Impressions from the 2016 Marianas Expedition: A CIOERT Perspective

Shirley Pomponi, Ph.D. – Executive Director
Deborah Glickson, Ph.D. – Associate Director
NOAA Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT)
Harbor Branch Oceanographic Institute - Florida Atlantic University

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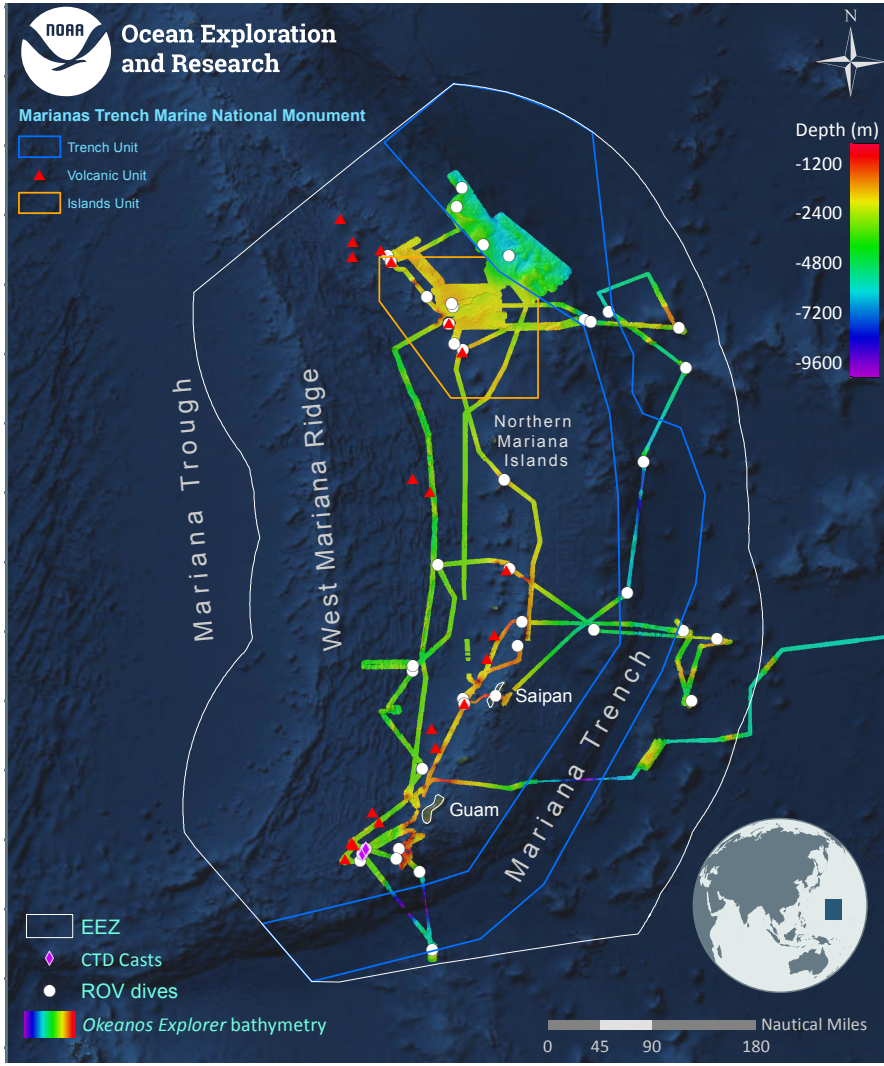
Deepwater Exploration of the Marianas Expedition Overview

- Leg 1 (Apr 20 - May 11): Telepresence-enabled ROV cruise focused on southern section of CNMI/MTMNM
- Leg 2 (May 29 - Jun 11): Mapping cruise focused on northern section of CNMI/MTMNM
- Leg 3 (Jun 17 - Jul 10): Telepresence-enabled ROV cruise focused on northern section of CNMI/MTMNM



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Scientists and Mission Leads

Leg 1: ROV
- Biology/Geology Leads: Diva Amon and Deb Glickson
- Mission Coordinator: Kelley Elliott
- Mapping Lead: Lindsay McKenna
- Dive Supervisor: Jim Newman

Leg 2: Mapping
- Mapping Lead: Meme Lobecker

Leg 3: ROV
- Biology/Geology Leads: Shirley Pomponi &Patty Fryer
- Mission Coordinator: Kasey Cantwell
- Mapping Lead: Derek Sowers
- Dive Supervisor: Jim Newman

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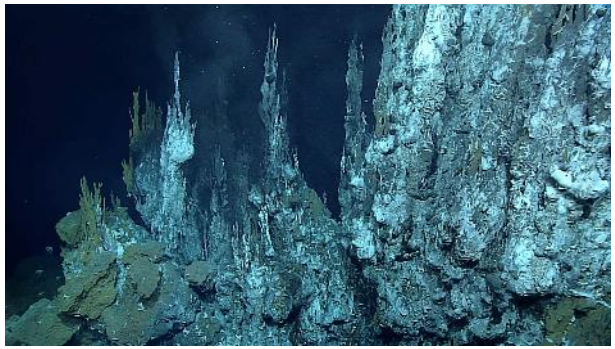
Expedition Objectives



1) Gather information on important habitats for commercially fished species

2) Identify & map vulnerable marine habitats, particularly high-density deep-sea coral & sponge communities.

3) Characterize seamounts in & around the Prime Crust Zone (PCZ), an area of the Pacific with the highest concentration of commercially valuable deep-sea minerals

3) Visit hydrothermal vents and mud volcano habitats, home to unique chemosynthetic communities

4) Explore poorly-known areas of the trench and subduction zone processes

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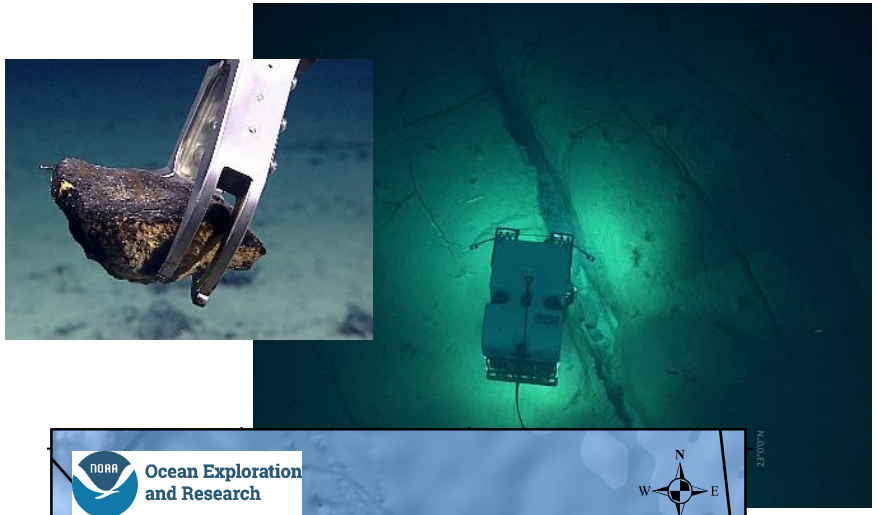
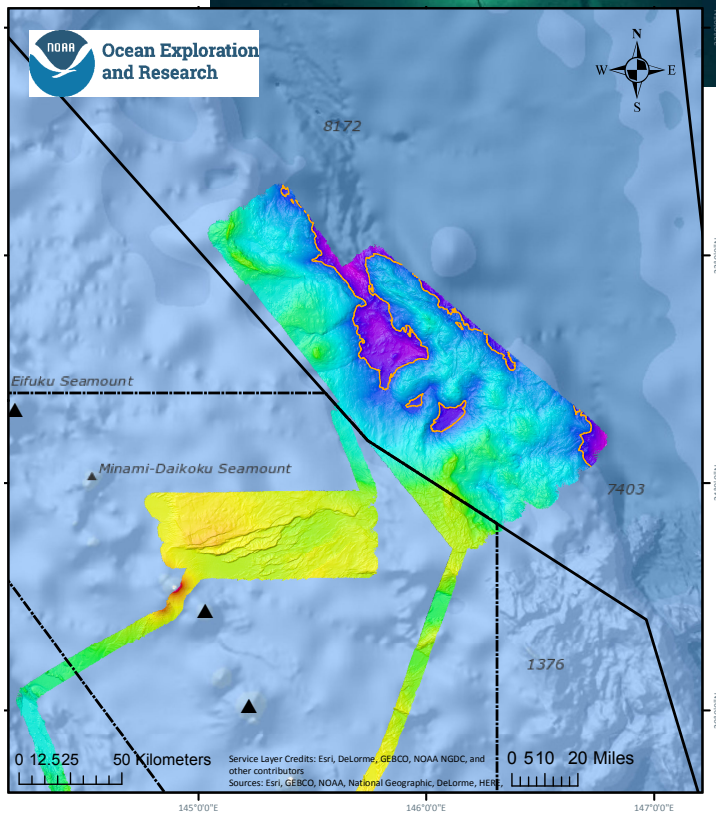
Cruise Statistics

- 41 dives at depths from 240 to 6000m
- Over 130 samples collected
- Shallow dives focused on bottom fisheries & precious corals
- Deep dives focused on seamounts, mud volcanoes, hydrothermal vents, trench walls
- 4 dives included midwater surveys
- >78,700 km^2 mapped
- Over 3.1 million total views of the live streams
- 100 scientists, managers, and students in 9 time zones participated via telepresence





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CIOERT/Science Leads' Perspective

The expedition exceeded expectations

- Achieved many NOAA mission objectives across line offices – fisheries, precious corals, PCZ, exploration
- Good prep work on website and media/press beforehand

Good interactions among scientists, mission specialists, ROV/video, ship crew

- Very active shore-based science team – essential for success!
- Worked across disciplines, time zones, varying technology
- Clear lines of communication among mission coordinators, science leads, mission leads, and ROV team

Great engagement with CNMI/Guam and public

- Several videos were widely publicized (Time, National Geographic, etc.)
- Strong media interest (LA Times, BBC, etc.)

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CIOERT/Science Leads Perspective

There are some areas that can be improved…

Cruise planning

- Needs to be started earlier and finalized earlier

A broader community of scientists needs to be engaged

- Only a small pool of frequent contributors
- Not enough advance planning or notice

Rethinking dive objectives

- Are there/should there be different objectives for different dives?
- Priorities on imagery, science, or management?

Personnel/staffing

- Can science leads do all asked of them?
- Data manager needed on all ROV legs?

Sampling protocols and processes

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Sampling

Need to revisit sampling and archiving policies and procedures

Current sampling scheme is rigid

- Arbitrary number of samples
- Does not necessarily conform to needs of dive or scientists

Lack of sampling/manipulator tools other than a claw

- Scoop for sediments and soft-bodied organisms
- Suction sampler/slurp gun for soft-bodied organisms
- Coring abilities for sediment and microbial mat

ROV as technology testbed?

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Broadening science participation

CIOERT can help OER increase scientific community participation

- Expeditions need to have more visibility within relevant communities.
- In some instances, need a wider range or depth of expertise.
- Capitalize on networks that already exist within the scientific community.
- Broaden expertise in exploration and relevant disciplines.

An example: CIOERT currently planning an introductory telepresence and deep sea biology workshop for early-career scientists.

Could increase participation for discussion of expedition locations, sampling protocols, increasing data value.

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End-to-End Process

IODP as a possible model

- Rigorous proposal process (often led by experienced PIs)
- Applications to sail/shore-based participation
- Pre-drilling surveys to characterize area
- Expedition
- Post-expedition awards for analysis

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Thank you!

Questions? Discussion?

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