

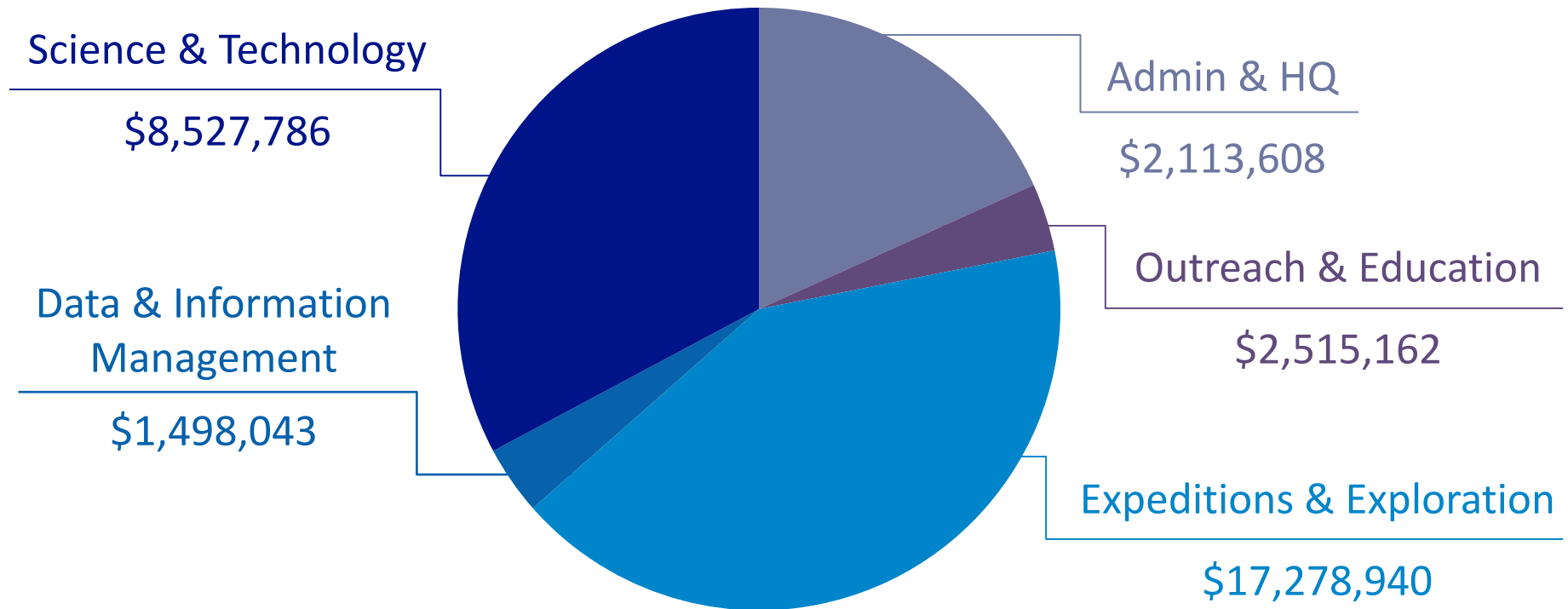
NOAA Ocean Exploration and Research Program Update

Alan Leonardi, Director
Twelfth Meeting
Ocean Exploration Advisory Board
Oakland, CA
March 26 – 27, 2019

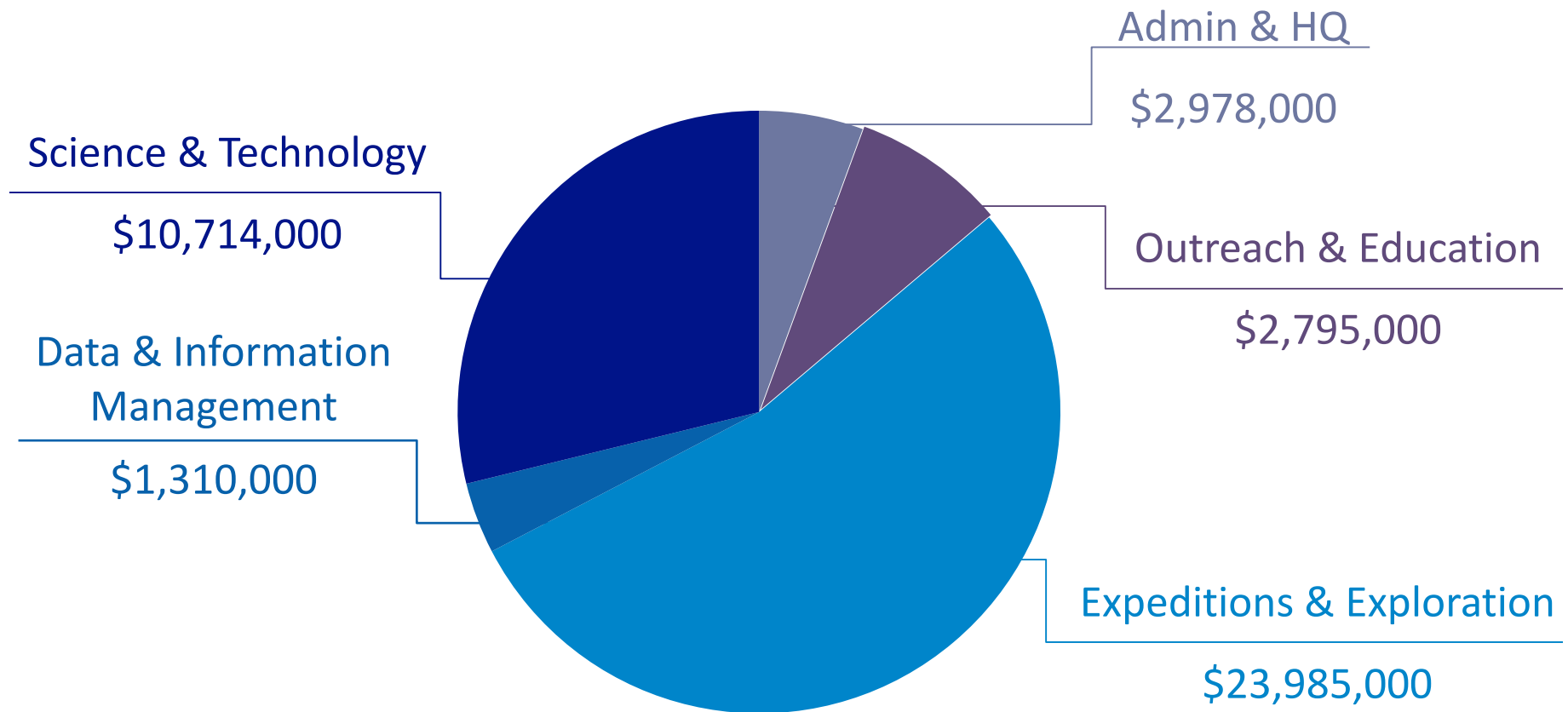
Overview

- FY18 and FY19 Budget Overview
- 2018 Engagement Metrics
- 2019 Activities
 - Review of operations to date
 - What's next
- 2020 and 2021 Outlook
- FFO and Partnerships
- ECS
- CI and NOPP

FY18 OER Budget by Strategic Categories



FY19 OER Spend Plan by Strategic Categories





2018 Expeditions



NOAA Ship *Okeanos Explorer*

10 cruises

226,039 km² mapped
40,819 linear km mapped

49 ROV dives

821 hours of ROV time

280 hours on bottom

821 hours of video

141 samples collected
263 subsamples collected

3,424 m depth reached

100+ participating scientists

22 cruises

333,164 km² mapped
60,289 linear km mapped

131 ROV dives

1,544 hours of ROV time

974 hours on bottom

1,544 hours of video

948 samples collected
2,560 subsamples collected

3,497 m depth reached

hundreds of participating
scientists

E/V *Nautilus*

12 cruises

107,125 km² mapped
19,470 linear km mapped

82 ROV dives

723 hours of ROV time

694 hours on bottom

723 hours of video

807 samples collected
2,297 subsamples collected

3,497 m depth reached

150+ participating scientists

2018 Engagement & Outreach



Ocean Exploration
and Research



OCEAN
EXPLORATION
TRUST

% change from FY17



Website Visits

~5,412,000

~1,984,800

↓ 49.5% decrease



Live Video Views

~700,000

~2,049,600

↓ 51.3% decrease



Facebook Likes

~136,600

~94,800

↑ 10.6% increase



Twitter Followers

~185,600

~22,600

↑ 2.2% increase



Instagram Followers

~47,000

~34,500

↑ 263.8% increase



YouTube Views

~4,071,000

~9,286,900

↓ 15.5% decrease

YouTube Subscribers

~77,800

~150,700

↑ 35.6% increase

YouTube Minutes Watched

~18,798,600

~20,642,600



Educators Trained

890

133

↑ 9.06% increase

Reached Students

107,000+

20,800+

↑ 29.4% increase

Educator Workshops

35

5

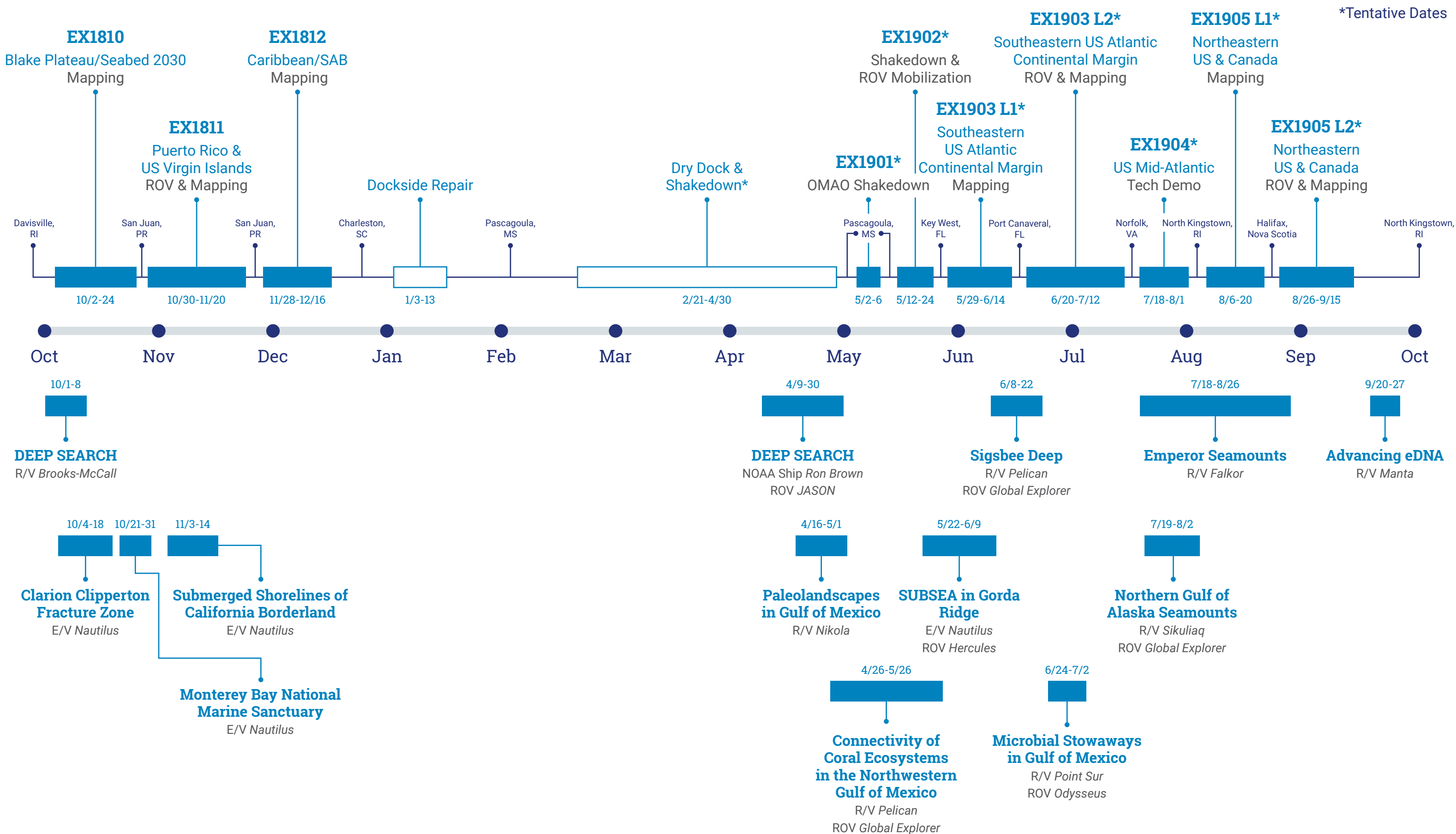
↑ 5.3% increase



Media Mentions

- Stories covering OER's work were generated by hundreds of outlets ranging from Associated Press, CNN, NBC, ABC, USA Today, Washington Post, National Geographic, Business Insider, Forbes, Daily Mail, Newsweek, Popular Mechanics, Live Science, and local media outlets in Puerto Rico.
- Over 670 *Nautilus*-related news reports in print, radio, television, and online media with an estimated reach of more than 40 million people. Outlets included the Washington Post, BBC, CNN, LA Times, Smithsonian Magazine, National Geographic, Forbes, Boston Globe, Space.com, Popular Science, Science Friday, and many more local, national, and international outlets.

FY 2019 Expeditions



NAUTILUS LIVE

2019

GORDA RIDGE

GREATER FARALLONES
CORDELL BANK
MONTEREY BAY
NATIONAL MARINE SANCTUARIES

CALIFORNIA MAPPING

PACIFIC
SEAMOUNTS

OSBORN BANK

JOHNSTON ATOLL

CLARION-CLIPPERTON
FRACTURE ZONE

KINGMAN REEF

PALMYRA ATOLL

JARVIS ISLAND

HOWLAND ISLAND

BAKER ISLAND

AMERICAN SAMOA

NATIONAL MARINE SANCTUARY OF
AMERICAN SAMOA

ASPIRE EXPEDITIONS

Northern Neighbors: Transboundary Exploration of Deepwater Communities

June 2017, June 2019

NOAA NMFS/Dalhousie University, NOAA Ship *Henry B. Bigelow*

US-Canada ROV and Mapping

Summer 2019

NOAA OER/ONMS, NOAA Ship *Okeanos Explorer*

New England Seamounts ROV and Mapping

Summer 2020

NOAA OER, NOAA Ship *Okeanos Explorer*

Mid-Atlantic Ridge ROV and Mapping

Summer 2020

NOAA OER, NOAA Ship *Okeanos Explorer*

Carolina Canyons

August 2016, August 2017

NOAA NMFS

NOAA Ship *Pisces*

DEEP SEARCH

2017-2019

BOEM/USGS/NOAA, Multiple Platforms

Seabed 2030 Mapping

Spring 2019

NOAA OER, NOAA Ship *Okeanos Explorer*

Southeast US ROV and Mapping

Summer 2018, Spring 2019

NOAA OER/NMFS/ONMS, NOAA Ship *Okeanos Explorer*

US Southeast and Bahama Ridge Mapping

October 2018

NOAA OER/OCS, NOAA Ship *Okeanos Explorer*

ASMIWG Pilot Area Mapping

July 2018

NOAA OER, NOAA Ship *Okeanos Explorer*

US Caribbean ROV and Mapping

Fall 2018, Spring 2020

NOAA OER/OCS, NOAA Ship *Okeanos Explorer*

Existing ASPIRE Partners



Fisheries and Oceans
Canada



European
Commission

Horizon 2020
European Union funding
for Research & Innovation

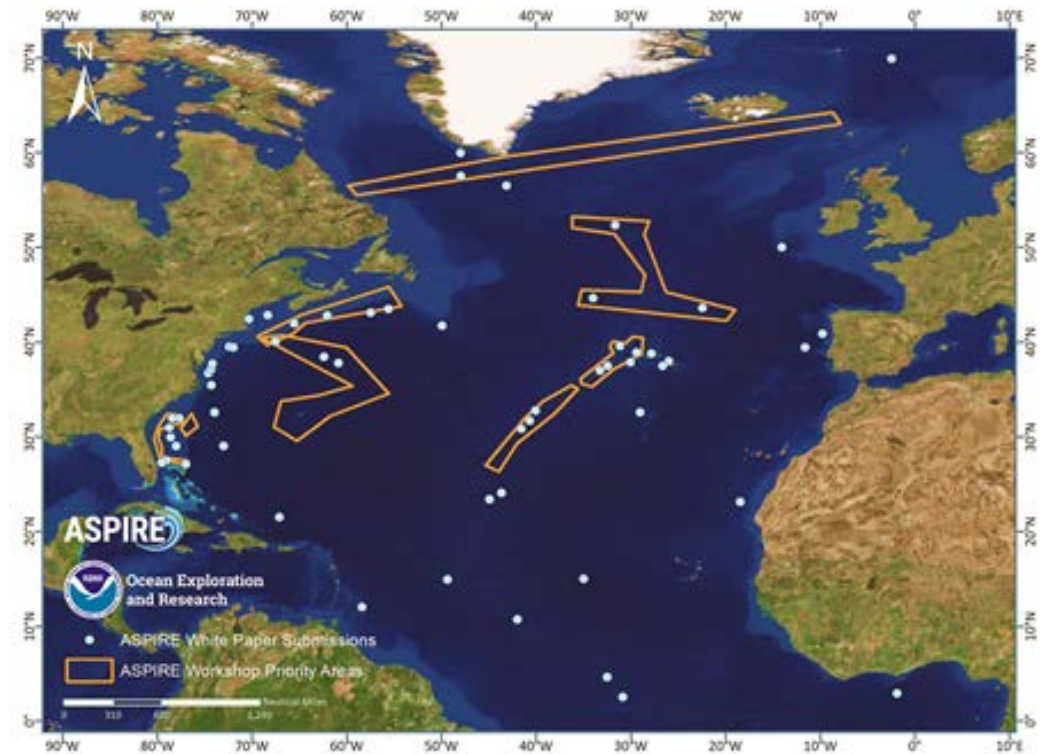


ASPIRE Science Themes & OER Priorities

- **Improve knowledge of unexplored areas** within the US EEZ, including critical habitats, geological features, and potential living and mineral resources enhancing the agencies contribution to the Blue Economy
- **Locate and characterize** deep-sea coral, sponge, and chemosynthetic **communities**
- **Enhance predictive capabilities** for vulnerable marine habitats and submarine geohazards
- **Extend bathymetric coverage** in the US EEZ and international waters in support of **Seabed 2030**
- Increase understanding of deep-sea ecosystem **connectivity** across the Atlantic basin
- **Leverage international partnerships** to conduct coordinated exploration and mapping of high-seas areas of the North Atlantic, including the Mid-Atlantic Ridge

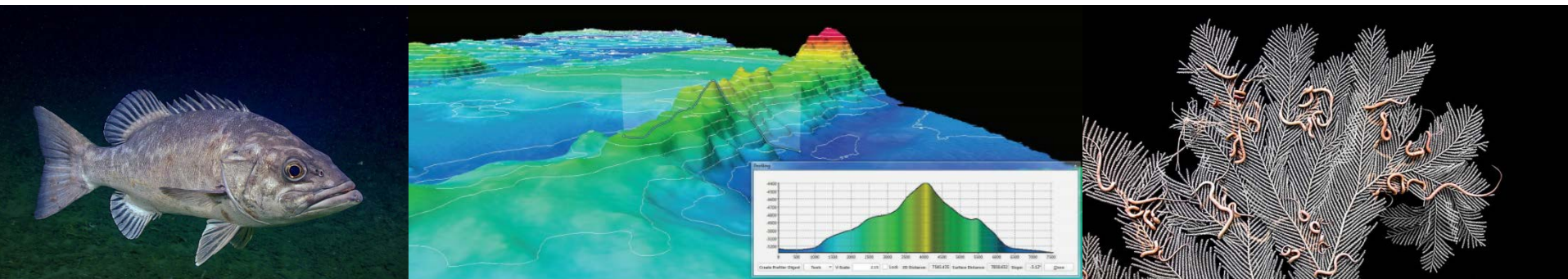
2018 ASPIRE Workshop

- 50+ attendees from US, EU, Canada, Iceland, and Russia
- Academia, government, and industry all represented
- Collected initial feedback in SeaSketch survey — priorities and interests span Atlantic basin
- Outputs are informing OER priorities in FY19 – FY21 field seasons



Okeanos Explorer ASPIRE Work To Date

- Mapping and ROV exploration of South East Deep Coral Initiative, South Atlantic Fishery Management Council, and Caribbean Fishery Management Council priority areas
- Mapping of priority areas south of Bermuda identified by the Atlantic Seabed Mapping International Working Group
- Mapping of high-priority areas designated by the U.S. Extended Continental Shelf (ECS) Project
- Collaboration with US Navy and University of New Hampshire to understand sound propagation through the water column

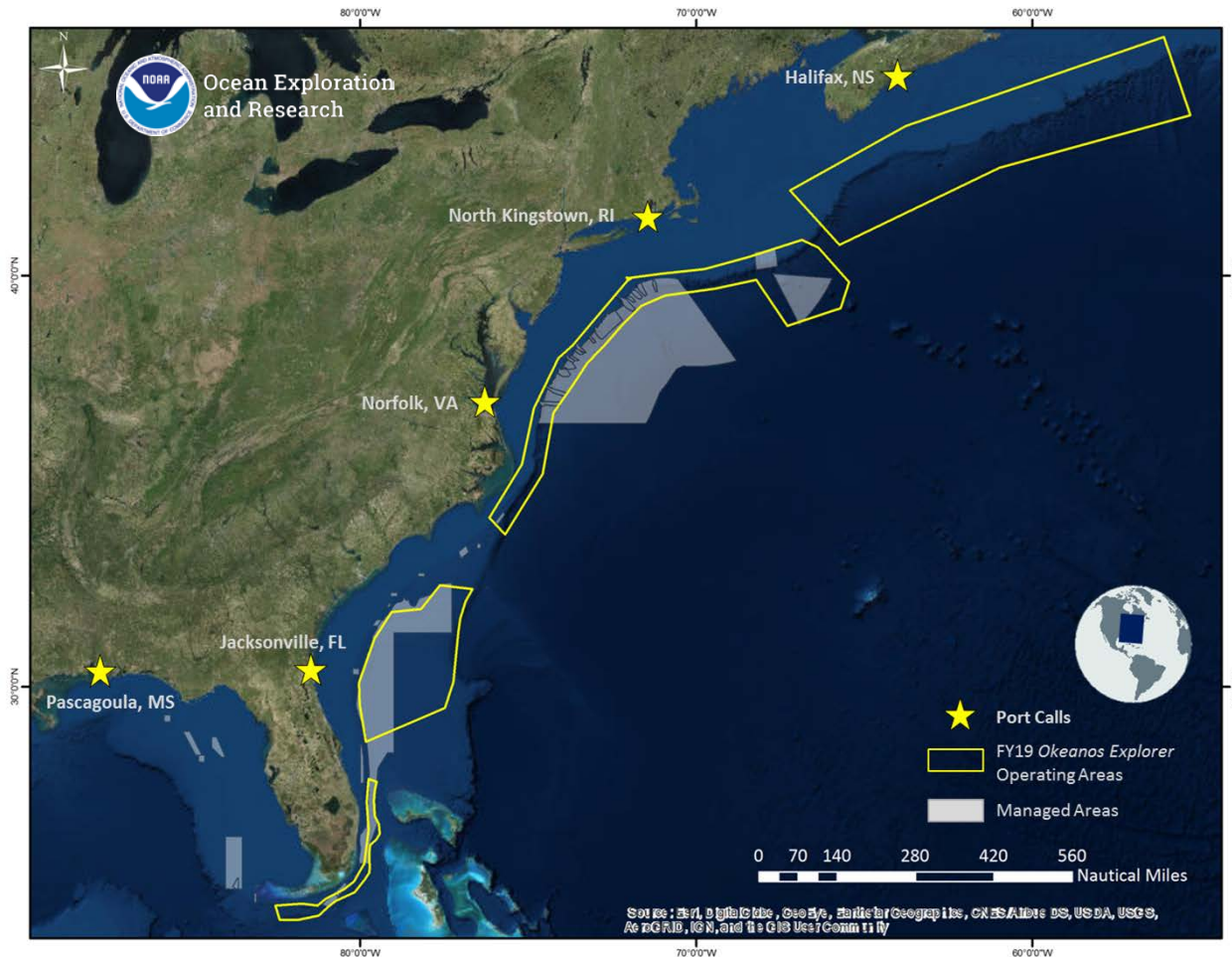


Okeanos Explorer in 2019 - At a Glance

- ONMS, OCS, OER submitted an integrated package of ship time requests for 173 DAS
- Schedule was impacted by government shutdown and reworked to include rescheduled FY18 expedition and additional priorities heard at ASPIRE Workshop
- Coordinating operations with BOEM-USGS, DSCRTP, DFO-Canada, Galway
- Technology demonstration cruise likely to include NOAA, NGO, and industry partners



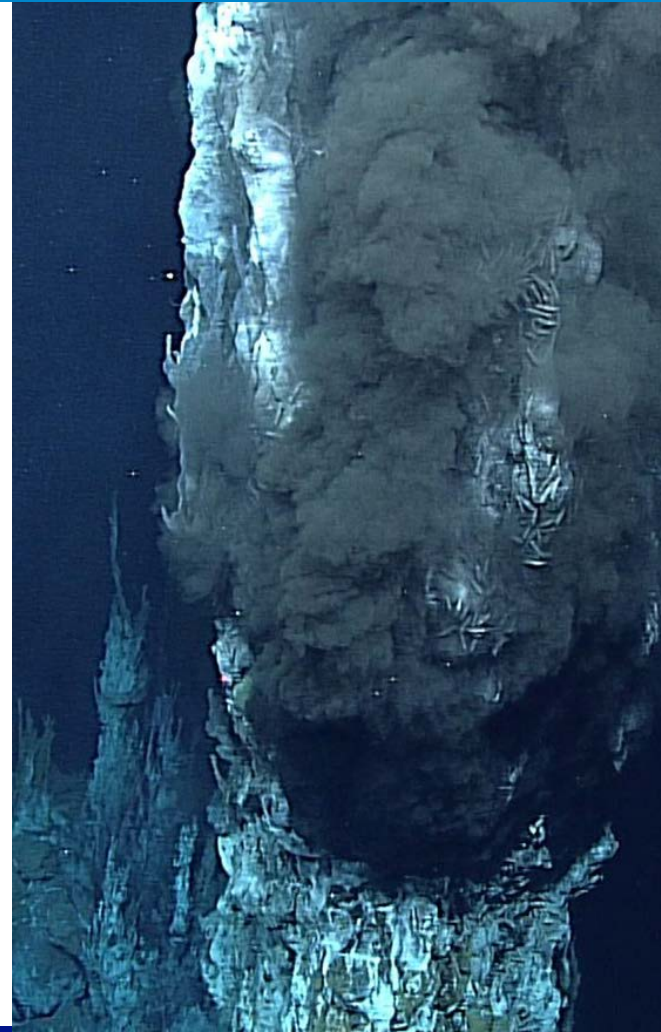
2019 Expeditions



- **May:** ROV and mapping shakedown period
- **June – July:** SE US mapping and ROV cruises
- **July – August:** Mid-Atlantic US tech demonstration
- **August – September:** NE US & Canada mapping and ROV cruises

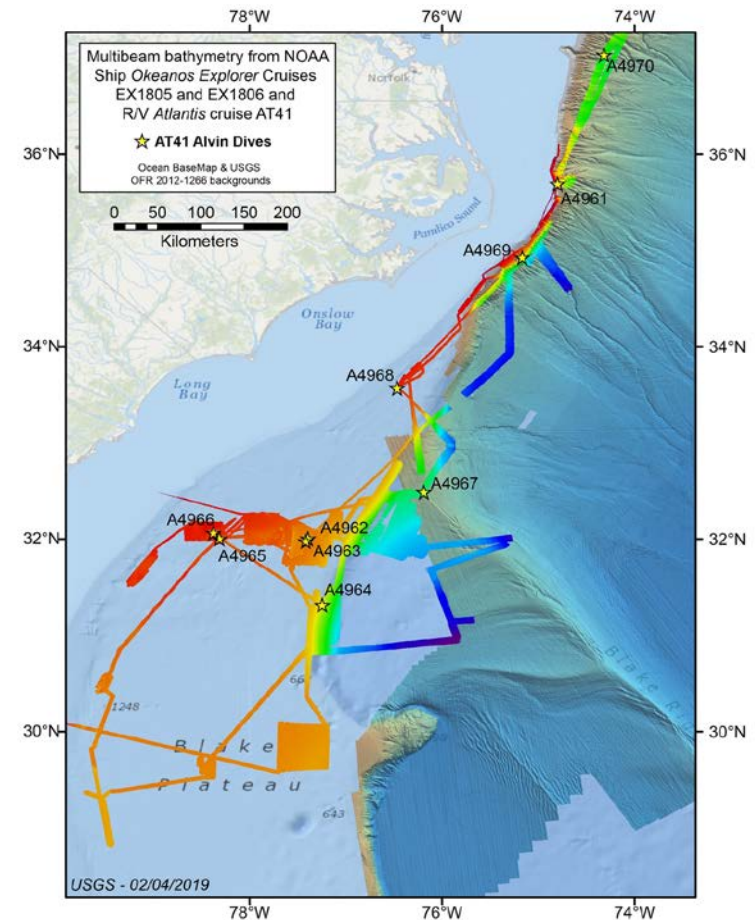
Opportunities in 2020 and Beyond

- 2020/2021 *Okeanos Explorer* priorities include:
 - US Caribbean
 - Mid-Atlantic Ridge
 - Bermuda
 - New England Seamounts
 - US Southeast and Bahamas
- Potential for *Okeanos Explorer* to transition from the Atlantic and into the Pacific in 2022
- E/V *Nautilus* and Mobile System
 - Both Central and Western Pacific work
 - Extend and expand CAPSTONE
 - EXPRESS



DEEP SEARCH

- 4.5 year, \$12M BOEM-USGS-NOAA study under the NOPP
- Second year of field work in 2018
- *Okeanos Explorer* collected 29,700 km² MB data to fulfill mapping obligations
- Highly successful 15-day cruise with R/V *Atlantis* and HOV *Alvin*
 - 11 dives at 3 canyons, 2 seeps, and 4 coral sites
 - Augmented EX mapping with additional 8,233 km²
 - Explored 85 miles of discontinuous *Lophelia* reef 160 miles offshore Charleston, SC
- Lander deployments completed on R/V *Brooks* *McCall* charter cruise



EXPRESS

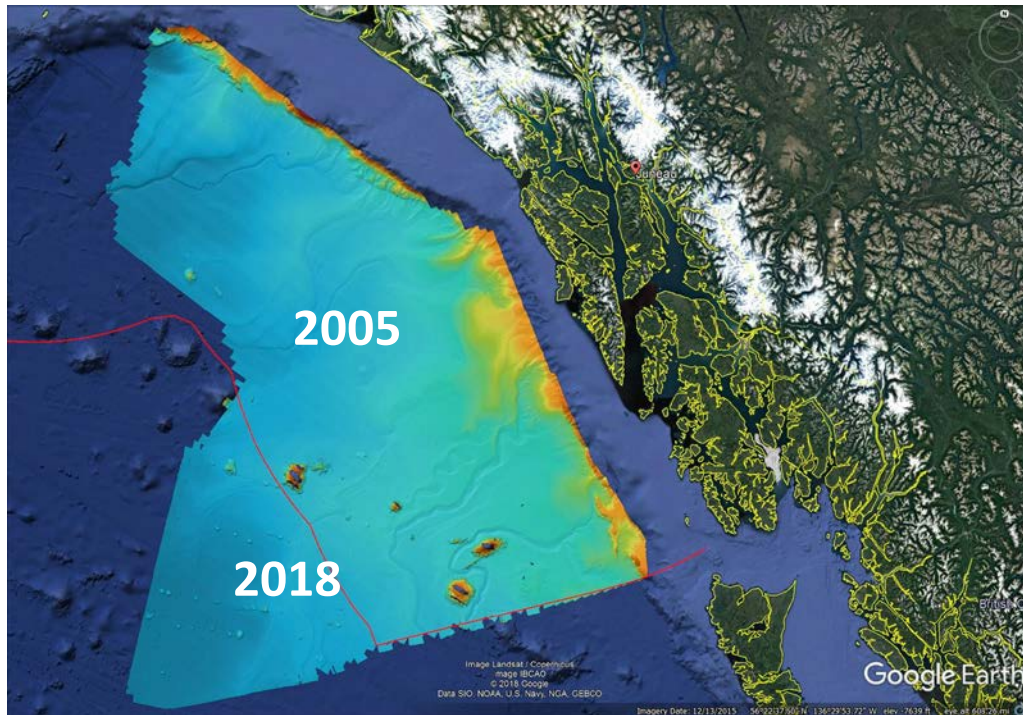
- Emerging West Coast campaign with BOEM, USGS, and NOAA that has completed field work in FY18-19 on NOAA Ships *Rainier* (mapping) and *Shimada* (AUV, ROV, mapping)
- OER contributed funding for 10 DAS on NOAA Ship *Rainier* in 2018
- Aligned with NOAA's West Coast Deep Sea Coral Initiative
- Potential future OER contributions include:
 - ROV support on NOAA Ship *Reuben Lasker* deep sea coral cruise
 - Critical minerals exploration of the Escanaba Trough
 - Cascadia Margin mapping



Federally Funded Opportunities in 2019

PI	Institution	Dates
Evans	Coastal Environments Inc.	April 16 – May 21, 2019
Hall	Mote Marine Lab	May 13 – 18, 2019
Hamdan	University of Southern Mississippi	June 24 – July 2, 2019
Boswell	Florida International University	TBD, Summer 2019
McDermott	Lehigh University	September 20 – 27, 2019
Bartlett	Scripps Institution of Oceanography /UCSD	August 1 – 22, 2019
Brooke	Florida State University	October 1 – 10, 2019
Wang	Woods Hole Oceanographic Institution	October 11 – 17, 2019
Michel	Woods Hole Oceanographic Institution	TBD, No 2019 field work
Jakuba	Woods Hole Oceanographic Institution	TBD, 2021 field work
Licht	University of Rhode Island	N/A

Extended Continental Shelf in 2018: Gulf of Alaska & Blake-Bahama Ridge



Coverage From 2005 & 2018 ESC Gulf Of Alaska Mapping Surveys
Image Credit: UNH/CCOM/JHC

Gulf of Alaska

- R/V *Kilo Moana*, July 1-Aug 3
- Mapped 98,777km² (28,799nm²)
- This cruise embellished findings from earlier NOAA bathymetric & USGS seismic ECS surveys in the area.

Blake-Bahama Ridge

- NOAA Ship *Okeanos Explorer*, Oct 3-24,
- Mapped 23,900km² (9,200nm²)
- As well as strengthening documentation to establish the outer limits of the US continental shelf in this area, these data will help inform ongoing maritime boundary negotiations between the US & the Commonwealth of The Bahamas.

Extended Continental Shelf in 2019

- Continuing management and archival of ECS data and derived products with US ECS Project Partners
- Drafting region-specific documents for eventual submission to Commission on the Limits of the Continental Shelf
- Seeking the input of external experts
- No additional at-sea data collection planned
- Value for ocean exploration generally
 - New data management indexing and visualization tools
 - Investigation into using ECS multibeam data to classify habitat
 - Data availability for baseline characterization

NOAA Cooperative Institute for Ocean Exploration (CIOE)

A long-term collaborative environment between NOAA and the awardees where broad-based exploration, research, technology advancement, and education/outreach capabilities, focused on NOAA's priorities for the global ocean's living and non-living marine resources, can be developed and sustained.

Funding totals could be as much as \$30M/year.

NOAA CI for OE Competition TimeLine

Where Do We Stand?

Pre-Award Phase - Request for Proposals & Proposal Review



Award Phase – Award Decisions & Notifications



Post-Award Phase – Implementation, Reporting & Closeout

National Ocean Partnership Program NOPP

Two Primary Partnership Mechanisms:

- NOPP Broad Agency Announcement (BAA)
- ONR leads BAA process; Contributes \$6-8M
- NOPP Agencies define solicitation topics
- Partners bring money or other resources

NOPP Agencies Partner Outside BAA Process

- Partners agree on projects and level/type of support
- Partners are generally federal and non-federal

New NOAA Line for NOPP (\$5.5 million)

- OER NOAA NOPP lead
- NOPP priorities support 2030 goals, among others

FY19 NOPP BAA Topics

- Cube Satellites Sensors
- Sustained Observations of Marine Biodiversity (NOAA)
- Advanced Sensor Technology
- Autonomous Profiling Floats (NOAA)
- Improving Arctic Operational Forecasts
- Data Assimilation for Ocean Prediction
- Autonomous mapping (NOAA)

Questions?

alan.leonardi@noaa.gov

OceanExplorerer.NOAA.gov



**Ocean Exploration
and Research**