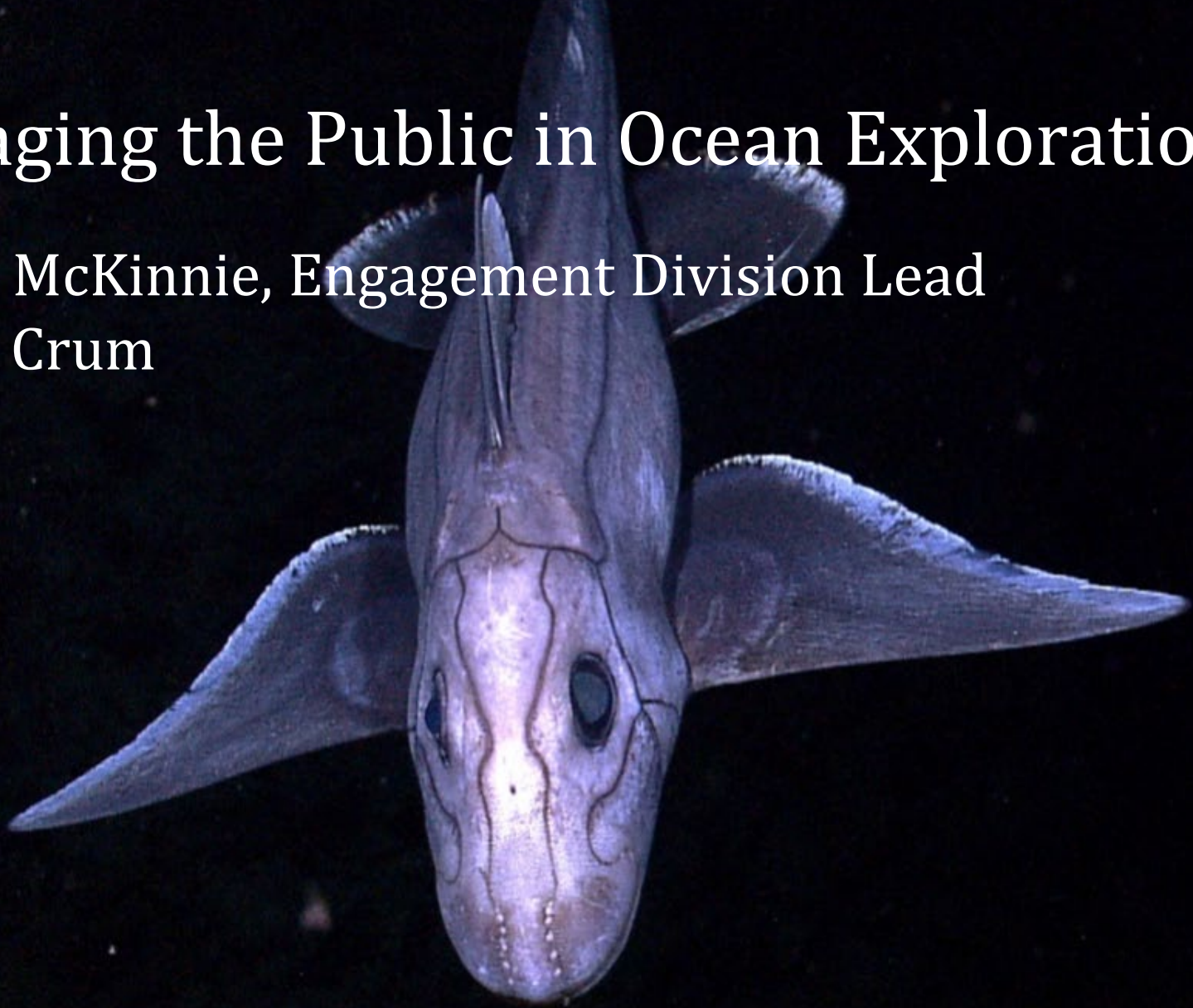


# Engaging the Public in Ocean Exploration

David McKinnie, Engagement Division Lead

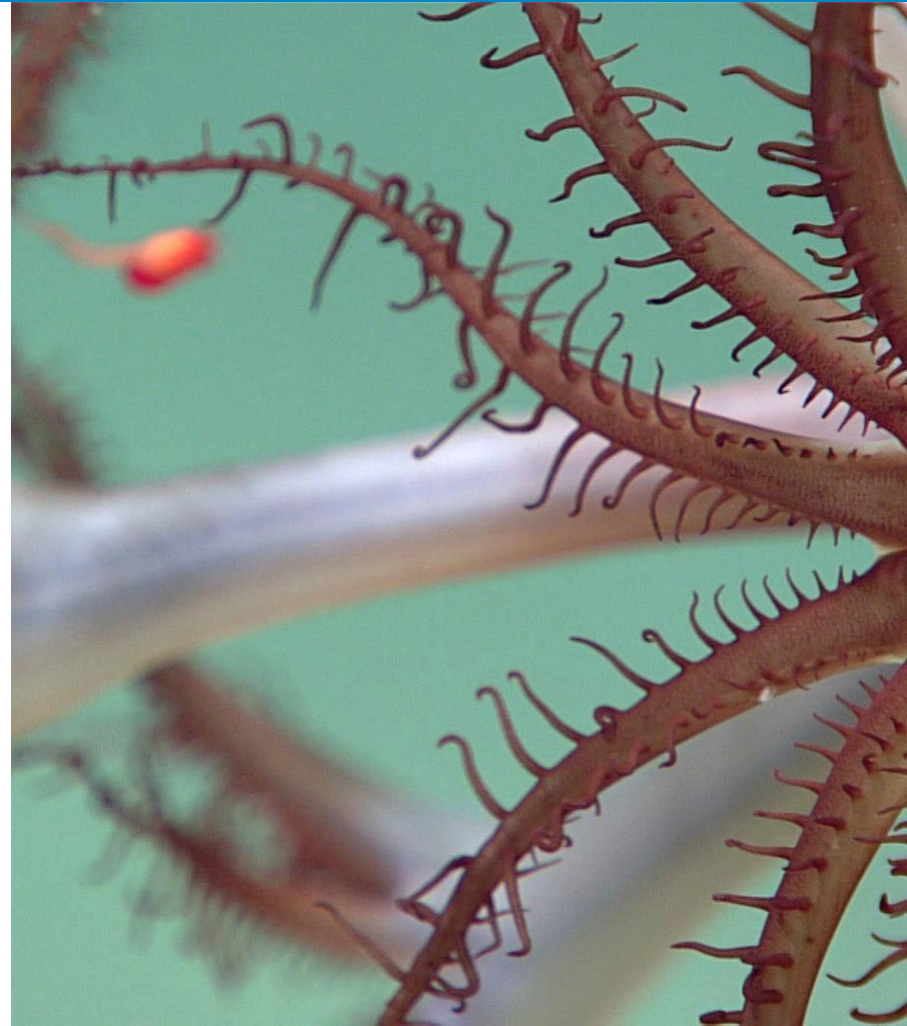
Emily Crum



# Engagement Focus

## Target Audiences

- Ocean-interested public
- Science community
- Resource managers and decision makers
- Educators
- Internal NOAA



# Engagement Groups



- Communications and Media
- Education
- Special Projects
  - National Ocean Exploration Forums
  - Publications
  - etc.
- Diversity and Inclusion
- Technical (Web) Services

# National Forum

**2013:** Ocean Exploration 2020

**2014:** NOAA and Ocean Exploration

**2015:** National OE Forum 2015

**2016:** Beyond the Ships

**2017:** Ocean Exploration in Sea of Data

**2018:** All Hands on Deck





# OER Education Review Response: Implementation Update



# OER Education Initiatives



## Educator Professional Development

Workshops, Lesson Plans, Activities



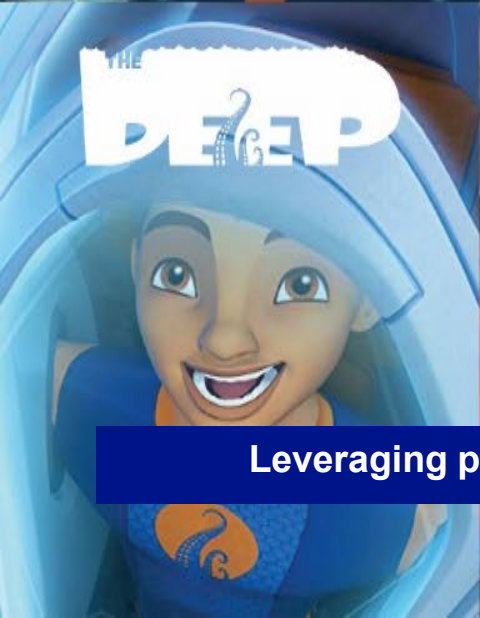
...time, so the pulse has travelled during this time. For this reason, the general is:

$$\text{range} = (1/2) (\text{local speed of sound})$$

A multibeam sonar system uses multiple beams at different angles on either side of a ship's hull. The time interval between signal and return echo arrival is used to estimate depth. The swath. In addition to high-resolution bathymetry data can be used to create three-dimensional

## Scientist Professional Development

Explorer-in-Training, Hollings Scholar, Knauss Fellowship



Leveraging partnerships to reach all age groups across the education spectrum.

# Education Review Recommendations

## I. Promote and Strengthen the Community of Ocean Exploration Programs

- OET-SOI-OER-NOAA Education “alliance”  
“Cuerpo de Exploración”
- Octonauts and The Deep
- Ocean Discovery Institute  
focus on underserved communities
- Inner Space Center  
new livestreaming/live interaction approaches

# Education Review Recommendations

## II. Enhance Value of Expeditions to the Education Community

- SOI-OET-OER Website with shared education resources, including ship schedules and other information about expeditions (July 2020)
- Increase number and format of live interactions. Not ship schedule dependent
- Linking expedition results to educators in underserved communities (Puerto Rico, American Samoa)



# Education Review Recommendations

## III. Enhance Professional Development Workshops to Increase Impact

- Expert observers engaged to advise on ways workshops can incorporate current pedagogy, standards, and learning. (First workshop using recommendations two weeks ago).
- Regular updates to workshop materials to reflect current expedition results, other information; pending revamp of OER education materials (with outside facilitation, OET, SOI).
- New evaluator hired through NMSF to assess and inform future implementation using qualitative approaches as well as quantitative measures

# Education Review Recommendations

## IV. Improve Organization of Educational Materials and Website

- Rebuilding OER website and reorganizing Education content to improve user experience.
- Strengthening education focus of expedition videos and other engagement products.
- Increasing engagement of education community through Facebook
- Launch cooperative ocean exploration education OER-SOI-OET web space on (noaa.gov)

# Education Review Recommendations

## V. Update/Develop Educational Materials to Reflect Current Research and Standards

### Short term

- Rebuild “theme pages” into modular packages based on specific topics/phenomena

### Medium Term (2019-2021)

- Redesign OER product line in collaboration with OET and SOI using design services to ensure education content has maximum impact
- Build out new OER-OER-SOI education website with new content



# Education Review Recommendations

## VI. Expand the Ocean Exploration Education Alliance Network, with a Particular Emphasis on Inland States

- Since the review, added new Alliance partners:
  - Albuquerque BioPark, NM
  - Great Lakes Aquarium, Duluth, MN
  - EcoExploratorio, San Juan, PR
  - American Samoa through Hawaii Alliance Partner
- US Virgin Islands, Guam, and CNMI to be added
- NMSF to help identify other inland opportunities (such as Detroit and Denver)

# Education Review Recommendations

## VII. Enhance diversity in program participants

Explore more effective approaches to educators serving Spanish-speaking, Native American, and Pacific Island communities

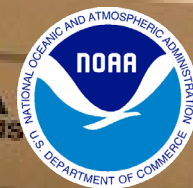
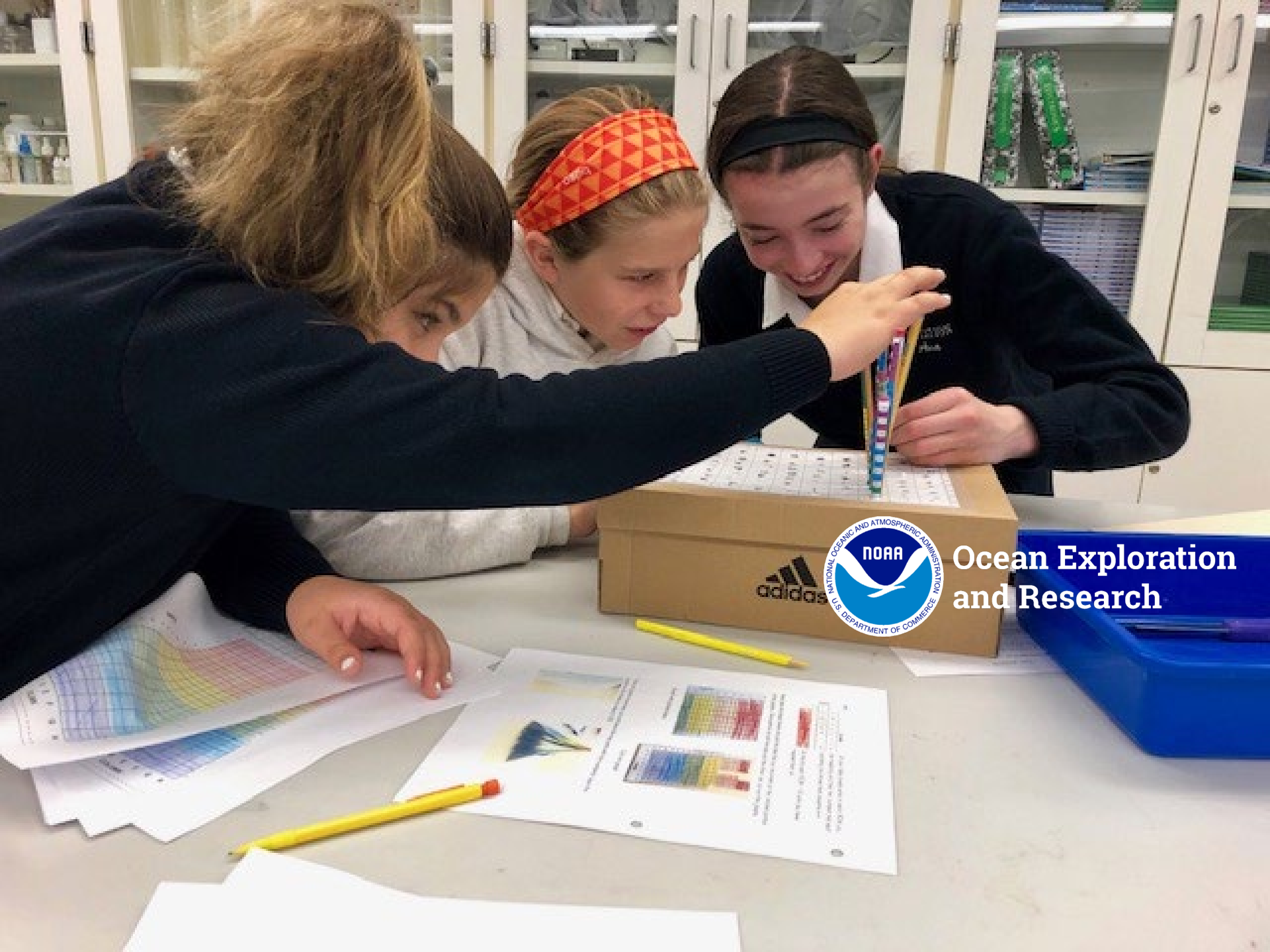
- Using existing relationships and experience

### Spanish-Speaking

- Puerto Rico (linked to 2015 and 2018 expeditions)
- Ocean Discovery Institute
- Translation, new services

### Pacific Island

- Teacher workshops in American Samoa through Waikiki Aquarium
- Potential to expand to CNMI and Guam
- Leverage CAPSTONE legacy



Ocean Exploration  
and Research





# Engaging the Public in Ocean Exploration

Emily Crum

# “Ocean Exploration Act of 2009”

To the extent appropriate, the Administrator shall seek to facilitate coordination of data and information management systems, **outreach and education programs to improve public understanding of ocean and coastal resources**, and development and transfer of technologies to facilitate ocean and undersea research and exploration.

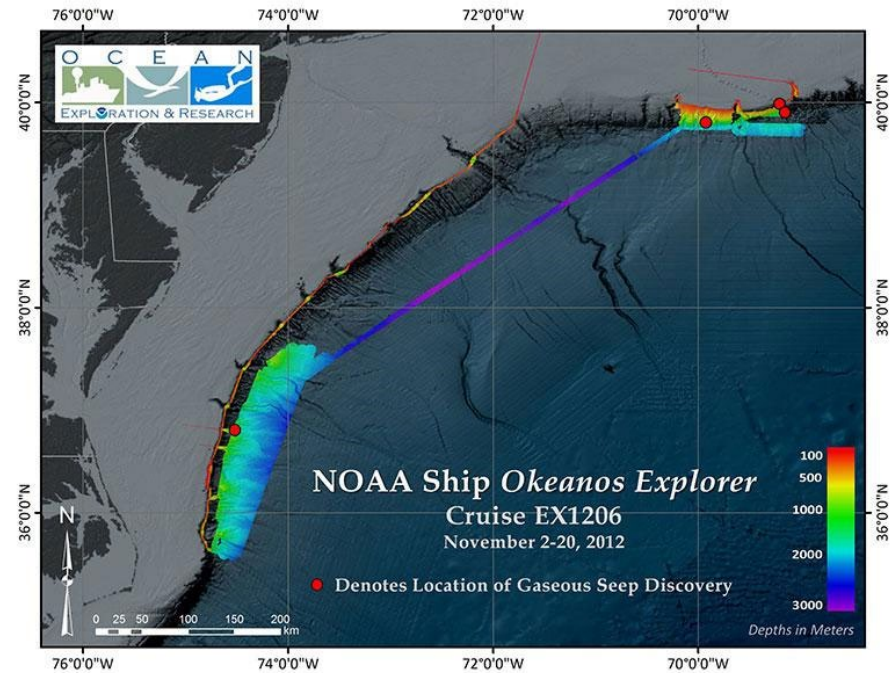
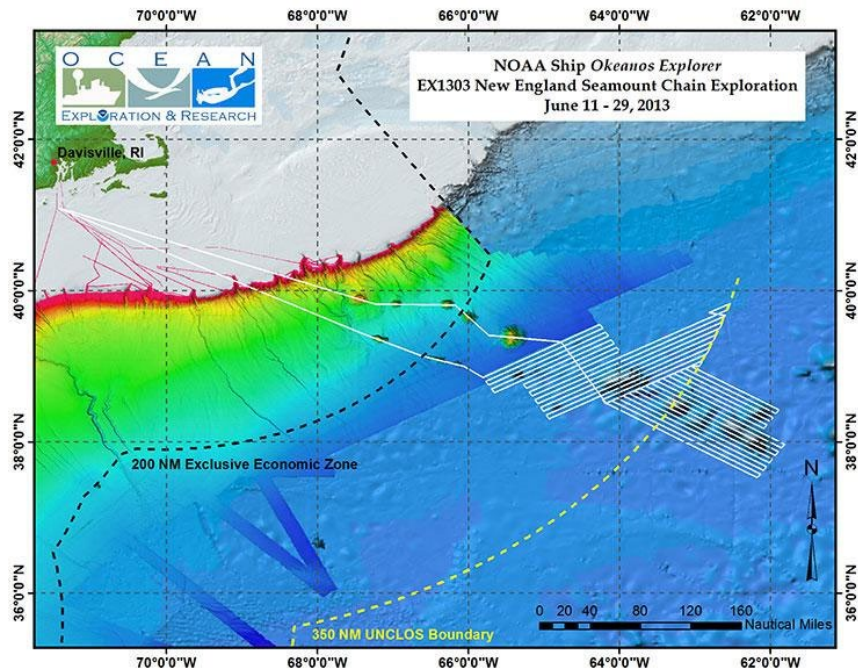
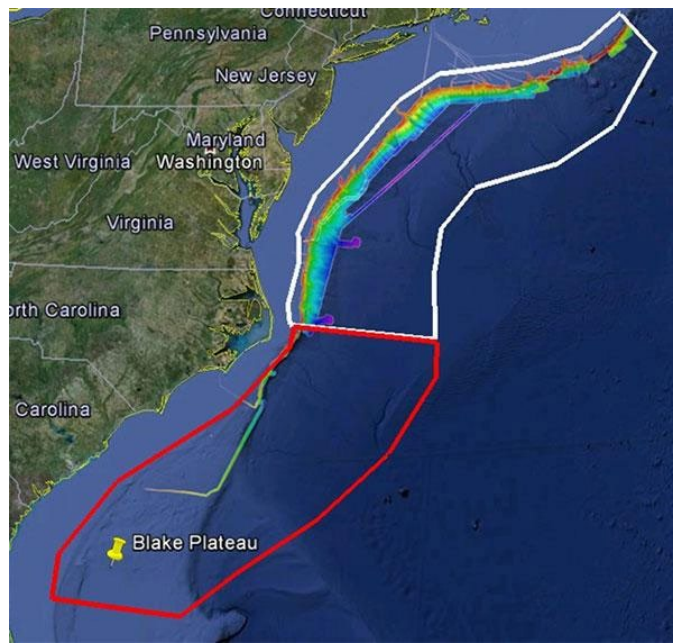






# Establishing an OER Identity





# Visual Identity Guide

The visual language for all OER products, print and digital.



Ocean Exploration  
and Research

## 1. Introduction

Consistent branding helps to promote our efforts by clearly indicating our office as the source of information. We do great work and these guidelines were created to maximize the impact of that work. The typefaces, colors, and design assets in this style guide are your starting point and can be applied to all OER produced collateral, including:

- External Documents
- Fact sheets
- PowerPoint presentations
- Maps
- Posters

Logo files and official Word and PowerPoint templates are available on our OER Google site at <https://sites.google.com/a/noaa.gov/oar-oer/communications-guidance>

If you need help creating a more complex document for external publication or if you have any questions about applying these guidelines, please contact Matt King at [matthew.king@noaa.gov](mailto:matthew.king@noaa.gov).

### Contents

1. Introduction
2. Emblem
3. Typography
4. Color
5. Typical Usage
6. Maps



# OER Messages

Ocean exploration is valuable

OER is leading national efforts to explore  
America's deep ocean

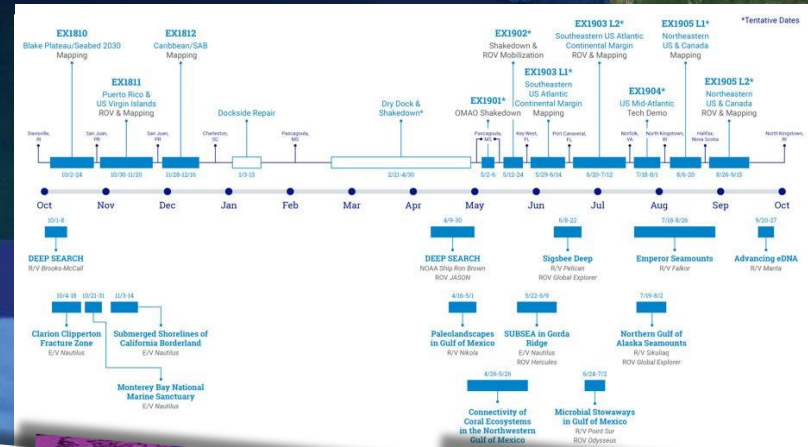
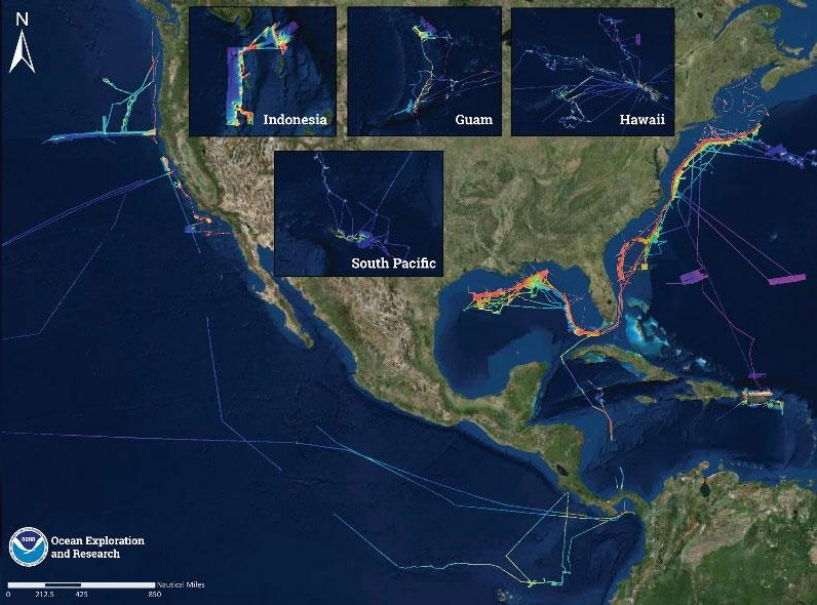
OER applies the tools and expertise needed to  
explore the deep ocean





# Ocean Exploration A National Priority

A healthy ocean and its resources are critical to a strong America, yet significant gaps exist in our basic understanding of U.S. deep waters and seafloor and the resources they hold. By leading national efforts to explore our ocean and making ocean exploration more accessible, the **NOAA Office of Ocean Exploration and Research (OER)** is filling gaps in the basic understanding of U.S. deep waters and seafloor, providing critical deep-ocean data, information, and awareness needed to sustain and accelerate the economy, health, and security of our nation.



**EXPLORE**

**EXPERIENCE**

**UNDERSTAND**

NOAA Ocean Exploration and Research

Windows to the Deep 2019  
EX1903 Leg 2 (EX1903L2) Cruise Report

Southeast U.S. Continental Margin  
Port Canaveral, FL to Norfolk, VA  
(June 20 - July 12, 2019)

Contributors:  
Alexis Weimig, Science Lead, Temple University  
Shannon Hoy, Mapping Lead, California State University, Sacramento  
Christopher J. Dunn, Sample Data Manager, NOAA Office of Ocean Exploration and Research  
Annabelle Condit, Expedition Coordinator, NOAA Office of Ocean Exploration and Research

NOAA Ocean Exploration and Research

Exploring the Deep Ocean  
Professional Development for Educators

Watching in 3D

Focus: Multibeam sonar

Grade Level: 9-12 (Physical Science/Earth Science, grades 6-8 Earth Science, undersea and Ocean Literacy Essential Principles)

Focus Question: How is multibeam sonar used to map the seafloor?

Learning Objectives:

- Students will explain how multibeam sonar works and how it is used to map the seafloor.
- Students will analyze and interpret identity patterns in the distribution of seafloor features and contribute to the development of a seafloor map.

NOAA Ocean Exploration and Research

ASPIRE

Windows to the Deep 2019: Exploration of the Deep-sea Habitats of the Southeastern United States (EX1903 L1)

NOAA Ship Okeanos Explorer  
May 30 - July 12, 2019

Windows to the Deep 2019: Exploration of the Deep-sea Habitats of the Southeastern United States was one of several expeditions being conducted from NOAA Ship Okeanos Explorer as part of the Atlantic Seafloor Partnership for Integrated Research and Exploration (ASPIRE) campaign, a major multi-year, multi-national collaborative field program, focused on raising collective knowledge and understanding of the North Atlantic Ocean.

Exploration Summary

The Windows to the Deep 2019: Exploration of the Deep-sea Habitats of the Southeastern United States (EX1903 L1) was a multi-national collaborative field program, focused on raising collective knowledge and understanding of the North Atlantic Ocean.

NOAA Ocean Exploration and Research

Explore With Us  
oceanexplorer.noaa.gov



# Evolving OER's Online Presence







NOAA

NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION  
UNITED STATES DEPARTMENT OF COMMERCE

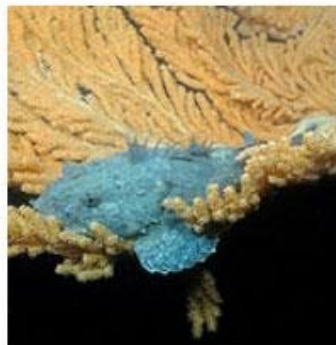
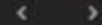
Go

# OCEAN EXPLORER

[Home](#) | [Explorations](#) | [Okeanos Explorer](#) | [Education](#) | [Technology](#) | [Data](#) | [Multimedia](#) | [Ocean Facts](#) | [About OER](#)



Why would a strong Loop Current affect our ability to deploy remotely operated vehicle *Deep Discoverer* on some expeditions and not others?



Explorations



*Okeanos Explorer*



Education



Ocean Exploration News




### Hunting for Alien Life at the Bottom of the Arctic Ocean

From September 19-October 16, a team of oceanographers will conduct *HACON: Hot Vents in an Ice-covered Ocean*, a mission to explore in detail for the first time a hydrothermal vent field in the Arctic Ocean.

[Read more](#)



Deep Connections 2019: Career Paths to the Oceans

[Read more](#)



Deep Connections 2019: Hurricanes and the Deep Sea

[Read more](#)



Search for the U.S. Revenue Cutter *Bear*

[Read more](#)



#### About OER

Learn about the NOAA Office of Ocean Exploration and Research, the nation's only federal organization dedicated to exploring the global ocean.

[Learn more](#)



#### Ten Years of Collecting Ocean Exploration Data

The NOAA Office of Ocean Exploration and Research has been collecting ocean exploration data from NOAA Ship *Okeanos Explorer* since 2009.

[Learn more](#)



#### Data & Results

Access diverse scientific data, video, images, documents, and other information associated with office-supported ocean exploration expeditions.

[Learn more](#)



#### For Educators

Find educational materials and professional development opportunities for educators designed to enhance ocean literacy.

[Learn more](#)



# Fiscal Year 2019 Website Content

**Expedition coverage:** 18 total; 10 “full” and 8 “summary”

**OER Updates:** 9 stories added

## Top 3 content sections:

- Ocean Facts
- Expeditions (including *Okeanos*)
- Education

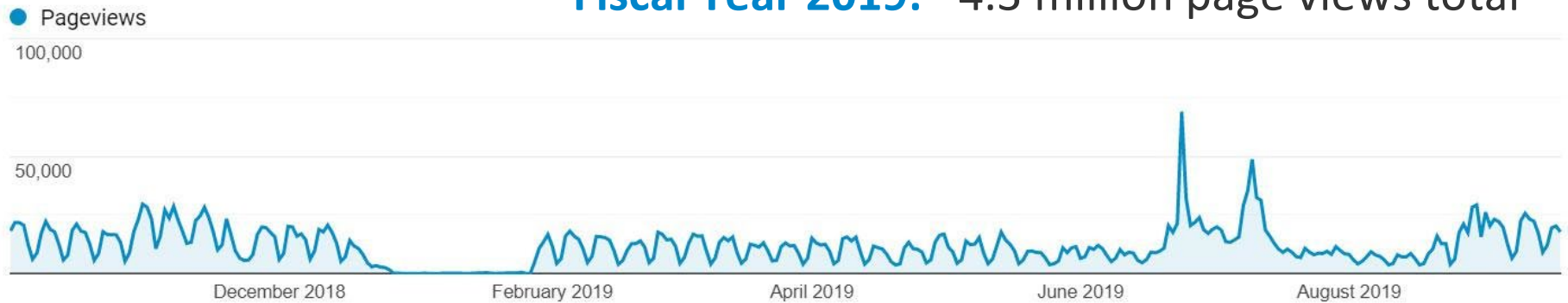
**Devices:** 54% Desktop | 40% Mobile | 6% Tablet

**Sources:** 56% Search Engines | 25% Social Media

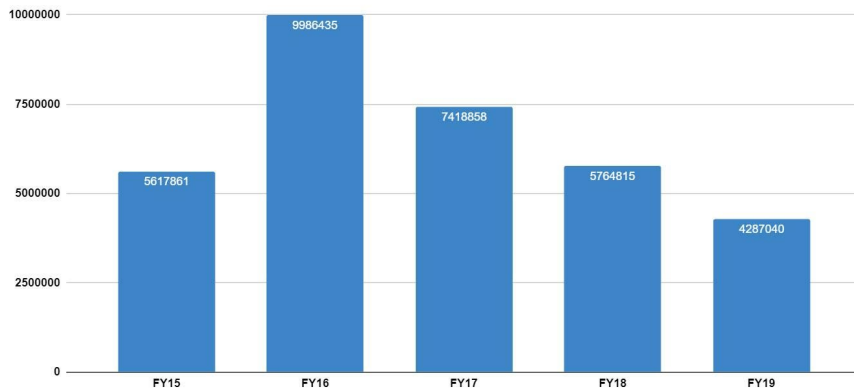


# Website Metrics

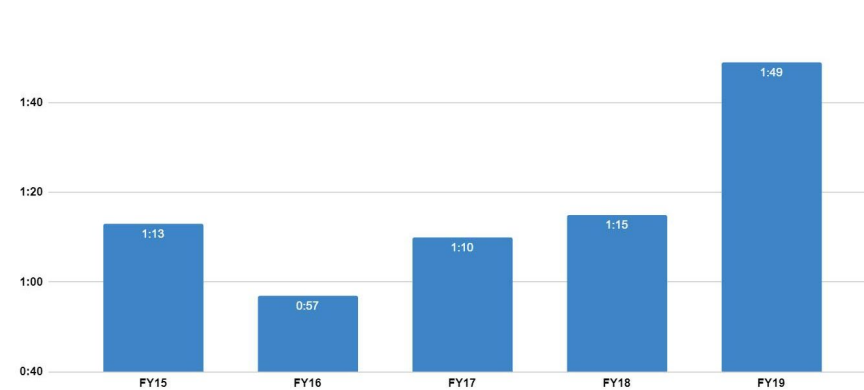
**Fiscal Year 2019: ~4.3 million page views total**



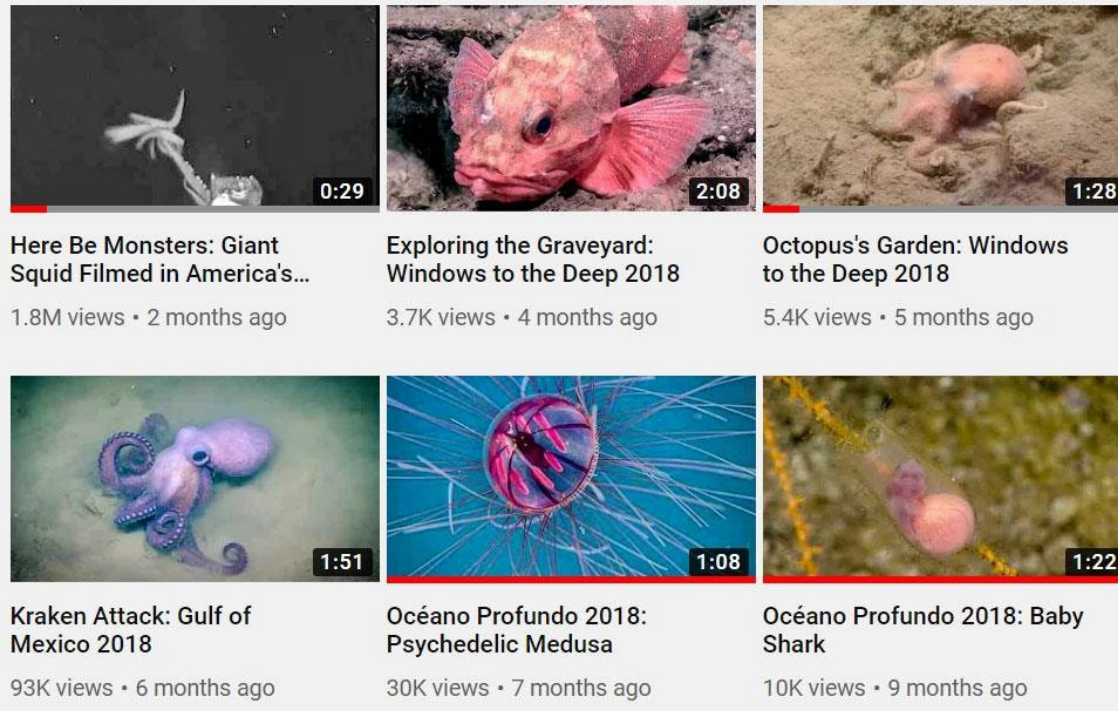
## Page views



## Average time on page







[youtube.com/user/oceanexplorergov/](https://youtube.com/user/oceanexplorergov/)

## FY2019 Metrics:

~85,700 subscribers

+14 million minutes of view time

~535,000 live video views

## Top 3 Videos:

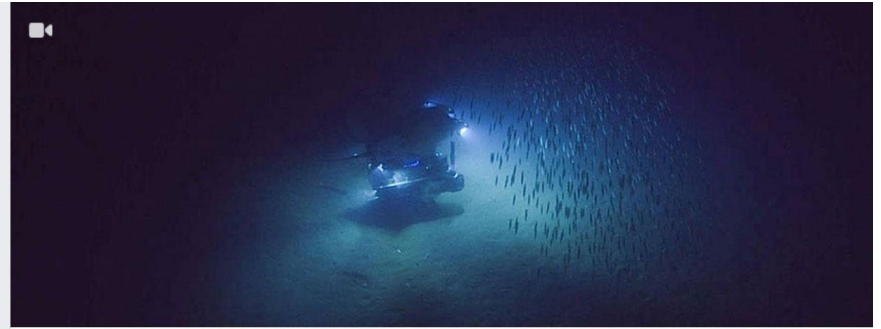
- Giant Squid Filmed in America's Backyard
- Titanic 2004
- Gulf of Mexico 2012 Shipwreck Discovery



# facebook



NOAA Office of  
Ocean Exploration  
and Research ✓  
@OceanExplorationResea  
rch



**NOAA Office of Ocean Exploration and Research**  
January 28

Annnnd...we're back! Figure that deserves a toothy grin (like the one on this deep-sea lizardfish, bathysaurus, imaged at ~ 1,770 meters/5,810 feet depth during the final dive of the Windows to the Deep 2018 expedition). Many thanks for your patience and support — we're looking forward to getting out and exploring again soon!

23,527 People Reached    2,394 Engagements    [Boost Post](#)

570 Reactions    18 Comments    123 Shares

Like    Comment    Share

**Performance for Your Post**

23,527 People Reached

1,151 Reactions, Comments & Shares

753 Like	459 On Post	294 On Shares
130 Love	88 On Post	42 On Shares
9 Haha	3 On Post	6 On Shares
84 Wow	35 On Post	49 On Shares
1 Sad	0 On Post	1 On Shares
52 Comments	21 On Post	31 On Shares
125 Shares	123 On Post	2 On Shares

1,243 Post Clicks

244 Photo Views	0 Link Clicks	999 Other Clicks
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**NOAA Office of Ocean Exploration and Research: Oh My Grouper, Look at that Shark: June 28, 2019...**

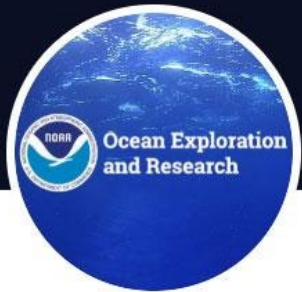
Today's #Okeanos dive has wrapped up, but if you're hungry for more, check out this shark footage -- complete with surprise ending! To learn more about this rare encounter, visit...



## FY2019 Metrics:

~143,000 likes | 7% increase | total reach: +3.5 million





**NOAA Ocean Explorer** ✓  
@oceanexplorer

## FY2019 Metrics:

~188,300 followers

~50 tweets per month

~6.9 million impressions | ~1.2% engagement rate

### Top Tweet

Big...or maybe we should say "giant" news! A few days ago, we posted about how Journey into Midnight expedition team was hunting for giant squid in Gulf of Mexico. Well, they found one... Take a break from [#Okeanos](#) live video for the full story: [oceanexplorer.noaa.gov/explorations/1...](http://oceanexplorer.noaa.gov/explorations/1...) [pic.twitter.com/6cNVH2b0IM](https://pic.twitter.com/6cNVH2b0IM)

### Top mention

 earned 752 engagements

**Dr Diva Amon**

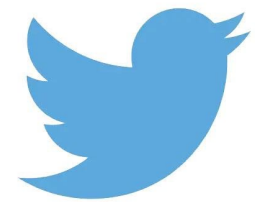
@DivaAmon · Mar 27

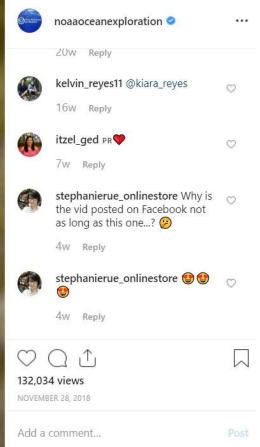
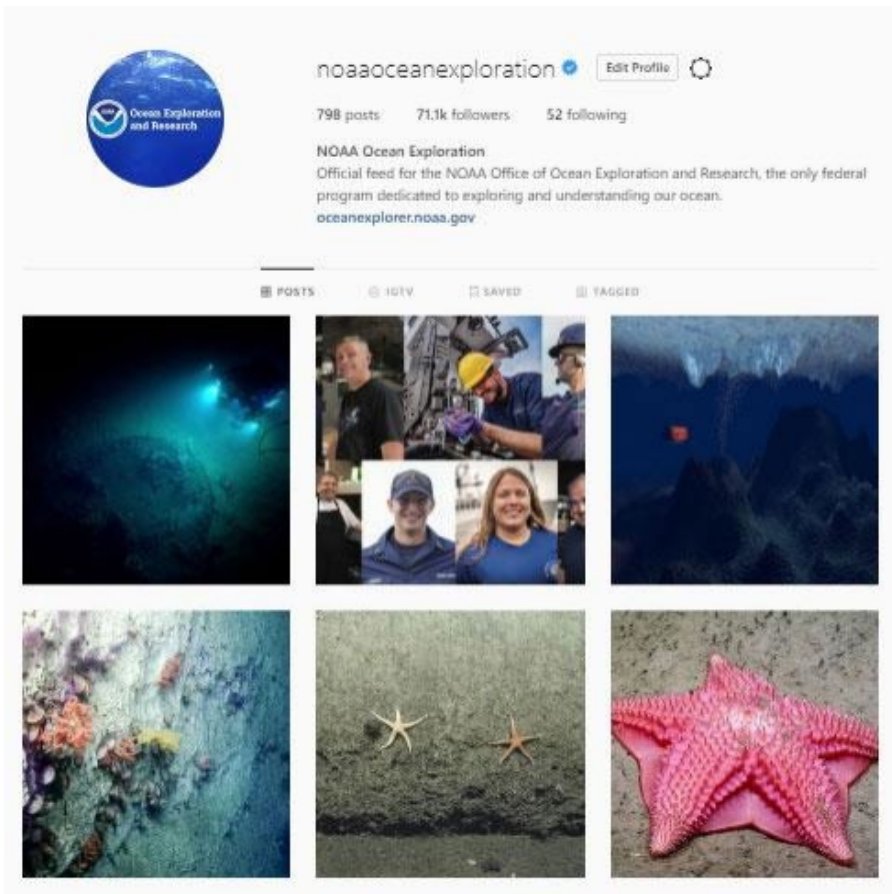
I should be on [@BBCOne](#) [#BluePlanetLive](#) Episode 2 airing tonight if all goes to plan, so here's a thread on trash in the [#deepsea](#) and its impacts. Questions and comments welcome!

[#deepseadebris](#) [#plasticpollution](#)  
[#NHMDeepSea](#) [#Okeanos](#)

📷 by [@oceanexplorer](#)

(1/n) [pic.twitter.com/7bMcbBiXZG](https://pic.twitter.com/7bMcbBiXZG)





**FY2019 Metrics:**  
 ~72,200 likes | +7 million impressions





[HOME](#) [NEWS & FEATURES](#)

## Watch live: NOAA's deep-sea expedition to seamounts and canyons off U.S., Canada

Tune in online August 28 through September 14

[Research](#) | [expeditions](#) [ocean exploration](#) [Okeanos Explorer](#)



**UPDATED: August 26, 2019.** Starting date for live video was changed to August 28 (weather permitting) from August 27 due to a change in weather conditions.

August 26, 2019 — Get ready: We've got more "must-see TV" of mysterious creatures and features of the deep sea coming your way.



Watch: 'Octonauts' make a visit to NOAA Ship Okeanos Explorer >

June 26, 2019



See this? Giant squid in Gulf of Mexico is captured on video for first time >

June 21, 2019



Watch live: NOAA expedition to unexplored waters off U.S. Southeast coast >

June 20, 2019







# Building Engagement Support for *Okeanos* Expeditions

# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa



# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

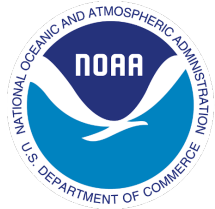
## Engagement Plan

- Team members
- Key spokespeople
- Key messages
- Audiences
- Media strategy
- Events and activities
- Web plan
- Social media plan
- Hard copy materials
- Internal communications
- Event calendar

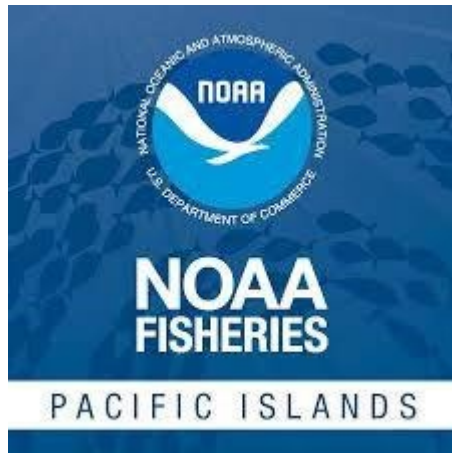


# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

## Engagement Planning Team Members



**Ocean Exploration  
and Research**



# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

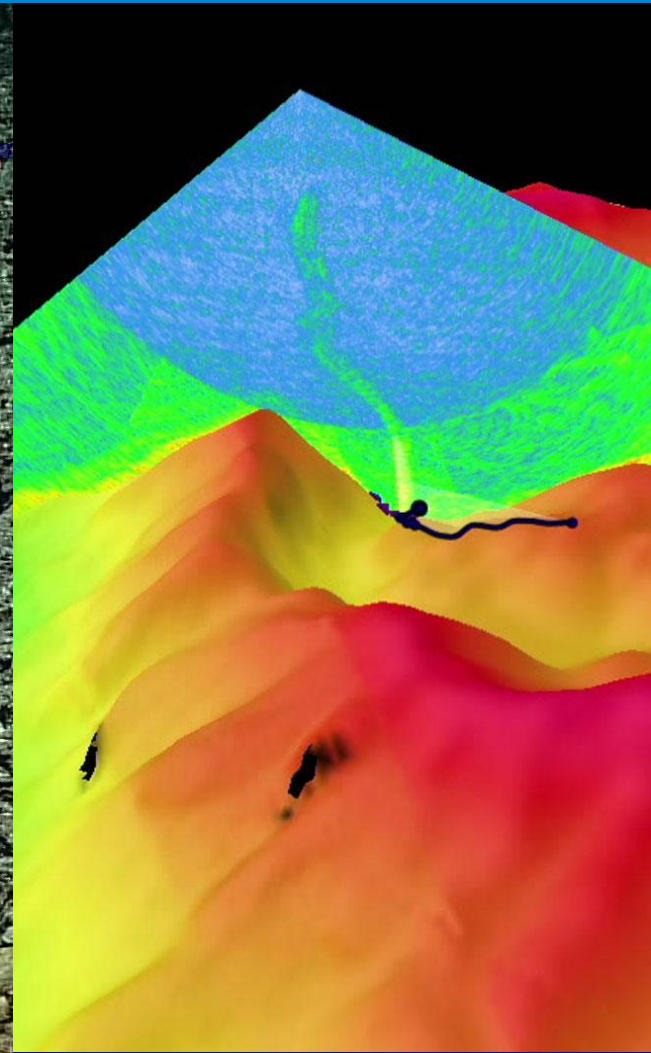
## Key Messages



Seamounts as hotspots of biodiversity



Deep and shallow water connections



Assessing past and future geohazards



# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

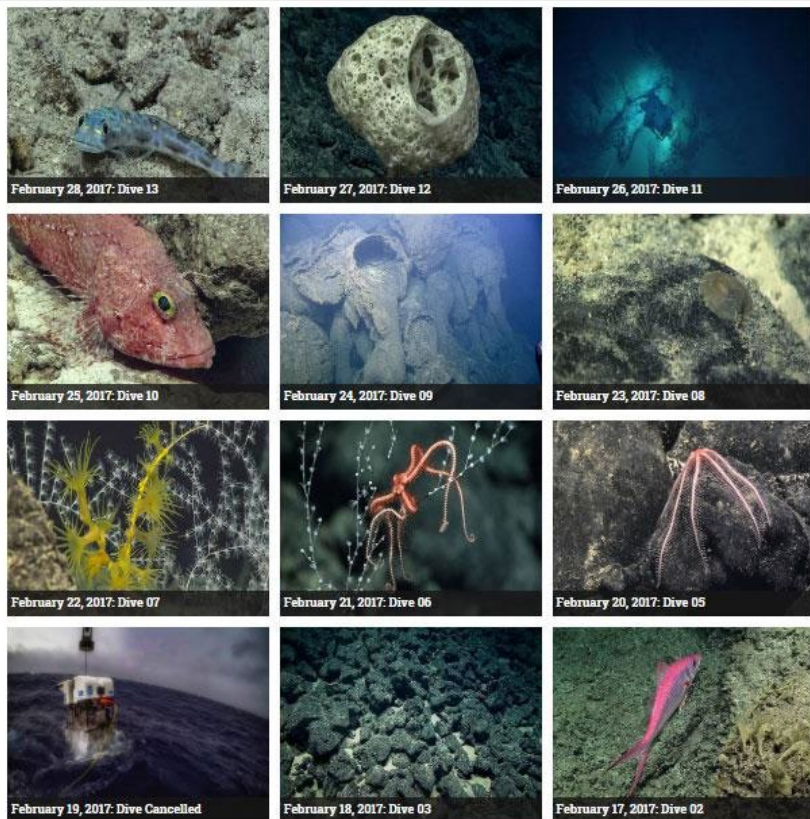
## Community Events





# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

## Web and Social Media



### Landslide Hazards in Samoa

February 20, 2017 | by Jasper Konter



Explosive eruptions, such as those from hotspot volcanoes, may generate volcanic sediment layers that form weak zones between the predominant submarine pillow lavas and/or lava flows, leading to volcanic flank failure. This has led to the common occurrence of large-scale (mainly submarine) landslides around volcanic ocean islands, as has been defined in areas such as Hawai'i and the Canary Islands.

[Read more](#)




# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

## Communication Products

**2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa**  
NOAA Ship *Okeanos Explorer*, February 16 – March 2, 2017  
<http://oceanexplorer.noaa.gov/okeanos/explorations/ex1702/welcome.html>

This expedition is part of a three-year Campaign to Address the Pacific monument Science, Technology, and Ocean NEEds (CAPSTONE), an initiative to collect deepwater baseline information to support science and management decisions in and around U.S. marine protected areas (MPAs) in the central and western Pacific.



Vicinity of American Samoa Expedition Overview Map

Conducted a mapping survey of Vailulu'u seamount revealing that the volcanic cone in the crater of Vailulu'u had grown extensively since it was last mapped in 2012. Multibeam and single beam data revealed a plume in the water column, and the plume appears to rise from the northern portion of Vailulu'u crater. The plume is likely to be composed of gas bubbles emanating from the volcano.

Identified distinct communities on seamounts that appear to be structured by environmental factors that vary with depth. These communities will be compared to the communities that are known from areas like Hawai'i and New Zealand, in addition to those that will be observed in subsequent expeditions in the central Pacific, to establish connection patterns and identify factors that define biogeographical provinces.

Web content received over 33,000 views and live video feeds received over 6.2 million views through YouTube and Facebook, via pages such as IFL Science, The Dodo, and The Weather Channel.

- ~12,000 square kilometers of seafloor mapped
- 11 remotely operated vehicle dives at a depth range of 250 – ~3,930 meters
- 101 biological & 30 geological samples collected
- ~30 undescribed species observed
- 48 participating scientists, students, & managers
- news & media coverage by 45+ outlets



2017 American Samoa Expedition:  
Suesuega o le Moana o Amerika Samoa

From February to April 2017, NOAA's telepresence-enabled ocean exploration vessel *Okeanos Explorer* collected baseline information of unknown areas of Rose Atoll Marine National Monument and National Marine Sanctuary of American Samoa. The 2017 American Samoa Expedition-based science teams will work together to collect deepwater scientific observations at sites. Planned expedition dates are:

**February 16 – March 2:** The ship will conduct remotely operated vehicle (ROV) dives and operations. The cruise starts in Pago Pago in Apia, Samoa.

**April 4 – 21:** The ship will conduct 24 cruise starts in Apia, Samoa, and other locations.

### Objectives

The 2017 American Samoa Expedition and priority areas put forward by the NOAA, management agencies in American Samoa and Samoa with a focus on Rose Atoll Marine National Monument and National Marine Sanctuary of American Samoa. Throughout the expedition, the team conducted daytime remotely operated vehicle (ROV) dives, overnight mapping operations, and conductivity, temperature, and depth (CTD) rosette operations. Expedition priorities included a combination of science, education, outreach, and open data objectives that will support management decisions at multiple levels. Major accomplishments from the expedition are summarized below.

### 2017 American Samoa Expedition Part 1: Suesuega o le Moana o Amerika Samoa

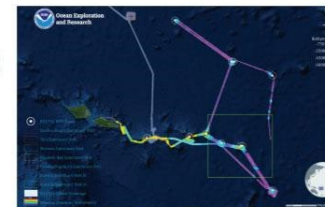
NOAA Ship *Okeanos Explorer*, February 16 – March 2, 2017

This expedition is part of the three-year Campaign to Address Pacific monument Science, Technology, and Ocean NEEds (CAPSTONE), an initiative to collect deepwater baseline information to support science and management decisions in and around U.S. marine protected areas in the central and western Pacific.

### Summary Accomplishments

The 2017 American Samoa Expedition Part 1: Suesuega o le Moana o Amerika Samoa, was a 14-day telepresence-enabled expedition to explore unknown and poorly understood areas in American Samoa and Samoa with a focus on Rose Atoll Marine National Monument and National Marine Sanctuary of American Samoa. Throughout the expedition, the team conducted daytime remotely operated vehicle (ROV) dives, overnight mapping operations, and conductivity, temperature, and depth (CTD) rosette operations. Expedition priorities included a combination of science, education, outreach, and open data objectives that will support management decisions at multiple levels. Major accomplishments from the expedition are summarized below.

- Conducted 11 ROV dives** from 250 to 4,000 meters depth to survey for a diversity of benthic habitats and features, including high density deep-sea coral and sponge communities, hydrothermal vents, bottomfish habitats, seamounts, and the water column.
- Observed hundreds of different species of animals and significant coral and sponge communities. Identified distinct communities on seamounts that appear to be structured by environmental factors that vary with depth.
  - Collected 101 biological specimens (31 primary specimens and 80 associates), including corals, anemones, zoanibids, hydroids, sponges, sea stars, leather stars, brittle stars, urchins, squat lobsters, amphipods, shrimp, barnacles, snails, and polychaete worms. As many as 30 of these specimens could represent new species, and most of the specimens from known species will represent new range records.



This potentially new species of dandelion siphonophore was imaged on the deep slopes of Rose Atoll.



# 2017 American Samoa Expedition: Suesuega o le Moana o Amerika Samoa

## Media Coverage



SCIENTIFIC  
AMERICAN®



samoa news

HUFFPOST GIZMODO

Mashable VIDEO ENTERTAINMENT CULTURE TECH SCIENCE SOCIAL GOOD SHOP MORE

If footage of this ethereal jellyfish doesn't calm you, nothing will

Share on Facebook Share on Twitter +



TALANEI  
News & more for American Samoa



# Current State of Engagement Planning



# Looking Ahead...What's Next?



- Develop and implement a comprehensive media strategy
- Enhance use of social media
- Leverage web content services
- Leverage web technical services
- Enhance approach to planning public events and interactions





[OceanExplorer.NOAA.gov](http://OceanExplorer.NOAA.gov)



**Ocean Exploration  
and Research**