

NOAA Ocean Exploration and Research Program Update

Alan Leonardi, Director
Seventh Meeting
Ocean Exploration Advisory Board
Austin, Texas
February 22-23, 2017

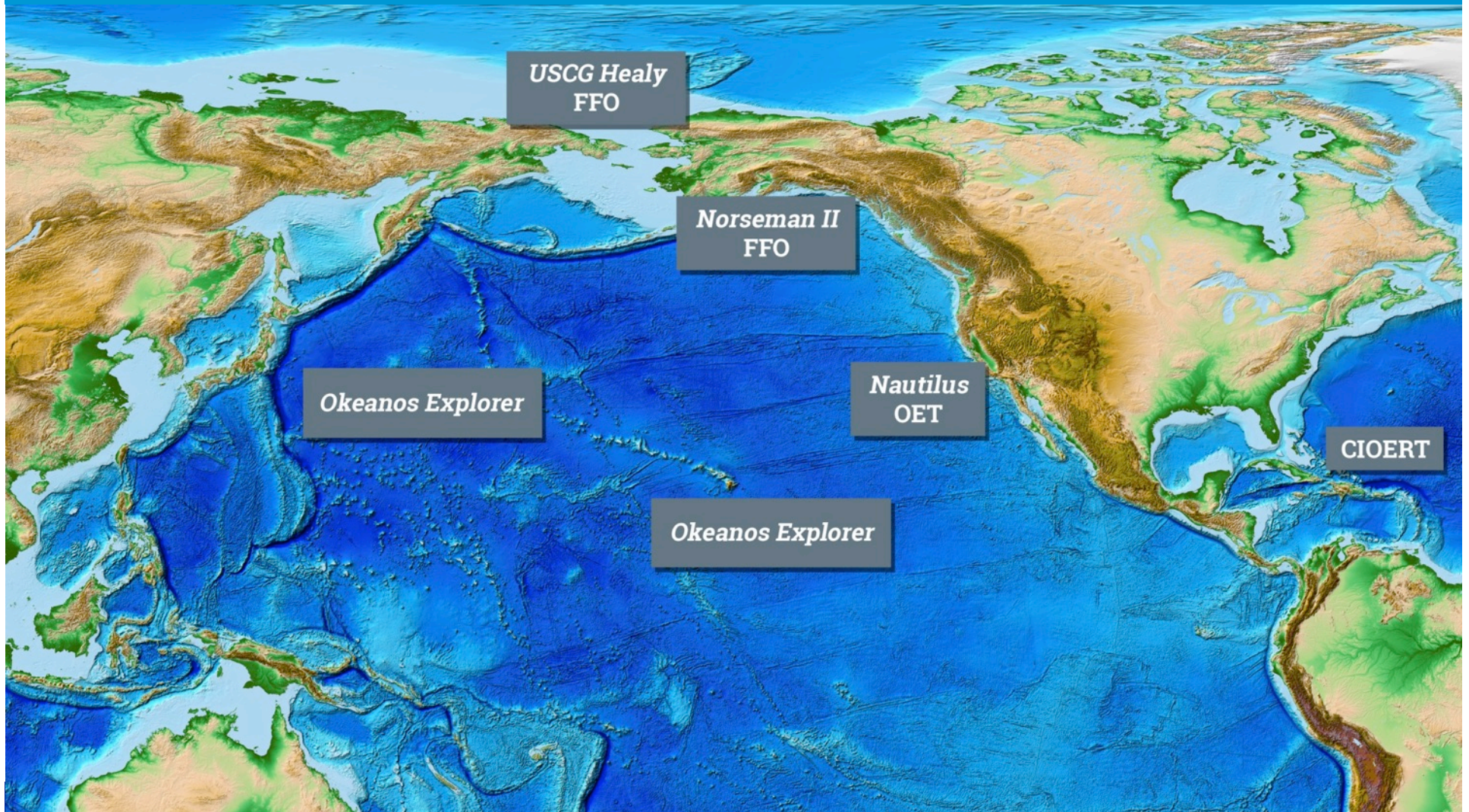


Overview

- 2016 Ocean Exploration Highlights
- FY17 Budget Overview
- 2017 Expedition Plans
 - two campaigns
 - four basins
 - ten ships
 - five vehicles
- 2018 and 2019 Outlook



2016 OER Supported Expeditions

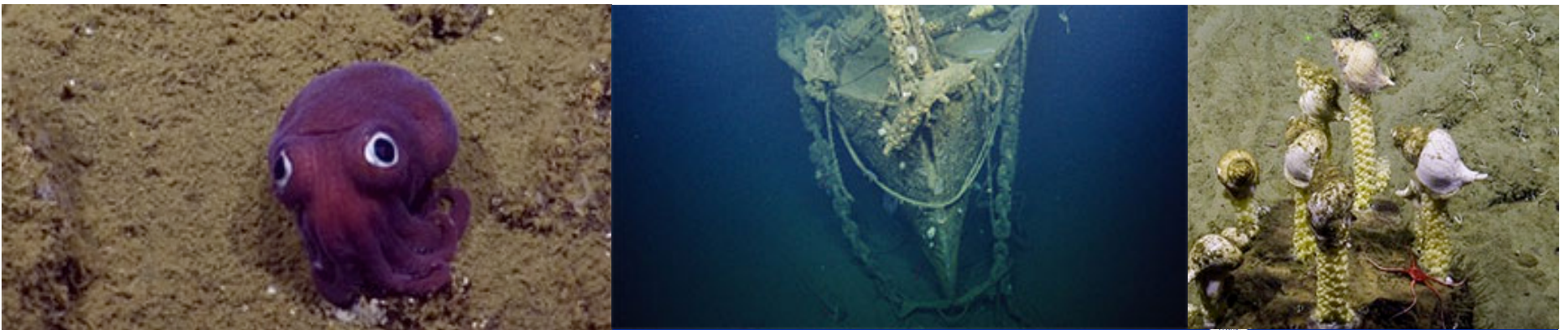


2016 Major Expeditions: Pacific

- Central Pacific ECS Mapping - *Ron Brown*
 - Pacific Remote Islands Marine National Monument (MNM) (Kingman/Palmyra)
- Central/Western Pacific – *Okeanos Explorer*
 - Papahānaumokuākea MNM
 - Pacific Remote Islands MNM (Wake Island)
 - Mariana Trench MNM
- Western Pacific – *Falkor*
 - Marianas Back-Arc
- Eastern Pacific – *Nautilus*
 - *Pacific Northwest*
 - *West Coast Sanctuaries*

2016 E/V Nautilus Field Season

- Seeps and Ecosystems of the Cascadia Margin
- Central California Canyons
- Channel Islands National Marine Sanctuary (NMS)
- Southern California Margin
- U.S.S. *Independence*/Greater Farallones NMS





2016 Expeditions



NOAA Ship *Okeanos Explorer*

10 cruises

273,047 km² mapped
94,442 linear km mapped

63 ROV dives

532 hours of ROV time

335 hours on bottom

470 hours of video

201 samples collected
127 subsamples collected

6,000 m depth reached

100+ participating scientists

19 cruises

313,047 km² mapped
116,177 linear km mapped

151 ROV dives

1,332+ hours of ROV time

989+ hours on bottom

1,270+ hours of video

750 samples collected
2,386 subsamples collected

6,000 m depth reached

hundreds of participating
scientists

E/V *Nautilus*

9 cruises

40,000 km² mapped
21,735 linear km mapped

88 ROV dives

800+ hours of ROV time

654+ hours on bottom

800+ hours of video

549 samples collected
2,259 subsamples collected

3,352 m depth reached

100+ participating scientists

2016 Engagement & Outreach











Ocean Exploration
and Research



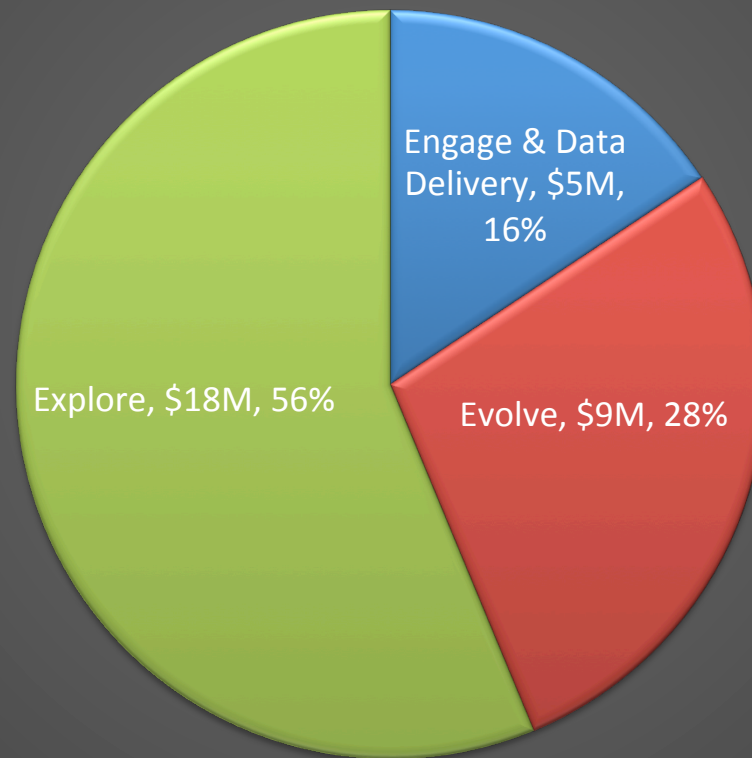
OCEAN
EXPLORATION
TRUST

% change from FY15

	Website Visits	14,016,409	2,700,000	↑ 10.6% increase
	Live Video Views	4,300,000+	1,700,000	↑ 112.5% increase
	Facebook Likes	98,662	79,200	↑ 73.3% increase
	Twitter Followers	78,764	15,000	↑ 28.5% increase
	Instagram Followers	662	9,000	↑ 222% increase
	Youtube Views	8,088,687	13,800,000	↑ 59.8% increase
	Youtube Subscribers	34,716	60,400	↑ 173.7% increase
	Educators Trained	1000	137	↑ 17% increase
	Reached Students	114,502	70,000+	↓ 7.7% decrease
	Educator Workshops	43	5	↑ 20% increase
	Media Mentions	Thousands of stories were generated from hundreds of outlets ranging from NBC, CNN, Associated Press, Scientific American, TIME, and The Weather Channel, to Gizmodo, BuzzFeed, and HowStuffWorks.		

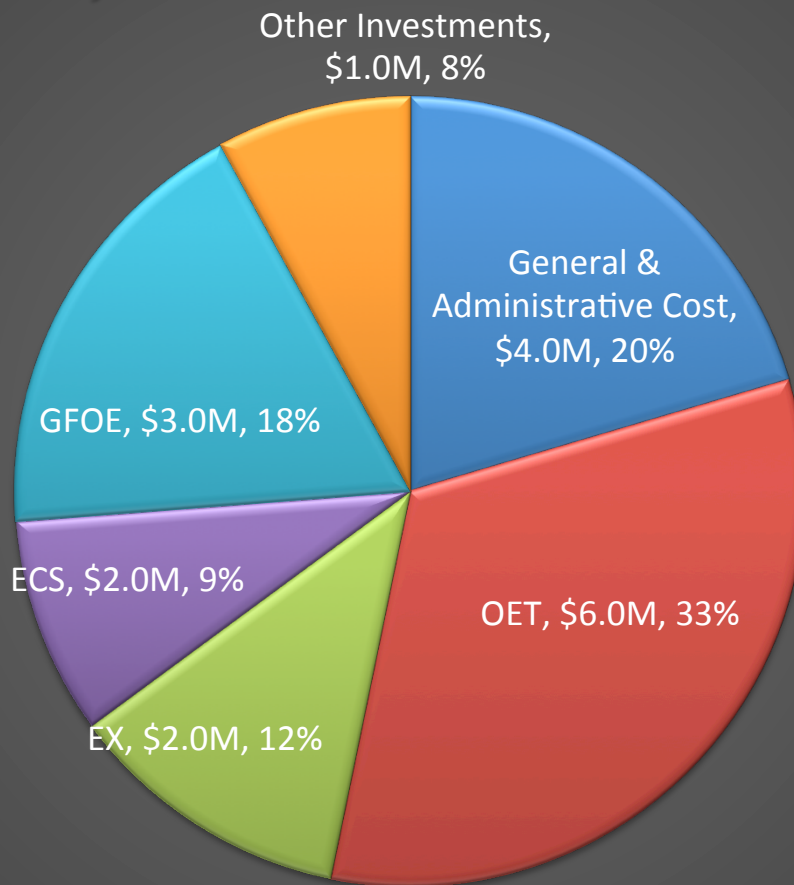
FY17 OER Budget by Strategic Categories

FY 2017 Continuing Resolution (CR) Anticipated Amount \$32M
by Strategic Categories



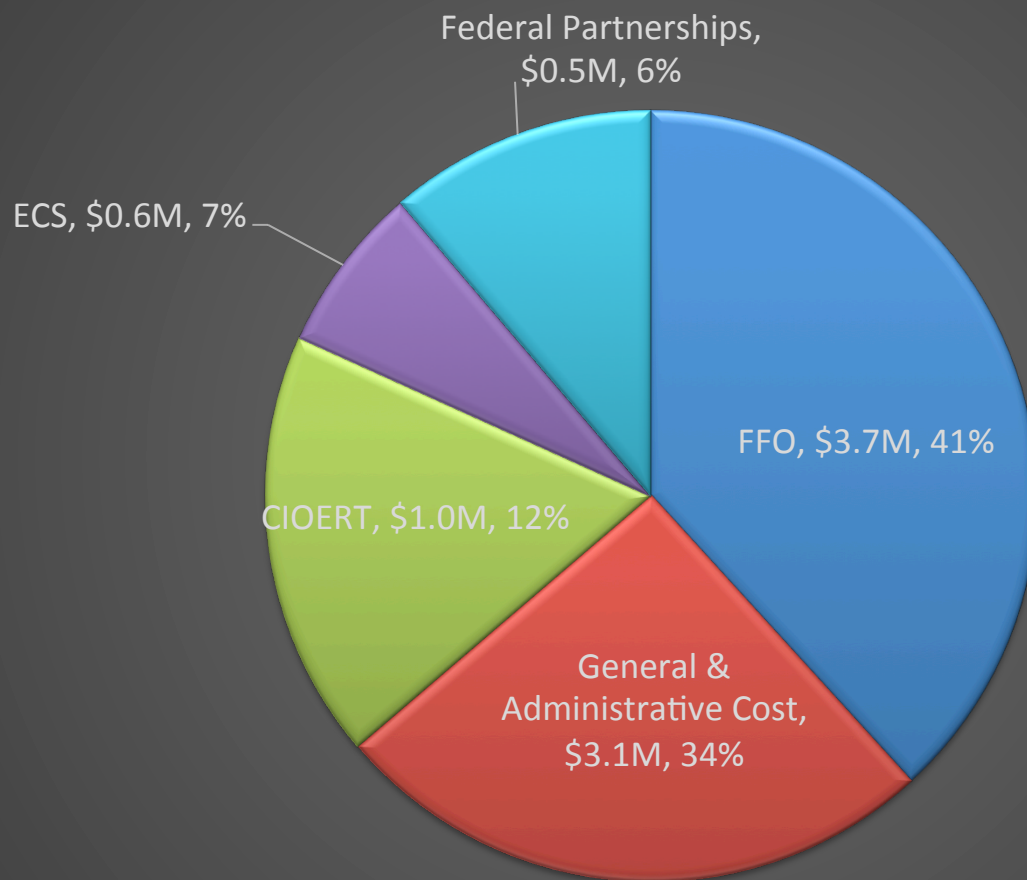
FY17 - Explore

FY 2017 CR (Anticipated) \$18M



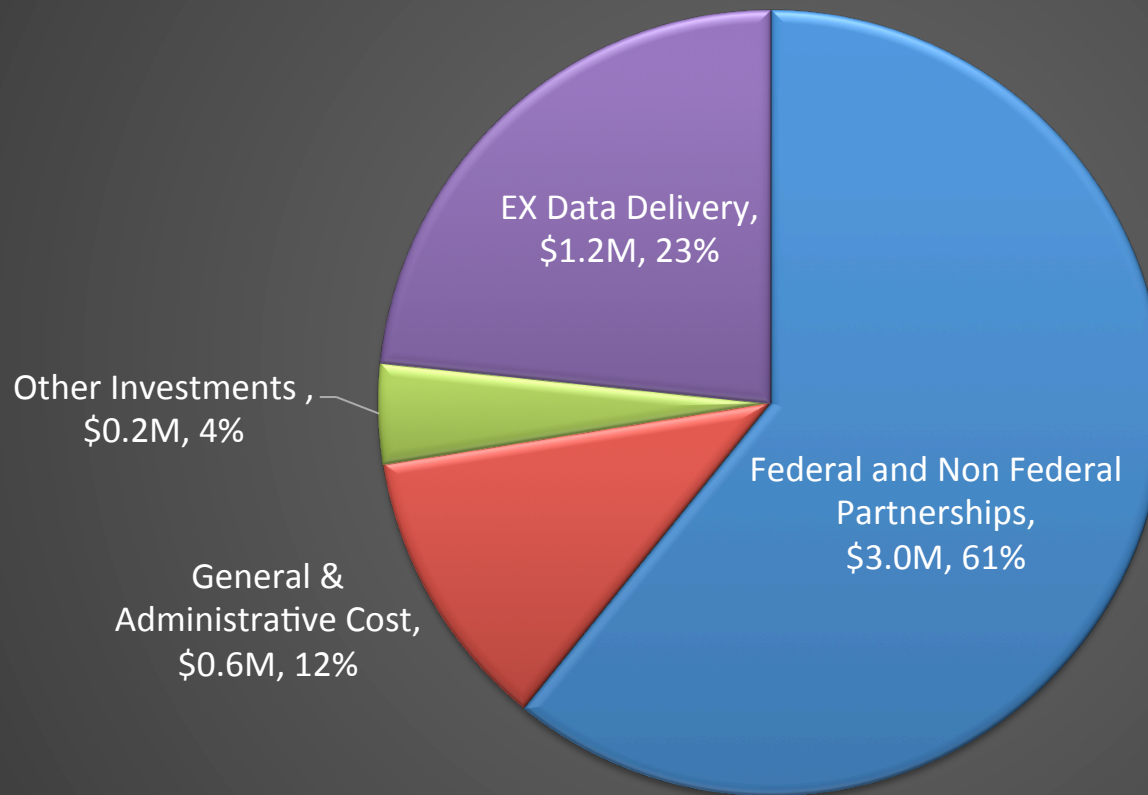
FY17 - Evolve

FY 2017 CR (Anticipated) \$9M

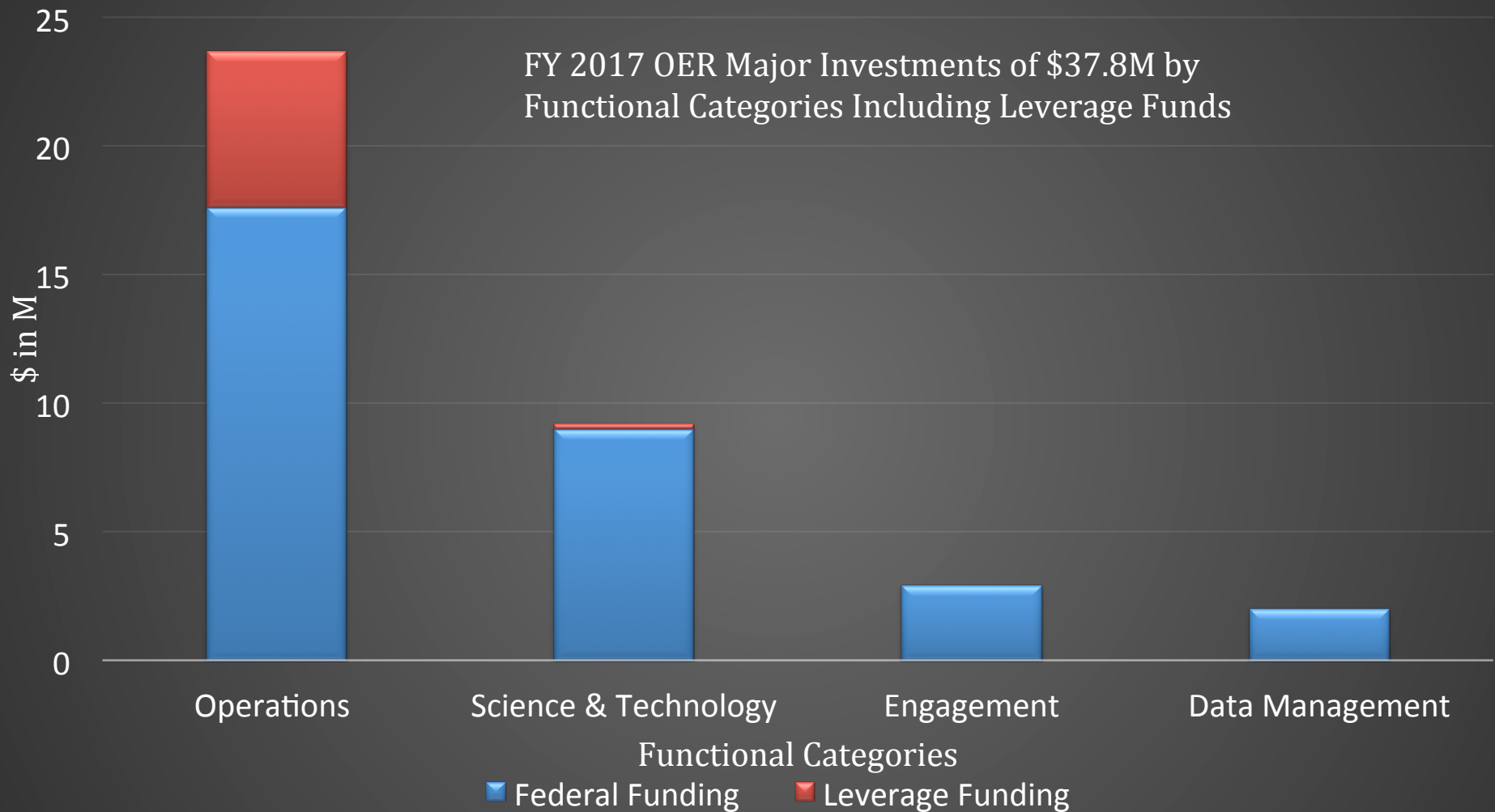


FY17 – Engagement and Data Delivery

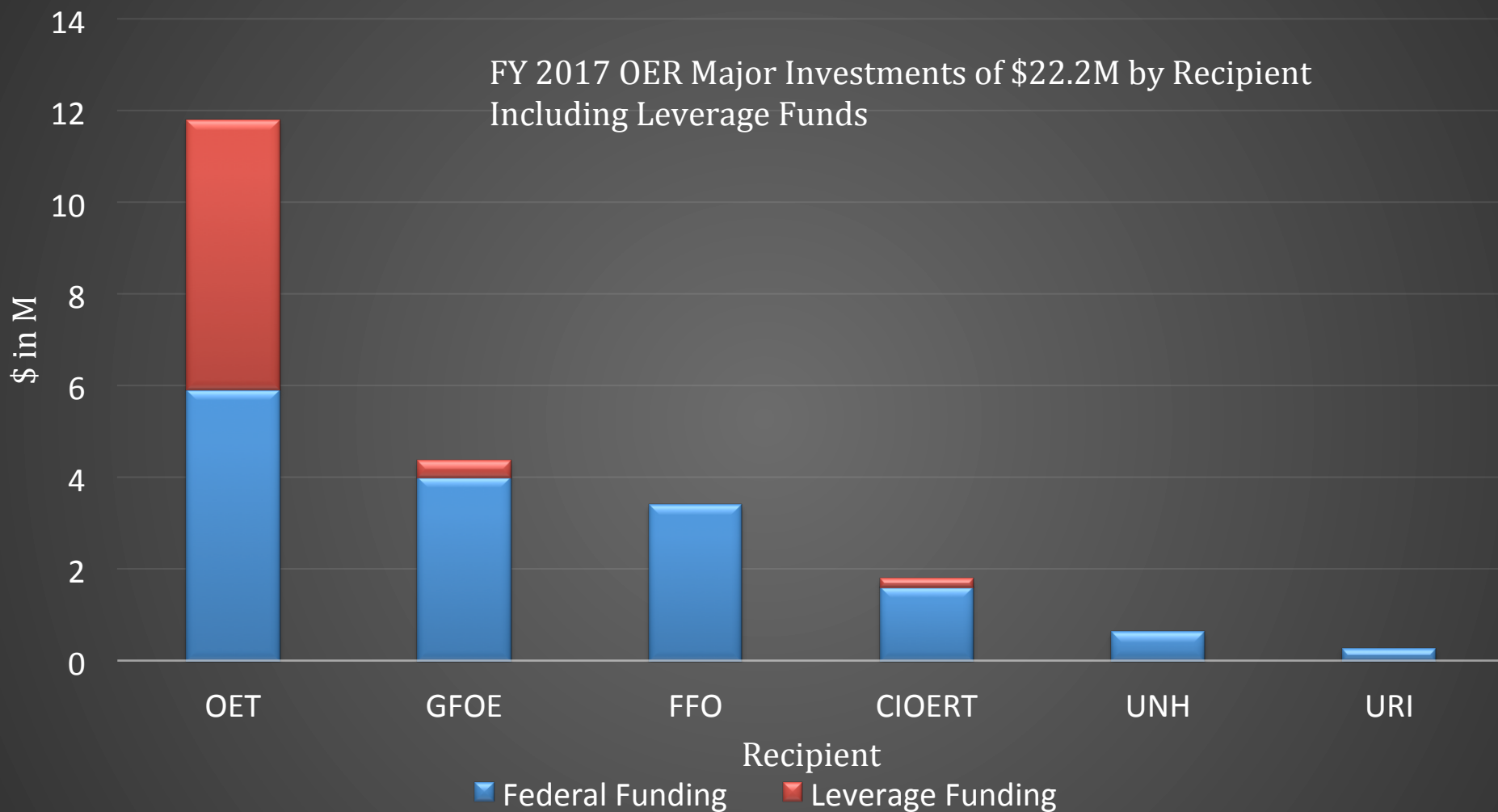
FY 2017CR (Anticipated) \$5M



FY17 – Functional Categories



FY17 – External Partners



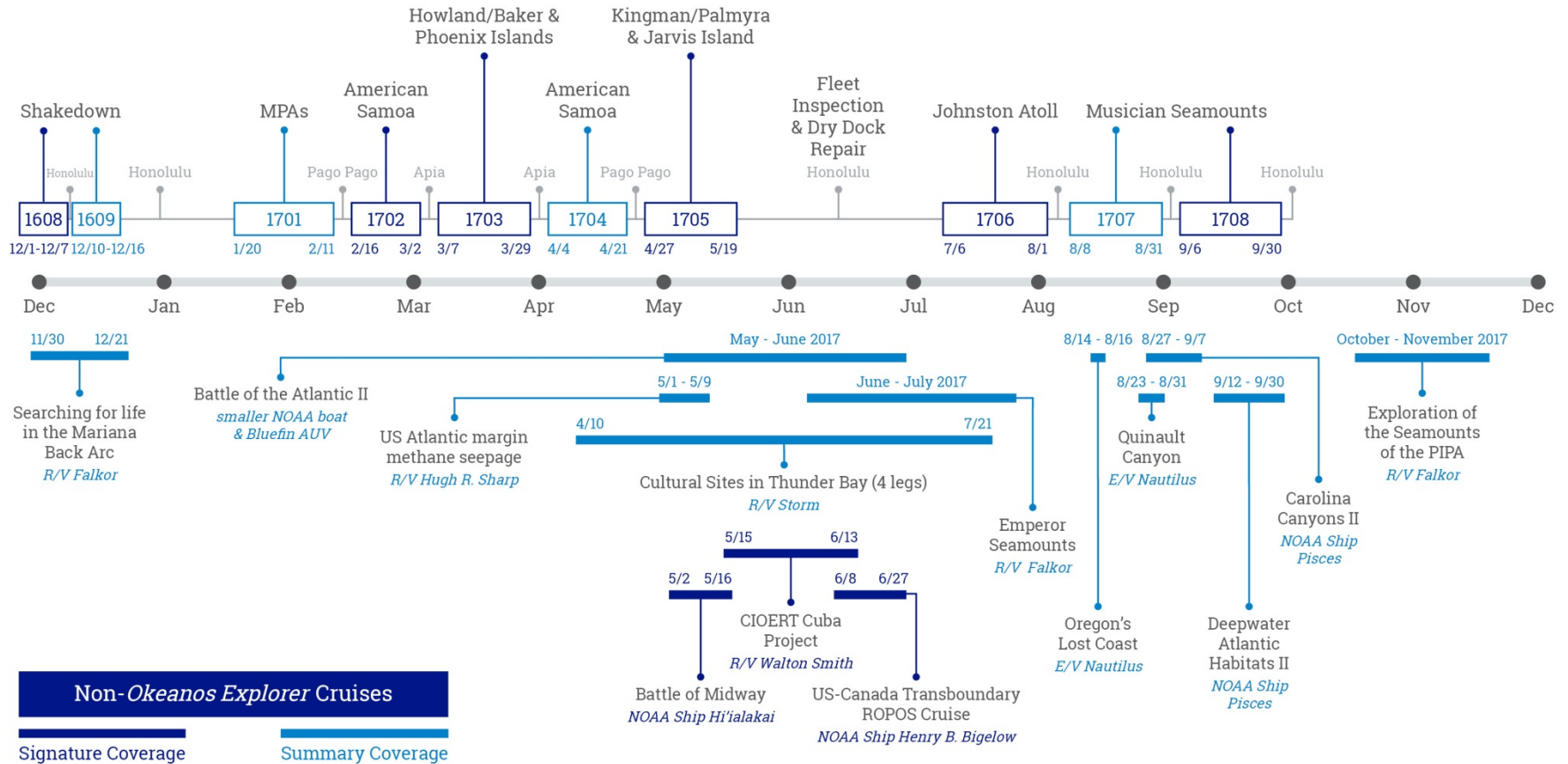
2017 Expeditions



Okeanos Explorer

ROV & Mapping

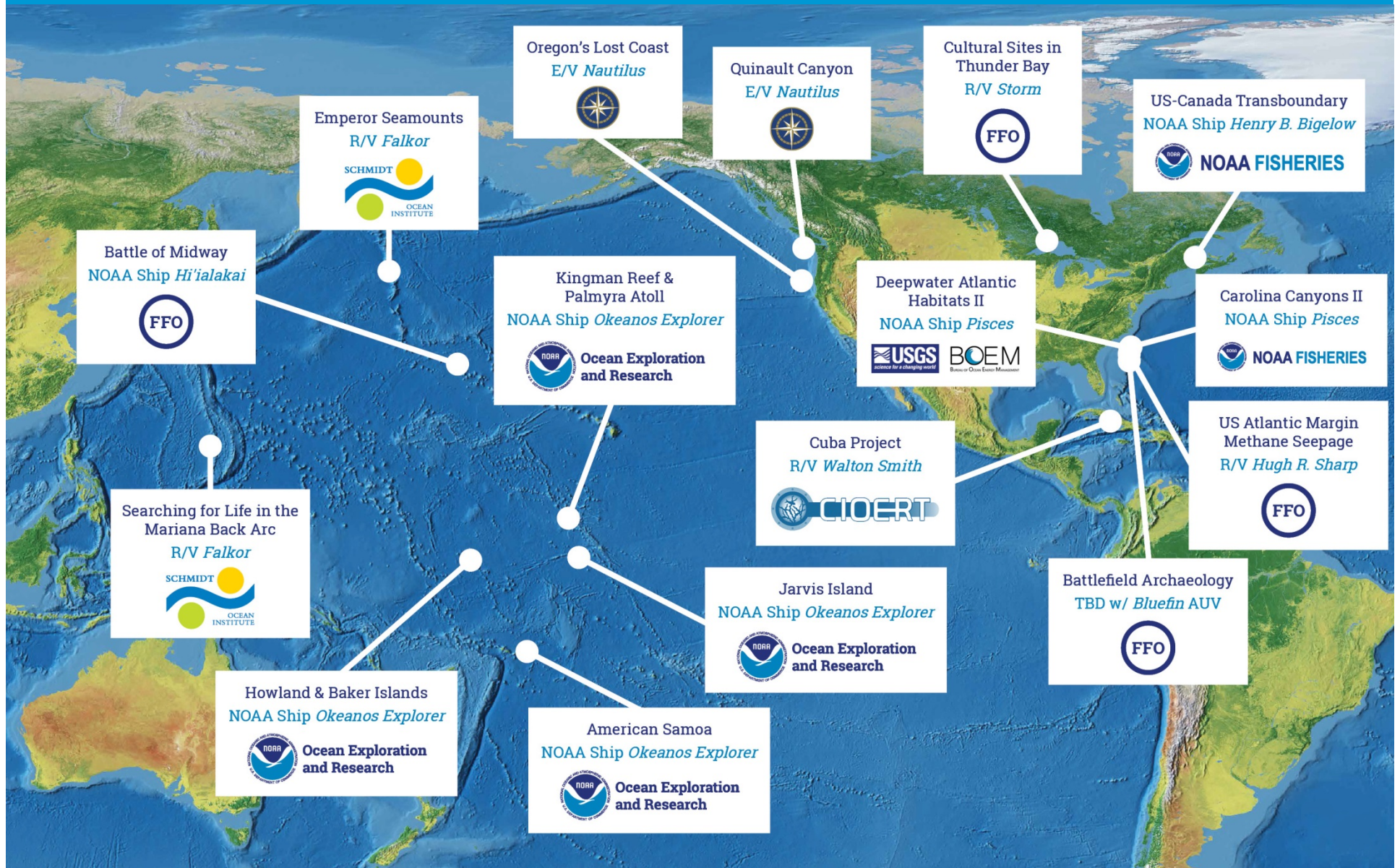
Mapping



OceanExplorer.NOAA.gov



2017 Supported Expeditions

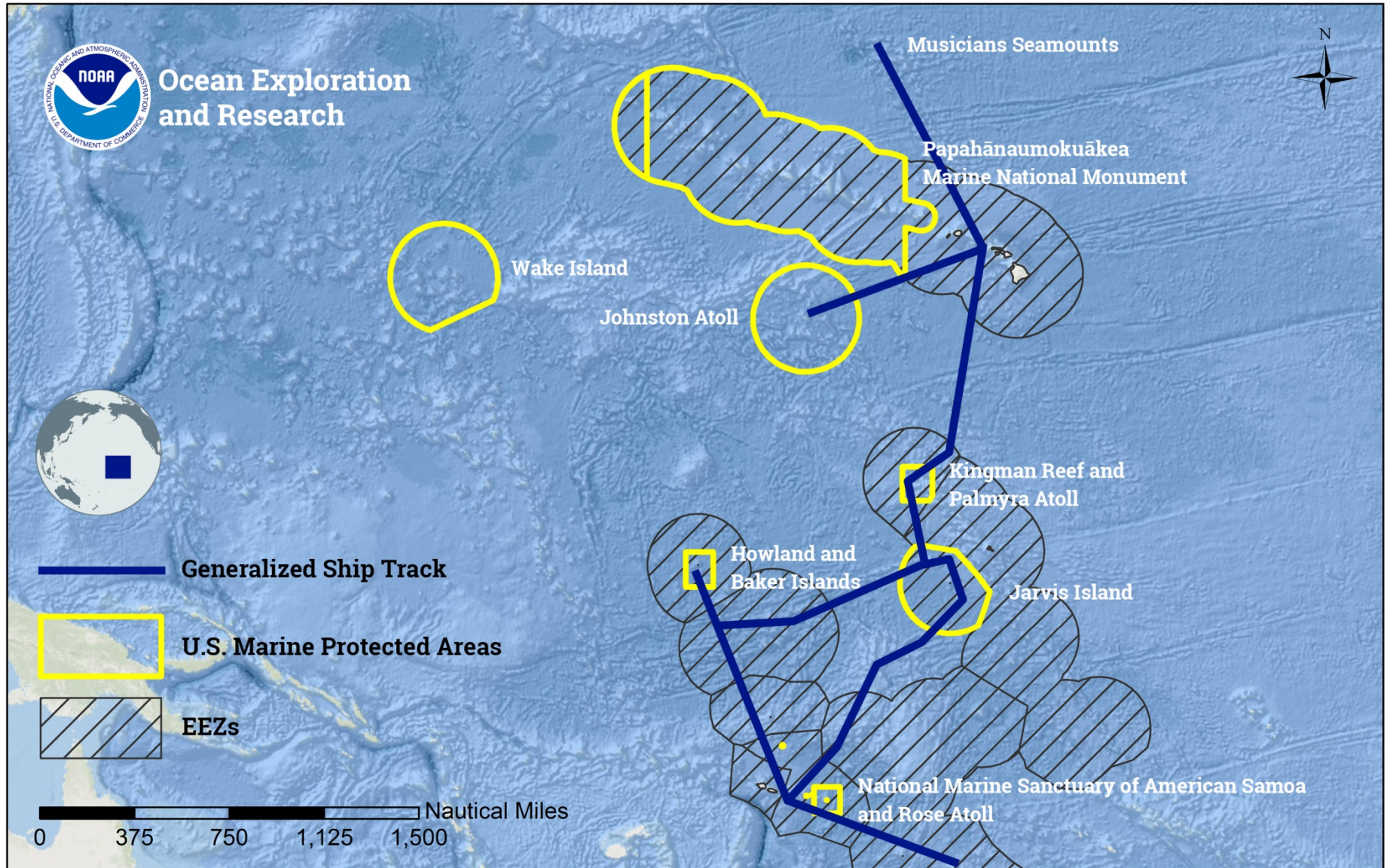


2017 *Okeanos* Field Season

- Shakedown (Hawaiian Islands)
- 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

CAPSTONE 2017

General Operating Focus Areas and Shiptracks



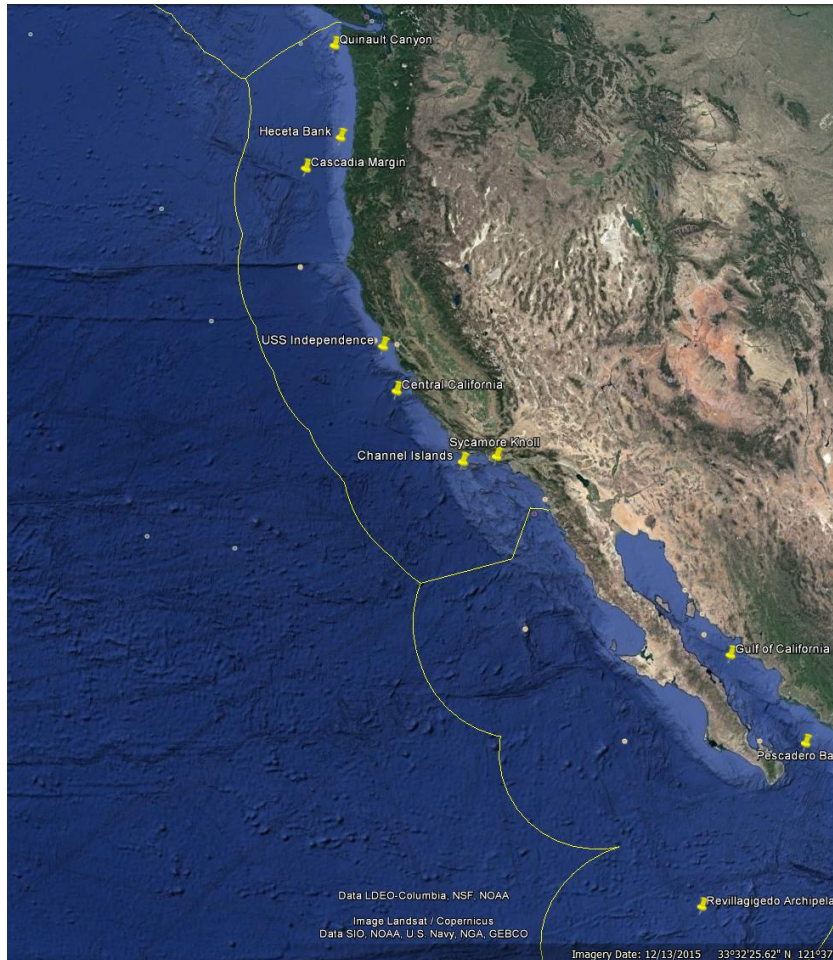
Service Layer Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

CIOERT: 2017 Expeditions

- Cuba-U.S. expedition (deferred from 2016) to explore mesophotic reefs in Cuba for comparison with other reefs in Cuba, Flower Gardens, Florida Keys NMS
- Flower Garden Banks NMS expedition to further establish connectivity among Gulf of Mexico banks.

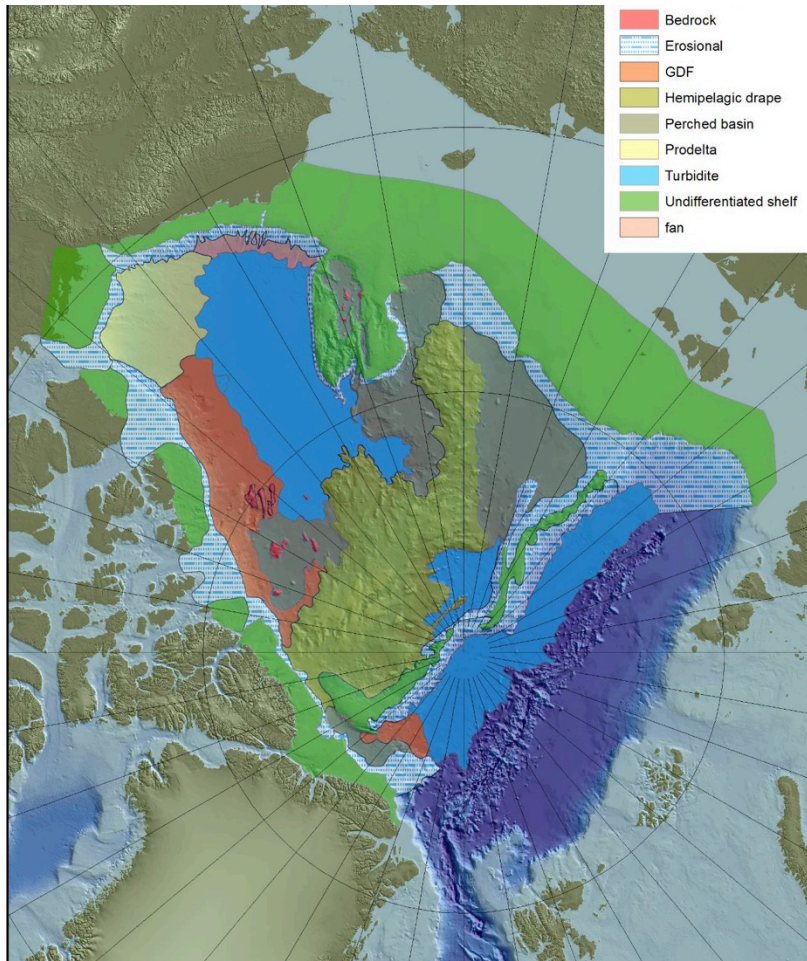


Ocean Exploration Trust E/V *Nautilus*



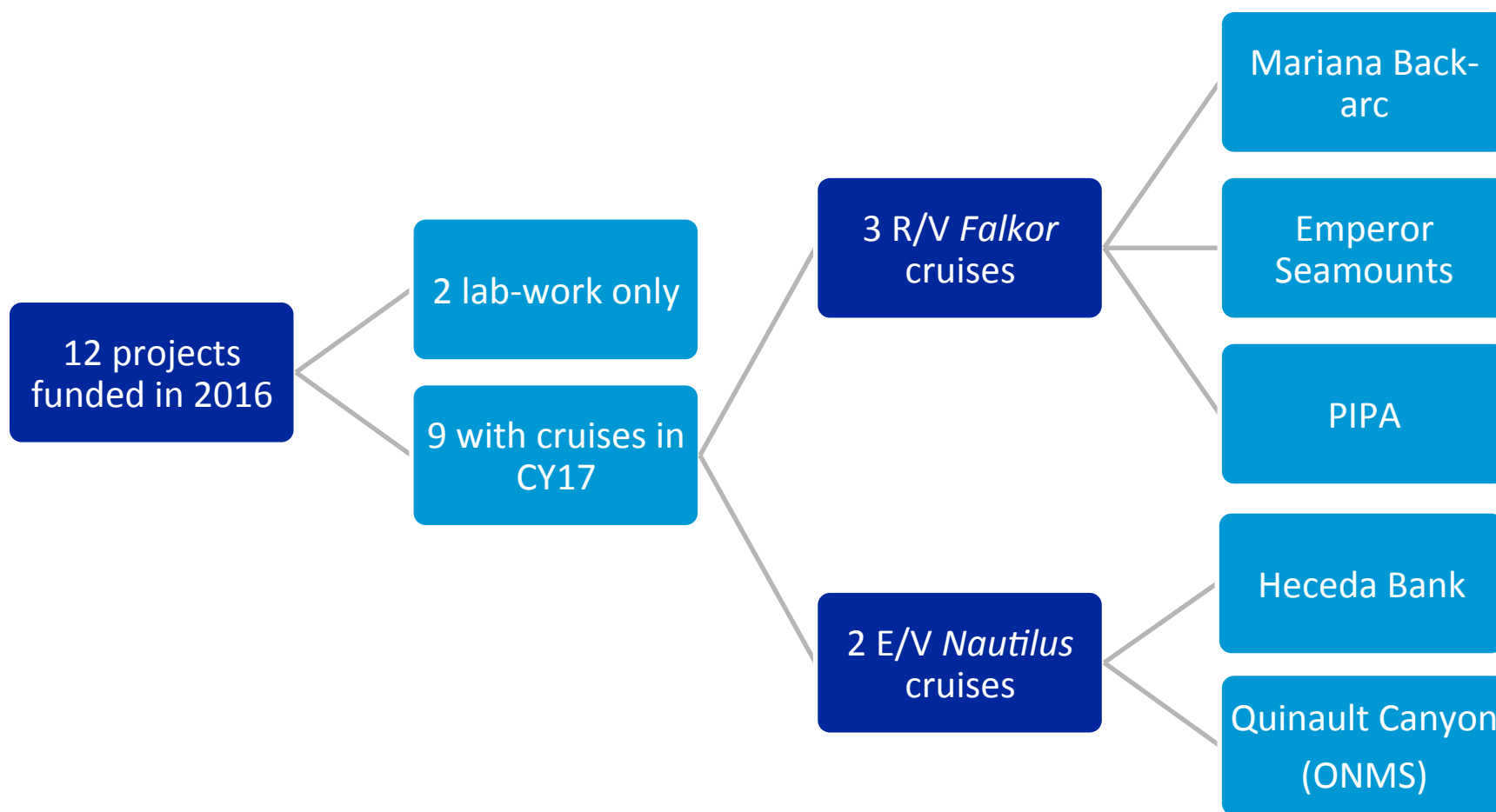
- Targets include:
 - Revillagigedo Islands
 - Gulf of California
 - Channel Islands
 - USS *Independence*
 - Cascadia Margin
 - Heceda Bank (FY16 FFO)
 - Quinault Canyon (FY16 FFO)
- Further Investigations in National Marine Sanctuaries:
 - Olympic Coast NMS
 - Cordell Bank NMS
 - Monterey Bay NMS
- Red Dot Surveys

Extended Continental Shelf in 2017



- Planned expedition to Necker Ridge (R/V *Kilo Moana*, UNOLS)
- Processing and analysis of data at NESDIS
- Argument development for UNCLOS submission (with USGS, State)
- Continued development of ECS data management framework
- Initial steps to link ECS data and habitat classification schema to meet NOAA mission needs
- Possible 2018 survey in the Gulf of Alaska

Leveraging *Falkor*, and *Nautilus* through the FFO



ASPIRE: North Atlantic Campaign



ASPIRE

Gulf of Mexico

Caribbean

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

- Emerging international campaign generally focused on the North Atlantic.
- 2016 to ~2020
- Builds off of previous OER and partner efforts
- Combination of aligning existing plans and developing new ones
- NOAA efforts will likely be considered a major US contribution to Galway Statement on Atlantic Ocean Cooperation
- An evolution and maturation of ACUMEN (Atlantic Canyons Undersea Mapping ExpeditionNs) approach
- Interagency participants include: BOEM, USGS, NOAA (SEFSC, NEFSC, OST, DSCRTP, NCCOS, ONMS, NCEI, OMAO, OER)

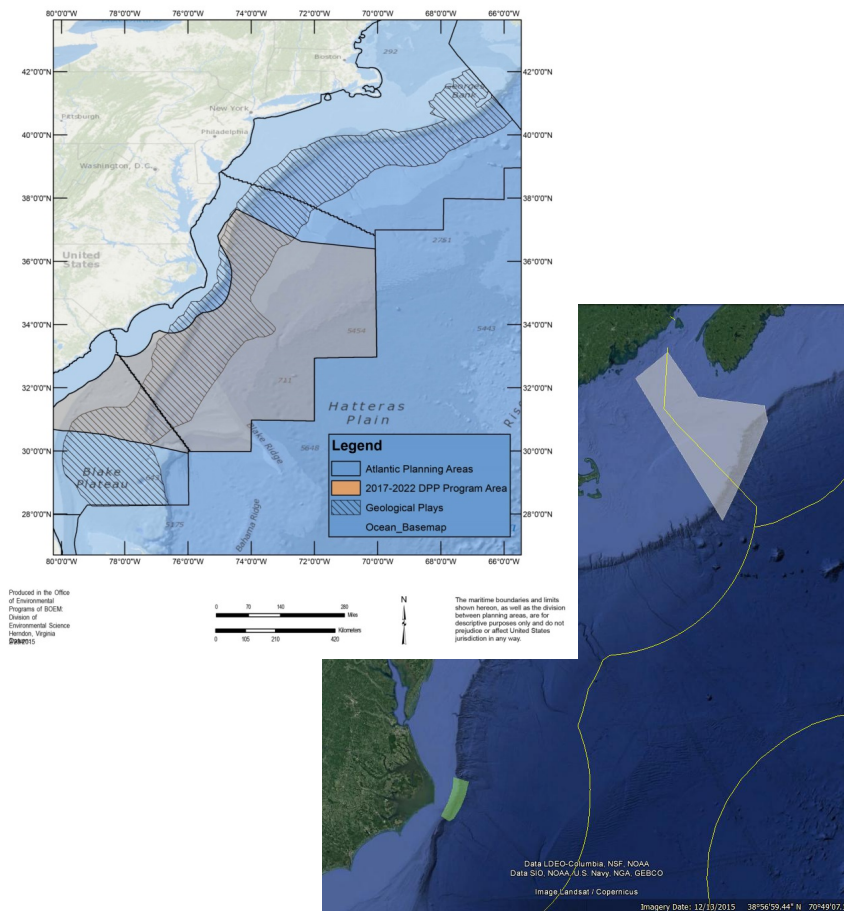
2013 Galway Statement

“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



Geologic Plays in the Atlantic Planning Areas
including detail on continental shelf bathymetry

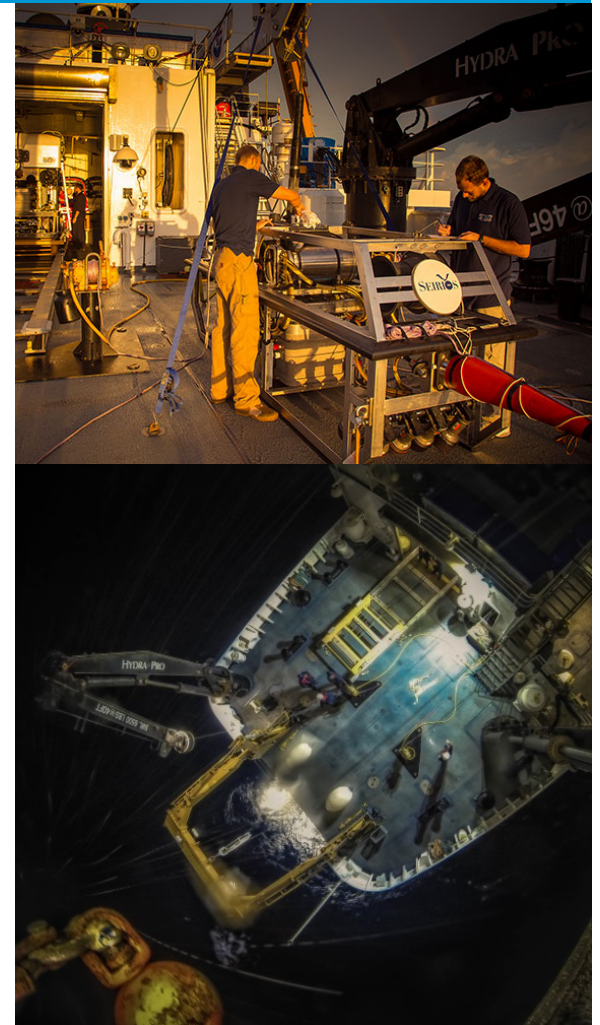


- Deepwater Atlantic Habitats
 - BOEM-USGS-NOAA partnership
 - NOAA Ship *Pisces* and AUV *Sentry*
 - RFP will confirm expedition
- U.S.-Canada Transboundary Expedition
 - U.S.-Canada PIs; NOAA Ship *Bigelow* and ROV *ROPOS*
- Carolina Canyons II
 - Continuation of 2016 work; NOAA Ship *Pisces* and AUV *Sentry*



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. (Details TBD)



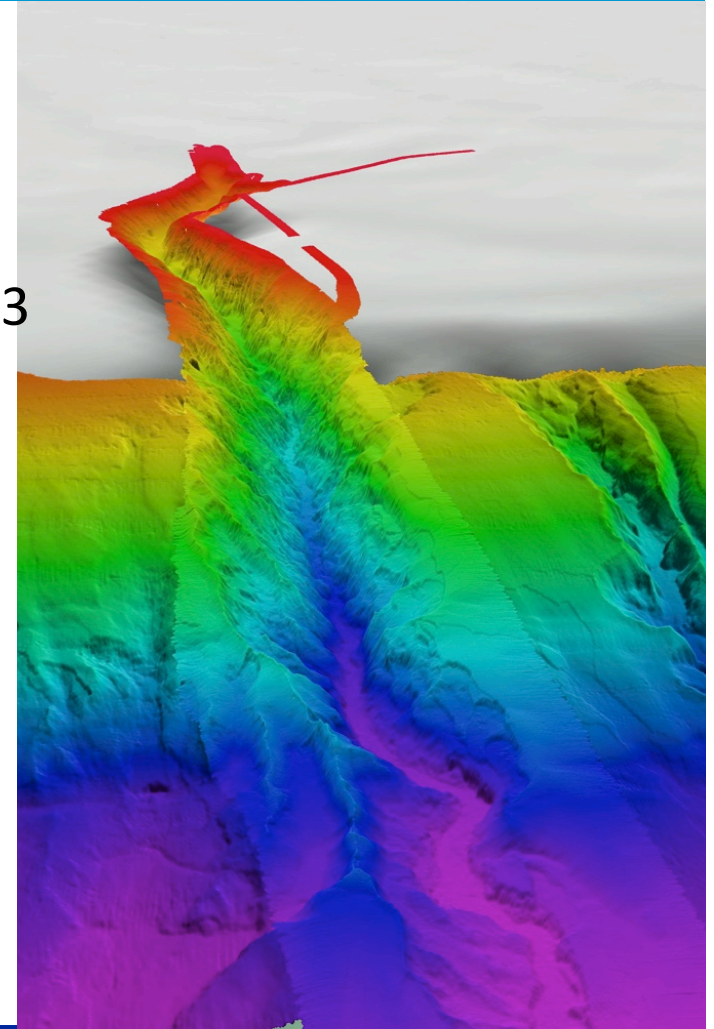
Other 2018 Plans and Opportunities

- BOEM-USGS-OER: Mid & South Atlantic Bight (ASPIRE)
 - 2nd of 3 expeditions
 - Mid and South Atlantic Bight
 - Charter vessel with science-class ROV
- *Ron Brown* in Western Pacific
 - Likely bound for the Indian Ocean
 - ~35 DAS Jakarta to Guam schedule gap
- E/V *Nautilus*: CAPSTONE II
 - Both West Coast and Central Pacific work
- IFREMER TransAtlantic
 - Support Galway and NOAA-IFREMER bilateral
- NMFS NEFSC *Bigelow* cruise: Northeast US
- Dalio Foundation and the *Alucia*
- FFO, MBON, ECS, Marine Archaeology



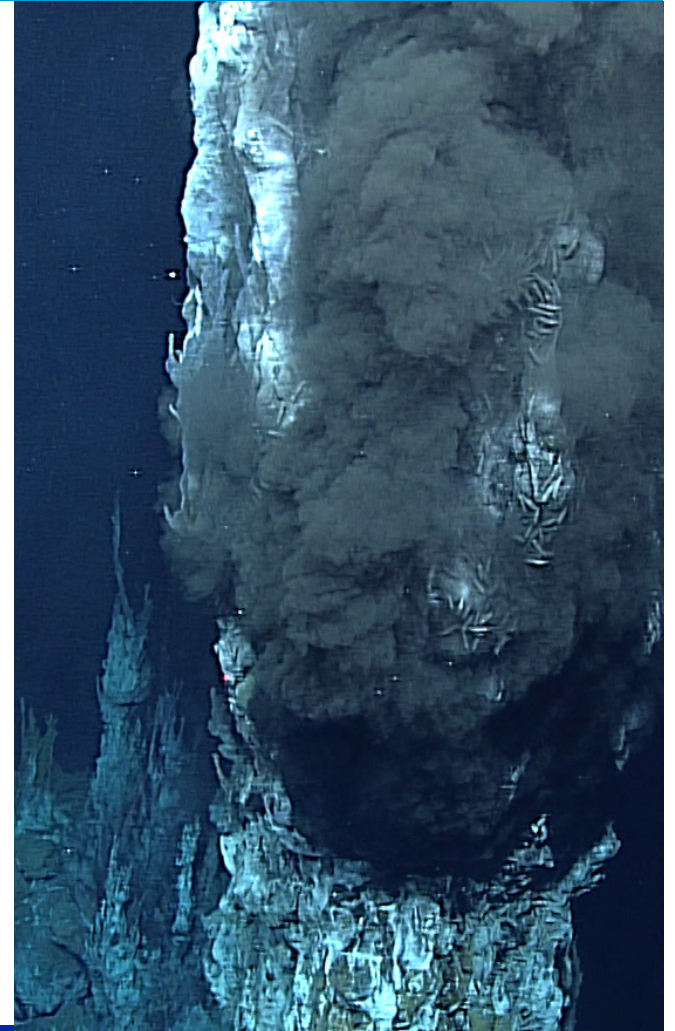
Okeanos Explorer Initial Plans for 2019

- South Atlantic Bight, Caribbean, Dry Dock, 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?

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**Ocean Exploration
and Research**

Backup Slides



Japanese Mini Submarines Media Coverage

Live views: ~1.5 million views

YouTube (~74,000 views), USA Today, ABC, Facebook Live

Traditional media: 7000+ news stories

ABC, CBS, FOX, Washington Post, NY Times, Stars & Stripes, Live Science, and more

Social Media: reached ~500,000 people

- **OER**
 - Facebook: ~230,000
 - Twitter: ~127,000
 - Instagram: ~2500
- **ONMS**
 - Facebook: ~102,000
 - Twitter: ~33,000
 - Tumblr: ~600)

The Economist aboard *Okeanos Explorer*



- Focused on the future of ocean science
- Highlighted shipboard technology and instrumentation
- Film to premiere at World Ocean Summit in Bali on February 23, 2017

CAPSTONE FY15-FY17

