Northwest Association of Networked Ocean Observing Systems

The Integrated Ocean Observing System (IOOS)
Regional Association for the Pacific NW

www.nanoos.org
Welcome!

1. Roll Call & Introductions,
2. Welcome and Call to Order

David Martin
NANOOS GC Board Chair
3. IOOS Recap and Introduction

Oriana Villar
U.S. IOOS Program Office
U.S. IOOS Program Updates

Oriana Villar
August 18, 2020
New Hires

- Brian Zelenke - Surface Currents Program Manager
- Matt Biddle - Data Management Analyst
- Dr. Tracy Fanara - Coastal Modeling Portfolio Manager
Marine Biodiversity Observation Network (MBON)

- Pacific Northwest (Northern California Current) MBON launched fall 2019
- Emphasis on plankton diversity, distribution, abundance and dynamics
- Tools include satellite observations, bio-optics, eDNA, Imaging FlowCytobot, plus traditional chemistry, zooplankton, fish abundance
- NANOOS to host data products
- PI Kavanaugh (OSU) also leading MBON US and global development of satellite-derived Seascapes, now produced on CoastWatch

https://marinebon.org/
IOOS funding summary FY2020

FY20 $6.9M - ‘National IOOS’
- Part of Navigation, Observations, and Positioning
  - Salaries and Benefits
  - Technical Service Contract
  - Office IT, operations, overhead
  - National Data Management Projects

FY20 $39M - IOOS Regional Observations
- Regional Association Cooperative Agreements (~$34M)
- Alliance for Coastal Technologies – Sensor Evaluation Program ($1M)
- Ocean Technology Transition Program ~$2.7M
- Coastal Ocean Modeling Testbed Program ~$1M (plus $1M leveraged)

FY20 ~$6M Other NOAA, BOEM, NASA, Navy/ONR, USGS etc.
Estimated Enacted levels are ‘post rescission’ appropriation totals for each year
‘Request’ = the President’s Budget Request
NOAA National Ocean Service - Navigation, Observations, and Positioning
‘National IOOS’ component FY21 House Mark $6.9M & ‘Regional IOOS Observations’ $40.5M
FY21 House Mark is first, next is Senate Mark, then Conference.
Thank you!
4. IOOS Association Recap

Josie Quintrell
IOOS Association
Observing our oceans, coasts and Great Lakes
Providing information to those who need it, when they need it
IOOS Association: Fill the Gaps Congressional Campaign

- Scalable campaign
- Tangible outcomes
- Align with Administration Priorities
- Filling targeted gaps in:
  - HR Radars
  - Gliders
  - Streamlining observations
FY 17-21 Request:

Scalable requests each year for HFR, Gliders based on regional needs

From 2017-20:
Increase $8.5M
- Gaps Campaign started in FY17
House Report Language

- The Committee supports IOOS’s efforts to expand its use of underwater gliders and encourages NOAA to fill critical gaps in the current surface mapping system and to ensure streamlined access to data for weather forecasting, detection of ecological phenomena, and safe maritime operations.
- The Committee provides $2,000,000, from within the funds allocated for IOOS, to continue and expand the pilot program launched in fiscal year 2020 for IOOS to enhance the nation’s capacity for monitoring and detection of Harmful Algal Blooms (HABs) by leveraging the expertise of the IOOS regional associations—including through expanding the deployment of in-situ observing assets—in order to improve HABs warning and forecast accuracy. IOOS is directed to coordinate with the National Centers for Coastal Ocean Science on the implementation of these funds.
COVID Impacts

- Highlighted vulnerability of system to interruptions
- Request to build resiliency to system: Aging infrastructure

Economic Stimulus - $25M
- ‘In the pipeline projects’ for maritime transportation, weather, sea level rise, ecological health (HABs), fisheries and coastal hazards.

Immediate Needs for Resiliency: $25 million for restoring, sustaining, and building resiliency for critical observations in support of weather forecasting, safe and efficient marine operations, and search and rescue missions.

IOOS works as an integrated system of a variety of observing platforms, but to restore mission critical operations impacted by COVID-19 and continue protecting lives and livelihoods, we request support specifically for our radars, buoys, and gliders.

This includes:
- $12 million for high frequency radars
  - Supporting maritime commerce and at-sea safety
- $7 million for gliders
  - Supporting accurate weather forecasting including hurricanes
- $6 million for coastal moorings
  - Supporting accurate weather forecasting and real-time data for weather forecast offices

Longer Term Resiliency
COVID-19 further exposes gaps and weaknesses in our infrastructure and their negative impacts on life and the economy. For the IOOS system to achieve full resiliency, estimated costs are $75.65 million over the next 1-3 years.

The estimated cost for full resiliency of the integrated system, by subsystem is:
- $22 million for high frequency radars
- $11.57 million for gliders
- $23 million for coastal moorings
- $3 million for shore stations, including water levels and met stations
- $2.15 million for modeling/computing capacity

In support of the U.S. Integrated Ocean Observing System

Alaska (AOOS) • Caribbean (CarriCOOS) • Central and Northern California (CeNCOOS) • Great Lakes (GLOOS) • Gulf of Mexico (GOCCOOS) • Pacific Islands (PacIOOS) • Mid-Atlantic (MAEACOOS) • Northeast-Atlantic (NERACOOS) • Pacific Northwest (NANOOS) • Southern California (SCCOOS) • Southeast-Atlantic (SECOORA)

Learn More: Josie Quinrell | josie@ioosassociation.org | www.ioosassociation.org
**ICOOS Reauthorization**

**House:** *HR 729 – passed House 12/2019*
- Straight reauthorization with 3 amendments:
  - Allows Feds to serve on RA Board
  - Clarifies language regarding interagency financing
  - Authorization: $47.5 M for FY21-FY25

**Senate:** *S 914 PASSED!*
- Updated language and purpose
- Add glider, HFR studies and OA
- Authorization levels:
  - FY21 $48M
  - FY22 $50M
  - FY23 $52M
  - FY24 $54M
  - FY25 $56M

**Other Bills:**
- NOPP
- Aquaculture bill
- BLUE GLOBE
- Ocean Exploration
- HABRCA
UN Decade

OceanObs’19

National Outreach

EO on Mapping

EO on Aquaculture

NOAA’s Strategies
Harmful Algal Blooms (HAB)

- IOOS and NCCOS are partnering to advance HAB research into operations
  - IOOS Regional Association HAB initiatives - [http://www.ioosassociation.org/habs-initiatives](http://www.ioosassociation.org/habs-initiatives)

- Collaboration with NCCOS/MERHAB on transition planning for Pacific Northwest HAB Bulletin

- Funding for new HAB detection technologies through the OTT Program - [https://ioos.noaa.gov/project/ott-habs-hypoxia/](https://ioos.noaa.gov/project/ott-habs-hypoxia/)

- FY20 included $1M to pilot five HAB observing network projects - AOOS, NANOOS, SCCOOS/CeNCOOS, GLOS, GCOOS
CARAID Award

Annual award to recognize outstanding contributions to coastal and Great Lakes observing through collaboration

PRESENTS THE FIRST CARAID AWARD TO

DR. RU MORRISON

For his outstanding contributions to ocean observing through vision, leadership, and collaborative spirit.

Ru's vision, leadership, and can-do approach was instrumental in developing a thriving regional observing system as well as inspiring action at the national and international levels. His values, dedication and passion are what distinguish him and what inspires us: his work was done with Caraid.

Caraid: A Scottish Gaelic word, meaning "care" or "love" and is pronounced like "courage." These are the attributes that make IOOS work: caring and the courage to do what matters.
Other Projects

• Association Strategic Planning Process
  • Looking Forward to the Next Decade
• IOOS Economic Valuation
• IOOS/OAR Collaboration Workshop -
  • Pacific Basin - Aug 25-26
  • Atlantic - June 30 – July 1
  • Great Lakes – Oct 6-7
• HAB Observing Network: Framework for implementation
• Diversity and Inclusion Discussion
  • Supporting regional efforts,
• FY 22 Appropriations Request
• Infrastructure/stimulus request

IOOS Association
Annual Meeting
Friday, Oct 9
10 am – 1 pm   PT
Thank you!
5. NANOOS Recap

Jan Newton
NANOOS Executive Director
Northwest Association of Networked Ocean Observing Systems

The Integrated Ocean Observing System (IOOS)
Regional Association for the Pacific NW

www.nanoos.org
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
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<td>Oak Harbor Middle School</td>
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<td>Long Live the Kings</td>
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<td>World Ocean Council</td>
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**KEY:**
- **Tribal**
- **Industry**
- **NGO**
- **Academia/Research**
- **Federal/State/Local Government**
NANOOS Objectives for FY2020

1) Maintain NANOOS as the U.S. IOOS PNW Regional Association
2) Maintain and enhance surface current and wave mapping capability.
3) Sustain existing buoys and gliders in the PNW coastal ocean, in coordination with other national programs.
4) Maintain observation capabilities in PNW estuaries, in coordination with local and regional programs.
5) Maintain core elements of beach and shoreline observing programs, in coordination with state programs.
6) Provide sustained support to a community of complementary regional numerical models.
7) Maintain NANOOS’ Data Management and Communications (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 NANOOS outreach, engagement and education efforts.
NANOOS budget:

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
FY20: $3,923,322 ($2,462,136 base; $546K add to base; $373K OA; $250K HABs; $292K adds)
Year 14 or 5
FY 20: $3,923,322 ($2,462,136 base; $546K add to base; $373K OA; $250K HABs; $292K adds)

**Adds to base**
- $150,000 for Columbia glider O&M
- $150,000 for La Push glider O&M
- $80,000 for WA HFR O&M
- $75,000 for offshore buoys
- $91,000 for HAB ESP Spring deployment

**OA**
- $123,895 for NANOOS ocean acidification observations in Oregon coastal waters (OSU)
- $66,291 for NANOOS ocean acidification observations in Washington coastal waters (UW)
- $90,000 to enhance the GOA-ON data portal as an OA dashboard to the world (UW)
- $80,000 to continue funds for OA experts to aid OA observations for growers (OSU/UW)
- $13,000 to support NOA-ON mooring test-beds (UW)

**Other**
- $250,000 HAB understanding and prediction as part of HAB-ON
- $16,500 for biology pilot projects in honor of Matt Howard on biological data stewardship
- $7,500 for OceanHackWeek 2019 (Mayorga)
- $160,000 for Columbia River extension of Salish Sea model (Khangaokar)
- $108,000 for CRITFC for observation, modeling, DMAC activities
COVID-19

- NANOOS, our PIs, and partners are adapting to the challenges presented by COVID-19 as presented in our latest six-month NANOOS Progress Reports. Primary impacts are from delayed research cruises and supply chain disruptions;
  - Delayed La Push and Columbia glider deployments; Trinidad glider suffered casualty; all anticipated later this year
  - Delayed first WA HF installation; initiated on week of 10 August
- Observation asset deployment and maintenance has resumed with strict COVID-19 screening prior and concluding any at-sea activities, and with field teams wearing additional Personal Protective Equipment (PPE) to ensure crew safety.
- NANOOS continues providing sustained ocean observations and is working with its members' virtually further the scientific and operational design and maintenance of the Pacific Northwest regional ocean observing system.
HFR installation at Westport Beach State Park!!

Installation has started !!!
Congrats Mike Kosro and team
New NVS-TsunamiEvac phone app

- A major update receives push notifications from the National Tsunami Warning Center that may include information statements on distant earthquakes, tsunami advisories, watches, or warnings.

- The NVS Tsunami Evacuation Zone App was highlighted in a newsletter produced on behalf of the National Tsunami Hazard Mitigation Program. NANOOS PI Jon Allan provided a retrospective on the 10-year development of the NVS Tsunami web app and smartphone application, highlighting the strong collaborative approach taken by NANOOS, DOGAMI and WA DNR to ensure easy access to critical life safety information (tsunami evacuation zones and warning information) for the PNW region.

- The process and app product were successful because strong stakeholder input guided its development and because of the strong partnerships.
HABs highlighted in FY20

• Funds for HAB-ON and preserving PNW HAB Bulletin, now on NANOOS

• Operational funds for additional ESP deployment in spring 2021

• OTT award for additional HAB sampling
Operational ecological forecasting of PNW harmful algal blooms using an Environmental Sample Processor

MERHAB award: Operational funds for 4 years
Pacific Northwest Harmful Algal Blooms Bulletin
May 19, 2020  HAB risk = 

HAB risk key:
- low
- medium
- high

Beach Sampling (Pseudo-nitzschia)
(particulate domoic acid)

WA Pseudo-nitzschia & Domoic Acid

Hobuck Beach 13-May 0 c/L
La Push, First Beach 09-May 0 c/L
Kalischo 11-May 11.4 c/L

OR Pseudo-nitzschia & Domoic Acid

Clatsop 11-May 21000 c/L
Sunset 11-May 14900 c/L

Summary - During the first half of May, waves fluctuated, but remained primarily downwelling-favorable. This, coupled with the spring freshet, led to a large quantity of Columbia River water along the WA coast. Satellite imagery suggests higher chlorophyll-a concentrations there, consistent with recent beach monitoring results. Beach samples confirm a mix of both large and small morphology Pseudo-nitzschia (PN). In WA, the highest recent PN concentrations were at Westport (large: 55,000 cells/L, small: 20,000 cells/L) on 14-May and Copalis (large: 28,000 cells/L, small: 37,000 cells/L) on 18-May. In OR, PN concentrations were highest at Clatsop South Jetty (large: 102,000 cells/L, small: 21,000 cells/L), but were much lower or absent south of Sunset Beach. Despite the elevated concentrations of large morphology PN, recent seawater particulate domoic acid (pDA) concentrations were low where sampled (Twin Harbors: 16.4 c/L on 12-May; Clatsop: 11.4 c/L on 11-May). No recent offshore samples have been collected and the PN species have not been identified. As of 13-May, WA raccoon clams DA concentrations remain low (25 ppm). PIP levels in razor clams remain greater than regulatory limit of 36 ppm as of 8-May. In OR, results from 14-May indicated that razor clam DA was 64 ppm at Clatsop South Jetty, 12 ppm at both Newport Aerie Beach and Coos Bay North Jetty sites, and 24 ppm at Gold Beach. Near Humboldt, CA, recent reports indicate that seawater DA has been increasing, consistent with an ongoing PN bloom; razor clams there contain to trace levels of DA. Forecasts - ENSO neutral conditions continue, and are expected to persist through summer and fall. The recent PDO value remains negative. High pressure offshore will lead to generally southeastward winds this week. The LiveOcean forecast suggests some upwelling, with northwest currents turning southward. Northwest winds are forecast for the weekend, but high pressure is expected to build next week which should drive additional upwelling. Given this, we do not anticipate rapid changes in the state of the coastal ocean. The current low pDA concentrations are encouraging. The short-term predicted risk of a large DA outbreak remains low, but managers should prepare with updated PN and pDA results as the weather changes, particularly during any extended duration harvests. Given the elevated seawater DA levels in northern CA, managers should continue diligent monitoring in northern OR.

Pacific Ocean Indices

Ocean Surface Currents

Satellite Chlorophyll-a

North-south Wind Stress

Cumulative Wind Stress

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

Columbia River Discharge

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

Marine Weather Forecast

Fair weather can support plankton blooms whereas storms can concentrate any plankton and toxins on beaches.

LiveOcean Forecast Model

Day of Year

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

WA Pseudo-nitzschia & Domoic Acid

OR Pseudo-nitzschia & Domoic Acid

No data

No data

No data

No data

No data

No data

No data
The IOOS Ocean Technology Transition Program awarded $1M over 3 years to UW, OSU, Ocean Aero and NOAA NWSFC partners to enhance and deploy an Ocean Aero ASV to collect offshore HAB samples in Washington and Oregon. The enhanced Ocean Aero ASV will augment existing HAB sampling efforts by collecting water samples in rough weather conditions, common during peak HAB seasons of early spring and fall, that would prohibit sampling by small vessels. In addition to acting as an early warning system, this sampling will provide valuable measurements to the Pacific Northwest (PNW) HAB Bulletin, ground-truthing and increasing the accuracy of HAB forecasts and providing essential measurements of toxin concentration.
Ocean Observatories Initiative (OOI) Newport Hydrographic Line glider data are available via NVS for temperature, salinity, and bio-chemical data and links to the IOOS Glider DAC where users can download these data. This collaboration between OOI and NANOOS builds upon previous work to include near real-time OOI mooring observations in the NVS Data Explorer.
Enabling Change Working Group

• Seven people volunteered to help NANOOS develop actions to increase our diversity, equity, and inclusion.

• Our first call was July 24th and we plan to meet monthly.

• Solutions are not quick or easy, but some ideas are gelling; we know we need to work to achieve the results we want.
FISHERIES SCIENCE and COMMERCE

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

— Anthony Oddell, 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 decisions surrounding harvest, food safety and market operations. Having immediate access to data and information throughout the summer allows us to ensure the highest ground confidence that our forecasting and harvest schedules are in accordance with the latest practices and state data control plans. As an industry, we've greatly benefited from an expansion of the program and increase in monitoring tools to help us utilize this technology for safe and profitable resource use."

— Justin Stang, Wholesale Manager, Hanna Hamo 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 Research Unit at MOWRPA. We use this information to assist us with planning our field sampling on a daily and weekly basis. We use this information to understand conditions and to inform our management. We have made several updates to our system in the last year.

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

"I wanted to let you know that I was using the tuna fisheries application again after a year away from fishing due to back surgery. I am so impressed with the improvements you have made since I used it last. Your group has added a very solid and valuable tool for our tuna fishing business. Some of my favorite features are trip planning and creating menus, constant water temperatures, current and forecasts, catching places, and understanding current flow so I can estimate the direction and distance we will drift at night and vary and verify forecasting. This application is helping us explore safer trips, find the fish easier and save on fuel usage. Thank you for the great job you are doing, we appreciate it very much."

— Gary and John Palmer, Fishing Oregon Pescador

"As an ocean sport fisherman, I want to give a huge shout out to the team at NANOOS. The NWS Tuna Fisheries application has given myself and other sport boats the ability to narrow our search for the fish we seek. As a sport tuna fisherman, water height, wind and current direction are very important in how far we travel offshore as well as setup for fishing. This tool provides the ability to glimpse hours out into the day before we 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 means for tuna. I was then able to use your chlorophyll and sea surface temperature for the region I thought may be productive. Using the GPS coordinates from your mapping product, I reached out to an acquaintance who operates a tuna charter boat. I asked the captain if he could help me access to an area that he felt was most productive on that particular day. Much to my surprise, he gave me coordinates about 1 NMY from where I had planned to start. 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 tools. Keep up the great work!"

— Wallace Costa, F/V Elizabeth Marie, Oregon Recreational

TSUNAMI RISK REDUCTION

"As a coastal community, we need to stay well-prepared and informed. We use TsunamiWatch to stay informed on the status of tsunami warnings and plan accordingly. The tsunami watch system is an essential tool for us to take action in the event of an emergency."

— Justin Stang, Wholesale Manager, Hanna Hamo Company

"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 tsunami map centered on your home, workplace, hotel or even campsite. Users can then determine their nearest point of safety outside the evacuation zone and develop a plan for how to get there."

— Jon Allen, Coastal Geomorphologist, Oregon Department of Geology and Geophysical Industries

RECREATION SAFETY

"For Pacific Northwest boaters crossing the Strait of Juan de Fuca or the Strait of Georgia, real-time data on wave height, wind speeds, and other meteorological information can be invaluable. To time such passages properly 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 VNOOS NWS system."

— Captain Lincoln Rettie, SV/Skyle

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

— Dan Gustafson, Washington Policy Manager, Surfrider Foundation
NANOOS pays annual $1000 non-federal dues to IOOS Association, split by:
  – Seabird Scientific
  – Pacific Coast Shellfish Growers Association

THANK YOU!!!
NANOOS Standing Committees

- User Products
- DMAC
- Engagement, Outreach, Education
NANOOS Visualization System Update

Jonathan Allan
NANOOS User Products Chair

Team: Troy Tanner, Rachel Wold, Nick Rome, Beth Curry
Jan Newton (APL, UW); Craig Risien, Mike Kosro
(CEOAS, OSU), Charles Seaton (CMOP, CRITFC).
NVS History and Status:

Oct 2014 – v3.8 – Climatology web app released

Jun 2017 - v. 4.0 iPhone/Android NVS rebuild released

May 2018 – v6.0 – Developed new web app for fishing community (SEACAST, unplanned). New UI released (simplified format). Expanded Xtide to include Canadian tide stations (Boaters);

January 2019 – v. 2.0 iPhone/Android TsunamiEvac released

2019 – v6.3 – Updated tsunami evacuation zones (Washington); Improvements to timeline (able to plot timeseries for model outputs for any location in map); ability to query overlay (model) data in Boaters App (new overlays)

2020 – v. 2.3 iPhone/Android TsunamiEvac updated – added push notifications

NVS v6.3 – Main improvement relates to a new ‘Overview’ tool on the back end (not publicly viewed) that allows the NANOOS development team to evaluate status of any sensor or model overlay.
Fewer people visiting the coast?
Focus for next 12 months:

• Particle tracking (product by spring 2021)
• Develop an integrated glider app for viewing multiple gliders at once
• Update NVS Data Explorer smartphone app
  • Map view
  • Favorite assets
• Updated bathymetry contours (entire region) / habitat GIS layers
• Model cross-section tool
Data Management and Cyberinfrastructure (DMAC) 2019-2020 Updates

Craig Risien (OSU CEOAS)

Troy Tanner, Alex Dioso, Emilio Mayorga (UW APL)
Charles Seaton (CRITFC)
Jonathan Allan (DOGAMI)
DMAC 2019-2020 Updates

• **New Data Streams**
  • ONC Baynes Sound mooring
  • OOI Endurance Array moorings
  • CDIP Angeles Point wave buoy
  • NWS wind stations north and south of the Columbia River mouth
  • USGS river gage in Vancouver, WA,
  • Friday Harbor Laboratory weather station

• **Upgraded Data Streams**
  • New pH sensors on Dabob Bay, Hansville and Point Wells ORCA buoys
  • Ingesting latest version of UBC SalishSeaCast model

• **New Glider Data**
  • OOI glider transects off Newport, OR and Grays Harbor, WA
DMAC 2019-2020 Updates

• **NCEI Data Archiving**
  - Continued archiving of CMOP time series data
  - Ongoing efforts to archive 20 yrs of DOGAMI shoreline surveys
  - Ongoing efforts to archive pH data from Washington Shelf and Puget Sound moorings maintained by the UW NWEM group

• **ERDDAP* Implementation**: Easier Access to Data Integrated by NANOOS
  - Released an ERDDAP server that provides data access to **113 datasets** that include NANOOS gliders, NANOOS processed time series and climatologies from NDBC, NOS and CDIP, and NANOOS-originated remote sensing products.

  http://data.nanoos.org/erddap

*ERDDAP (the Environmental Research Division's Data Access Program) is a data server that gives you a simple, consistent way to download subsets of scientific datasets in common file formats and make graphs and maps.*
NANOOS Outreach, Engagement, & Education

NANOOS Joint Governing Council and PI Meeting
August 18, 2020

Rachel Wold (UW APL)
NANOOS Outreach Chair
Outreach, Engagement, Education:

2019-2020 Updates

• Engaged with the general public and targeted user groups
  • Various public events, tradeshows, conferences, meetings
  • Offered virtual NVS demonstrations
• Made NVS enhancements based on user input

Signs of success:
• Asked back
• Saltwater Sportsmen Show: >70 at 8 am Sunday talk
• More quotes from Tuna fishers
• More traffic on NVS with Qs

Plans for Upcoming Year

• Continue engaging existing and new user groups
  • Explore more virtual opportunities
• Develop stronger bonds with commercial maritime (e.g., USCG, pilots) and resource managers
THANK YOU !!!
5. Recognition

Thanking Antonio Baptista and Welcoming CRITFC
Executive Director Jaime Pinkham
NANOOS wishes to recognize

Antonio Baptista

for exemplary leadership and vision that guided years of developing coastal ocean margin observing and predicting tools that have been part of NANOOS since its inception; for transitioning these capabilities such that these can continue to benefit Columbia River tribes, NANOOS, and the public for years to come.
NANOOS warmly welcomes

Jaime Pinkham, CRITFC Executive Director & NANOOS GC Member
Charles Seaton, CRITFC, CMOP Coordinator & NANOOS PI
5. Recognition

Thanking Emilio Mayorga and Introducing the NANOOS DMAC Lead Craig Risien and the distributed DMAC team
NANOOS wishes to recognize

Emilio Mayorga

for outstanding leadership and vision that guided the development of data management systems for NANOOS, connecting with and building a distributed DMAC team, interacting with myriad stakeholders to connect their data streams into the NANOOS Visualization System data portal; for applying his expertise and knowledge to U.S. IOOS; and for adapting NVS to serve the Global Ocean Acidification Observing Network.
NANOOS introduces our DMAC Team

Craig Risien, NANOOS DMAC Lead

Charles Seaton, CRITFC
Troy Tanner and team, UW
Jon Allan, DOGAMI
BREAK
NANOOS
The Next 5 years:
Response to NOAA IOOS NoFO

NANOOS Governing Council Meeting
August 18, 2020
NANOOS Proposal for IOOS NoFO

- 5-year period
- Due 31 December 2020
- $6M budget for each of five years

- Proposal text will describe two efforts: $3M and $6M
- Award funding for NANOOS now is ~$3M

- Need to scope the full budget
FFO process

- Discuss NANOOS GC priorities
- Solicit input from current PIs for sustaining current observations, modeling, DMAC, products, EEO, and operations
- Solicit input from all PIs for new ideas
- Use Executive Committee (Board plus functional Chairs, and ED) to rank and decide on final budget priorities
NANOOS Functional Systems

- Observations
- Modeling
- DMAC
- Engagement, Education, & Outreach
- Management
NANOOS Geographic Priority Areas

- **Coastal Ocean**
  - La Push buoy & glider; Columbia buoy & glider; Coos Bay buoy; Trinidad Head glider
  - HF Radar in OR & WA
  - LiveOcean & OSU ROMS

- **Estuaries**
  - South Slough; Columbia estuary; Puget Sound & Bellingham Bay
  - X-band radar in Yaquina
  - Columbia modeling & LiveOcean

- **Shorelines**
  - Washington and Oregon shorelines and bathymetry
NANOOS Theme Areas

- **Climate**
  - Buoy, glider, shoreline time-series measurements

- **Coastal Hazards**
  - Shoreline accretion/erosion; project on oil spill trajectories

- **Ecosystem Assessment**
  - Hypoxia, OA, HABs, nutrients, temperature, salinity, LiveOcean

- **Fisheries and Biodiversity**
  - Plankton data; Columbia habitat modeling; projects with IFCBs, eDNA, HABs, WCOFS

- **Maritime Operations**
  - Currents, model real-time conditions, forecasts by OSU ROMS, Columbia, & LiveOcean
### 2014-2020 proposal

#### "Effort versus Application" Map for Observing and Modeling

<table>
<thead>
<tr>
<th>EFFORTS:</th>
<th>APPLICATIONS:</th>
<th>Coastal Ocean</th>
<th>Estuaries</th>
<th>Shorelines</th>
</tr>
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<tbody>
<tr>
<td>Multivariable assets:</td>
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<tr>
<td>WA shelf glider line</td>
<td>no coastal nearshore</td>
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<tr>
<td>Columbia shelf glider tracks</td>
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<tr>
<td>CA shelf glider line</td>
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<td>WA shelf buoy</td>
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<tr>
<td>Columbia shelf buoy</td>
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<tr>
<td>OR shelf buoy</td>
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<td>PNW nearshore hypsos</td>
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<tr>
<td>OR nearshore OAH</td>
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<tr>
<td>Puget Sound estuary buoys</td>
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<td>Puget Sound estuary ferry boat</td>
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<td>Columbia estuary buoys</td>
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<td>Salish Sea estuary buoy</td>
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<tr>
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<td>Puget Sound biogeochem forecasts</td>
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<tr>
<td>Columbia estuary habitat forecasts</td>
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<td>Coastal wave forecasts</td>
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<tr>
<td>Flood/errosion forecasts</td>
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<td>no forecast</td>
<td>no forecast</td>
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</tbody>
</table>

**KEY:**
- Italicized efforts indicate new investment
- Currently directly supports
- Currently indirectly supports
- Proposed to directly support
- Proposed to indirectly support
- Not applicable
- Text explains the current gap the proposed activities fill
Next 5-y FFO will post before our next meeting

- What are your priority needs?
- What do you value: sustaining obs or new investments?
- What kind of products do you need?
  - For decision support, for prediction?
- Are there geographical priorities?
2019 GC consensus:

- Sustain existing assets and capabilities
- Assure that transition plans are developed
- Seek to bring in new work, but not at cost of eliminating existing work; and cognizant that level funding is actually de-funding over time
- Continue to work with Congress and feds on growing budget
2019 GC slide

**FFO process**

- Discuss NANOOS GC priorities
- Solicit input from current PIs for sustaining current observations, modeling, DMAC, products, EEO, and operations
- Solicit input from all PIs for new ideas
- Use Executive Committee (Board plus functional Chairs, and ED) to rank and decide on final budget priorities
NANOOS Proposal for IOOS NoFO

NANOOS Invites Expressions of Interest on Next 5-Year Effort

NANOOS invites input for our response to the U.S. Integrated Ocean Observing System (IOOS) Notice of Federal Funding to guide the next 5 years of NANOOS operations. If you would like to be considered for projects under the new 5-Year award, follow the links below to submit your (1) Expression of Interest and (2) Budget Estimate. Submissions are due 25 July; see Timeline for more information.

Federal Notice  
Expression of Interest (DOCX)  
Budget Estimate (XSLX)  
Response Timeline (DOCX)
# Timeline

<table>
<thead>
<tr>
<th>DATE</th>
<th>ACTION</th>
<th>POINT</th>
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</thead>
<tbody>
<tr>
<td>25 June</td>
<td>Expressions of Interest (EOI) process announced</td>
<td>PIs</td>
</tr>
<tr>
<td>25 July</td>
<td>All EOIs due to <a href="mailto:janewton@uw.edu">janewton@uw.edu</a> and <a href="mailto:nrome@uw.edu">nrome@uw.edu</a></td>
<td>PIs</td>
</tr>
<tr>
<td>Early August</td>
<td>EOIs prioritized by NANOOS Governing Council Executive Committee</td>
<td>GC Exec Comm</td>
</tr>
<tr>
<td>Late August</td>
<td>Further Management deliberation with NANOOS Governing Council Executive Committee to finalize budget and proposal scope</td>
<td>GC Exec Comm</td>
</tr>
<tr>
<td>31 Aug</td>
<td>All included PIs notified</td>
<td>PIs</td>
</tr>
<tr>
<td>Sept</td>
<td>Proposal writing begins</td>
<td>NANOOS</td>
</tr>
<tr>
<td>30 Sep</td>
<td>All sub-budgets due to their respective institutional fiscal offices</td>
<td>PIs</td>
</tr>
<tr>
<td>30 Oct</td>
<td>All sub-budgets, SOW, budget justification due to APL-UW</td>
<td>PIs</td>
</tr>
<tr>
<td>30 Nov</td>
<td>Proposal submission target date</td>
<td>NANOOS</td>
</tr>
</tbody>
</table>
NANOOS Submission

- Will articulate a $3M effort (~level with now) and, also, what enhanced and new activity would occur under a $6M effort.

- Does not need to prioritize beyond $3M vs. $6M in the 5-y plan

- Each year NANOOS “de-scopes” a budget: sustaining efforts plus filling the gaps targeted funds and support from other NOAA offices. If new “base” funding awarded, then EC/GC would be utilized for priorities to match increase.
NANOOS Budget Categories

- Sustained existing operations and functions
- Enhancements to existing operations and functions
- New operations
Plan for discussion today

• Affirming we are on track with this process and 2019 priorities

• GC reaction and input on “New” projects as advisory input to EC

• GC input on gaps
Recap and Action Item Review
ADJOURN