

2020 Annual Report to the IOOC on U.S. IOOS



U.S. IOOS 2020 Annual Report

IOOC Monthly Meeting
January 25, 2021 | Carl Gouldman

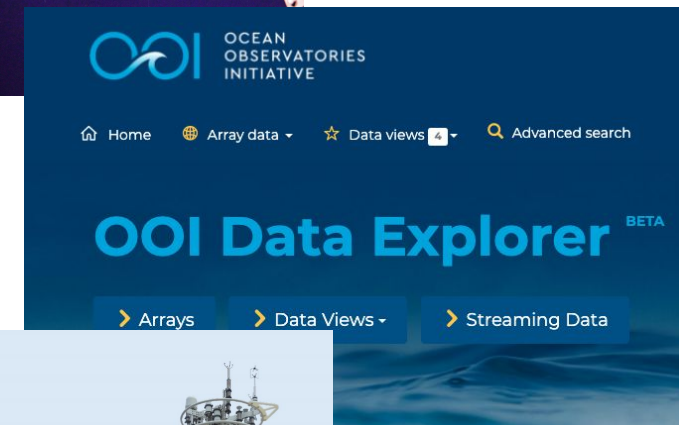
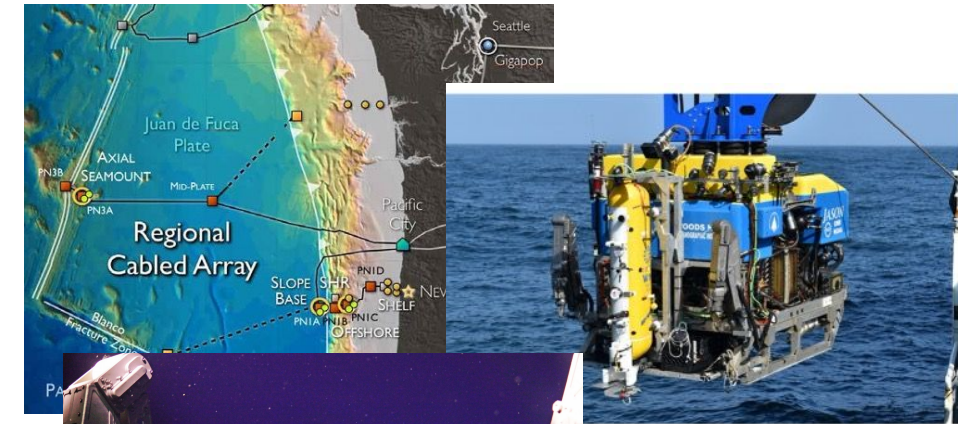
Coordinated Ocean Observations and Research Act of 2020 (Pub. Law 116-271) -
“...not less frequently than once each year, submit to the Interagency Ocean
Observation Committee a report on the accomplishments, operational needs, and
performance of the System to contribute to the annual and long-term plans...”

Approach - FY20 accomplishments - FY21 look ahead and next decade
priorities

- Portfolio updates and agency highlights
- FY21 Priorities, Implementing IOOS, and Research & Development
- IOOS Program office items

Ocean Observatories Initiative (OOI)

- Regional Cabled Array 2020 Expedition
 - Completed successful 23 day mission in August 2020
 - 1200 miles of transit
 - 44 ROV Jason Dives
 - Over 80,000 lbs of equipment mobilized
 - Turned, deployed or recovered 225 pieces of infrastructure on seafloor and in water column.
 - More than 500 hours of continuous livestreaming video from ship to shore
- Data Improvements
 - Launched new data exploration tool – OOI Data Explorer version 1.0 (October 2020)
 - Community Data Tool Addition - developed new toolbox with Easy-to-use MATLAB Data Tools



Environmental Protection Agency (EPA)

- U.S. EPA's Beach Report 2019 Swimming Season Published (October 2020)
- Updated and enhanced online tools:
 - Beaches Advisory and Closing Online Notification (BEACON) system 2.0:
<https://watersgeo.epa.gov/beacon2/>
 - New Dynamic National Report Generator:
<https://ofmpub.epa.gov/apex/beacon2/f?p=BEACON2:DNR:0>
 - Generate custom data reports and trend graphs at the state & local level:
<https://watersgeo.epa.gov/BEACON2/reports.html>



EPA's Beach Report: 2019 Swimming Season

Introduction

This report summarizes information that states, territories, and tribes with coastal and Great Lakes beaches submitted to EPA reporting beach advisories and closings for the 2019 swimming season. The information in this report covers January 1 through December 31, 2019, and includes data submitted to EPA as of July 29, 2020. A version of this report incorporating any updated data since this report was released can be generated at <https://ofmpub.epa.gov/apex/beacon2/f?p=BEACON2:DNR:0>.

The Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000 authorizes EPA to provide grants to eligible states, territories, and tribes to monitor their coastal recreational waters adjacent to beaches used by the public for attainment of applicable water quality standards for pathogens or pathogen indicators, such as bacteria, that indicate the possible presence of disease-causing pathogens and to notify the public when there is a potential risk to public health. EPA awarded nearly \$9.3 million in such grants in 2018 for the 2019 swimming season. The BEACH Act requires that grant recipients report their coastal recreational waters monitoring and notification data to EPA and that EPA maintain a publicly accessible electronic database of those data. This report is based on those data. Information on grouped or individual jurisdictions or beaches can be found at <https://watersgeo.epa.gov/BEACON2/about.html>.

2019 Swimming Season Results

States, territories, and tribes take water samples to monitor the water at swimming beaches to see if levels of specific indicator bacteria (e.g., enterococci) exceed the water quality standards that apply to that water. "Program beaches" have, at minimum, a program to notify the public if swimming in the coastal water is unsafe, and most also have a program to routinely monitor water quality. In 2019, 78 percent of coastal and Great Lakes program beaches in the United States were monitored for pathogens or pathogen indicators. Chart 1 shows the number of beaches that were monitored and the number of program beaches in each state, territory, and tribe in 2019. When monitoring results show exceedances of water quality standards for pathogens or pathogen indicators, states, territories, and tribes either issue a beach advisory that warns people of possible risks of swimming or a beach closing that closes the beach to public swimming. The states and local agencies that do not routinely monitor water quality use models or other policies (e.g., advisory after a certain amount of rainfall) as a basis for issuing notification actions at beaches. These advisories or closings typically stay in effect until monitoring shows that levels of pathogens or pathogen indicators are within acceptable limits.

BEACON 2.0 - Beach Advisory and Closing On-line Notification

Find a Beach

[BEACON 2.0 User's Guide \(PDF\)](#) (82 pp, 4.18MB, [About PDF](#))

This screenshot shows the "Find a Beach" interface. At the top, there are navigation tabs: "About Beacon", "Find a Beach" (selected), "Reports", and "RSS Generator". Below the tabs is a map of the United States with a search overlay. The search overlay includes a "Back U.S. View Forward" bar, a "Latitude: 64.0009 Longitude: -150.8105" display, a "Find address or place" search box, a "Find Beach by ID or Name" search box, and a "Go to: (select an option)" dropdown menu with a "Go" button. There are also zoom controls and a "Legend" section at the bottom left. A "Use automatic basemap selection" checkbox is checked. At the bottom right, there is a section for "Other States, Territories & Tribes" with buttons for "Alaska" and "Hawaii".

BEACON 2.0 - Beach Advisory and Closing On-line Notification

Find a Beach

[BEACON 2.0 User's Guide \(PDF\)](#) (82 pp, 4.18MB, [About PDF](#))

This screenshot shows a detailed view of a beach. The search overlay is still present, but now a "CAMP PENDLETON" information window is open. The window displays: "Beach ID: VA514504", "County: Virginia Beach", "Status: No advisory or closure", and "Date: 7/11/2019". Below this, there are links for "Advisories and Monitoring Data", "Beach Advisory and Closing Information", "Water Quality", "Beach Profile", "Contact Information", and "Additional Reports". A "Zoom to Beach" button is at the bottom of the window. The background map shows a satellite view of the beach area.



Marine Mammal Health Monitoring and Analysis Platform



Health MAP vision:

For everyone to observe spatial and temporal interactions among marine mammal health, ocean health, & human activities

CY20 Activities and Accomplishments:

- Continued development of a prototype data platform in the Gulf of Mexico (Gulf MAP)
- Development and implementation of the standardized, basic and detailed health data fields
- GCOOS and SECOORA engaged with further development of Health MAP capabilities in the Gulf through the CETACEAN* project as part of Restoration under the Open Ocean Trustee Implementation Group

*CETACEAN: "Compilation of Environmental, Threats, and Animal data for Cetacean population health ANalyses."

Partners:



Updates available:

<https://www.mmc.gov/priority-topics/marine-mammal-health-and-strandings/>



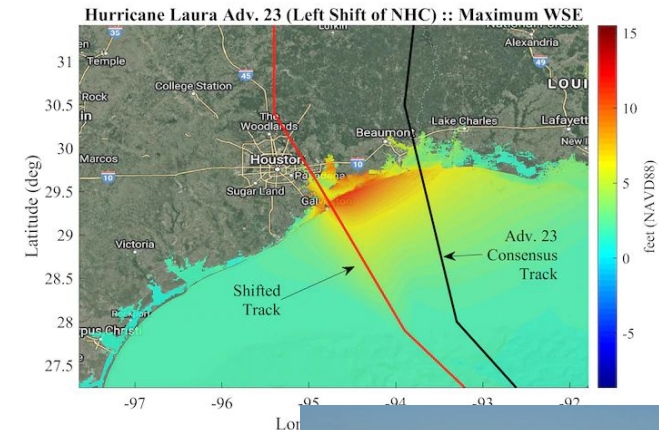
- **Testing New Unmanned Autonomous Surface Vessels**

- Demonstrated new unmanned autonomous surface vessel (USV) to monitor munitions constituents
- USV: G6 from SubSeaSail, LLC, a sailing vessel powered by the wind and solar energy



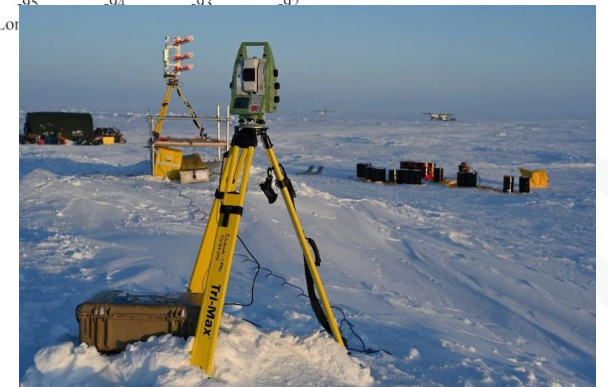
- **Modeling to assist with hurricane preparations**

- Using numerical modeling systems, like ADCIRC, to help USACE districts prepare for tropical storms.
- Simulating scenarios for impacts to district maintained and operated structures.



- **Collaborated with the U.S. Navy during the annual Sea Ice Dynamics Experiment (SIDEx)**

- Experiments to measure how the ice moves and changes before it breaks.



DOE - Powering the Blue Economy: Ocean Observing Prize

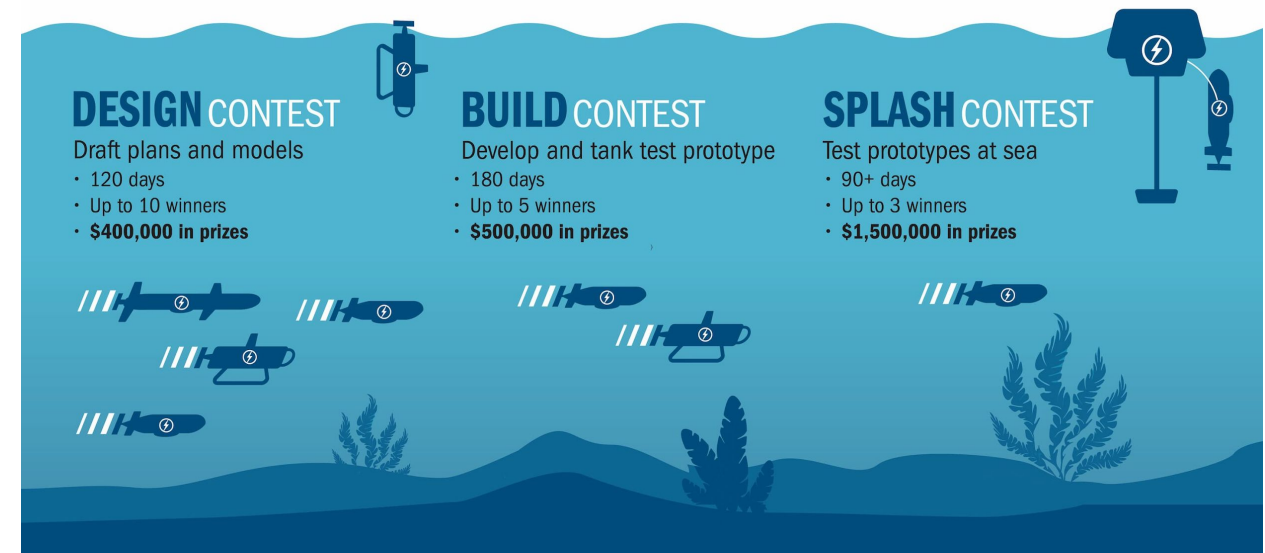


- **\$3 million prize competition** to generate innovation in marine energy-powered ocean observing platforms.
- DISCOVER Stage Winners Announced (April 2020)
 - 11 winners - 1 Nautilus Grand Prize Winner (CalWave) and 10 Explorer Prizes
- DEVELOP Stage Opened October 2020



DEVELOP COMPETITION

*Hurricane Monitoring:
Self-Charging AUVs*



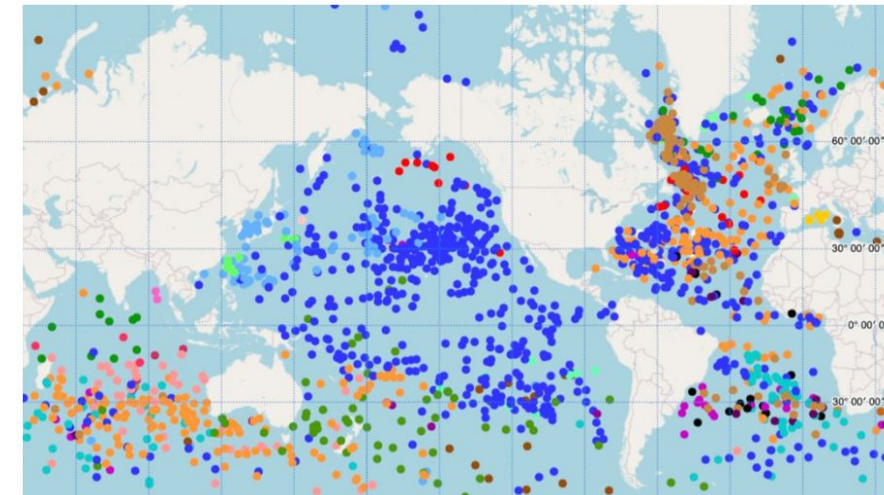
● Important Dates

- Submission Open: October 19, 2020
- Submission Close: February 16, 2021, at 5:00 p.m. EST
- Judging and Review Complete: Anticipated March 17, 2021
- Winner Announcement and Awards: Anticipated April 1, 2021

<https://americanmadechallenges.org/oceanobserving/>

Global Ocean Monitoring and Observing (GOMO) Program

- Office was officially elevated to the Global Ocean Monitoring and Observing (GOMO) Program in NOAA Research (April 2020)
- Global Drifter Program highlights:
 - Partnered with NDBC to support USN funded deployments
 - Launched new interactive map tool
 - Deployments continued thanks to partners around the world despite the pandemic
- New Optical Oxygen Sensor Developed and Deployed on BGC Argo Float
 - Revolutionary new optical oxygen sensor
 - Project funded by GOMO Program through 2019 NOPP BAA, in partnership with NASA's Ocean Biology and Biogeochemistry Program
 - Project to design and build a full-suite (6 parameter) biogeochemical (BGC) Argo profiling float



NOAA: Advancing Research Collaboratively

Blue Economy

Seafood Production

- Triple domestic marine aquaculture production and maximize sustainable commercial fishing by streamlining regulations

Tourism and Recreation

- Promote sustainable tourism and recreation in U.S. coastal areas and Great Lakes by strengthening national marine sanctuaries

Ocean Exploration

- Expand ocean exploration by making available seafloor maps and data of the entire U.S. exclusive economic zone

Marine Transportation

- Strengthen maritime commerce by increasing vessel transit safety and efficiency at major U.S. seaports to reduce costs

Coastal Resilience

- Support smarter coastal zone planning and more resilient economies in all U.S. coastal states and territories

Weather Research

and Forecasting Act of 2017 and 2019

Improved Hurricane Forecasting

- Improved forecasting tools
- Historical tropical cyclone tracking

Tsunami Warning and Education

- Coastal Digital Elevation Models
- Global Historical Tsunami Events

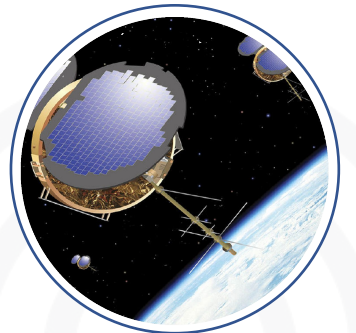
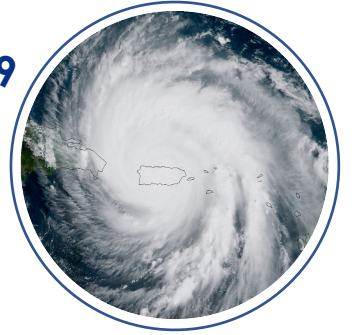
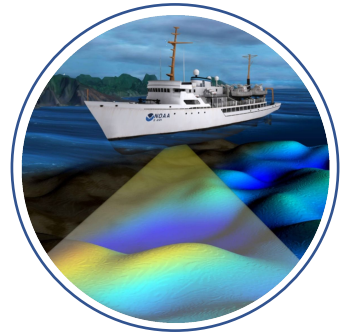
New Initiatives

Earth Prediction Innovation Center (EPIC)

- Strategic collaboration on environmental modeling

Six strategies

- Unmanned Systems
- Artificial Intelligence
- 'Omics
- Cloud Services
- Data
- Citizen Science



NOAA SCIENCE & TECHNOLOGY FOCUS AREAS

Six Strategies - intended to expand NOAA's application of these focus areas:

- Uncrewed Systems
- Artificial Intelligence
- 'Omics
- Cloud Services
- Data
- Citizen Science

Will guide transformational advances in the quality and efficiency of NOAA's science, products, and services.



<https://nrc.noaa.gov/NOAA-Science-Technology-Focus-Areas>

NOAA's National Ocean Service 2020 Highlights

- Center for Operational Oceanographic Products and Services (CO-OPS) Expands PORTS®
 - Enhances Safety of Marine Navigation Across U.S.
- Office of Coast Survey (OCS) Releases Ocean Mapping Strategy to Support Federal Initiative
 - Optimize the safety and utility of the nation's marine highway infrastructure
 - Map the full extent of the U.S. waters to modern standards
- NGS flight crews captured 23,401 Aerial Damage Assessment Images images during Hurricane Laura
 - Aids Safe Navigation and Records Storm Damage to Coastal Areas



U.S. Glider Network (Navy, NOAA, NSF, etc.)



8,293 Glider Days = 254,4977 observations
made available to models!

2020 Accomplishments

- Record Setting Year more profiles, glider days, and deployments than any other year!
- UG2 Steering Committee formed
- Minimal impacts to operations from COVID-19
- Navy partnership expanded beyond gliders
- 1 Million Profiles collected since 2009!

Looking Ahead

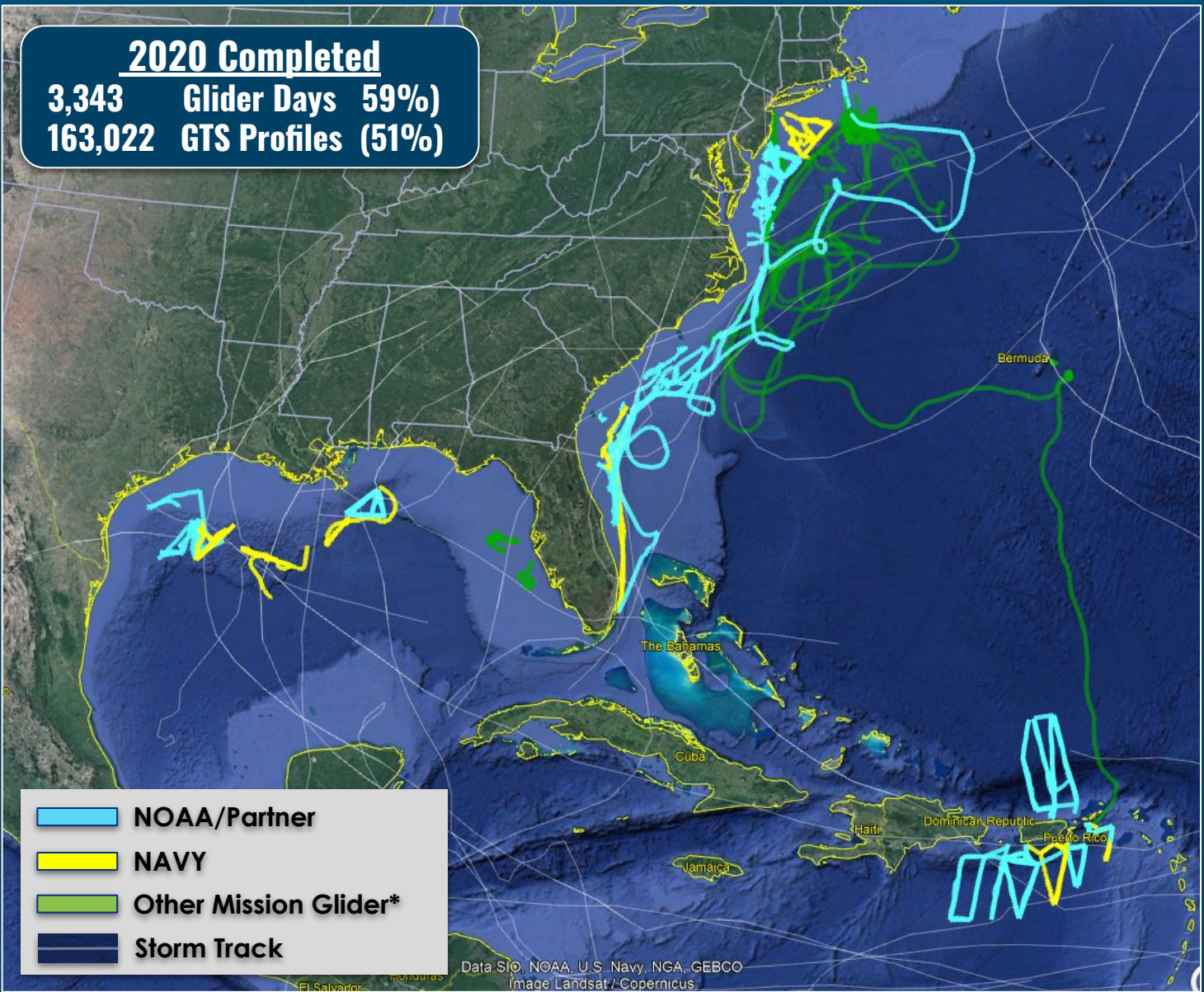
- Coordinated Hurricane Ocean Obs campaign in 2021
- Build and strengthen the UG2
- Continue Quarterly Webinars and host 2021 Workshop



2020 Operations Overview

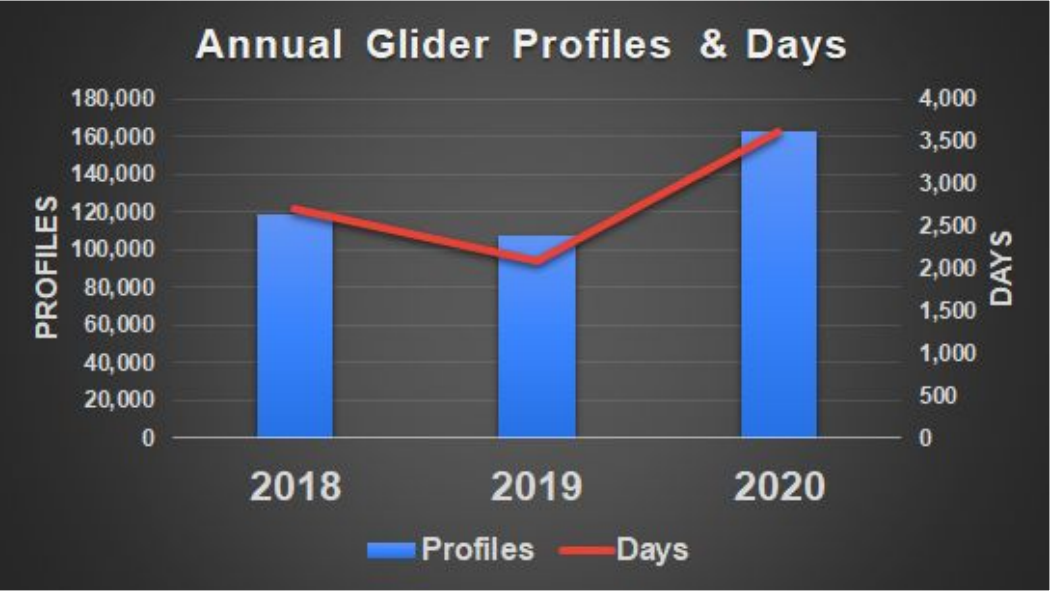


2020 Completed
3,343 Glider Days (59%)
163,022 GTS Profiles (51%)



- ▬ NOAA/Partner
- ▬ NAVY
- ▬ Other Mission Glider*
- ▬ Storm Track

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
 Image Landsat/Copernicus



U.S. Animal Telemetry Network (ATN)



- **FY20 Funding and Some Accomplishments**

- \$1.38M Total investment from ONR, BOEM, NOAA
- Building U.S. telemetry community:
 - ATN Data Workshops: NMFS NE and SW Science Centers
 - PACIOOS and SCCOOS-CeNCOOS-NANOOS Workshop Reports published
 - A single unified acoustic receiver network from Canada to Caribbean is implemented with ATN partners
- Amount of Data in ATN DAC has tripled to: 131 Projects/89 Discoverable, 54 Species, 2894 Tag Deployments, 20 Datasets DOI minted and archived
- ATN helps keep Cape Cod Beaches Safe with R/T acoustic shark detection buoys/text messaging
- International AniBOS (Animal Borne Ocean Sensors) Network
 - Approved by OCG as an emerging GOOS Network
 - ATN GTS Project for AniBOS - will insert ocean profiles from animal tags onto the WMO GTS
 - **“Animal-Borne Ocean Sensors: A Decadal Vision through New Eyes”** - proposed to UN Decade
- **Unifying ATN & MBON:** A Cross MBON/ATN Working Group now in place to promote and develop measures for integration and comparison of biodiversity and animal movement data

U.S. Animal Telemetry Network (ATN)



● FY21 Plans

- Continue to be the go-to resource for NOAA, U.S. and international partners for shared integrated data and information by sustaining and expanding the ATN (DAC) capabilities
- Add the ingestion and visualization of acoustic detection datasets, the generation of products from them and their long-term archival to the ATN DAC
- Further unify ATN and MBON data collection, management, visualization, integration, analysis, access and archiving through dedicated actions to harmonize and integrate these collaborative community activities
- Provide international guidance and technical leadership together with our global partners to insure a successful AniBOS Network for GOOS
- Create a tag distribution and acoustic receiver loaner program for ATN researchers
- Define and implement a user fees approach for acquiring funds from other IOOC agencies to augment support for ATN operations
- Prepare the next 5-year ATN Implementation Plan for 2022-2026



U.S. Marine Biodiversity Observation Network (MBON)

● FY20 Sample Accomplishments

- Co-leading Marine Life 2030 Ocean Decade Programme proposal, submitted by Smithsonian to IOC and by NOAA/IOOS to SOST, January 2021; Ocean Shot to the National Committee, December 2020
- MBON-ATN BioTrack launched to monitor biodiversity hotspots: <https://marinebon.org/pages/biotrack/>
- New MBON eDNA applications papers published: <https://marinebon.org/pages/publications/>
- Oct 2020 Arctic MBON cruise noted 'effects of oceanic heat that extend further into the fall and early winter'
- MBON, CariCOOS visualized Puerto Rico corals data (PRCRMP) in OBIS, MBON Portal; expanding to USVI in 2021
- MBON, NMFS, DFO convened US-Canada Zooplankton working group on plankton modeling for North Atlantic Right Whales

● FY21 Plans

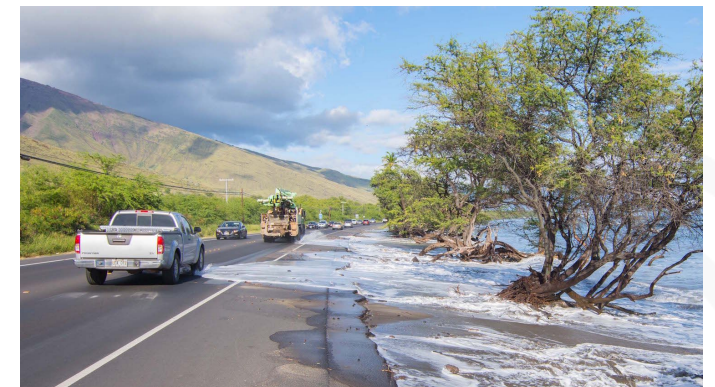
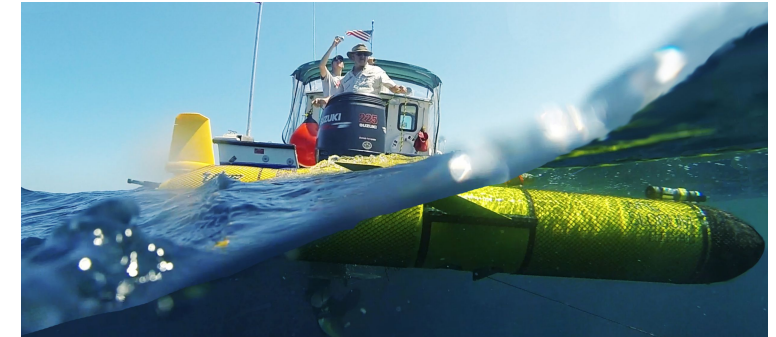
- All-MBON meeting with operational partners - VIRTUAL Feb 1, 2, 9 & 10, 2020
- New NOPP joint funding announcement to be published summer/fall 2021 for FY22 starts
- Marine Life 2030 Programme planning with Smithsonian, global partners
- Expanded partnerships for biodiversity observing with AtlantECO, NOAA OAP, others



FY2021 IOOS Office Priorities

Priorities

- Continue to deliver IOOS services everyday to meet customer needs in multiple mission areas.
- Continue Harmful Algal Bloom observing, modeling and information services in partnership with National Centers for Coastal Ocean Science
- Continue to support weather services via data, modeling, and services (Hurricane gliders, Tsunami applications, beach conditions, etc.)
- Align, inform, and contribute to **coastal resilience** and **climate services** as plans take shape.



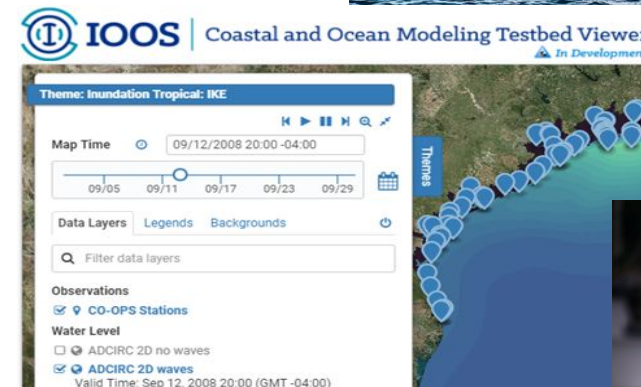
FY2021 IOOS Office Highlights

Implementing IOOS

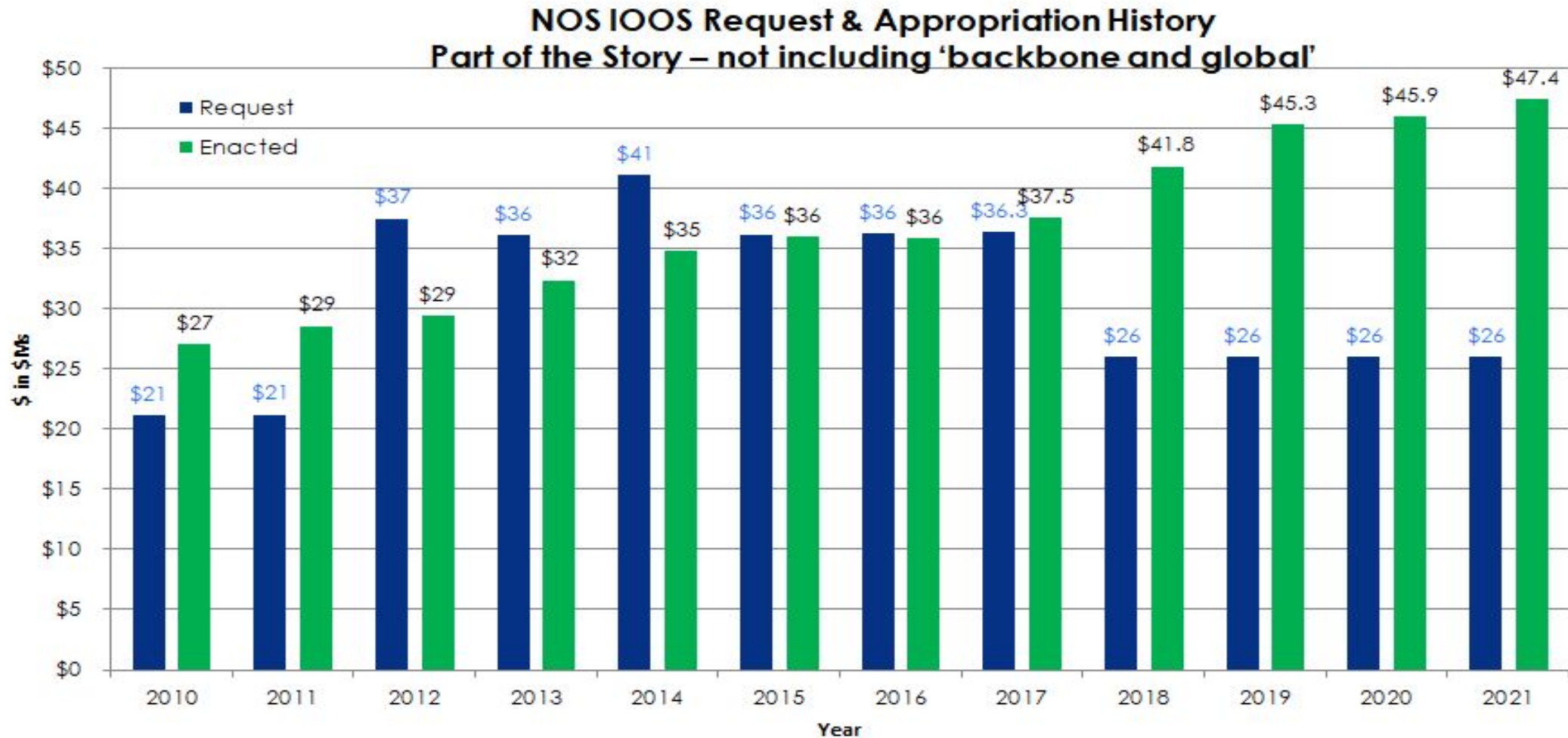
- ICOOS Act reauthorization - Coordinated Ocean Observing Research Act of 2020
- Weather Research and Forecasting Innovation Act 2017&19
- NOAA Water Initiative - and Title III of COORA
- CENOTE Act 2018 (Commercial Engagement Through Ocean Technology Act)
- Supporting the Blue Economy - Ocean Enterprise Study and Benefits of Ocean Observing Catalog
- Executing Regional Awards

Research and Development

- Coastal and Ocean Modeling Testbed (COMT) - Water Modeling, Forecasting, and Prediction
- Ocean Technology Transition - New Projects just started from FY20 Awards



U.S. IOOS Enacted and President's Budgets FY 2010–2021

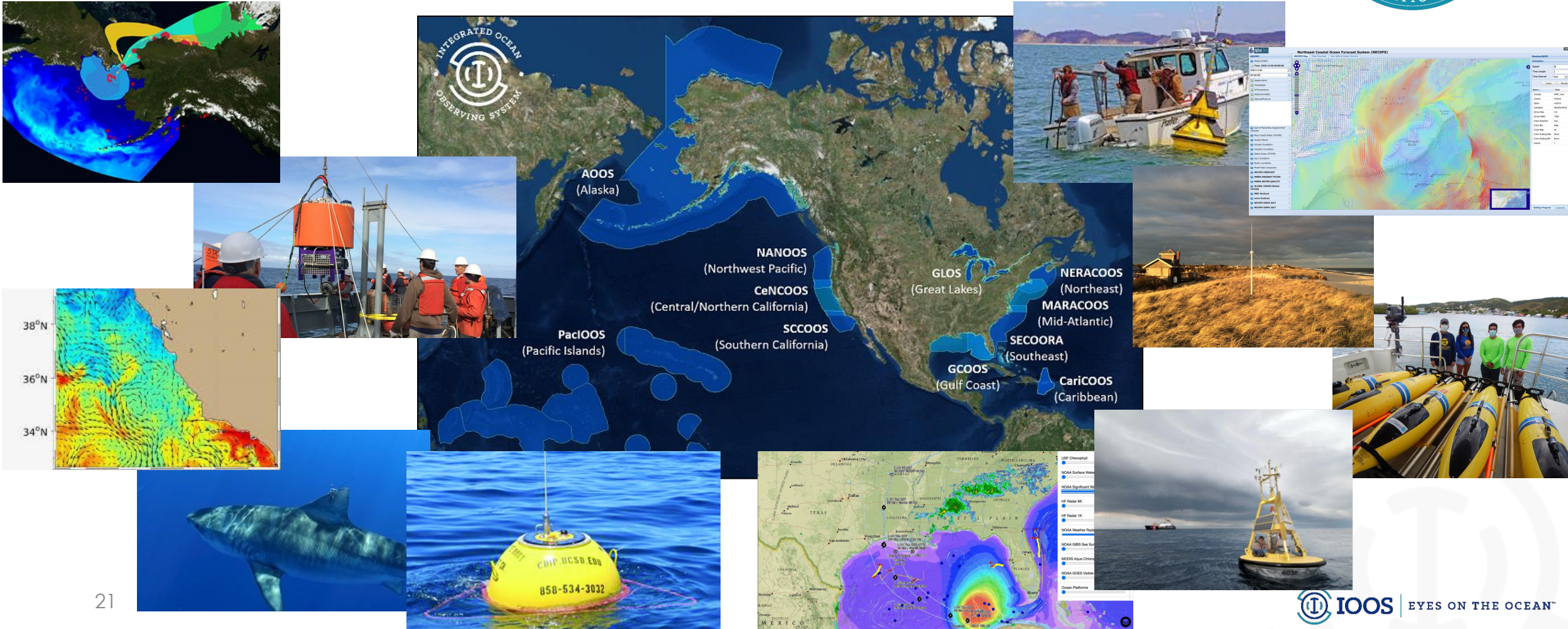


NOAA National Ocean Service - Navigation, Observations, and Positioning

'National IOOS' component FY 2021 Appropriation = \$6.9M & 'Regional IOOS Observations' = \$40.5M

IOOS Regions 2020 and 2021

- Delivering benefits every day
- RICE Recertification
- New 5-Year Awards up to \$6M for all 11 regions in FY2021



Harmful algal bloom forecasting/monitoring

FY20 (\$1M, \$11.6M including NCCOS funding)

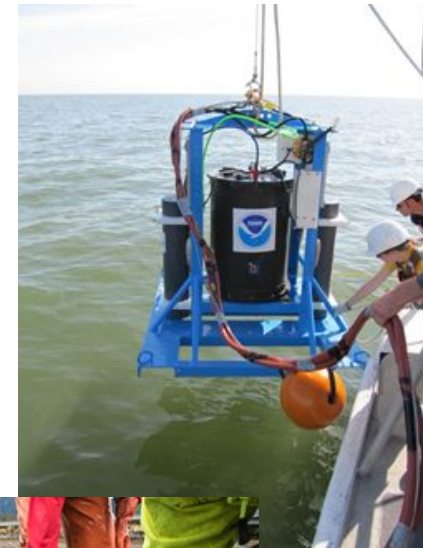
- Pilot projects in coordination with NCCOS
 - AOOS - Alaska Harmful Algal Bloom Network (AHAB) support and coordination
 - NANOOS - analysis, modeling, offshore sampling, beach sampling by tribes, and sample analysis.
 - SCCOOS/CeNCOOS - 10-11 IFCBs at critical land-based and offshore locations.
 - GLOS - integration of real-time and modeled data, seasonal deployment of the three Environmental Sample Processors (ESPs).
 - GCOOS - supporting a volunteer coordinator to recruit, retain, and train a network of volunteers, purchase supplies for the HABscopes, and purchase an image recognition software site.

FY20 continued:

- IOOS Regional Association HAB 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 -
- OMB briefing
- Congressional enquiries

FY21 (\$2.5M)

- Second year of pilot projects
- HAB technology testbed



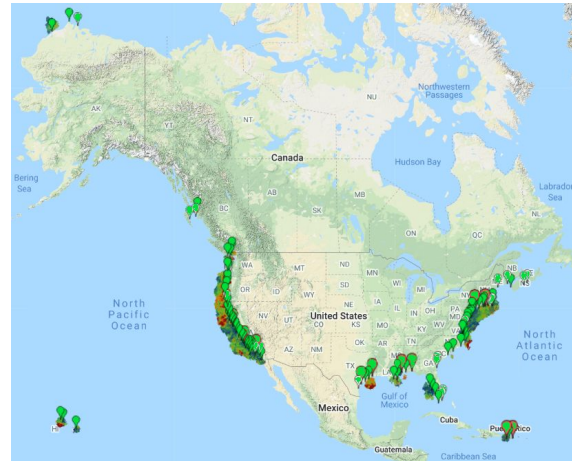
Surface Currents Program: HF Radar Network

- **FY 2020**

- New *Surface Currents Program Manager*: Brian Zelenke.
- Wind turbine interference mitigation software development.
- 11th Radiowave Operators Working Group (ROWG) Workshop was virtual for the first time. U.S. HF radar operators plus 13 different countries and all manufacturers.

- **FY 2021**

- Extend and enhance the utility of HFR data to our customers (e.g., U.S. Coast Guard, oil spill response, law enforcement, etc.)
- Migrate the HFR network to FCC-approved radio broadcast frequencies - get IDs for stations for all three U.S. technologies and shift away from “experimental” mode.
- Recapitalization + Fill-the-Gaps
 - New HFR stations
 - NEPA
- Offshore wind turbine radar interference mitigation (WTRIM)— with other Federal agencies and the offshore wind energy industry.
- Improving data availability, including “rawer” measurements (e.g., radials, spectra, range series)



National DMAC

FY20 (\$1.4M - National DMAC)

DMAC Advancements:

- ERDDAP/OpenGTS Implementation begins transition to production RA by RA, in collaboration w/NDBC
- IOOS Catalog connects with Google Dataset Search & Data.gov

Community Building and Outreach:

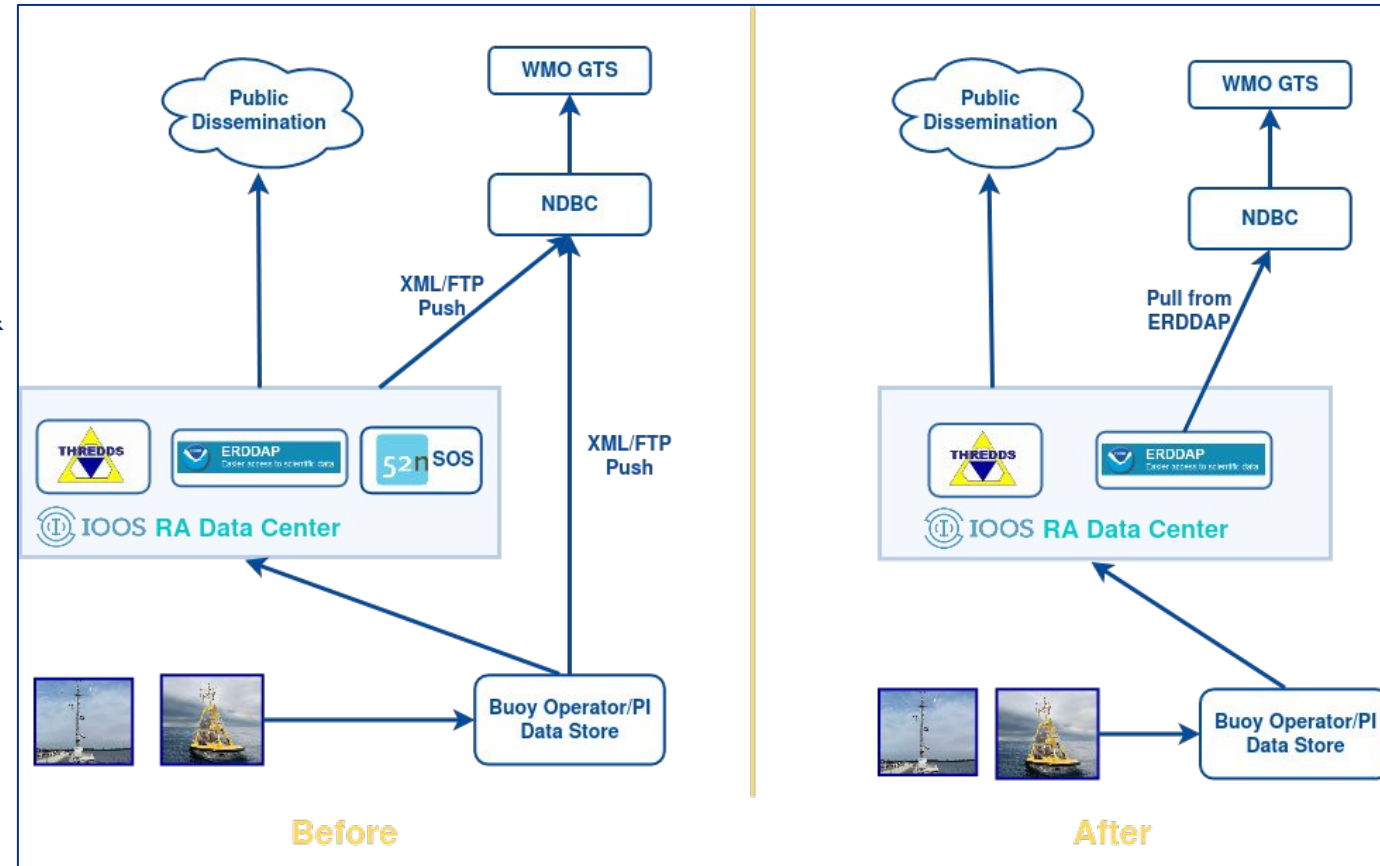
- IOOS sponsors virtual OceanHackWeek 2020
- Monthly DMAC Tech Webinars

DMAC Annual Meeting (October 2020):

- Over 130 attendees online simultaneously

FY21

- ERDDAP/OpenGTS full transition across 11 RAs
- NOFO Topic 2 - DMAC Cyberinfrastructure advertised
- IOOS Code Sprint 2 w/GLOS (~ Summer/Fall)

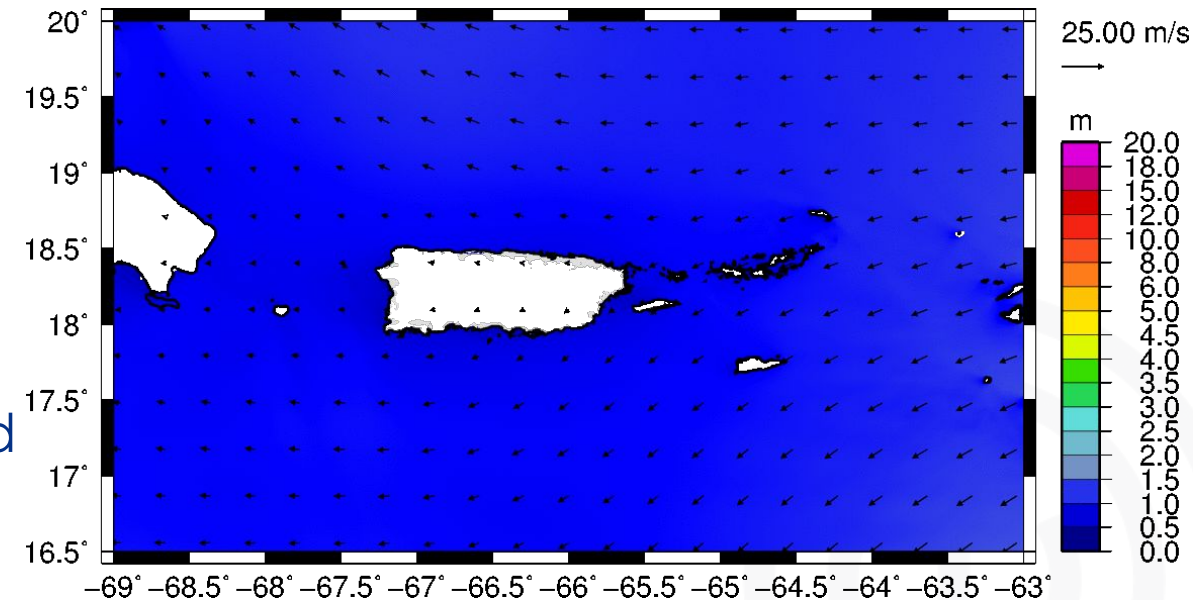


IOOS ERDDAP/OpenGTS Architecture Diagram

Before and after showing the RA data centers playing a more prominent role in regional real-time data distribution, replacing XML/FTP push to NDBC with centrally-managed ERDDAPs

Modeling

- NOAA's Unified Forecast System (UFS) is a community-based, coupled, comprehensive Earth modeling system. One component of the UFS that is of particular interest to IOOS is the suite of operational coastal ocean predictions.
- Coastal Application Team which will ensure that the coastal prediction applications are developed in coordination with the overall architectural design of the UFS.
- First UFS Users Workshop - Jul 27-29
 - NOS and IOOS had a strong presence; several presentations described how the IOOS community-based modeling enterprise is supporting NOAA UFS.
- New NOS Modeling Portfolio Manager (hosted by IOOS) started in August: Tracy Fanara



U.S. IOOS Office - Coastal and Ocean Modeling Testbed (COMT)

FY2021 Coastal and Ocean Modeling Testbed Notice of Funding Opportunity (NOFO)

<https://ioos.noaa.gov/about/funding-opportunities/>

- Objective - advance new or existing solutions that address long standing and emerging coastal modeling and forecast product development challenges.
- The projects will be focused on models, tools or products, that are sufficiently mature for evaluation and transition to long term operations.
- NOFO - currently published - will close 26 February 2021
- Three year projects will run from 2021–2024
- Max funding per project of \$300K/year and a total of up to \$2M in funding.



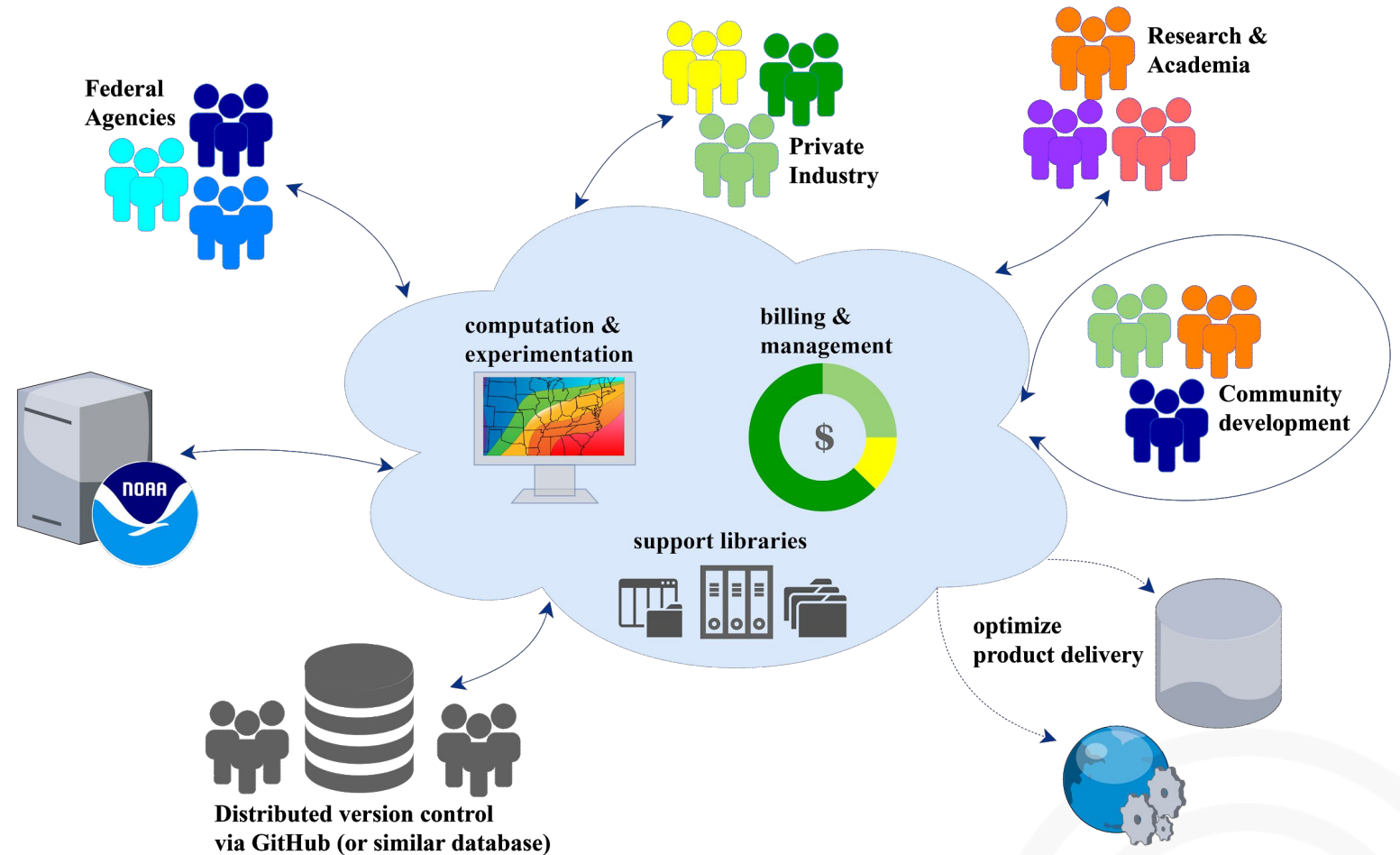
A cloud based model development sandbox

Project seeks to

- streamline the transition of research models to operations
- employ public/private effort
- reduce barriers for collaborations between NOAA and external partners.

FY 2020

- Models installed for testing
 - NOS operational forecast systems (OFS)
 - ADCIRC - running hurricane test cases
 - ROMS - Live Ocean HAB related forecasts
 - FVCOM
- Presentations
 - CO-OPS, CSDL
 - NOAA AI program (upcoming)
 - OAR cloud R and D and Ocean Portfolio
 - American Meteorological Society Annual Meeting
 - NOAA UFS and UMS committees



FY 2021

- Use cases and governance
- Opening up to new models and new users
- Graduate Student Test implementation

FY20 QARTOD manuals completed and published to ioos.noaa.gov:

- Update to Manual for Real-Time Oceanographic Data Quality Control Flags (June 2020)

New Paper Released (September 2020)

- QARTOD - Prospects for Real-Time Quality Control Manuals, How to Create Them, and a Vision for Advanced Implementation

FY21 QARTOD manuals planned:

- Update to Manual for Real-Time Quality Control of Water Level Data

All manuals are included in the Ocean Best Practices repository.

Other Activities:

- Ocean Best Practices System
- Participating in U.S. CLIVAR Ocean Uncertainty Quantification Working Group

<https://ioos.noaa.gov/project/qartod/>



Manual for
Real-Time Oceanographic Data
Quality Control Flags

Version 1.2
June 2020



Benefits of Ocean Observations Catalog

Community developed

Community driven

Community benefit

Community Engagement



Building on work begun at OceanObs 19, the BOOC project aims to engage with the entire ocean observation, measurement, and modeling community.

Collecting Case Studies



The BOOC will be continuously updated with new use case studies that demonstrate the benefits of ocean observing worldwide.

Developing Standards



The BOOC will provide the community with access to a comprehensive, consistent, and constantly improving view of the benefits of ocean observing that can be easily searched by location, benefit area, and type of observation.

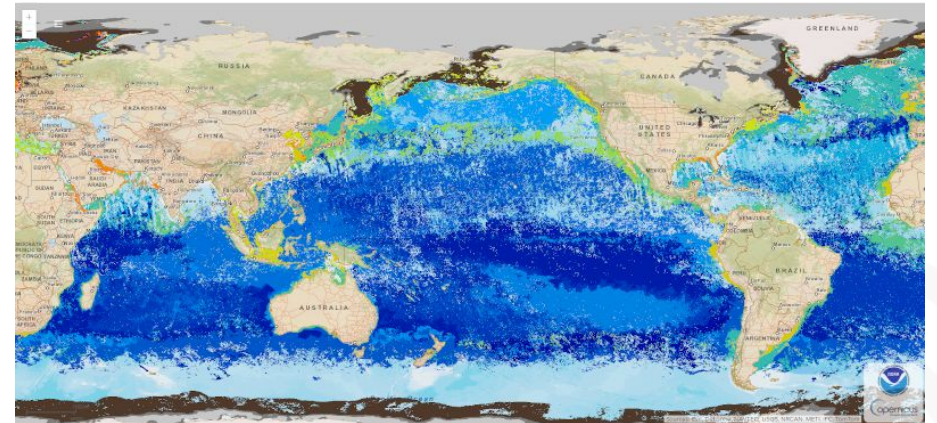
www.booc.info

IOOS Project team: Ralph Rayner, Sea Grant Fellow, Carl G., and partners at Office for Coastal Management and Ocean Obs Community et. al.

- **Benefits of Ocean Observing Catalog** (OceanObs '19 Rec.)
 - Concept paper and website published - www.booc.info
 - Under development:
 - BOOC work packages
 - community platform to be shared
 - repository

Looking forward

- UN Decade of Ocean Science for Sustainable Development
- Continuing to support and implement OceanObs'19 recommendations
- Connecting Global and Coastal observations
- Essential Ocean Variables and Communities of Practice development
- Marine Operations, Coastal Resilience, Climate Variability and Change, and Ecosystems Health, Water Quality, Fisheries and Biodiversity



Back up slides

Coordinated Ocean Observations and Research Act of 2020 (Pub. Law 116-271)

Notable Provisions:

- **PURPOSES** - Section 101- *to establish and sustain a national integrated System of ocean, coastal, and Great Lakes observing systems...*
 - *(1)(A) to the public.*
 - *(1)(D) - to provide easy access to ocean, coastal, and Great Lakes data and promote data sharing between Federal and non-Federal sources and promote public data sharing.*
 - *(1)(F) - to monitor and model changes in the oceans and Great Lakes, including with respect to chemistry, harmful algal blooms, hypoxia, water levels, and other phenomena*
 - *(3)- to sustain, upgrade, and modernize the Nation's ocean and Great Lakes observing infrastructure to detect changes and ensure delivery of reliable and timely information.*

Notable Provisions continued:

- **DEFINITIONS** - Section 102 - Regional Coastal Observing System (same definition, different name)
- **INTEGRATED OCEAN OBSERVING SYSTEM**- Section 103- *IN GENERAL.*—In order to fulfill the purposes of...
- *(a)(1)(D) - a product development system to transform observations into products in a format that may be readily used and understood.*
- *(a)(1)(E) a research and development program conducted under the guidance of the Council, consisting of:*
 - *(ii)an advanced observing technology development program to fill gaps in technology;*
 - *(iv) models to improve regional weather forecasting capabilities and regional weather forecasting products; and*
 - *(v) reviews of data collection procedures across regions and programs to make recommendations for data collection standards across the System to meet national ocean, coastal, and Great Lakes observation, applied research, and weather forecasting needs.*
- *(4)(2)(C)REQUIREMENTS - ...lead Federal Agency shall...*
 - *(xiii) work with users and regional associations to develop products to enable real-time data sharing for decision makers, including with respect to weather forecasting and modeling, search and rescue operations, corrosive seawater forecasts, water quality monitoring and communication, and harmful algal bloom forecasting.*

ICOOOS Act Reauthorization

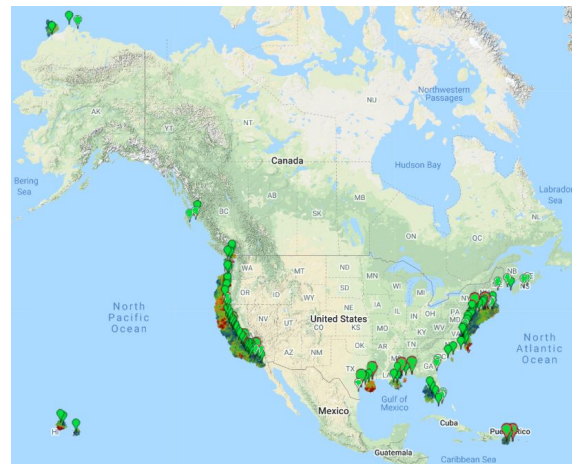
Notable Provisions continued:

- **IOOS Continued** - Section 103(b)(4)(B) PARTICIPATION: For the purposes of this subtitle, employees of Federal agencies are permitted to be members of the governing body for the regional coastal observing systems and may participate in the functions of the regional coastal observing systems.
- **FINANCING AND AGREEMENTS** - Section 104(a)- The Secretary of Commerce may execute an agreement, on a reimbursable or nonreimbursable basis, with any State or subdivision thereof, any Federal agency, any public or private organization, or any individual to carry out activities under this subtitle.
- **AUTHORIZATION OF APPROPRIATIONS** - Section 108 - There are authorized to be appropriated to the Secretary of Commerce to support the integrated oceans observations under this subtitle—
 - (1) \$48,000,000 for fiscal year 2021;
 - (2) \$50,000,000 for fiscal year 2022;
 - (3) \$52,000,000 for fiscal year 2023;
 - (4) \$54,000,000 for fiscal year 2024; and
 - (5) \$56,000,000 for fiscal year 2025.

Surface Currents Program: HF Radar Network

- **FY 2020**

- New *Surface Currents Program Manager*: Brian Zelenke.
- FCC ID accreditation underway for HFR manufacturers.
- Wind turbine interference mitigation software development.
- 11th Radiowave Operators Working Group (ROWG) Workshop was virtual for the first time. Brought together all U.S. HF radar operators along with those from 13 different countries and all manufacturers.



- **FY 2021**

- Extend and enhance the utility of HFR data to our customers (e.g., U.S. Coast Guard, oil spill response, law enforcement, etc.) by improving integration with models used by our customers.
- Migrate the HFR network to FCC-approved radio broadcast frequencies in accordance with the International Telecommunication Union (ITU) agreement.
- FCC IDs for LERA, WERA, and SeaSondes.
- FCC ULS “operational” radio broadcast license applications (Part 90, Form #601) for all HFR operators. Replace all “experimental” FCC licenses.
- Recapitalization + Fill-the-Gaps
 - New HFR stations (status vis-à-vis COVID-19)
 - NEPA
- Offshore wind turbine radar interference mitigation (WTRIM)—research, development, and coordination with other Federal agencies and the offshore wind energy industry.
- Improving data availability, including “rawer” measurements (e.g., radials, spectra, range series)

IOOS Strategic Plan

Vision - Improve lives and livelihoods with ocean, coastal, and Great Lakes information

Mission - To produce, integrate, and communicate high quality ocean, coastal and Great Lakes information that meets the **safety, economic, and stewardship needs** of the nation.

Five Strategic Goals:

Goal 1: Sustain long-term, high-quality observations of ocean, coastal, and Great Lakes environments to address local, regional and national needs.

Goal 2: Deliver standardized, reliable, and accessible data.

Goal 3: Support model predictions that address a wide range of user requirements.

Goal 4: Provide integrated, user-driven products and tools.

Goal 5: Increase the reach and effectiveness of IOOS through partnerships, stakeholder engagement, and Enterprise excellence.

