

*August 2-18, 2011*

# 2011 MID-CAYMAN RISE EXPEDITION

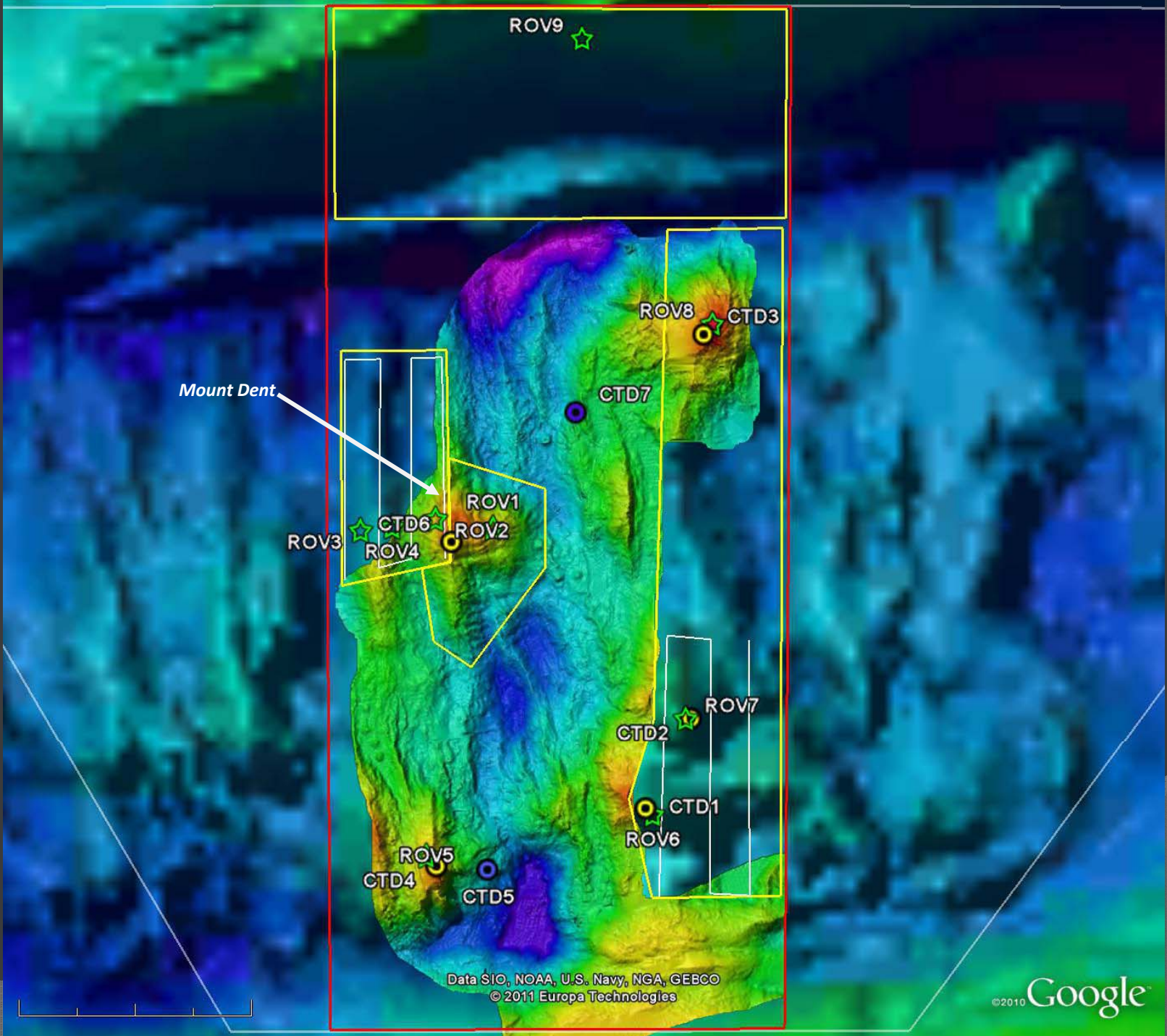
# Why the Mid-Cayman Rise?

- ◎ Submissions from the ocean exploration community
  - 2007 EX Maiden Voyage Planning Workshop
  - 2011 Atlantic Workshop
- ◎ Operational efficiencies

# Cruise Planning

- Selection of Science Team
- Science Planning
- Operational Constraints







# Science Objectives

- Locate, precisely, the first hydrothermal field (Von Damm) to be found on Mt Dent, characterize its geologic setting and use the ROV to obtain the first high quality HD video of both the geology of the site and the biological community present.
- Explore the rest of the summit of Mt Dent to understand its geologic setting and, ideally, locate a 2nd hydrothermal field (Europa) for which preliminary evidence exists (predicted to be of a Lost City type) to compare and contrast with the first site (Von Damm)
- Continue mapping off-axis to define the size and shape of the multiple other "Oceanic Core Complexes (OCCs)" that are geologically similar to Mt Dent, and line the walls of the Mid Cayman Rise.
- Use the CTD system, its *in situ* sensors, and shipboard analysis of samples for their dissolved methane concentrations to seek tell-tale signs of additional hydrothermal sources that may be hosted elsewhere along the Mid-Cayman Rise, including on top of the other OCCs we will map.
- Track any additional hydrothermal sites to source using the CTD and ROV in concert.
- Use the ROV to explore the top of at least one other OCC, even if we do not find evidence for more hydrothermal activity
- Map the north wall of the Cayman Trough fracture zone, immediately north of the Mid Cayman Rise
- Explore the cliff face of the Cayman Trough fracture zone using the ROV to examine what rock-types are exposed and what animals exist on the cliff face

# OPERATIONS



# URI Exploration Command Center



# Core Science Team

## Shore

- Mike Cheadle
- Barbara John
- Jameson Clarke
- Diva Amon
- Sarah Bennett
- Jill McDermott

## Ship

- Chris German
- Paul Tyler
- Cameron McIntyre

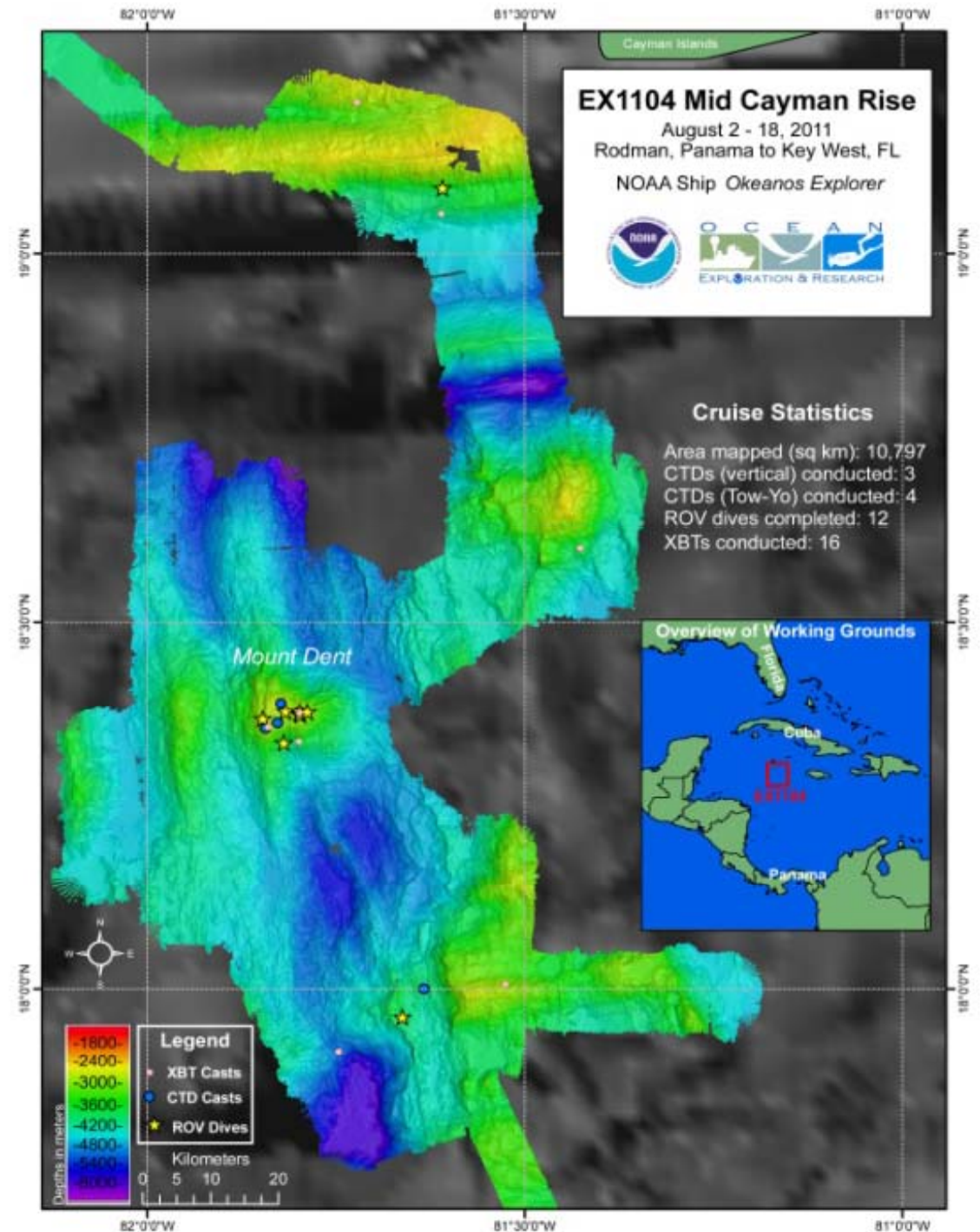


# Telepresence

- ◎ Participants based out of the URI ECC, but also tuning in via standard internet
  - Mini-ECC at WHOI (I2)
  - NASA Jet Propulsion Lab
  - Around the world (CA, PA, Germany, Canada, Portugal and United Kingdom)
- ◎ 24-hour ROV/CTD/mapping operations

# Operations

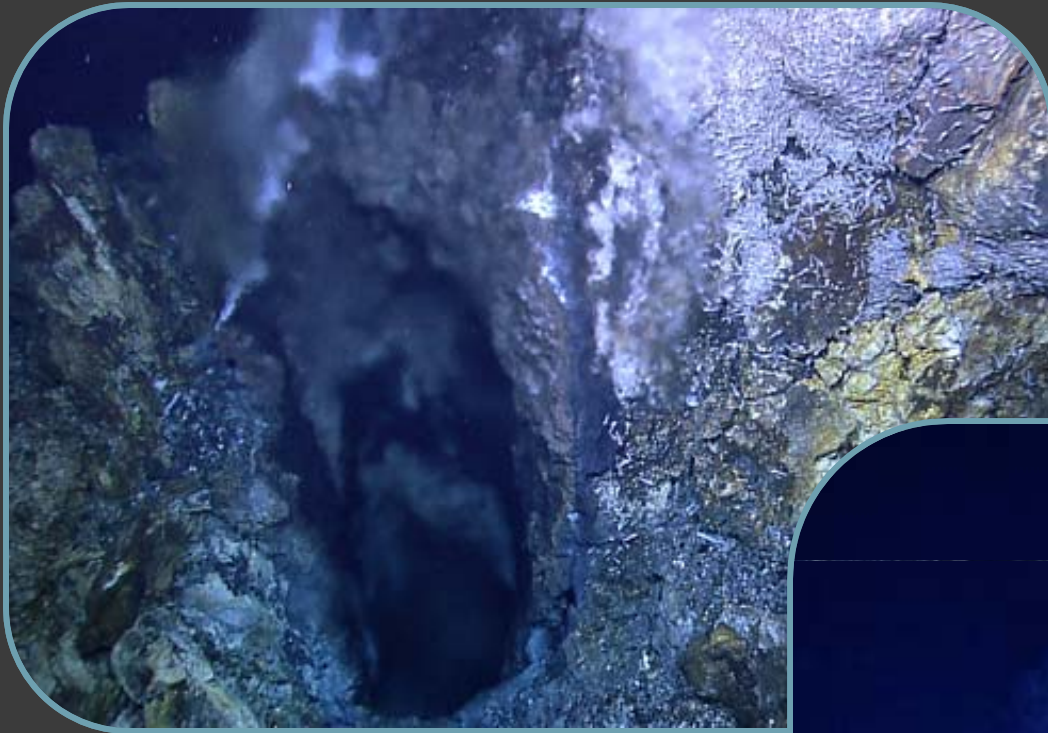
- 11 days
- Mapped ~10,800 km of seafloor
- 4 Tow-Yo's
- 3 Vertical Casts
- GC Analysis
- 12 ROV Dives



# SCIENCE FINDINGS & ACCOMPLISHMENTS



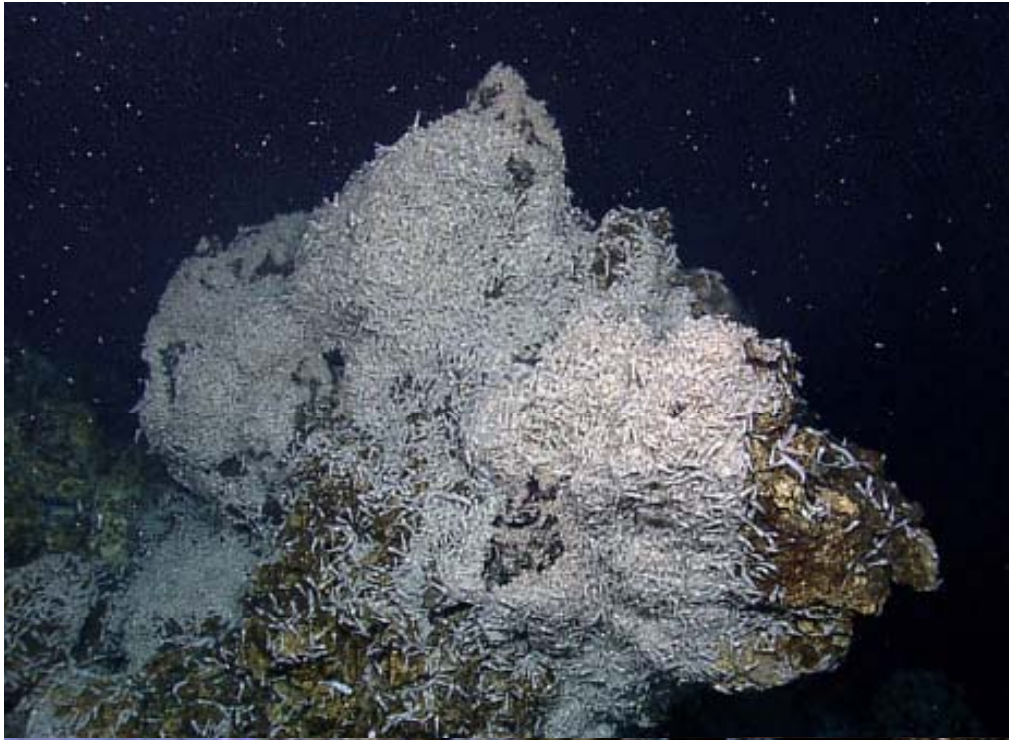




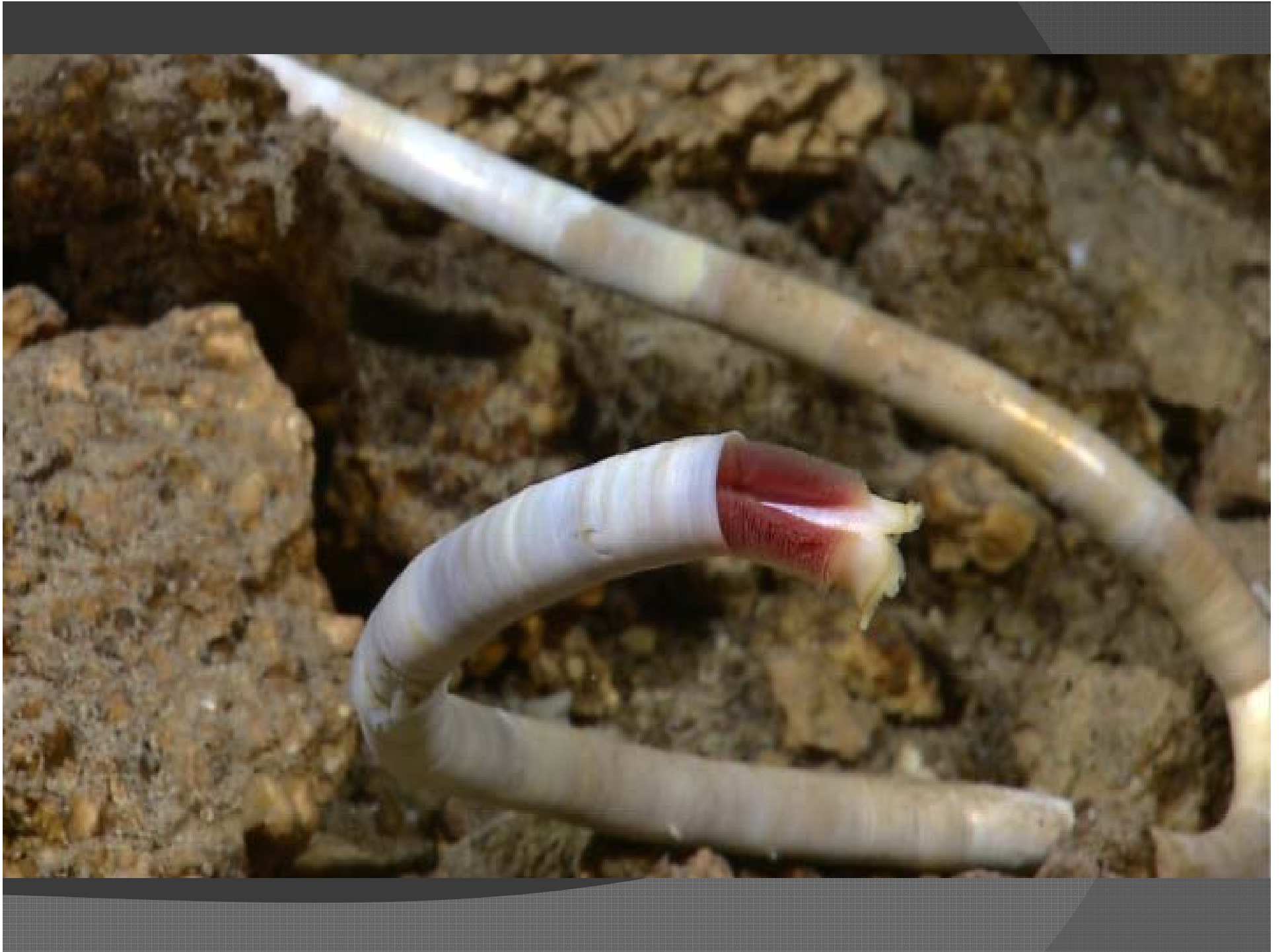
**~ 1m wide  
chimney orifice**















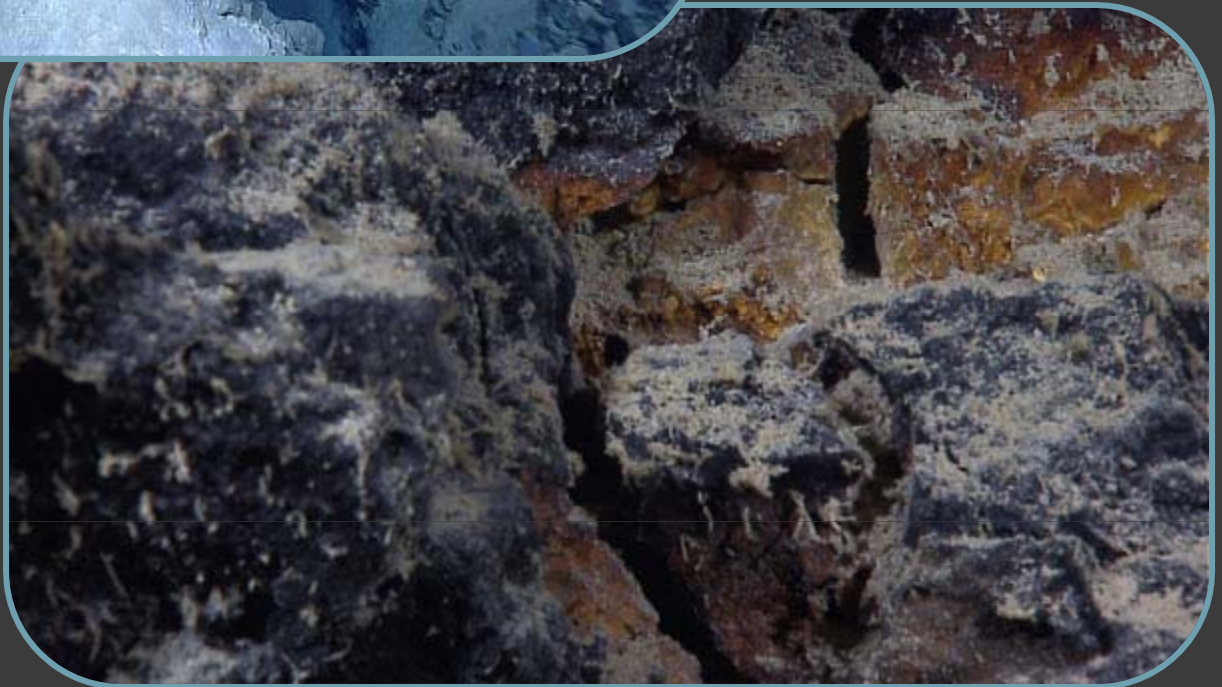


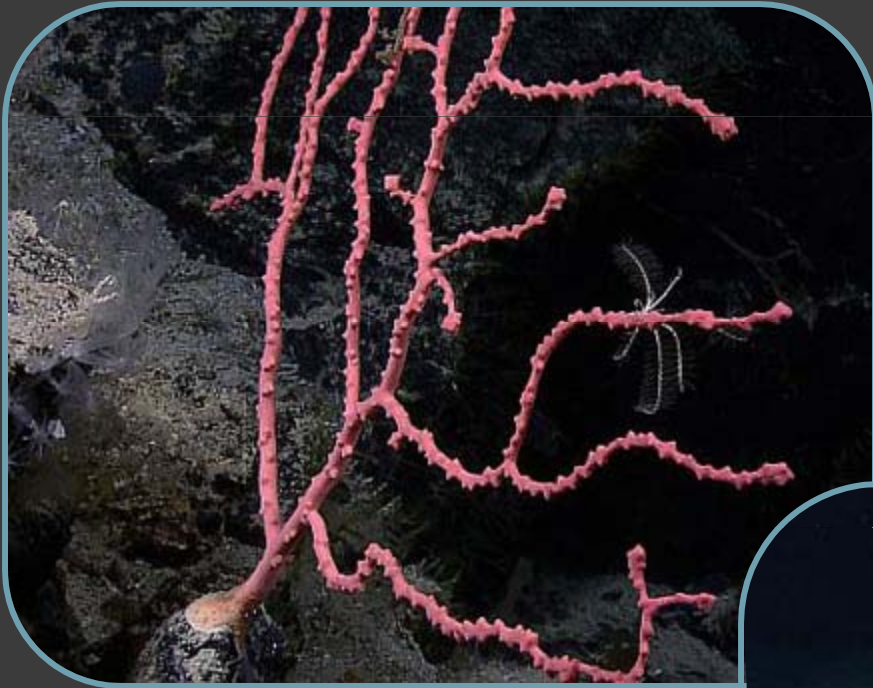




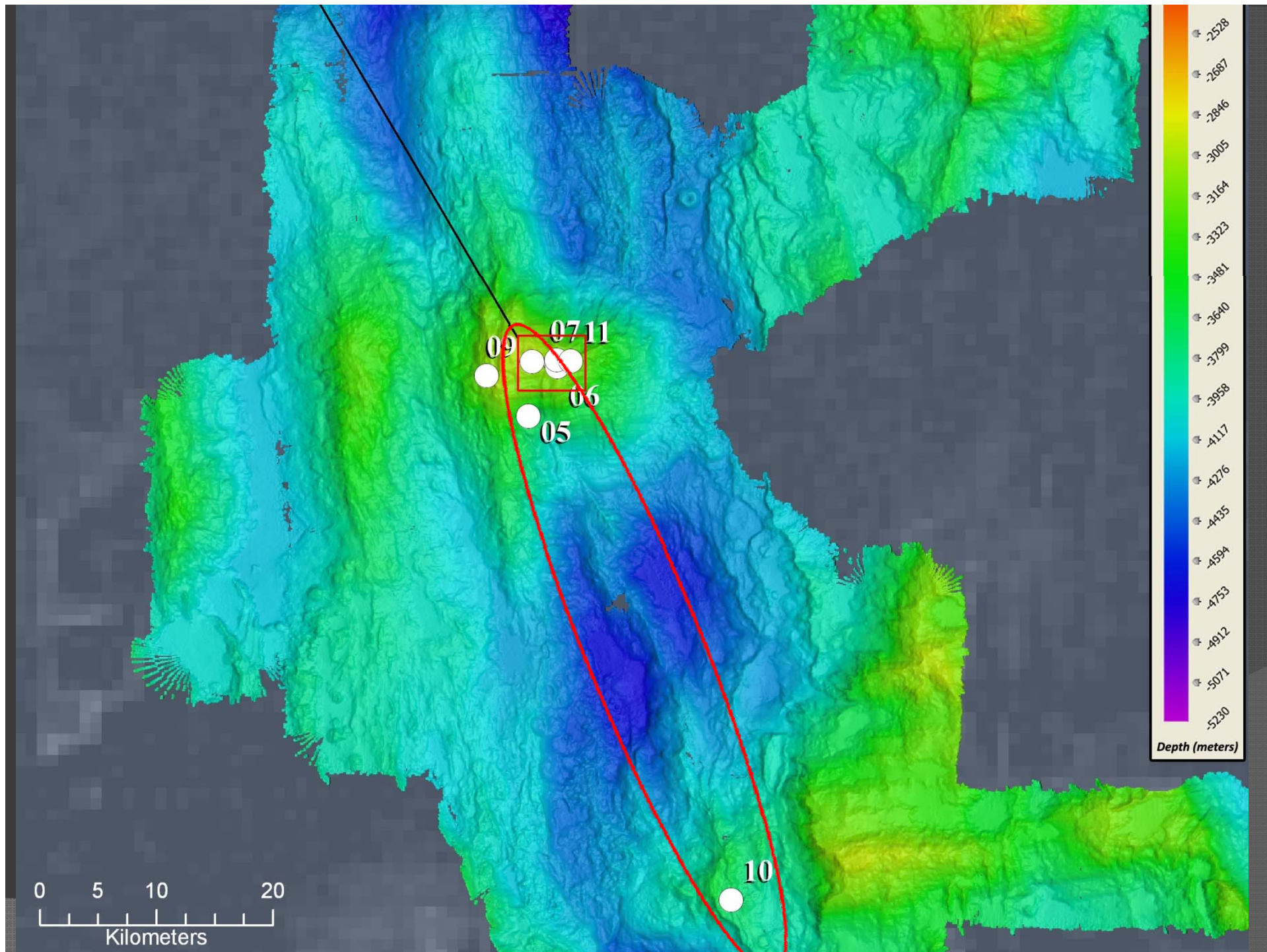
- Double Fissure

Hydrothermally-  
altered rock

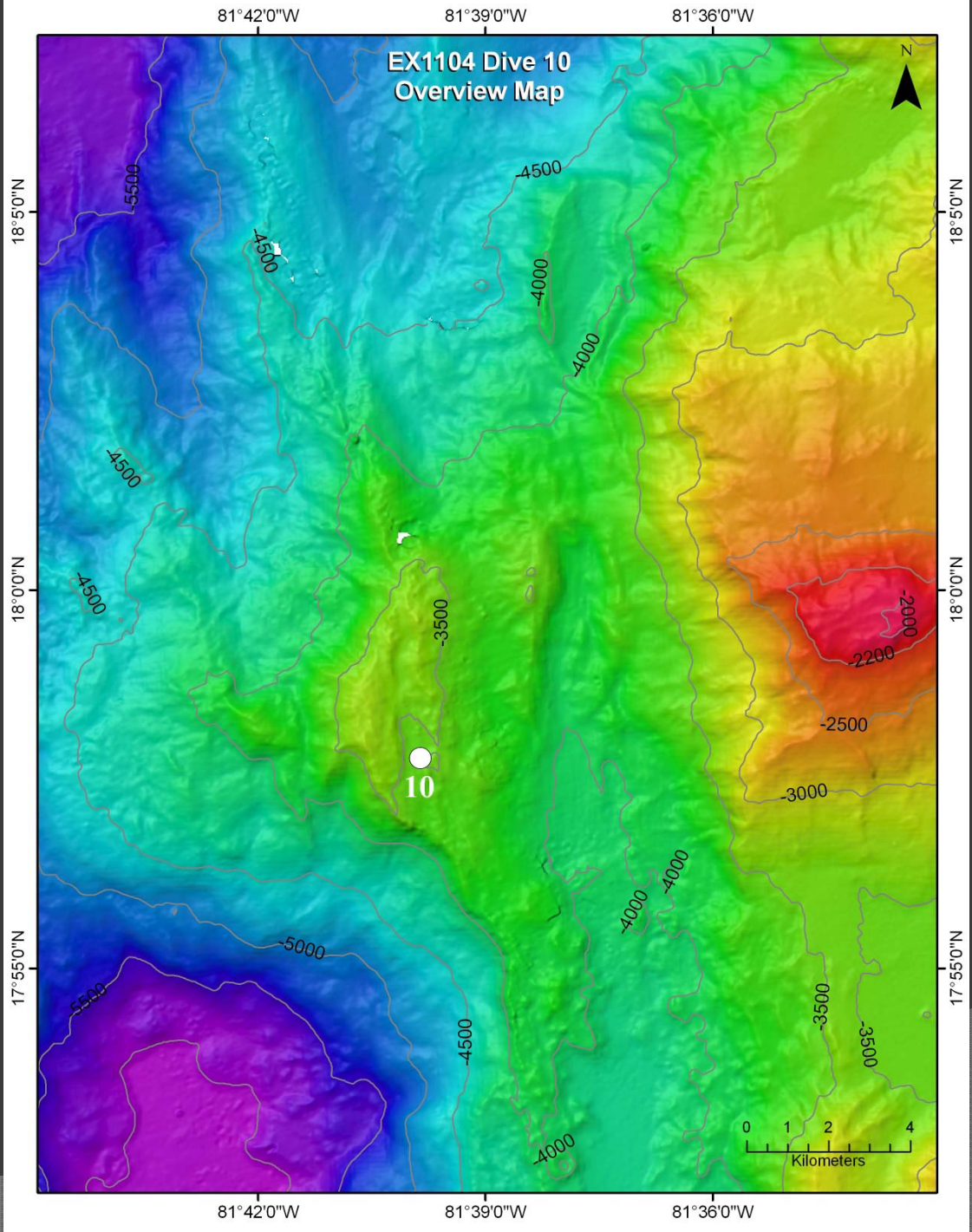






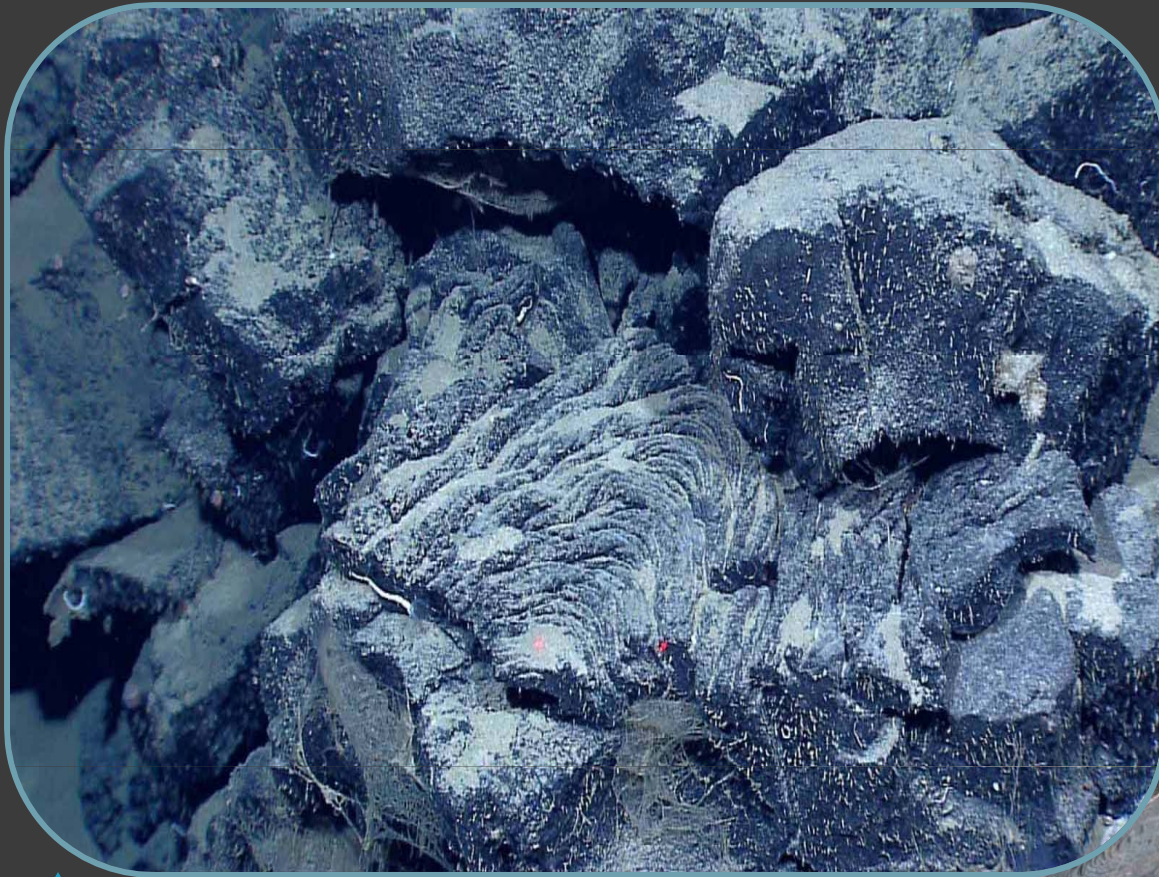








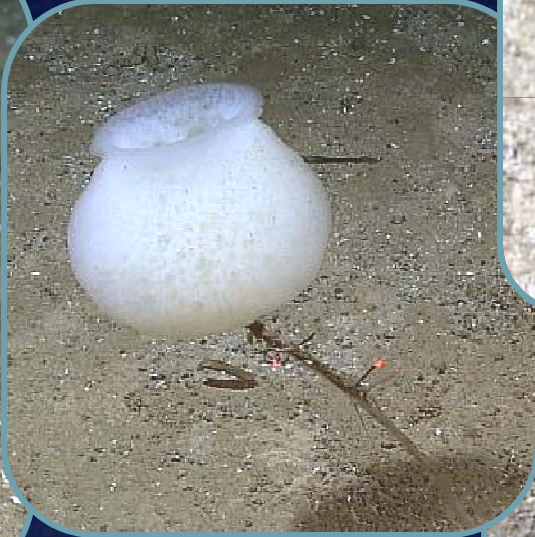
## Hawaii Volcanoes National Park



> 3000m deep,  
Mid-Cayman Rise









QUESTIONS?

