

NOAA Ocean Exploration and Research Program Update

Alan Leonardi, Director
Eighth Meeting
Ocean Exploration Advisory Board
Hanover, Maryland
July 11-12, 2017



Overview

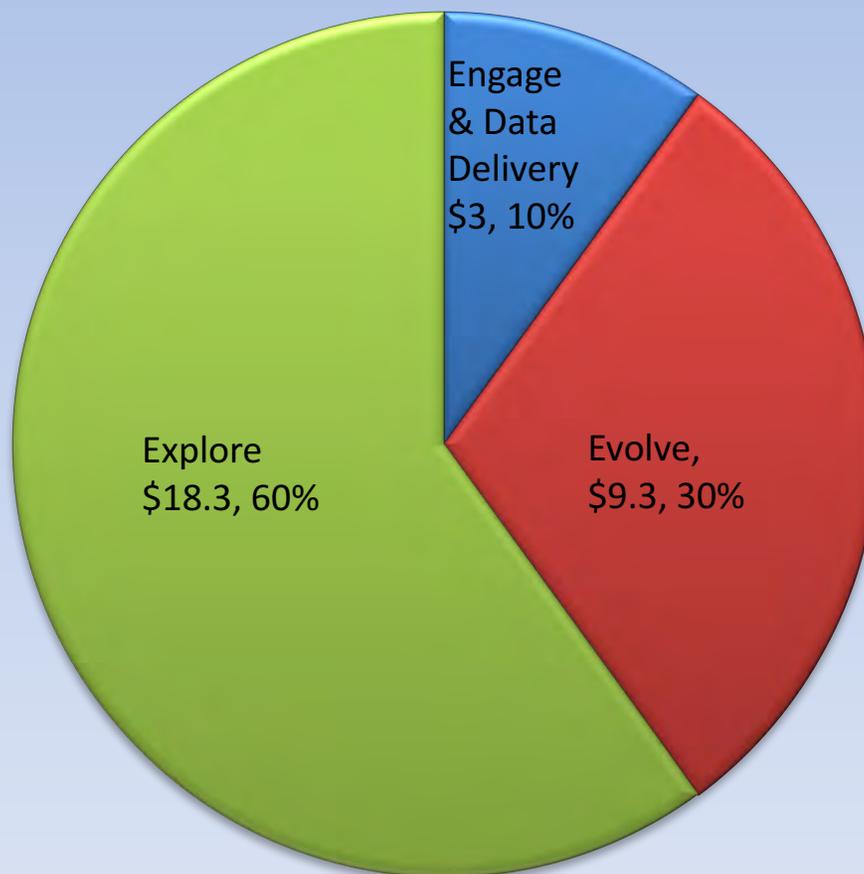
- FY17 Budget Overview
- 2017 Expeditions
 - Review of operations to date
 - What's next
- 2018 and 2019 Outlook



FY17 OER Budget by Strategic Categories

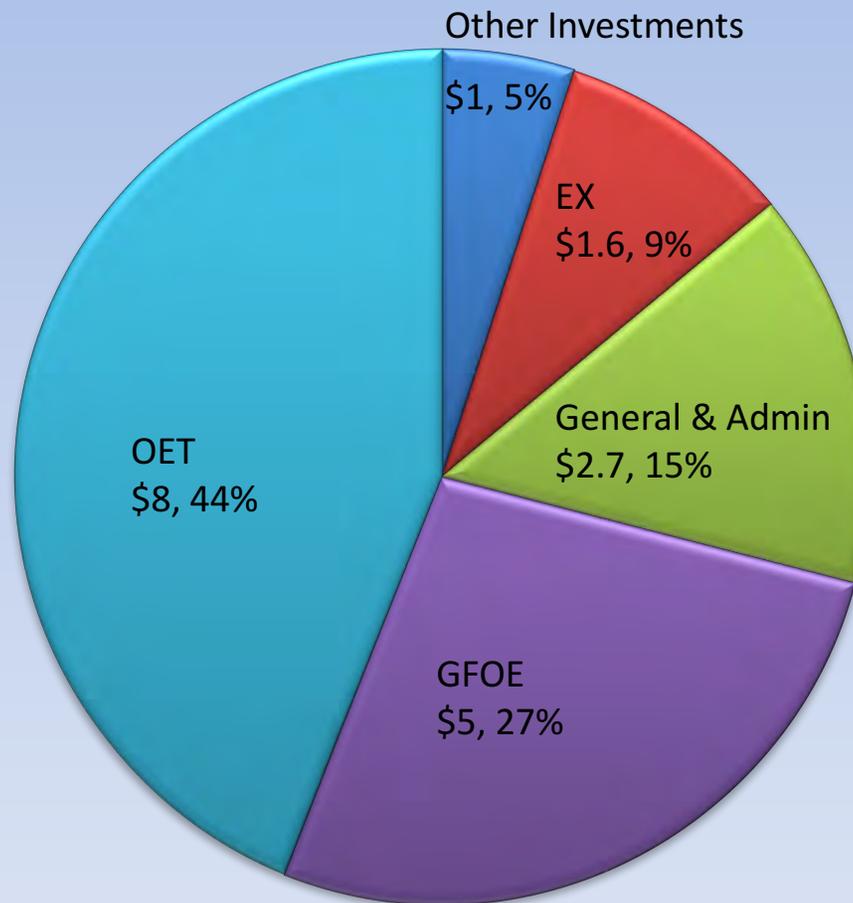
Total FY17 Budget \$36M by Strategic Categories

OER Planned Amount \$30.6M without Administrative Costs (\$3.3M) and NOAA/OAR Overhead (\$2.1M)



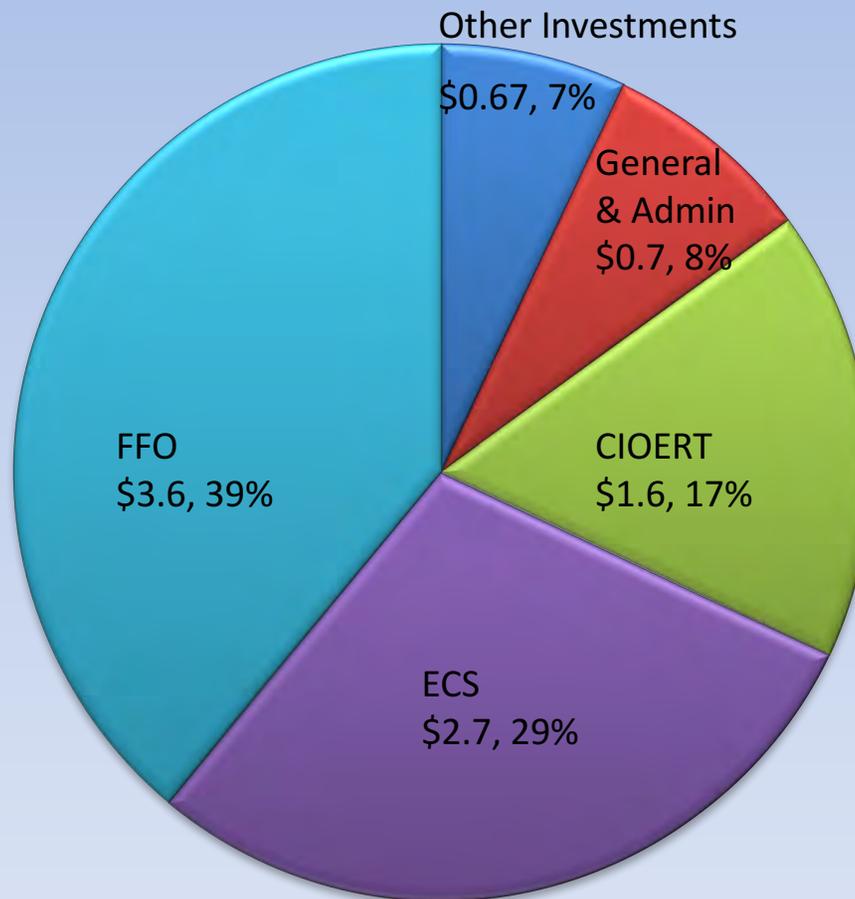
FY17 - Explore

OER Explore \$18.3M



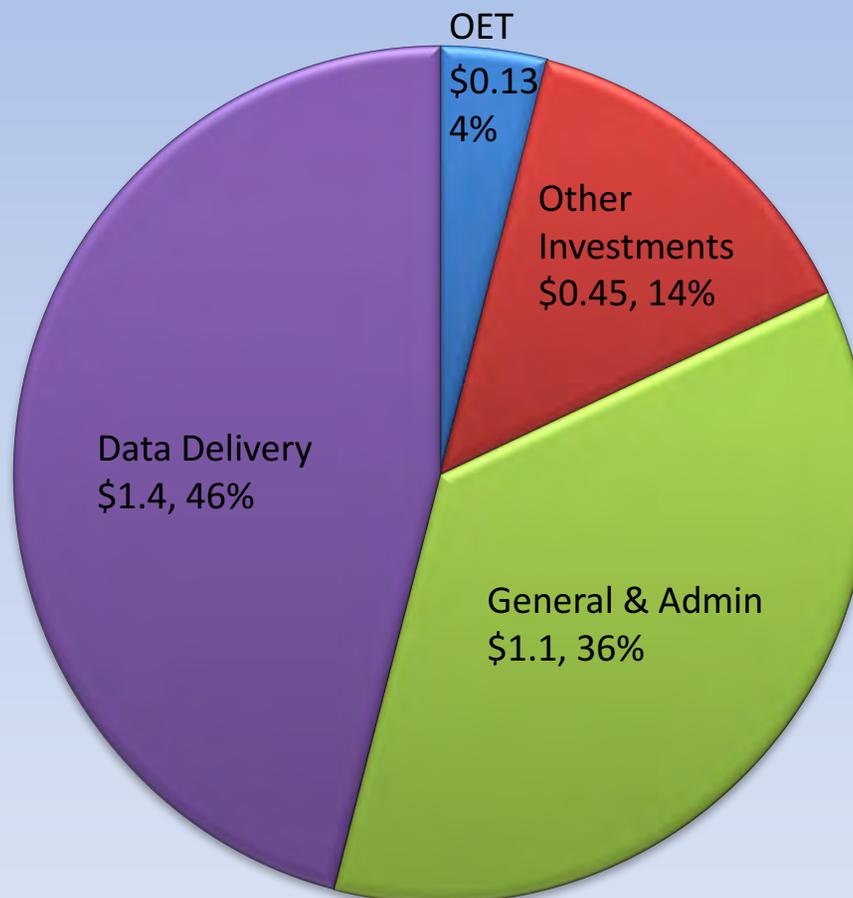
FY17 - Evolve

OER Evolve \$9.3M



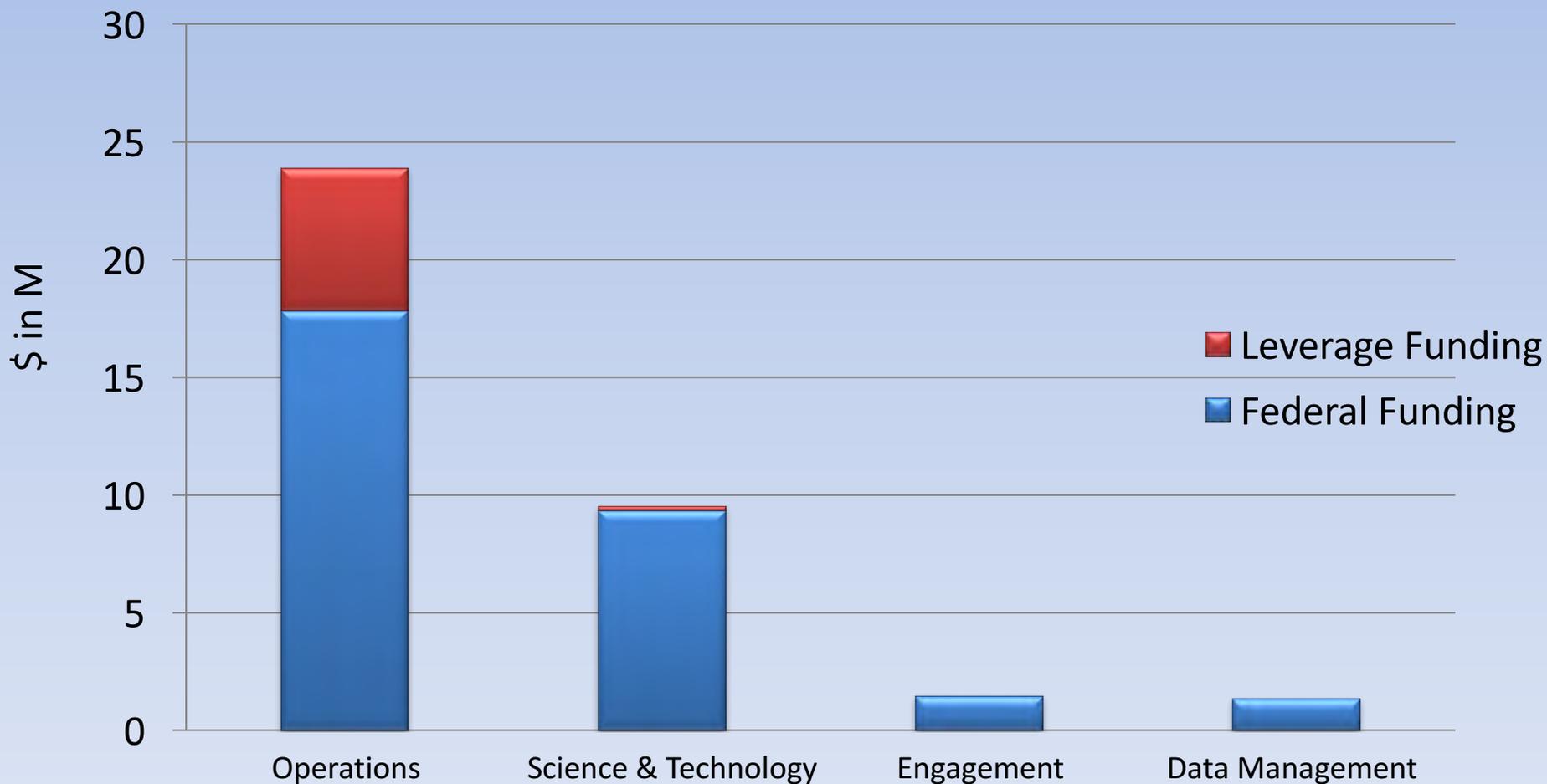
FY17 – Engagement and Data Delivery

OER Engagement and Data Delivery \$3M



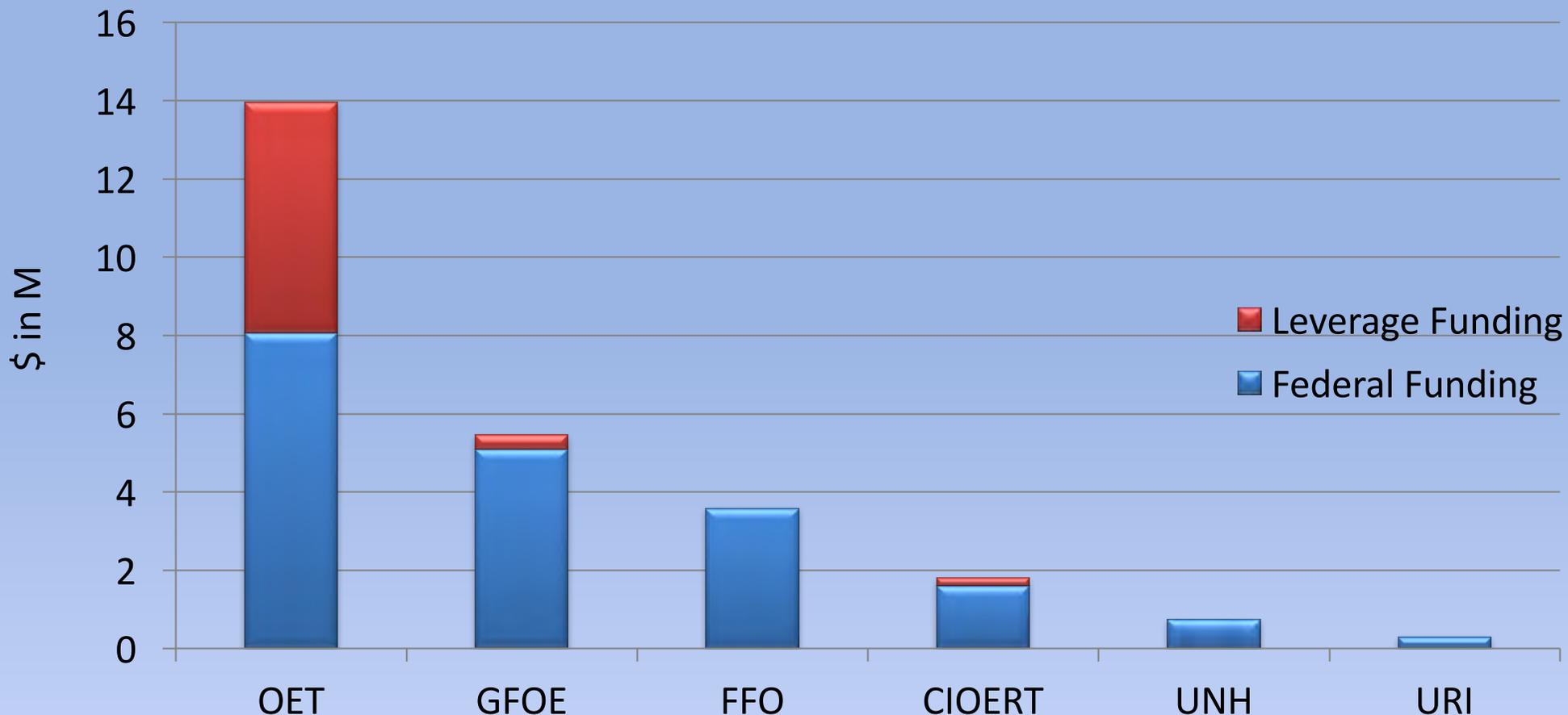
FY17 – Functional Categories

FY 2017 OER Major Investments of \$36.12M by Functional Categories Including Leverage Funds



FY17 – External Partners

FY 2017 OER Major Investments of \$25.835M by Recipient Including Leverage Funds



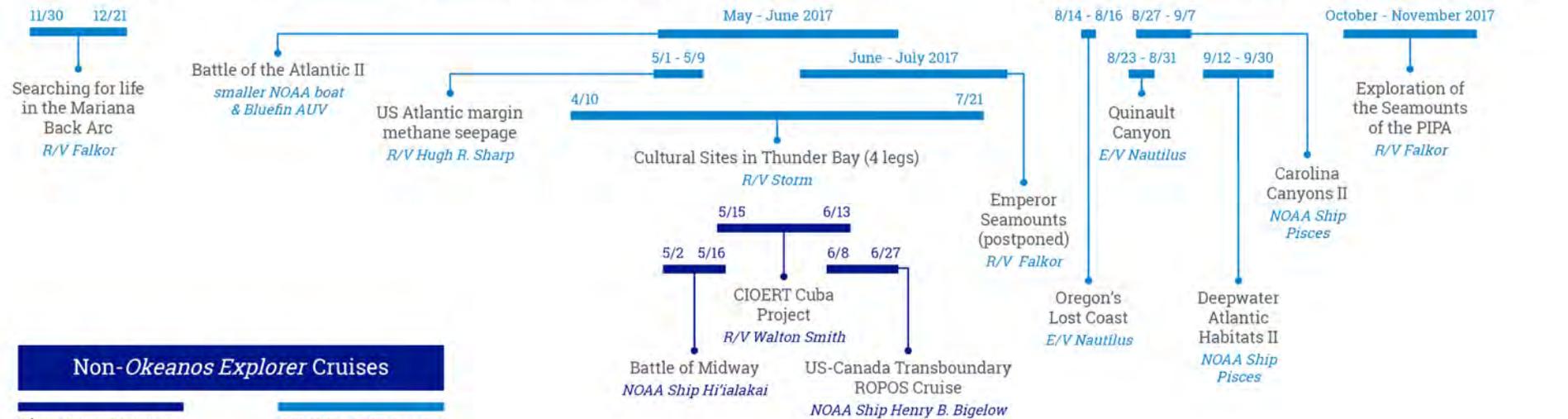
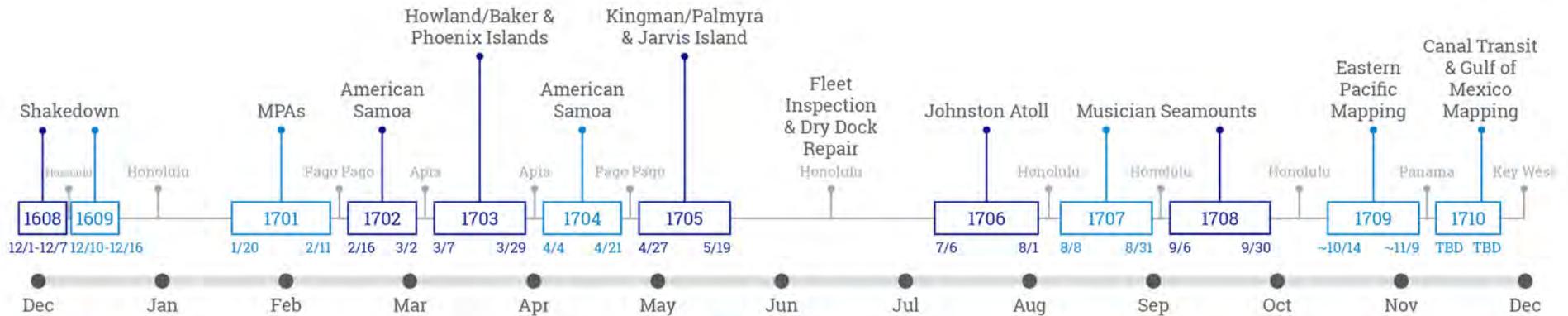
2017 Expeditions



Okeanos Explorer

ROV & Mapping

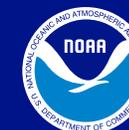
Mapping



Non-Okeanos Explorer Cruises

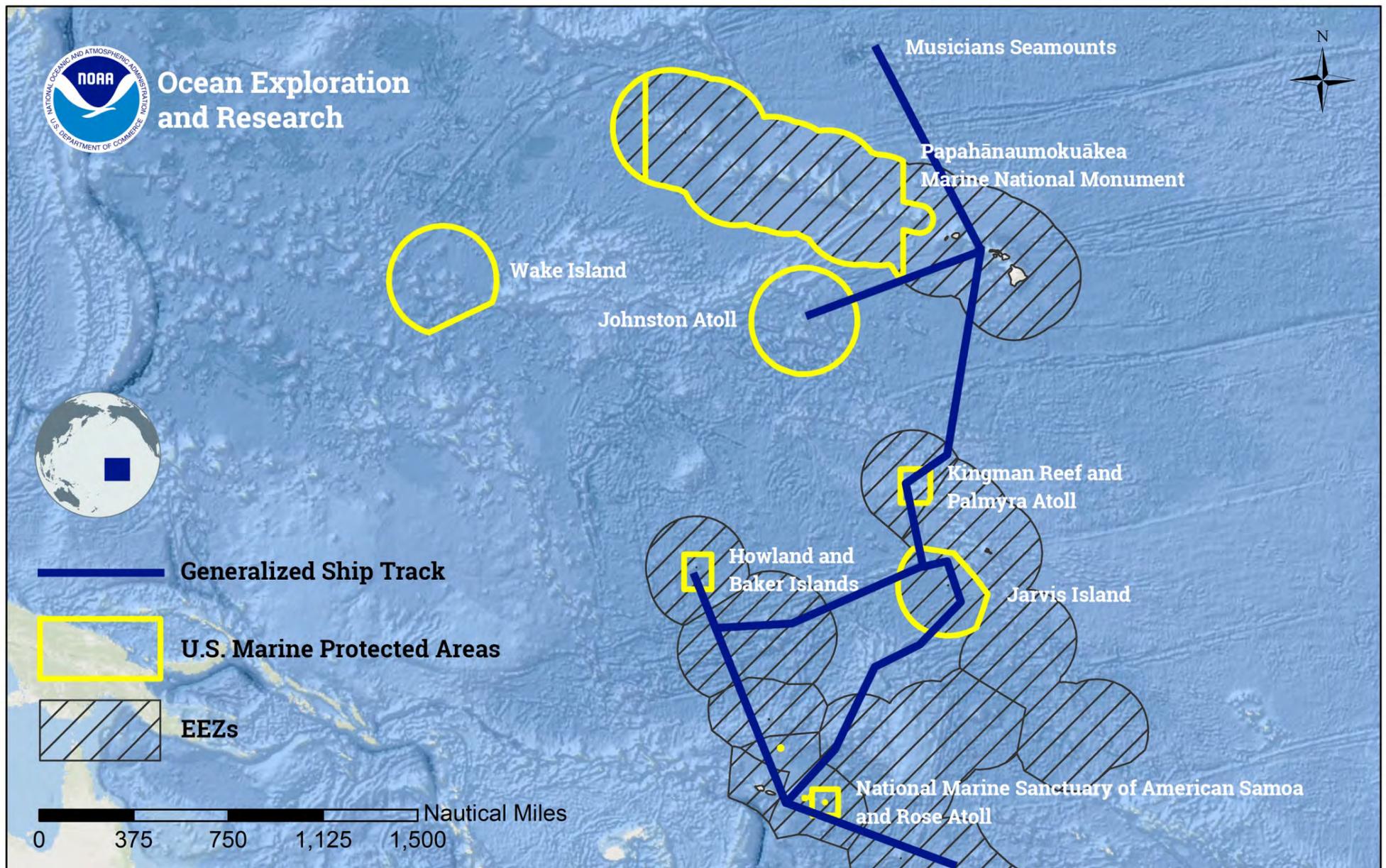
Signature Coverage

Summary Coverage



CAPSTONE 2017

General Operating Focus Areas and Shiptracks

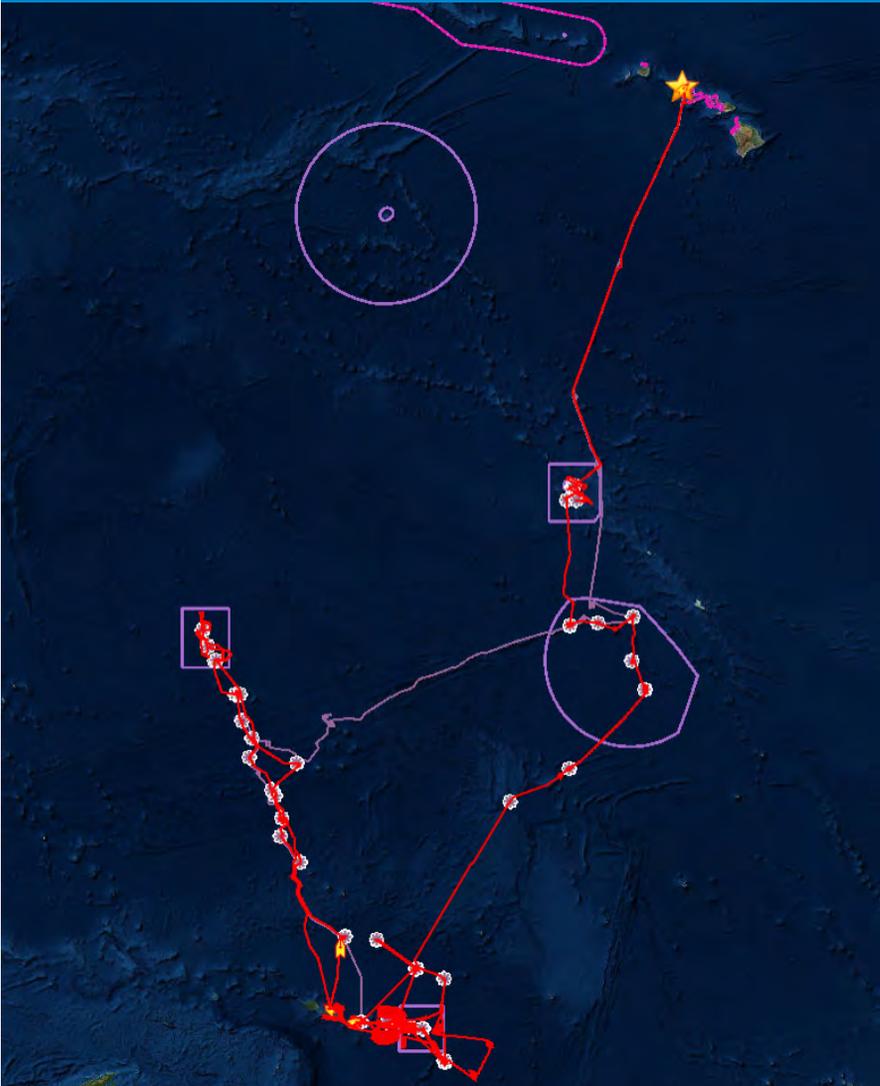


Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

2017 *Okeanos Explorer* Operations

- Southern Units of the Pacific Remote Islands Marine National Monument; Phoenix Islands Protected Area; Tokelau; and Cook Islands
- Samoa and American Samoa
- Johnston Atoll Unit of the Pacific Remote Islands Marine National Monument
- Musician Seamounts
- Coordinated operations with R/V *Falkor*, ECS expeditions
- Navy Red Dot Surveys
- Argo float deployments

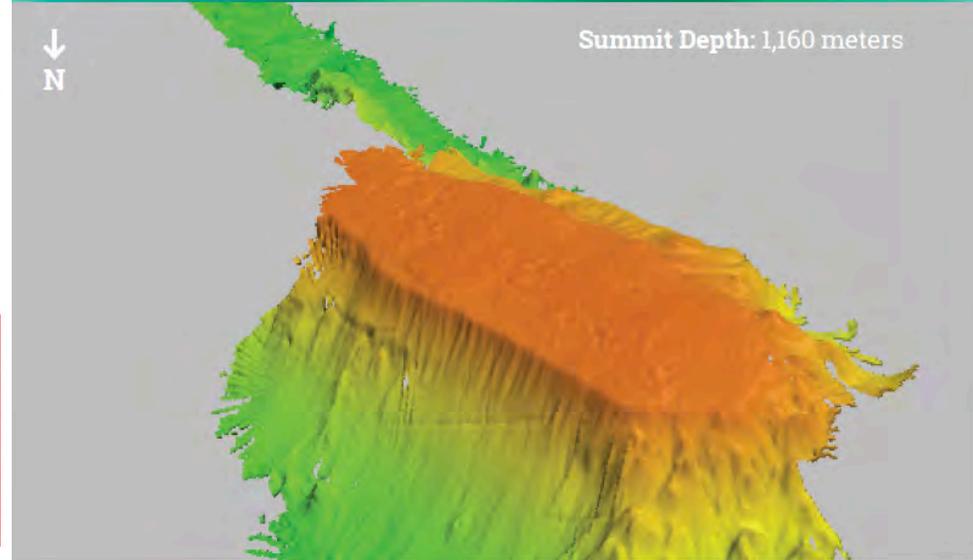
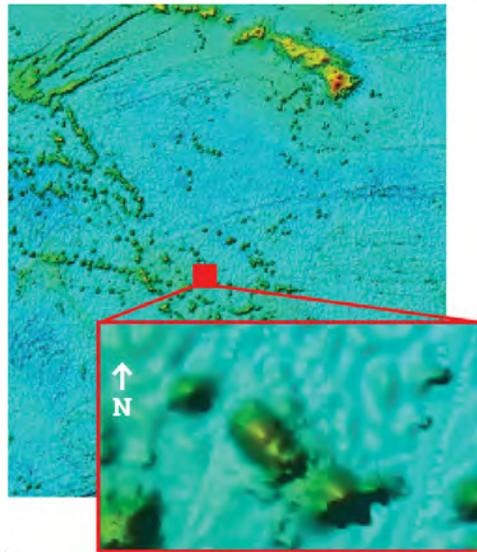
FY17 *Okeanos Explorer* Work To Date



- Final year of CAPSTONE
- ~195 DAS of integrated PIFSC, ONMS, and OER ship time
- Work in American Samoa, Samoa, Cook Islands, Kiribati, & Tokelau
- Targets remaining in U.S. MPAs and EEZ
- Coordinating operations with R/V *Falkor* and ECS effort
- 2 Red Dot Surveys; 1 ROV dive (USN)
- 4 Argo Float Deployments (PMEL)
- Commendations from Cook Islands and Kiribati (Phoenix Islands)

Red Dot Surveys

- Mapping of flat top seamount revealed that its form and depth were both significantly different than the satellite altimetry data suggested
- This mapping work was requested by the Naval Oceanographic Office



NOAA Ship *Okeanos Explorer* Repairs

- Dry dock to replace hull patch and shell plate
- Scheduled maintenance and servicing
- Install DP electronics and power redundancy



16" x 30" Hull Patch



Completed Repair

Okeanos Explorer – July-Sept. 2017



Ocean Exploration and Research



EX1707-08 Musician Seamounts
8/8-8/31 Tele-Mapping
9/6-9/30 ROV/Mapping

EX1706 Johnston Atoll
7/7-8/2 ROV/Mapping

-  U.S. EEZ
-  Johnston Atoll Unit
-  Musicians Seamounts



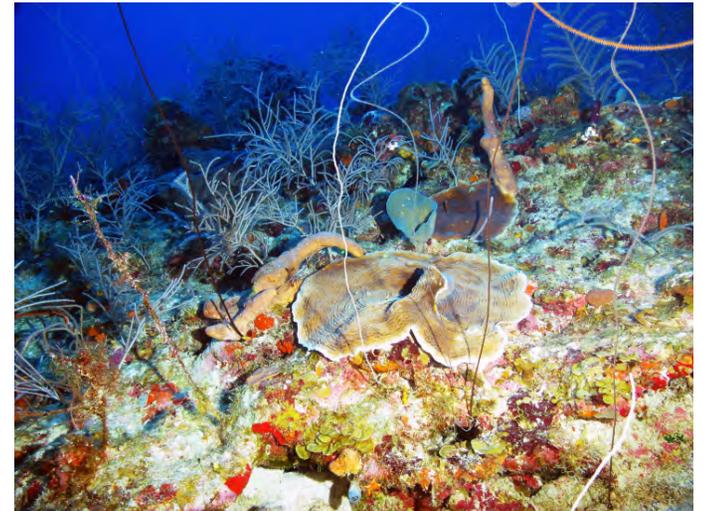
Battle of Midway



- FY16 FFO project awarded to Papahānaumokuākea Marine National Monument
- Partnered with NPS and USFWS
- Completed 2 weeks of exploratory remote sensing surveys
- Surveyed for alien invasive species at all dive sites
- Photogrammetry surveyed 3 known aircraft sites

CIOERT Expedition to Cuba

- R/V *Walton Smith* & *Mohawk* ROV
- U.S. and Cuban scientists circumnavigated Cuba and explored mesophotic reefs
- Completed 43 ROV dives in 29 days
- Collected coral, sponge, and algae samples for further analysis

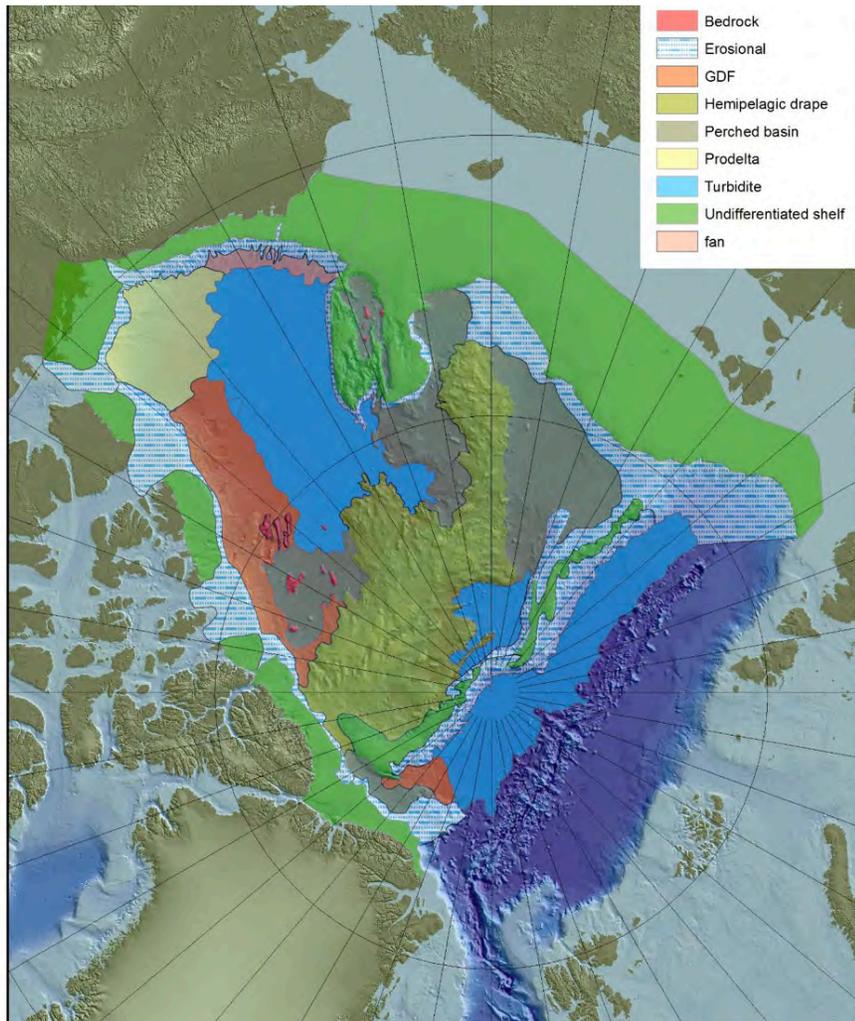


Northern Neighbors Transboundary Cruise



- NOAA Ship *Henry B. Bigelow* & ROPOS ROV
- 180 hours of ROV dive video collected
- 230km² mapped in both US and Canadian waters
- 199 samples collected
- Data shared with both NEFMC and DFO Canada to aid management

Extended Continental Shelf in 2017-2018



- Planned expedition to Necker Ridge in early FY18 (R/V *Kilo Moana*, UNOLS)
- Processing, analysis, management, and archival of ECS data and derived products
- Draft scientific, technical, and legal interpretation documents
- Continued development of ECS data management framework
- Initial steps to link ECS data and habitat classification schema to meet NOAA mission needs
- Possible 2018 Gulf of Alaska survey

Value of International Collaboration

International collaborators found value in our:

- incorporation of their priorities
- exploration model
- engagement activities
- live interactions



Left to Right: Cook Islands Prime Minister the Honorable Henry Puna, OAR AA and Acting NOAA Chief Scientist Craig McLean, Marae Moana Project Manager Jacqui Evans, and Cook Islands Director of UN and Foreign Treaties Joshua Mitchell at UN Ocean Conference, June 8, 2017.

Engagement & Outreach (Jan-Jun 2017)



Web

Website Visits: 5,842,000

Expeditions Covered: 5 *Okeanos*, 6 non-*Okeanos*

Expedition Content Added:

 ~150 content essays

 ~600 images

 ~60 videos

Referrals to Site:

 ~40% search engines

 ~12% social media:

 ~17% Facebook

 ~5.5% YouTube

 ~2% Twitter



Social Media

 Facebook Likes: ~120,100 ↑12%

 Instagram Likes: ~5,900 ↑290%

 Twitter Followers: ~135,250 ↑36%

 YouTube Subscribers: ~56,500 ↑60%



Media

More than 230 news stories were generated from nearly 200 outlets including the Washington Post, New York Times, LA Times, USA Today, ABC, NBC, CBS, CNN, Scientific American, Gizmodo, National Geographic, and more.



Video

 Live Video Views: 2,650,000

 YouTube Views: ~4,200,000



Ship Events

 Ship Tour Attendees: 650+

 In-Port Attendees: ~1,300

 Telepresence Events: 14

 Telepresence Attendees: ~500



Education

 Reached Students: 50,457

 Educators Trained: 417

 Educator Workshops: 18

ASPIRE: North Atlantic Campaign



Google earth

US Dept of State Geographer

© 2016 Google

Image Landsat / Copernicus

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

ASPIRE: Atlantic Seafloor Partnership for Integrated Research & Exploration

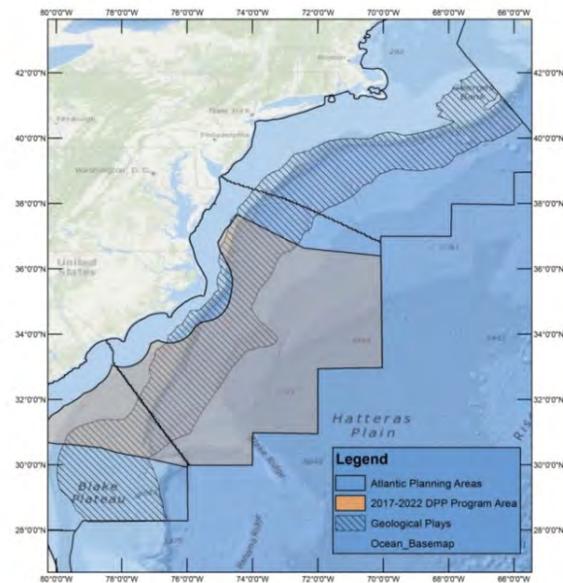
- 2016 to ~2020 emerging international campaign with focus on the North Atlantic
- Builds from previous OER and partner efforts
- Aligning existing and developing new plans
- NOAA efforts considered a major U.S. contribution to Galway Statement on Atlantic Ocean Cooperation
- An evolution and maturation of ACUMEN approach
- Interagency participants include: BOEM, USGS, NOAA (SEFSC, NEFSC, OST, DSCRTP, NCCOS, ONMS, NCEI, OMAO, OER)

2013 Galway Statement

“cooperation is intended to increase our knowledge of the Atlantic Ocean and its dynamic systems. . . By aligning our ocean observation efforts to improve ocean health and stewardship and promote sustainable management of its resources.”

ASPIRE in 2017

BOEM
Bureau of Ocean Energy Management
Geologic Plays in the Atlantic Planning Areas
including detail on continental shelf bathymetry



Produced in the Office of Environmental Programs of BOEM, Division of Environmental Science, Hatteras, Virginia 24541.

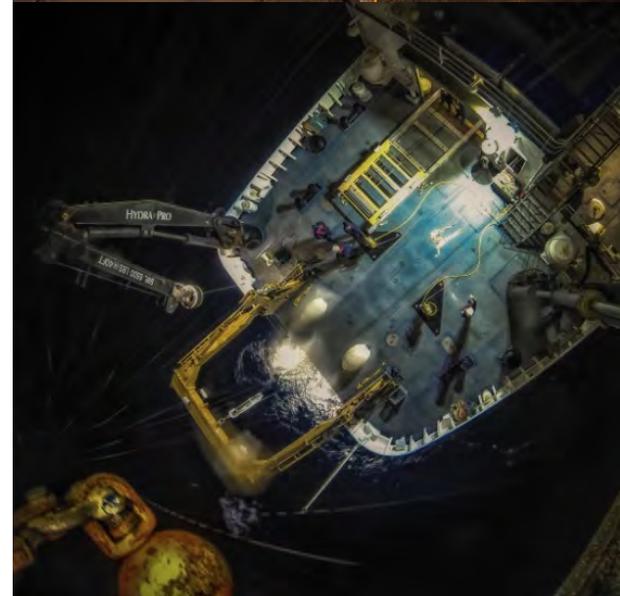
The marine boundaries and limits shown herein, as well as the division between planning areas, are for descriptive purposes only and do not preclude or affect United States jurisdiction in any way.



- U.S.-Canada Transboundary Expedition - *complete*
 - U.S.-Canada PIs; NOAA Ship *Bigelow* and ROV *ROPOS*
- Carolina Canyons II
 - Continuation of 2016 work; NOAA Ship *Pisces* and AUV *Sentry*
- Deepwater Atlantic Habitats
 - BOEM-USGS-NOAA partnership; NOAA Ship *Pisces* and AUV *Sentry*
- Southeast Deep Coral
 - NCCOS and DSCRTP partnership; NOAA Ship *Nancy Foster*

NOAA Ship *Okeanos Explorer* in 2018

- Return to the Atlantic
- Clipperton Fracture Zone, Gulf of Mexico, South Atlantic Bight, Canada-US
- SEFSC, NEFSC, ONMS, OER submitted an integrated package of ship time requests for ~182 DAS
- Subset of work to support new ASPIRE campaign
- Coordinating operations with BOEM-USGS, DSCRTP, DFO-Canada, Galway
- 2 placeholders for short emerging technology cruises.
- Possible N2 sensor testing during eastern Pacific mapping



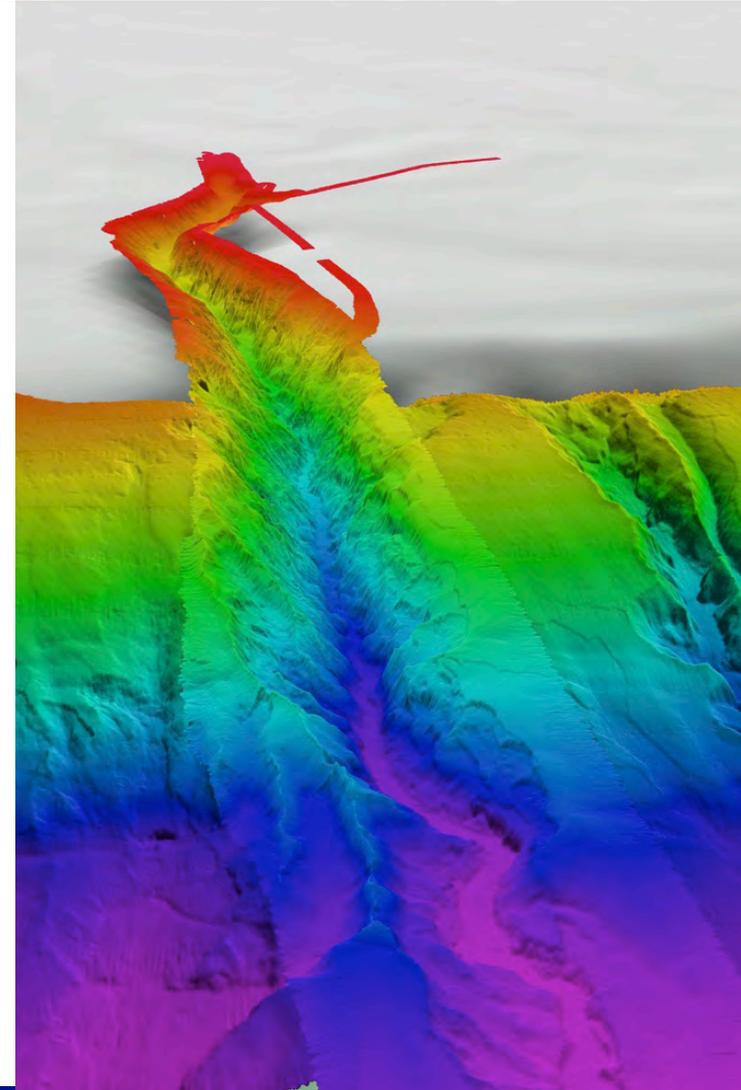
Other 2018 Plans and Opportunities

- BOEM-USGS-OER: Mid & South Atlantic Bight (ASPIRE)
 - 2nd of 3 expeditions
 - Mid and South Atlantic Bight
 - NOAA Ship *Nancy Foster* with ROV TBD
- Search for *USS Indianapolis*
 - NOAA Ship *Ron Brown*
 - 17 DAS from Darwin to Guam
 - In partnership with OET, search tools TBD
- E/V *Nautilus*: CAPSTONE II
 - Both West Coast and Central Pacific work
- NMFS NEFSC *Bigelow* cruise: Northeast US
- FFO, MBON, ECS, NCOG



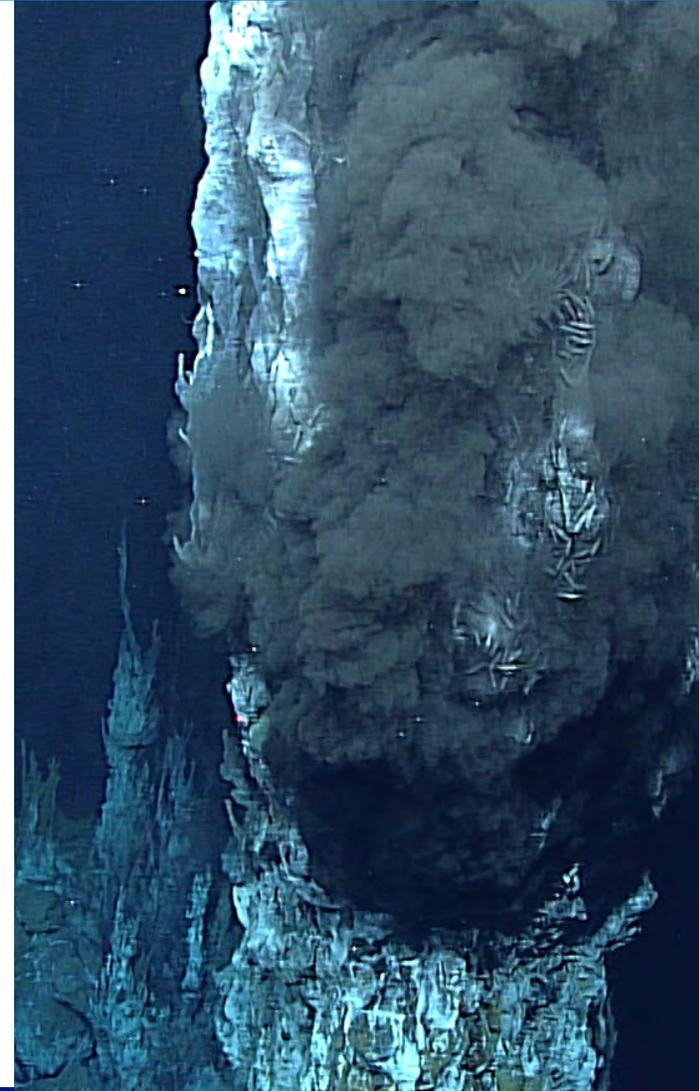
Okeanos Explorer Initial Plans for 2019

- South Atlantic Bight, Caribbean, Scheduled Maintenance/Repairs, Mid-Atlantic Ridge, NE Seamounts
- SEFSC, NEFSC, ONMS, OER submitted an integrated package of draft requests for ~183 DAS
- Placeholder for potential Cuba work
- Coordinating operations with BOEM-USGS, DSCRTP, DFO-Canada, Galway
- Placeholder for short emerging technology cruises. Details TBD
- Potential for international multi-ship effort focused on the Mid-Atlantic Ridge



Opportunities in 2019 and Beyond

- BOEM-USGS-OER Partnership
 - 3rd of 3 expeditions
 - Mid and South Atlantic Bight
 - *Ron Brown* with science-class ROV
- E/V *Nautilus*
 - Both Central and Western Pacific work
 - Extend and expand CAPSTONE
- IFREMER TransAtlantic
 - Support Galway and NOAA-IFREMER bilateral
- Schmidt Ocean Institute
- NIWA and the Cook Islands
- FFO, MBON, ECS, Marine Archaeology



Questions?

alan.leonardi@noaa.gov

OceanExplorer.NOAA.gov



**Ocean Exploration
and Research**