



Ocean Exploration  
and Research

# **NOAA Report 2015/2016 DeSSC**

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# NOAA OER Updates

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- Undersea efforts
- *Okeanos Explorer* efforts
- Other major office efforts

# HYDROTHERMAL HUNT AT MARIANA



**Ship:** R/V Falkor

**Dates:** Nov 21 – Dec 17, 2015 - *currently underway*

**Vehicles:** AUV Sentry

## Objectives:

- Explore back-arc spreading center to find new sites of hydrothermal activity
- Add to the understanding of forces that shape biodiversity of vent systems

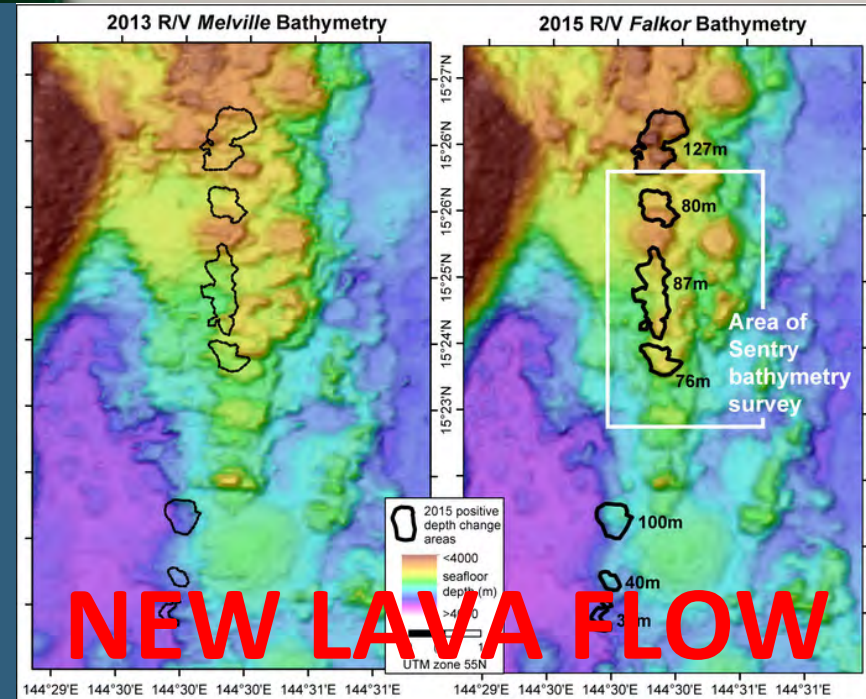
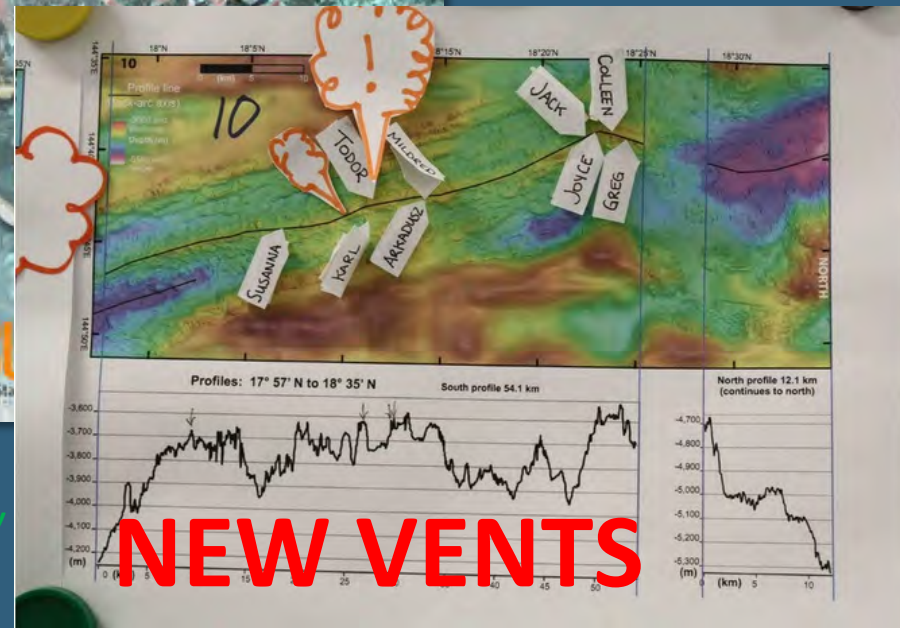
**Chief Sci:** Joe Resing

**PI's:** Ed Baker, Dave Butterfield, Bill Chadwick, John Lupton, Joe Resing

**Funding:** NSF, NOAA, UW, Oregon State, Schmidt Ocean Institute



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Images: Top Bill Chadwick, bottom Susan Merle.



# Coral Ecosystem Connectivity - Pulley Ridge

**Ship:** F.G. Walton Smith

**Dates:** August 22 – September 2

**Vehicles:** ROV Mohawk

## **Objectives:**

- Studied the benthic communities of Pulley Ridge, the deepest known photosynthetic coral reef off the continental U.S.
- Investigated whether mesophotic reefs serve as a refuge for impacted shallow reef species at nearby reefs of the Florida Keys and Dry Tortugas

**Chief Sci:** John Reed, Bob Cowen

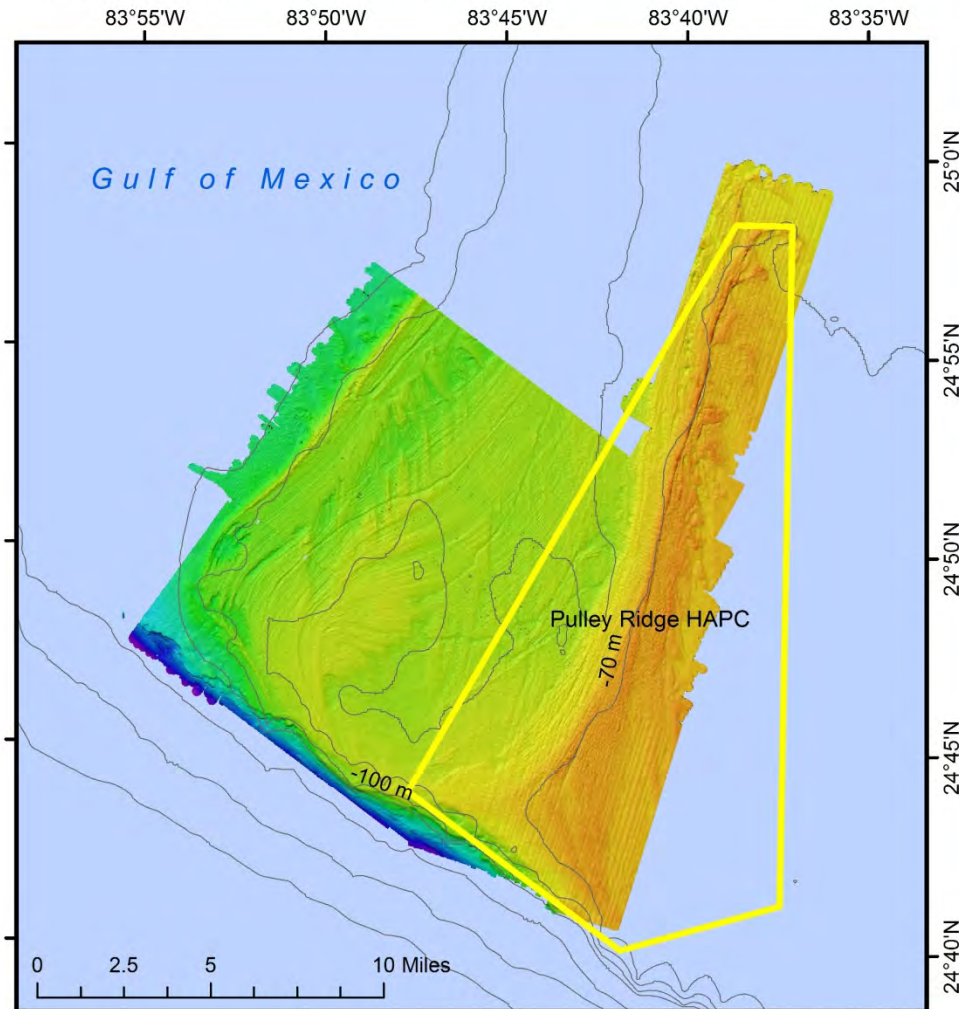
**PI's:** Many

**Funding:** NOAA (NCCOS, OER, ONMS, Gulf of Mexico Regional Office), NMFS SE,

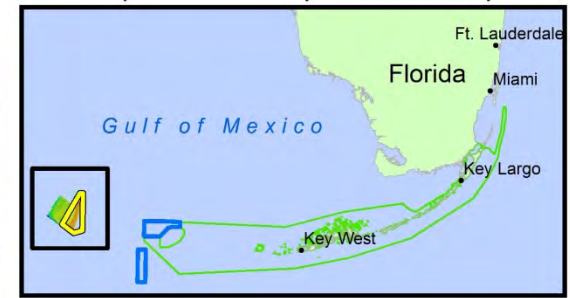
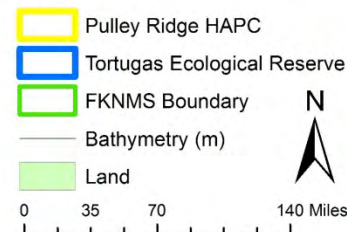
## Pulley Ridge

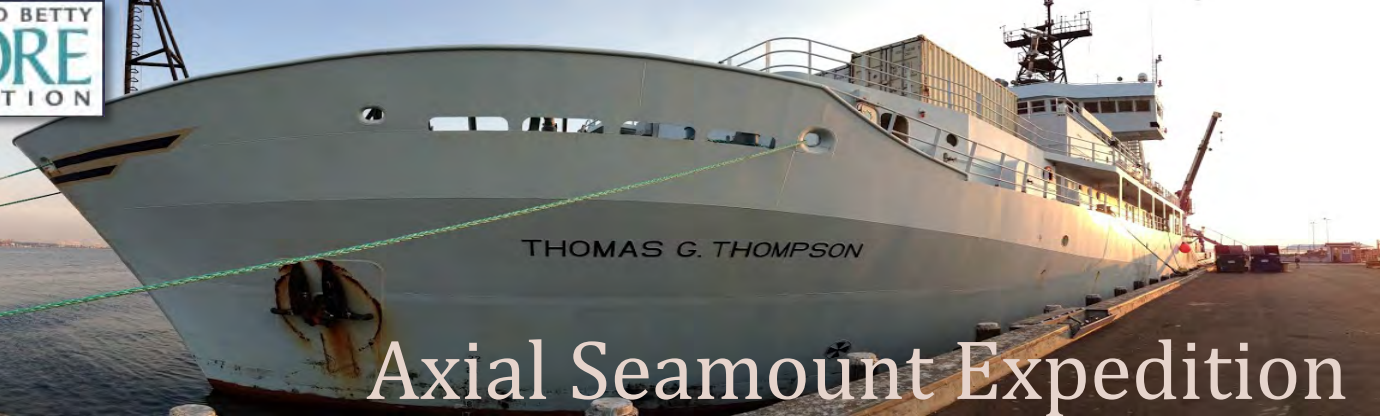
Habitat Area of Particular Concern (HAPC)

J. Reed & S. Farrington  
Harbor Branch Oceanographic Institution at FAU  
WGS\_1984\_UTM\_Zone\_17N  
GCS\_WGS\_1984  
Datum: D\_WGS\_1984



### Legend





# Axial Seamount Expedition

**Ship:** R/V Thompson

**Dates:** Aug 14-29, 2015

**Vehicles:** ROVs Jason/Medea & AUV Sentry

## Objectives:

- Conduct event response activities related to the April-May eruption
- Measure seafloor pressure for volcanic inflation/deflation
- Sample and incubate vent fluids for chemical & microbial analysis

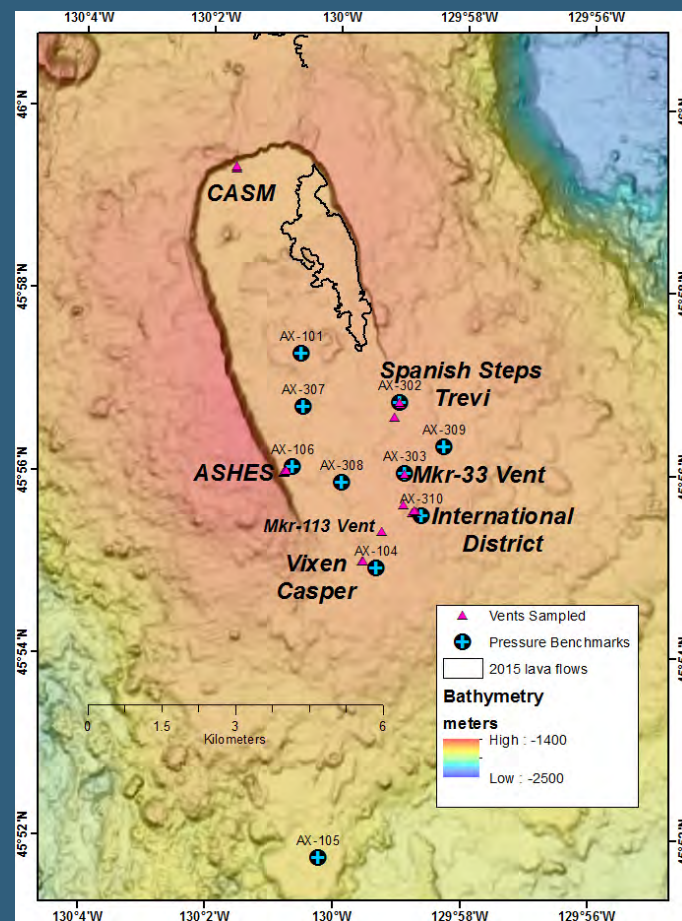
**Chief Sci:** Bill Chadwick

**PI's:** Dave Butterfield, Bill Chadwick, Jim Holden, Julie Huber, Scott Nooner

**Funding:** NSF, NOAA, Gordon & Betty Moore Foundation



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# Bioluminescence and Vision on the Deep Seafloor

**Ship:** R/V Pelican

**Dates:** July 15 - 28

**Vehicles:** ROV Global Explorer

*Image courtesy of Sönke Johnsen and Katie Thomas.*

## **Initial results:**

- Determined that bioluminescent species were more common on Gulf of Mexico abyssal flats than patch reef habitats
- Identified potential dual visual pigments in several species of crustaceans associated with corals

**Chief Sci:** Tamara Frank

**Funding:** NOAA, Duke University, Nova Southeastern University, Florida International University

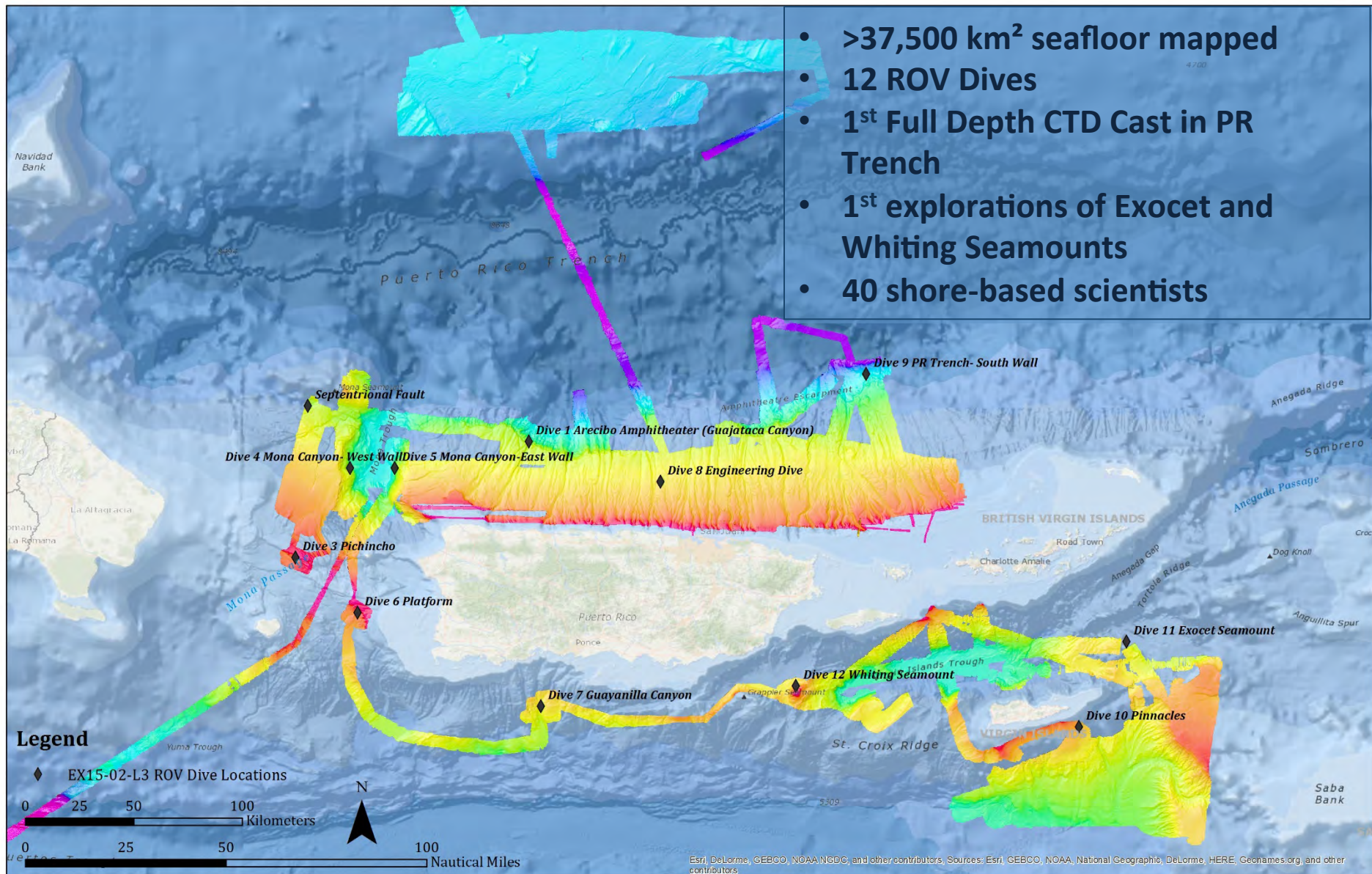


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# Okeanos Explorer

## Oceano Profundo Expedition: Exploring Puerto Rico's Seamounts, Trenches, and Troughs

- >37,500 km<sup>2</sup> seafloor mapped
- 12 ROV Dives
- 1<sup>st</sup> Full Depth CTD Cast in PR Trench
- 1<sup>st</sup> explorations of Exocet and Whiting Seamounts
- 40 shore-based scientists





# CAPSTONE

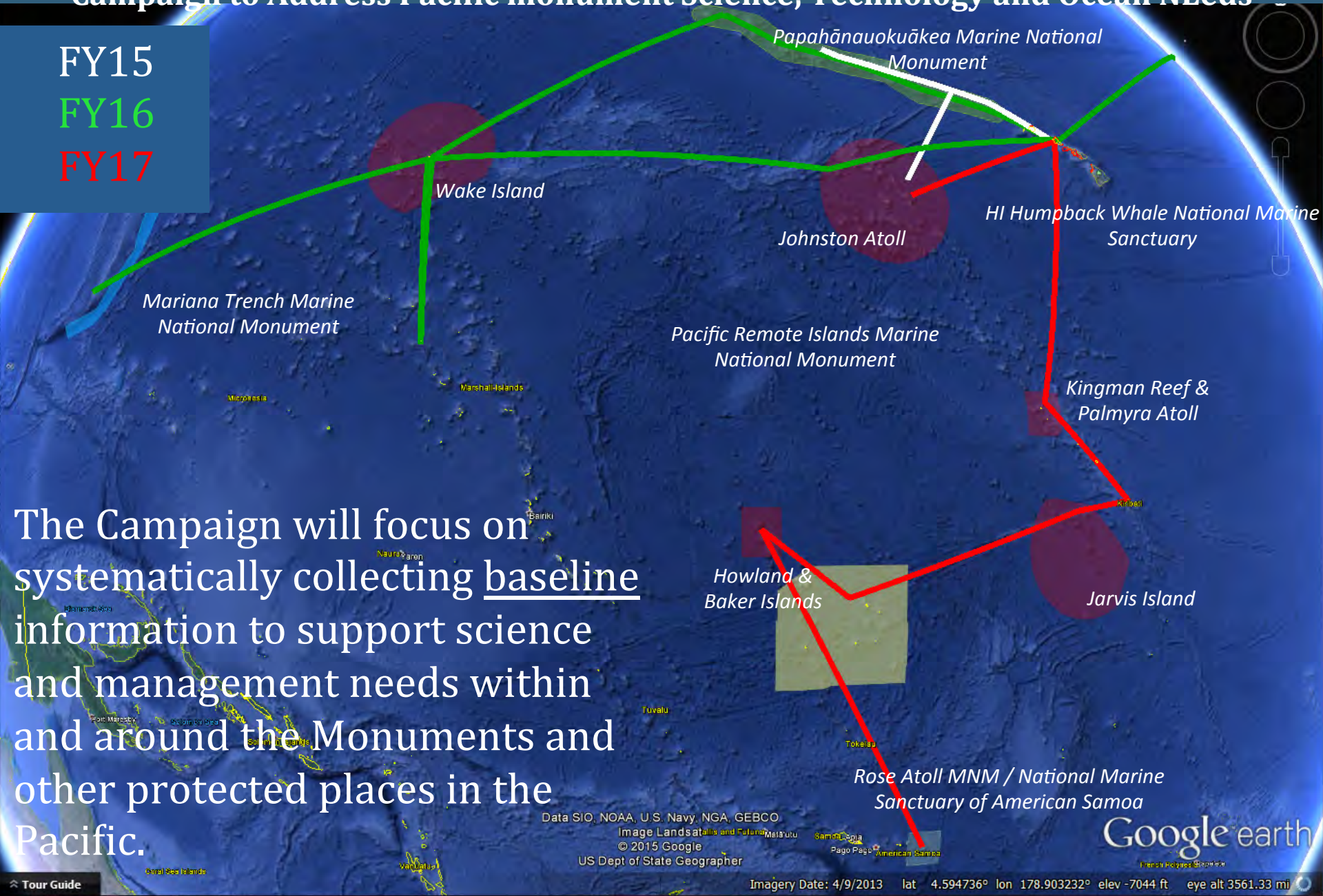
## Campaign to Address Pacific monument Science, Technology and Ocean Needs

FY15

FY16

FY17

The Campaign will focus on systematically collecting baseline information to support science and management needs within and around the Monuments and other protected places in the Pacific.





# Okeanos Explorer

## 2015 Hohonu Moana: Exploring Deep Waters off Hawai'i

- More than 75 scientists and students participated in the expedition
- ~575,000 views of live video feeds
- Web pages received ~150,000 views
- 3.1 million Facebook viewers engaged

- 79,000 sq. km seafloor mapped
- 37 ROV Dives – surveying 18.5 miles of seafloor
- 70 biological and 68 geological collections by the D2 ROV as part of an initial pilot sampling effort
- Early estimate of ~ 60 organisms thought to be new records/species
- Importance of ridge topography for deep sea habitat
- Cobalt-rich manganese crust habitats

### Johnston Atoll

### HI Humpback Whale National Marine Sanctuary

#### ROV Deep Discoverer Dive Locations

- EX1504 Leg 2 ROV Dives
- EX1504 Leg 3 ROV Dives
- EX1504 Leg 4 ROV Dives

#### Boundaries

- E/V Falkor Data Coverage
- Papahānaumokuākea Marine National Monument
- Pacific Remote Islands Marine National Monument
- United States Maritime Boundary

# OKEANOS FY 2016/2017

## Continuing CAPSTONE

FY16  
FY17

Mariana Trench Marine  
National Monument

Wake Island

Papahānaumokuākea Marine National  
Monument

Johnston Atoll

Kingman Reef &  
Palmyra Atoll

Pacific Remote Islands Marine  
National Monument

Howland &  
Baker Islands

Jarvis Island

Rose Atoll MNM / National Marine  
Sanctuary of American Samoa

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

Google earth

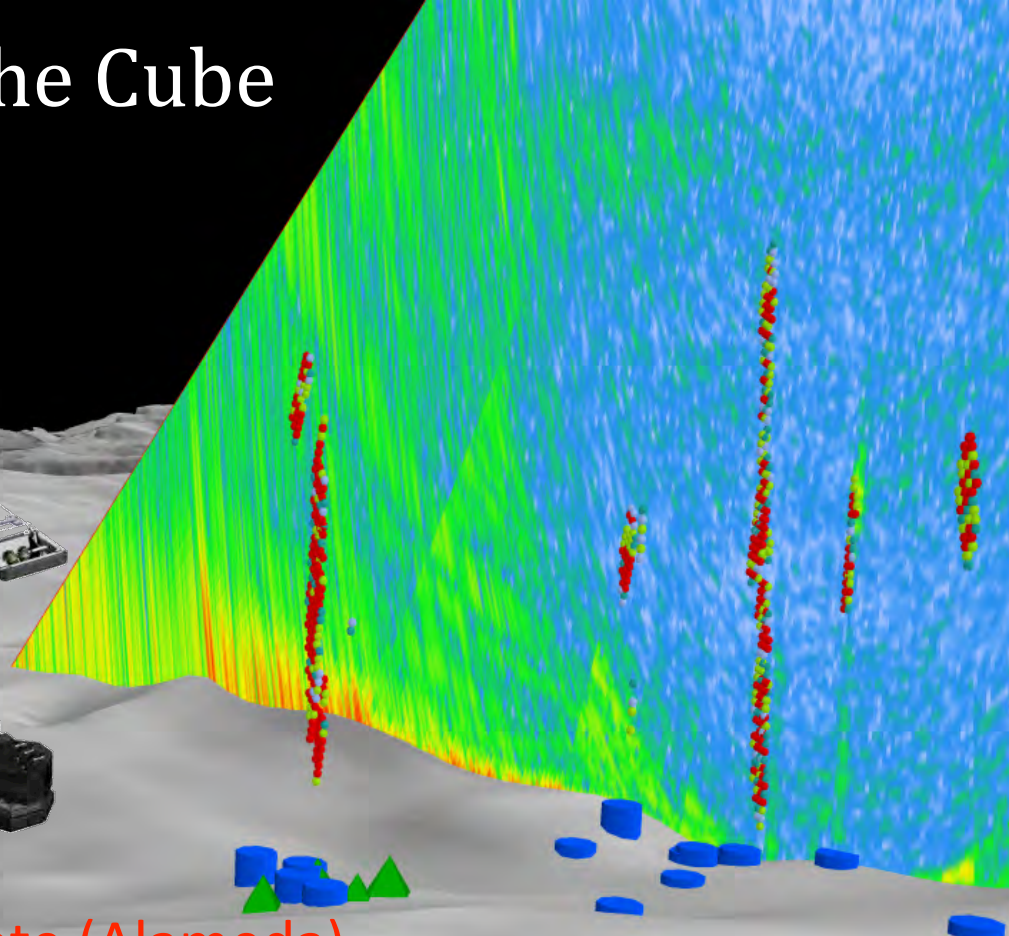
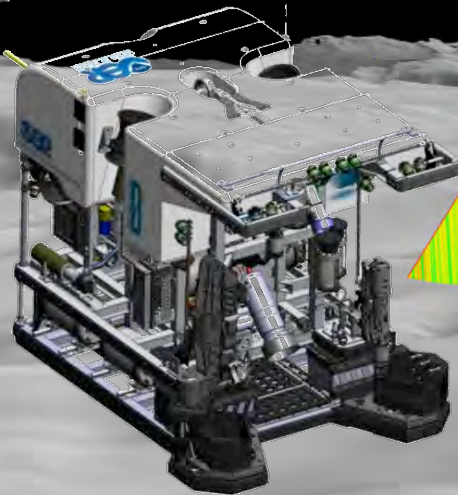
lat - 9.277707° lon -172.445470° eye alt 11001.31 km

### FY2016 Exploration Themes

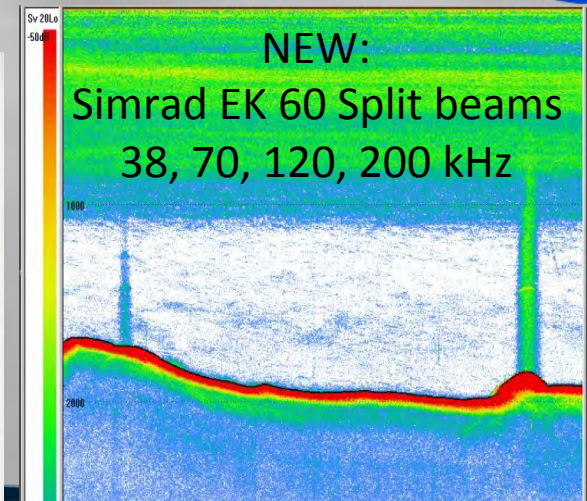
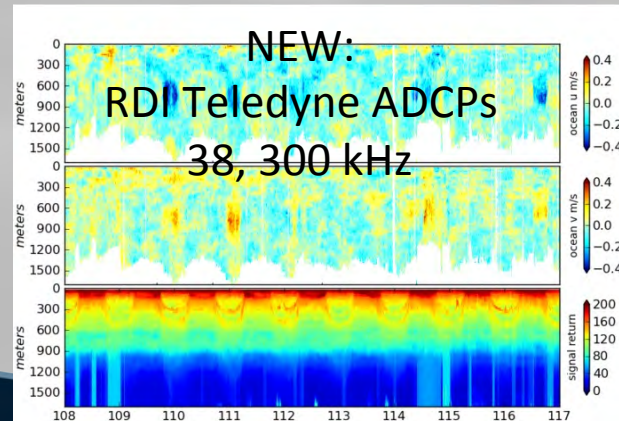
Fracture Zones  
Extended Continental Shelf  
Hydrothermal vents  
Water column  
Trenches/Subduction zones  
Mud volcanoes  
Coral and Sponge Communities  
Ridge topography  
Mn-crust seamounts  
Marine Archaeology



# Exploring the Cube



- New sonar installations complete (Alameda)
  - 2016 Shakedown
- ROVs D2 & Series
- Existing sonars



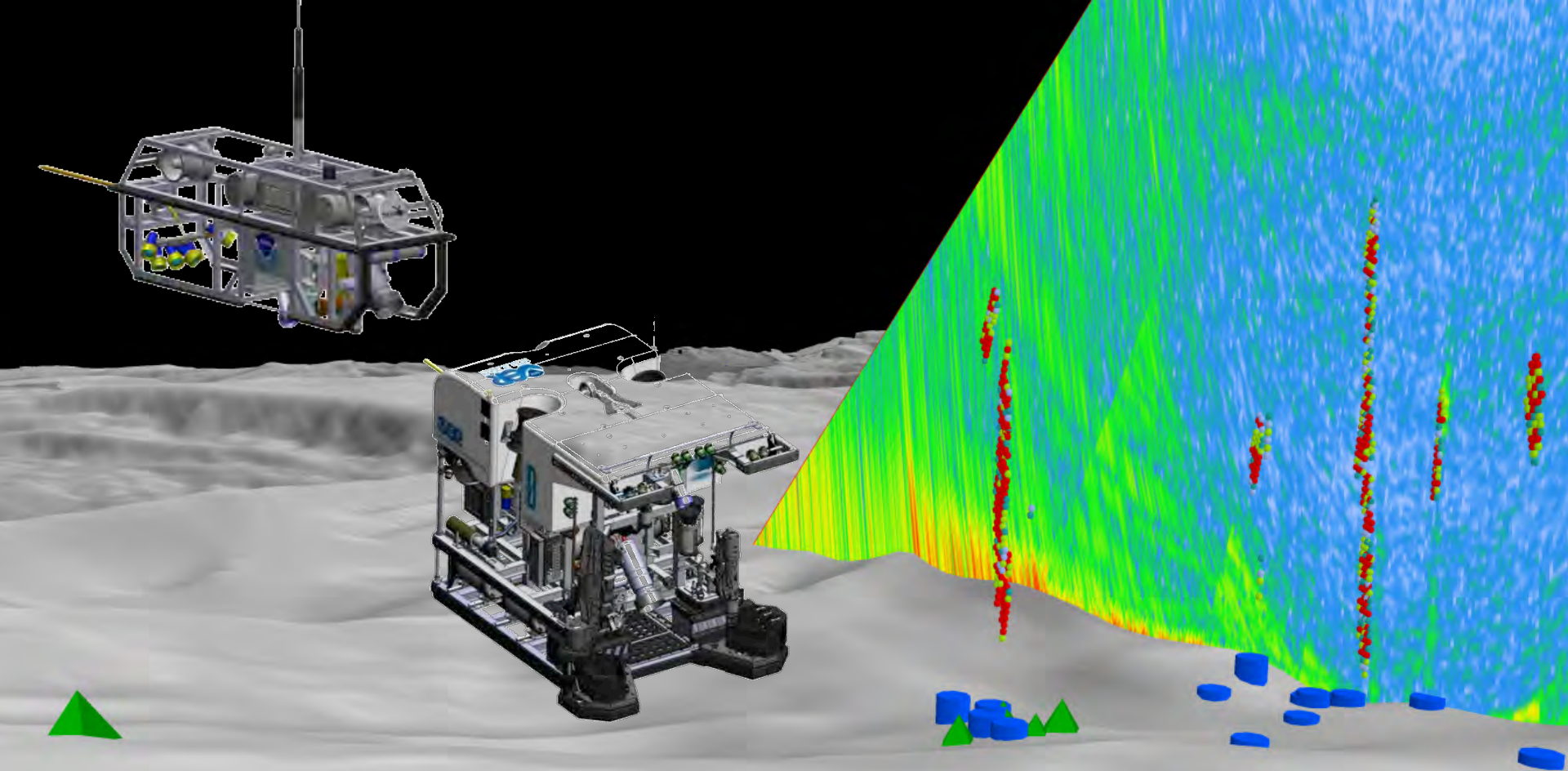
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# Other NOAA Activities

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- Federal Funding Opportunity (FFO) 2016
  - Preproposals received
  - Full proposal deadline: January 8
- Third Ocean Exploration National Forum
  - Held in Nov at Nat'l Aquarium, Baltimore, MD
  - Well > 100 people in attendance
  - Summary report forthcoming
- OER Strategic Plan FY2016-2020 forthcoming





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*From Jules Hummon*