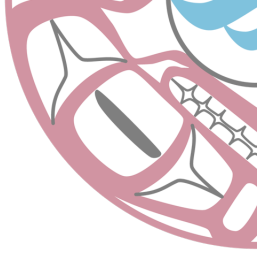
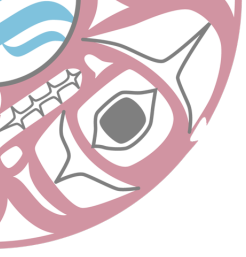
**Best of luck in
your retirement!**

**NANOOS always
welcomes you!!**



Member Updates





LUNCH





NANOOS Standing Committees

- DMAC
- User Products
- Engagement, Outreach, Education



User Products - DMAC Update

Jonathan Allan (DOGAMI)

Charles Seaton (CRITFC)

Troy Tanner, Alex Dioso, Roxanne Carini,

Jan Newton, Nick Rome, Anna Boyar (UW)

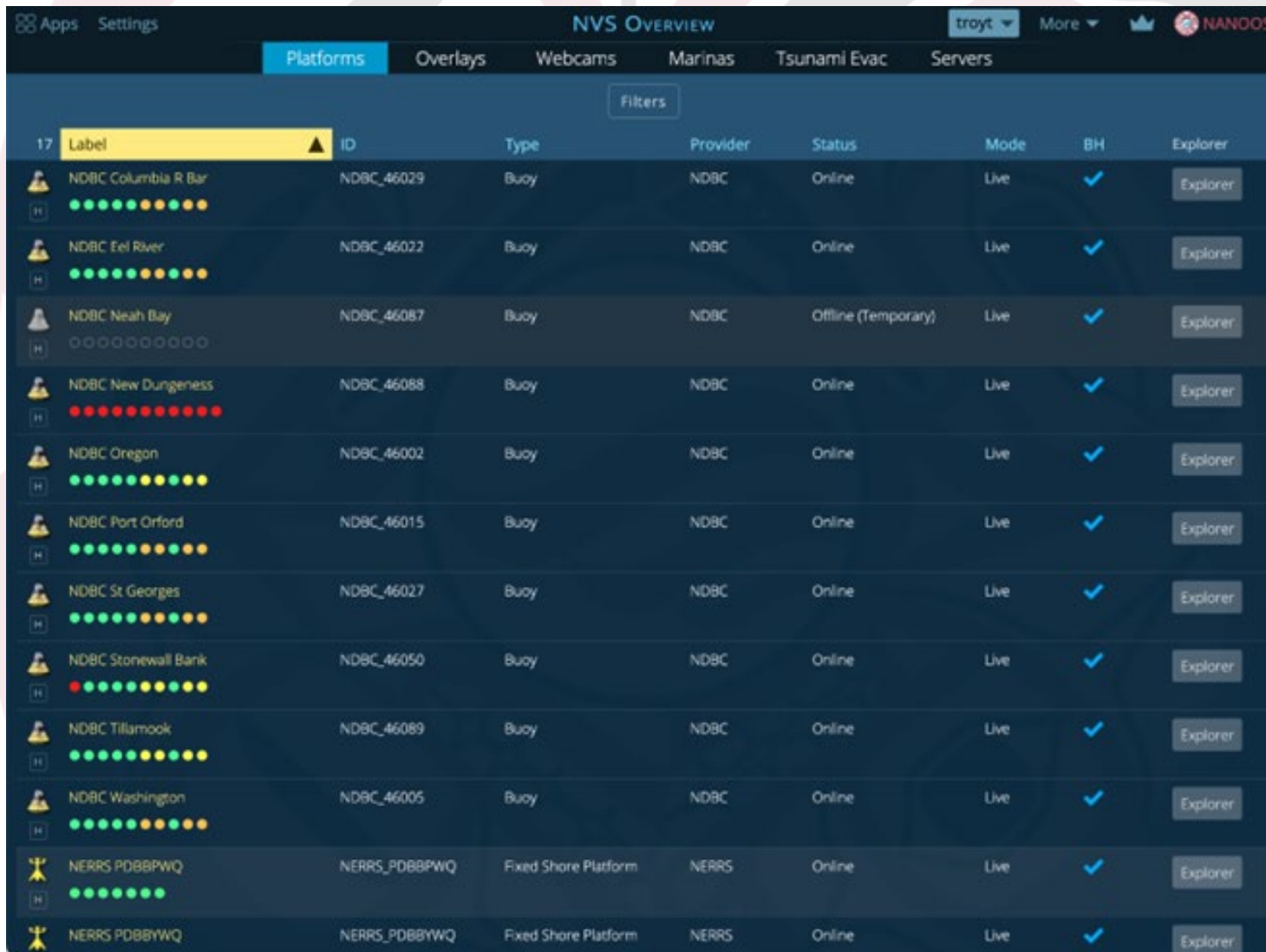
Mike Kosro (OSU)

Recent DMAC/UPC efforts:

- 1) Continue to hold weekly tag-ups
- 2) Held a hybrid Tri-Comm meeting at UW on April 28: reviewed existing activities and established goals for the next 12 months
- 3) Continue to modernize NVS data harvesters
- 4) Upgraded data transfers from CRITFC-CMOP to NANOOS (uses a new CRITFC ERDDAP server)
- 5) Significant updates to the Glider App
- 6) Developed new “Snapshot” tool, to allow for easy sharing and tool customization
- 7) Developing new customization for overlays (multiple color schemes for models; user defined ranges and depths)



Updated Data Harvesters



The screenshot shows the NVS Overview dashboard with the 'Platforms' tab selected. The dashboard displays a list of 17 data harvesters, each with a label, ID, type, provider, status, mode, and a 'BH' (Buoy Health) indicator. The 'BH' indicator is represented by a row of colored dots (green, yellow, orange, red) and a blue checkmark. An 'Explorer' button is located to the right of each row. The dashboard also includes a 'Filters' button and a 'More' dropdown menu.

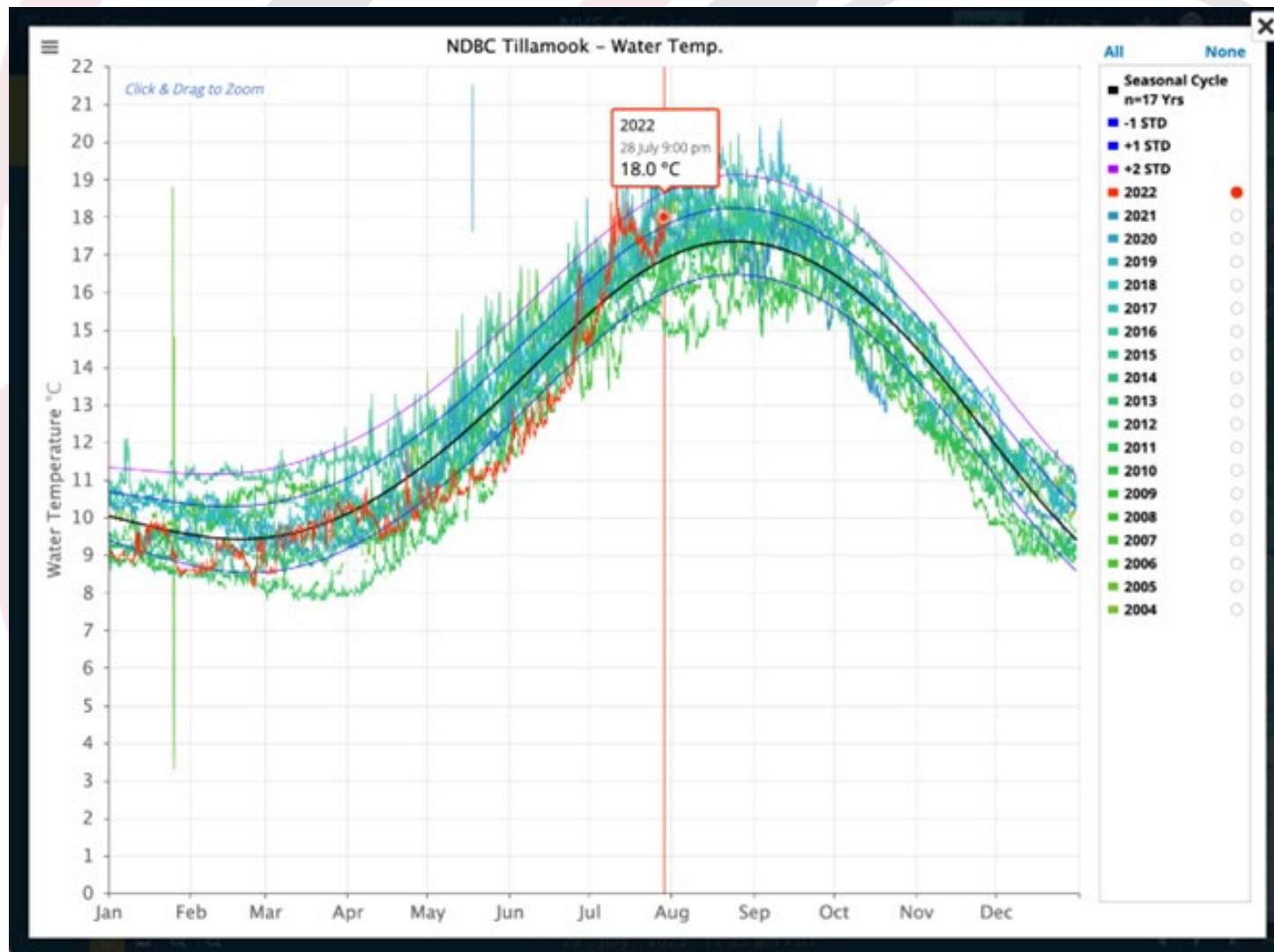
| Label | ID | Type | Provider | Status | Mode | BH | Explorer |
|---------------------|---------------|----------------------|----------|---------------------|------|----|----------|
| NDBC Columbia R Bar | NDBC_46029 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Eel River | NDBC_46022 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Neah Bay | NDBC_46087 | Buoy | NDBC | Offline (Temporary) | Live | ✓ | Explorer |
| NDBC New Dungeness | NDBC_46088 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Oregon | NDBC_46002 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Port Orford | NDBC_46015 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC St Georges | NDBC_46027 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Stonewall Bank | NDBC_46050 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Tillamook | NDBC_46089 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NDBC Washington | NDBC_46005 | Buoy | NDBC | Online | Live | ✓ | Explorer |
| NERRS PDBBPWQ | NERRS_PDBBPWQ | Fixed Shore Platform | NERRS | Online | Live | ✓ | Explorer |
| NERRS PDBBYWQ | NERRS_PDBBYWQ | Fixed Shore Platform | NERRS | Online | Live | ✓ | Explorer |

- New harvesting framework
- Migration of older data sets to new framework (majority are done)
- New harvesters
 - CMOP
 - Quileute

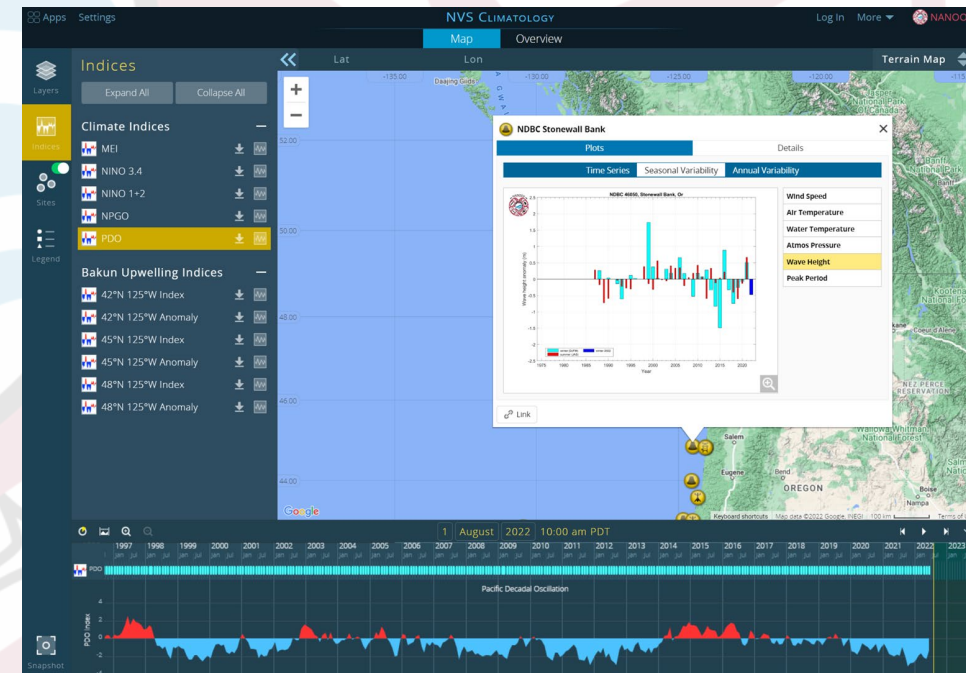
A few remaining core platforms to go including ORCA and a few NERRS platforms.

Automated Climatology Products

Climatology products have been updated to automatically load new data as it becomes available



- Buoy Plots
- Indices Plots



ERDDAP

Data from NANOOS platforms are being automatically added to NANOOS ERDDAP server

<https://data.nanoos.org/erddap/index.html>

| | | | | | | | | | | | | |
|-----|------|-------|---|---|---|---|---|------------|---|---|----------------------|---------------------|
| set | data | graph | Hourly NOS Neah Bay Met Climatology Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9443090_Met |
| set | data | graph | Hourly NOS Neah Bay Met Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9443090_Met |
| set | data | graph | Hourly NOS Neah Bay Water Level Climatology Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9443090_WL |
| set | data | graph | Hourly NOS Neah Bay Water Level Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9443090_WL |
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| set | data | graph | Hourly NOS Port Orford Met Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9431647_Met |
| set | data | graph | Hourly NOS Port Orford Water Level Climatology Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9431647_WL |
| set | data | graph | Hourly NOS Port Orford Water Level Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9431647_WL |
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| set | data | graph | Hourly NOS Seattle Water Level Climatology Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9447130_WL |
| set | data | graph | Hourly NOS Seattle Water Level Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9447130_WL |
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| set | data | graph | Hourly NOS Southbeach Water Level Climatology Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9435380_WL |
| set | data | graph | Hourly NOS Southbeach Water Level Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9435380_WL |
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| set | data | graph | Hourly NOS Toke Pt Water Level Data | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | NOS_9440910_WL |
| set | data | graph | NANOOS La Push glider deployment SG108-20130923T1728 | 📍 | F | I | M | background | 📄 | 📧 | Applied Physics L... | gliderlapush_SG187 |
| set | data | graph | NANOOS Mooring CB-06 | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | OSU_CB06 |
| set | data | graph | NANOOS Mooring ORCA Dabobbay | 📍 | F | I | M | background | 📄 | 📧 | University of Was... | ORCA_Dabobbay |
| set | data | graph | NANOOS Mooring ORCA Hansville | 📍 | F | I | M | background | 📄 | 📧 | University of Was... | ORCA_Hansville |
| set | data | graph | NANOOS Mooring ORCA Hoodsport | 📍 | F | I | M | background | 📄 | 📧 | University of Was... | ORCA_Hoodsport |
| set | data | graph | NANOOS Mooring ORCA NPB2Carr | 📍 | F | I | M | background | 📄 | 📧 | University of Was... | APL_NPB2Carr |
| set | data | graph | NANOOS Mooring ORCA Pt Wells | 📍 | F | I | M | background | 📄 | 📧 | University of Was... | APL_NPB1PtWells |
| set | data | graph | NANOOS Mooring ORCA Twanoh | 📍 | F | I | M | background | 📄 | 📧 | University of Was... | ORCA_Twanoh |
| set | data | graph | NANOOS SW Washington glider deployment unit_092-20090517T1331 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | NANOOS Trinidad Head glider deployment UW15-20141116T2118 | 📍 | F | I | M | background | 📄 | 📧 | Oregon State Univ... | glidertrinidad_UW15 |
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| set | data | graph | SG187-20110430T1450 | 📍 | F | I | M | background | 📄 | 📧 | Applied Physics L... | gliderlapush_SG187 |
| set | data | graph | SG187-20120912T1125 | 📍 | F | I | M | background | 📄 | 📧 | Applied Physics L... | gliderlapush_SG187 |
| set | data | graph | SG187-20140625T1330 | 📍 | F | I | M | background | 📄 | 📧 | Applied Physics L... | gliderlapush_SG187 |
| set | data | graph | unit_092-20090610T1625 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | unit_092-20090723T1757 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | unit_092-20090901T1725 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | unit_092-20100416T2033 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | unit_092-20100512T1617 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | unit_092-20100708T1523 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |
| set | data | graph | unit_092-20100810T2257 | 📍 | F | I | M | background | 📄 | 📧 | Oregon Health & S... | gliderswash_unit_0 |

117 datasets now available

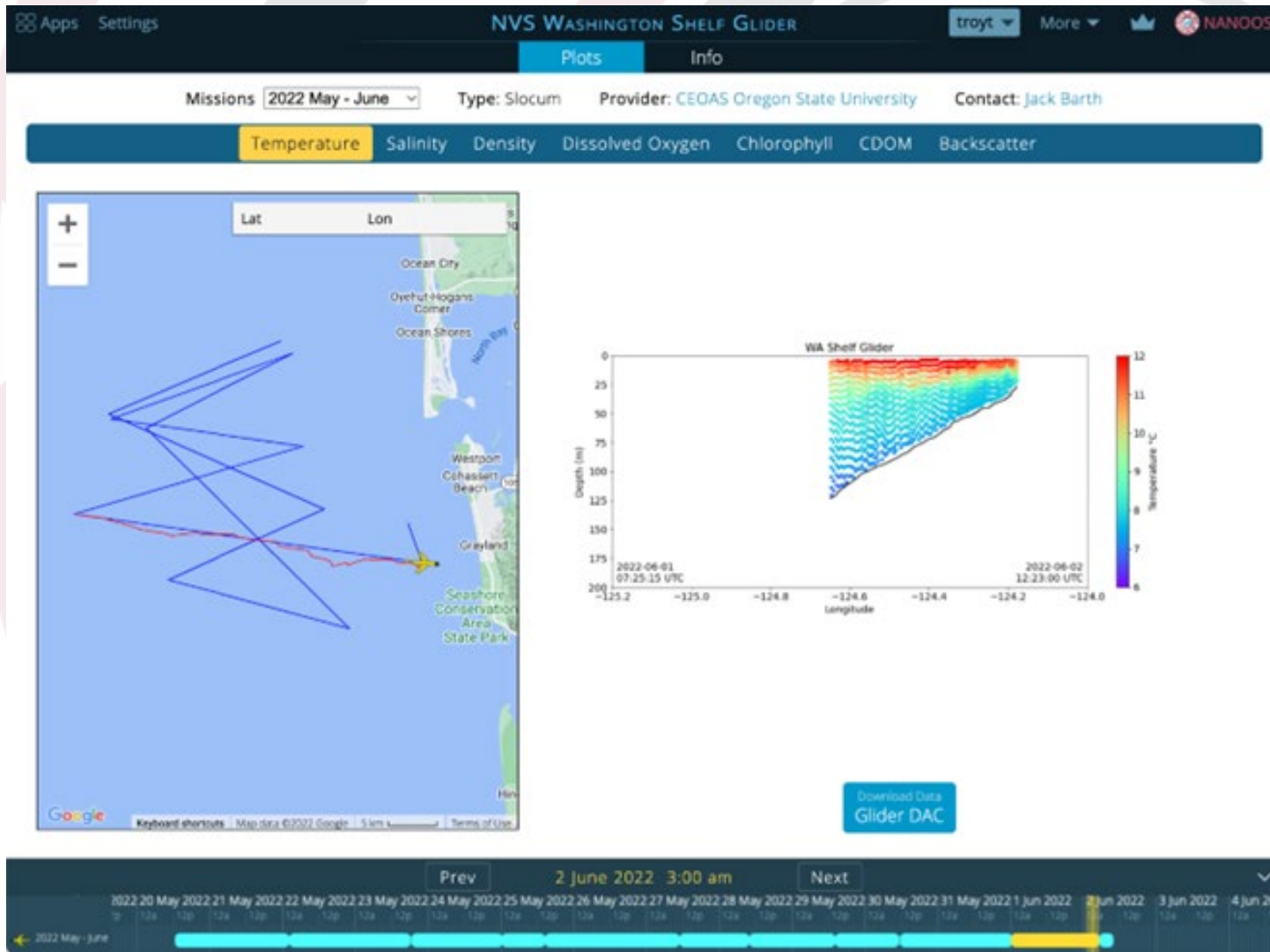
Recently added

- La Push
- ORCA
- CB-06
- Gliders

Other datasets include:
buoys, tide gauges,
climatologies

Gliders

Glider apps have been updated to automatically refresh the glider plots as new data is uploaded to the glider Data Assembly Center (DAC).



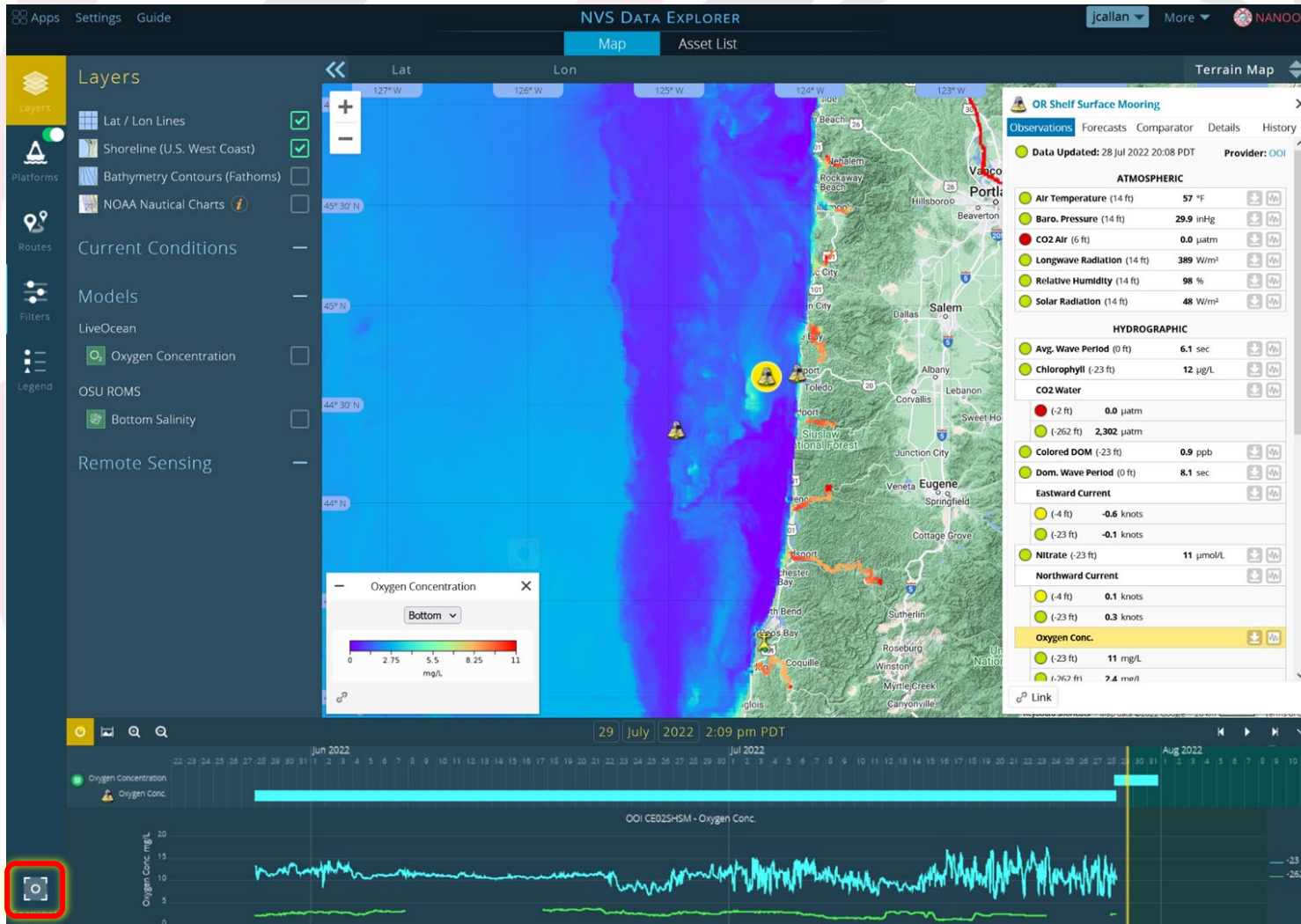
Completed development of a standardized data format and flow for gliders. Transitioned to new format:

- Washington shelf glider
- Trinidad Head glider

Next, a unified glidar app.

Snapshot

New NVS capability that allows users to create customised view of existing apps and share them with others



Users can now customize a suite of parameters, including:

- Map View
- Basemap
- Overlays
- Platforms
- Filters
- Selected time
- and more.

Snapshot

New NVS capability that allows users to create customised view of existing apps and share them with others

The screenshot shows a 'Snapshot' dialog box with the following sections:

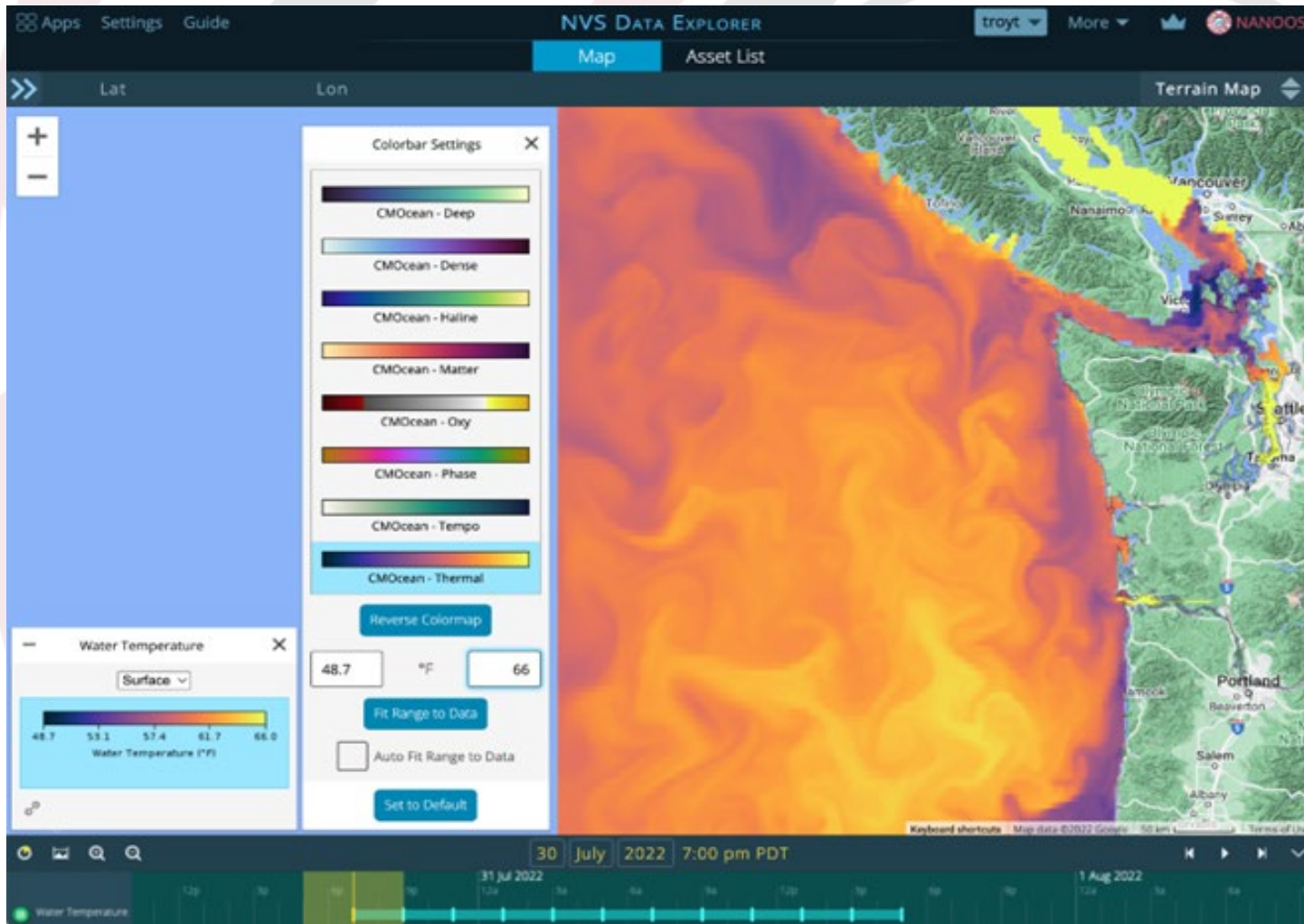
- Map View:** Includes coordinates (47° 47' 17.00" N, 121° 27' 21.00" W) and a 'Close' button.
- Selected Layers:** Includes 'Lat / Lon Lines' and 'Shoreline (U.S. West Coast)'.
- Selected Panel:** Includes 'Layers'.
- Platform Visibility Setting:** Includes 'Show Platforms on Map'.
- Selected Platform:** Includes '001 C002010M'.
- Selected Tab:** Includes 'Observations'.
- Selected Variable:** Includes 'Oxygen Concentration'.
- Filters:** Includes 'Busy' (001 C00105M, 001 C002010M, 001 C004050M, 001 C00605M, 001 C007050M, 001 C009050M), 'Fixed Shore Platform' (NERIS_P0000WQ, NERIS_P0000WQ, NERIS_S0000WQ), 'LiveOcean' (Oxygen Concentration, OSU ROMS), and 'Selected Model' (None Selected).
- Current Conditions:** Includes 'None Selected'.
- Selected Date & Time:** Includes '29 July 2022 2:00 pm PDT'.
- Snapshot Label:** Includes 'Explorer Snapshot 29 Jul 2022 2:10:54 pm'.
- Create Link:** A button to generate a shareable link.
- URL:** <http://nvs.nanoos.org/Explorer?snapshot=3a95fec1baf2b635e8bafd2de2845>

Users can now customize a suite of parameters, including:

- Map View
- Basemap
- Overlays
- Platforms
- Filters
- Selected time
- and more.

Dynamic Overlays

New NVS feature that allow users to select colormap and range for overlays



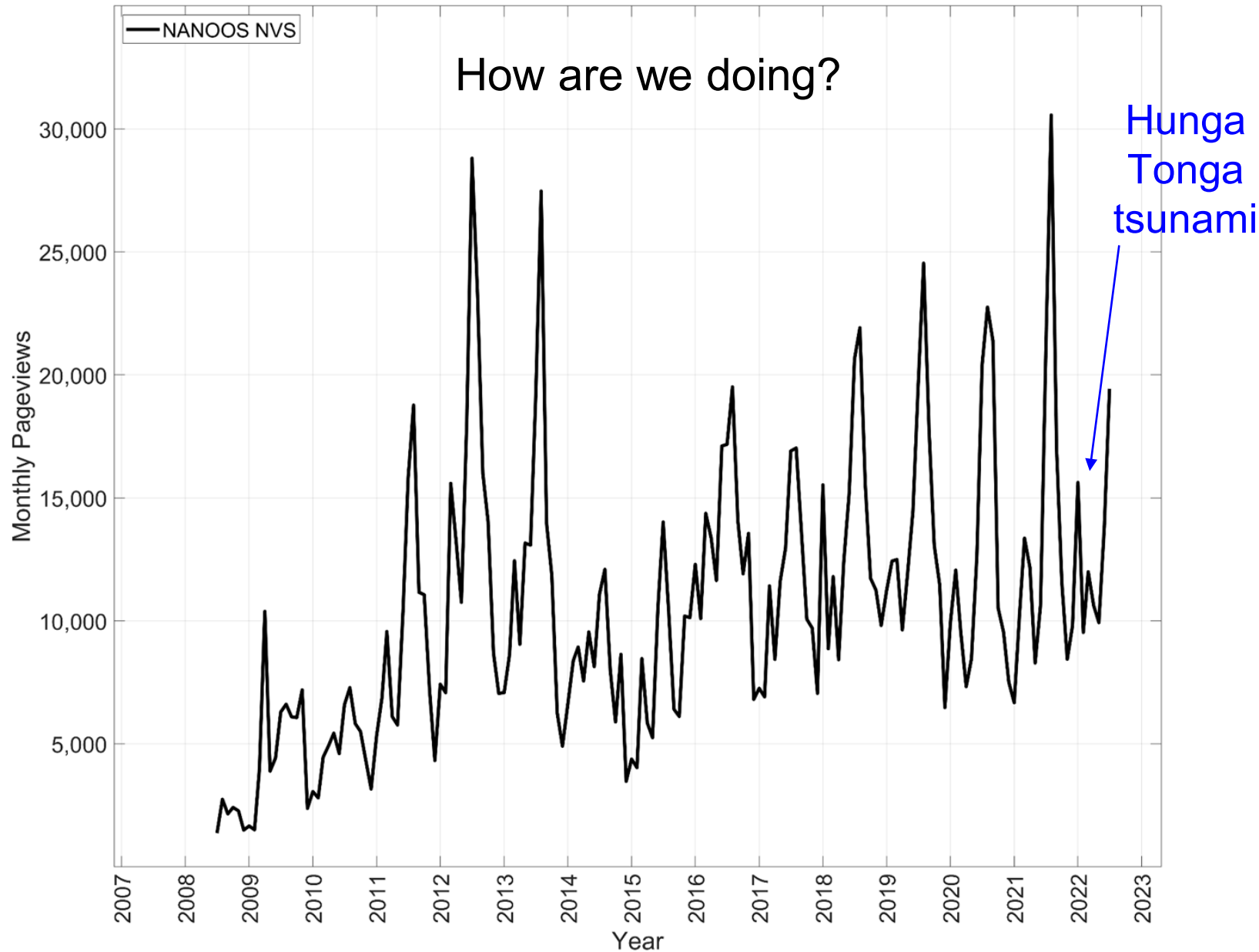
Users can now customize a overlays:

- Can select colormap from list
- Can set range to extent of overlay data
- Settings are automatically saved to NANOOS account
- In development, releasing soon
- Select overlays at this time

Focus for the next 12 months:


- 1) Release dynamic overlays for a few limited layers
- 2) Proceed with updating all overlays to enable point & click querying and dynamic overlays
- 3) Complete development of a unified glider app
- 4) Updates to the NVS and Tsunami smartphone apps
 - i) Map view
 - ii) Favorite assets
 - iii) Evacuation routing capabilities
- 5) Particle Tracking
- 6) Cross-section tool





Continue to see growth in the following areas:

- Fisheries (Tuna)
- Hazards (Tsunami)
- Other apps remain somewhat static



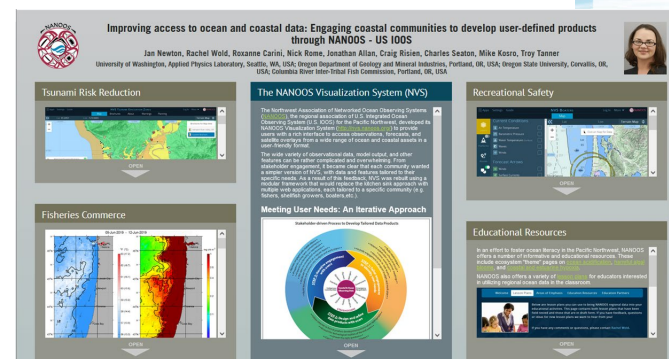
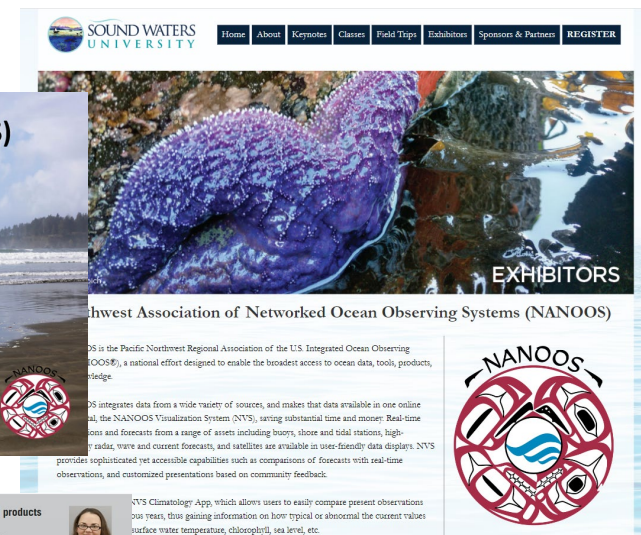
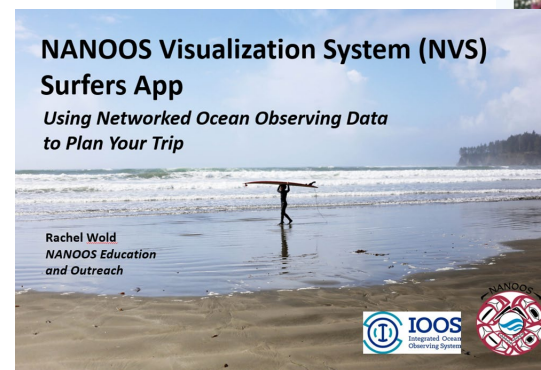
Outreach, Education, & Engagement Chair Update

Rachel Wold



Outreach and Engagement: Increasing awareness and connecting with users

- Engagement with general public, scientists, and targeted user groups:
 - NANOOS Community Workshop
 - Sound Waters: A One Day University for All
 - Salish Sea Ecosystem Conference
 - AGU Fall Meeting
 - Recreational boaters, fishers, surfers
 - Collect and utilize user feedback
- Increasingly active with external groups
 - IOOS Outreach Committee
 - Applied Physics Lab DEI Workgroup





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

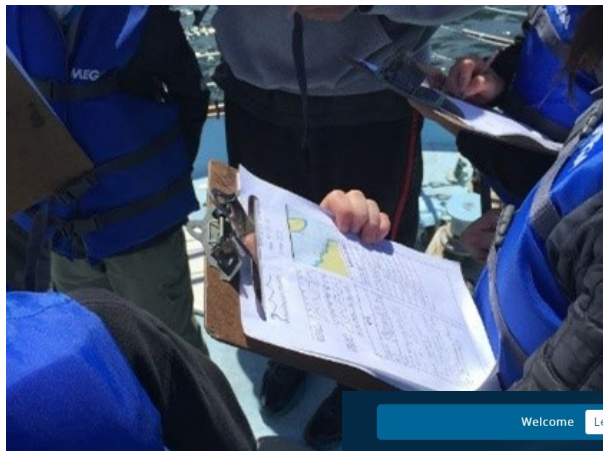
- Members: NANOOS, NOAA PMEL, NOAA West Coast Regional Office, Olympic Coast National Marine Sanctuary, IOOS Office
- Activities:
 - **Middle School** – Technology Access Foundation, OA Curriculum (*forthcoming*)
 - **High School** – Sea Potential, Seattle Maritime High School
 - **Undergraduate** – EarthLab and NOAA PMEL Summer Interns, (Louis Stokes Intern)
 - **All-Ages** – Outdoor Afro





Education: Increasing ocean literacy

- South Whidbey Middle School
 - Student buoy program
 - Teacher workshop – Using data in the Classroom
- NANOOS Enabling Change Activities
 - Middle school, High school and Undergraduate
- Lesson plans online




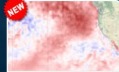



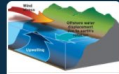


Welcome Lesson Plans Areas of Emphasis Education Resources Education Partners

Below are lesson plans you can use to bring NANOOS regional data into your educational activities. This page contains both lesson plans that have been field-tested and those that are in draft form. If you have feedback, questions or ideas for new lesson plans we want to hear from you!

If you have any comments or questions, please contact Rachel Wold.

Lesson Plans

| | | | | | |
|---|--|--|---|--|--|
|  HAB Forecaster (PDF) |  Habitat Habitat (PDF) |  Is it Warm Enough? (PDF) |  Marine Heatwaves |  Ocean Acidification |  Ocean Observation (PDF) |
| | |  Water Column Profiles (PDF) |  Well Well Well (PDF) | | |



Online Presence

IOOS | Integrated Ocean Observing System

Sign up for our Newsletter

NANOOS

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

NANOOS Visualization System
NVS provides easy access to observations, forecasts, data, and visualizations. [Help](#)

BACKYARD BUOYS

Empowering Coastal Indigenous Communities
NANOOS, AOS, and PacIOOS are collaborating with Sofar Ocean Technologies and coastal Indigenous partners in each region on a community-led ocean observing project funded by the NFS Convergence Accelerator program. Backyard Buoys uses simple and affordable instruments, called "Spotters", to put access to and stewardship of ocean data in the hands of those most affected by climate change on the coast.

[Read About the Project](#) [Watch the Video](#)

BACKYARD BUOYS
Empowering Coastal Indigenous Communities

NANOOS Presentation for NOAA West Watch

NANOOS Community Workshop 2022

Multi-Stressor Observations and Modeling

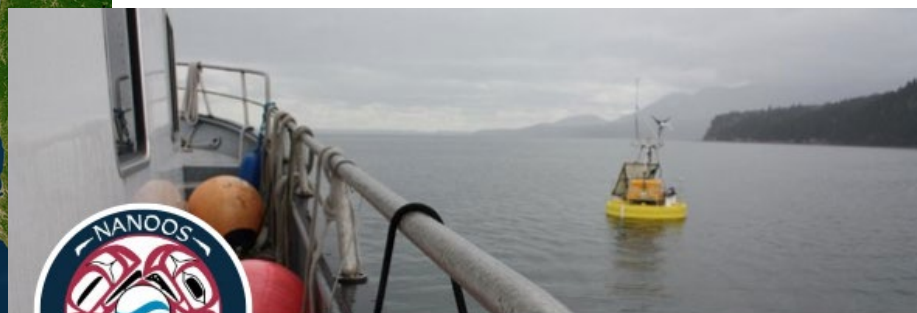
NANOOS AGU Fall 2021 Poster

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



NANOOS Observer

Spring 2022

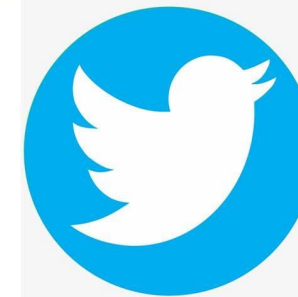


NANOOS

@nanoos_pnw

Joined December 2012

123 Following 233 Followers





Plans for the upcoming year

- Return of more in-person opportunities
 - Trade shows, conferences, meeting
 - Continue exploring hybrid capabilities
- Expand on Enabling Change endeavors
 - Utilize the NANOOS GC/PI network
- Develop stronger bonds with commercial maritime (e.g., USCG, pilots) and resource managers
- Increase awareness and use within member organizations





Moderated Discussion

General Feedback

Workshop Recap

Marketing Needs

Webinar Series

All



NANOOS Workshop 2022



Coastal Hazards

Safe Navigation

Fisheries

How can we improve the system?

How do we increase the visibility of NANOOS?



Who Attended

Applied Physics Laboratory
C-IOOS Atlantic
C-IOOS Pacific
Columbia River Inter-Tribal Fish Commission
Consortium for Ocean Leadership
Curry County, OR
Department of Fish and Wildlife, WA
Emergency Volunteer Corps of Nehalem Bay
Hakai Institute
IOOS Program Office
Lincoln County Oregon
Lincoln County Sheriff's Office - Emergency Management
L'Observatoire global du Saint-Laurent
Marine Exchange of Puget Sound
National Park Service
Nehalem Emergency Volunteer Corps
NOAA Fisheries
NOAA Office of Coast Survey
Northwest Indian College
NWIFC
Ocean Networks Canada
Olympic Coast National Marine Sanctuary
Oregon Coastal Management Program
Oregon Department of Geology and Mineral Industries
Oregon State University
Oregon State University Foundation
Oregon Tuna Fisher
ORHAB / UW ONRC
Pacific Shellfish Institute
Pierce County, WA
Quileute Indian Tribe
Quinalt Indian Nation
RBR Ltd
Scoot Science
Seabird Scientific
South Slough NERR
The Sailing Foundation
Tula Foundation/Ocean Decade Regional Collaborative Center
University of Washington
US Geological Survey
Washington Department of Fish and Wildlife
Washington Sea Grant
Washington State Department of Ecology
Washington State Department of Health
WeatherFlow-Tempest, Inc.



How can we improve the system?



CUSTOMIZATION

- View more data simultaneously (colormaps, contours, vectors, point time series)
- Scale offsets between platforms - better to standardize or allow user to customize
- Save locations and assets of interest, share routes with friends, etc.
- Different depth fields (e.g., bottom DO) for different fisheries, coastal conditions
- Current location (or ability to drop a pin)
- Clarify arrows indicating wind direction



ACCURACY

- Timeliness of data, lag an issue with near real-time and forecasts
- Shore lines misaligned with GPS positions
- Better bathymetric maps to see canyons and ridges
- Post tide corrections
- Link into climatological wind roses



How can we improve the system?



PARTNERSHIPS

- Partner with private fee-based apps to include more data and products
- Interest in seeing more community science (e.g., crab pot data) on NVS
- Commercial fishers
- Coast Guard and SeaGrant Offices on safety trainings
- Tour operators and watercraft organizations in different regions



EXPANSION

- Need more training tools on how to use and make the most of the apps
- Simple user guide for orientation to NANOOS
- More direct download of selected data
- Low-bandwidth access, how to save view for offline reference
- Optimize viewing data on small screens
- Add more webcam feeds



How do we increase the visibility of NANOOS?



MESSAGING

- Publish fisheries announcements and push notifications
- Develop training videos easily accessible in app and on website
- Cross-post between NANOOS and external partners websites e.g. NOAA weather sites, Wind Alert, etc.



ADVERTISING

- Advertise using gear manufacturers, fishing/regulations guidebooks)
- Post QR codes at high visibility sites (e.g. marinas, bait shops, etc.)
- Provide literature for hotels, local businesses, state park visitor centers (exhibit), aquaria, etc.



MARKETING

- Develop catchy phrases or signage to get people's attention
- Work with local leaders on placement of signage and pamphlets
- Dedicate local funding to disaster preparedness for outreach
- Buy catchy web domains that point to app More use of social media



What's Next?



CUSTOMIZATION

ADVERTISING/MARKETING

NANOOS WEBINAR SERIES

- Ocean Acidification
- Hypoxia
- Shoreline and Beaches
- Climatology
- Surfers
- Ports and Harbors



Recap & Action Item review

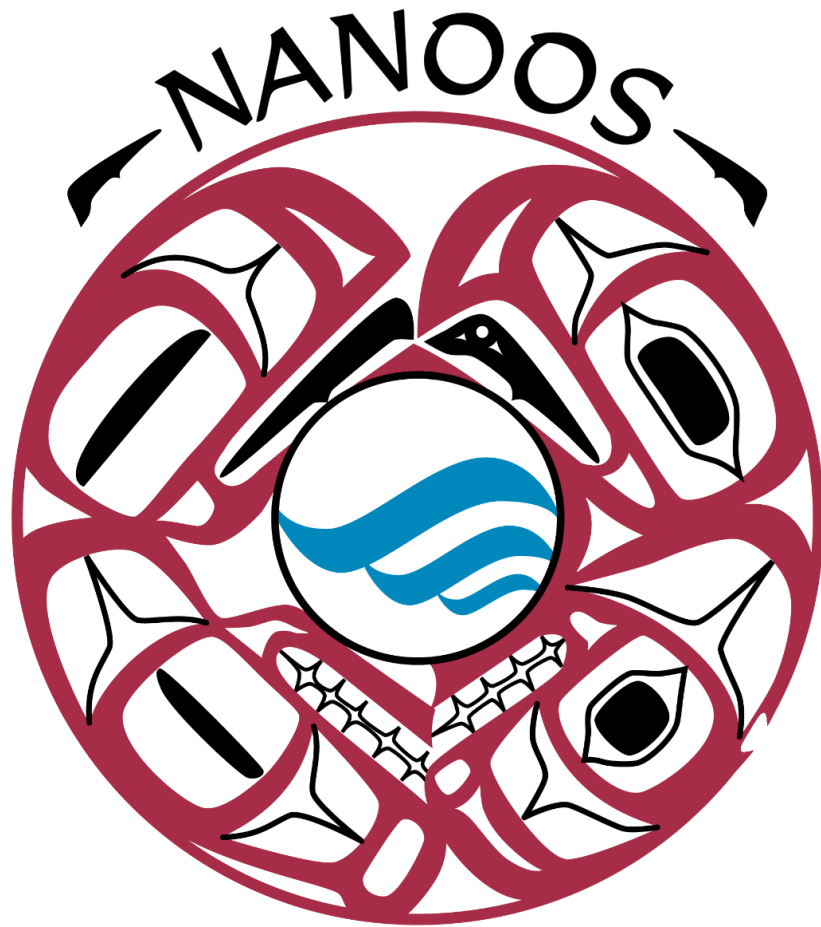
Jan Newton

ADJOURN



NANOOS

Northwest Association of Networked Ocean Observing Systems



THANK YOU !!!