

Okeanos Explorer Expeditions to PMNM

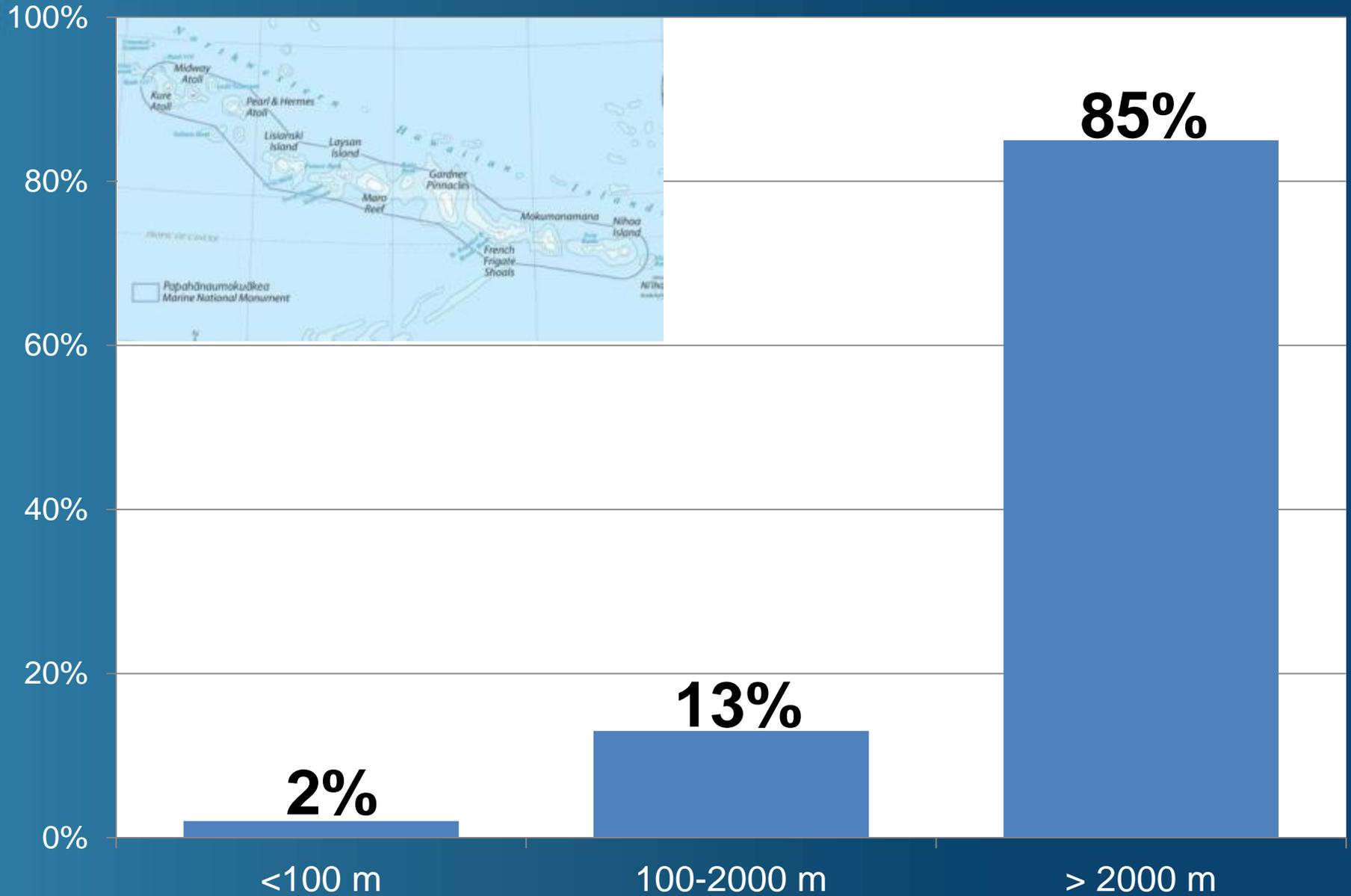


Daniel Wagner, Ph.D.
NWHI RAC Meeting
May 12, 2016

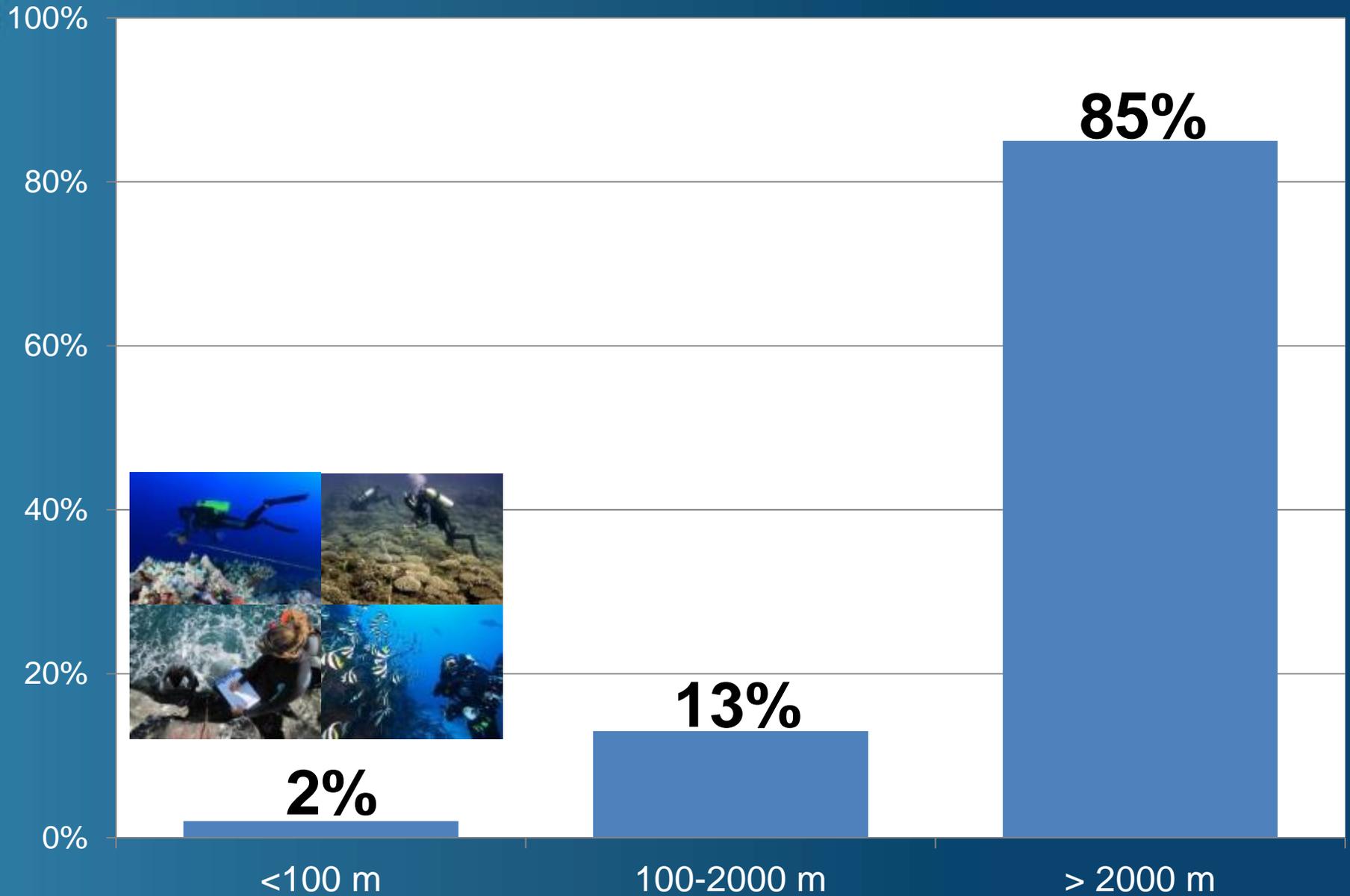




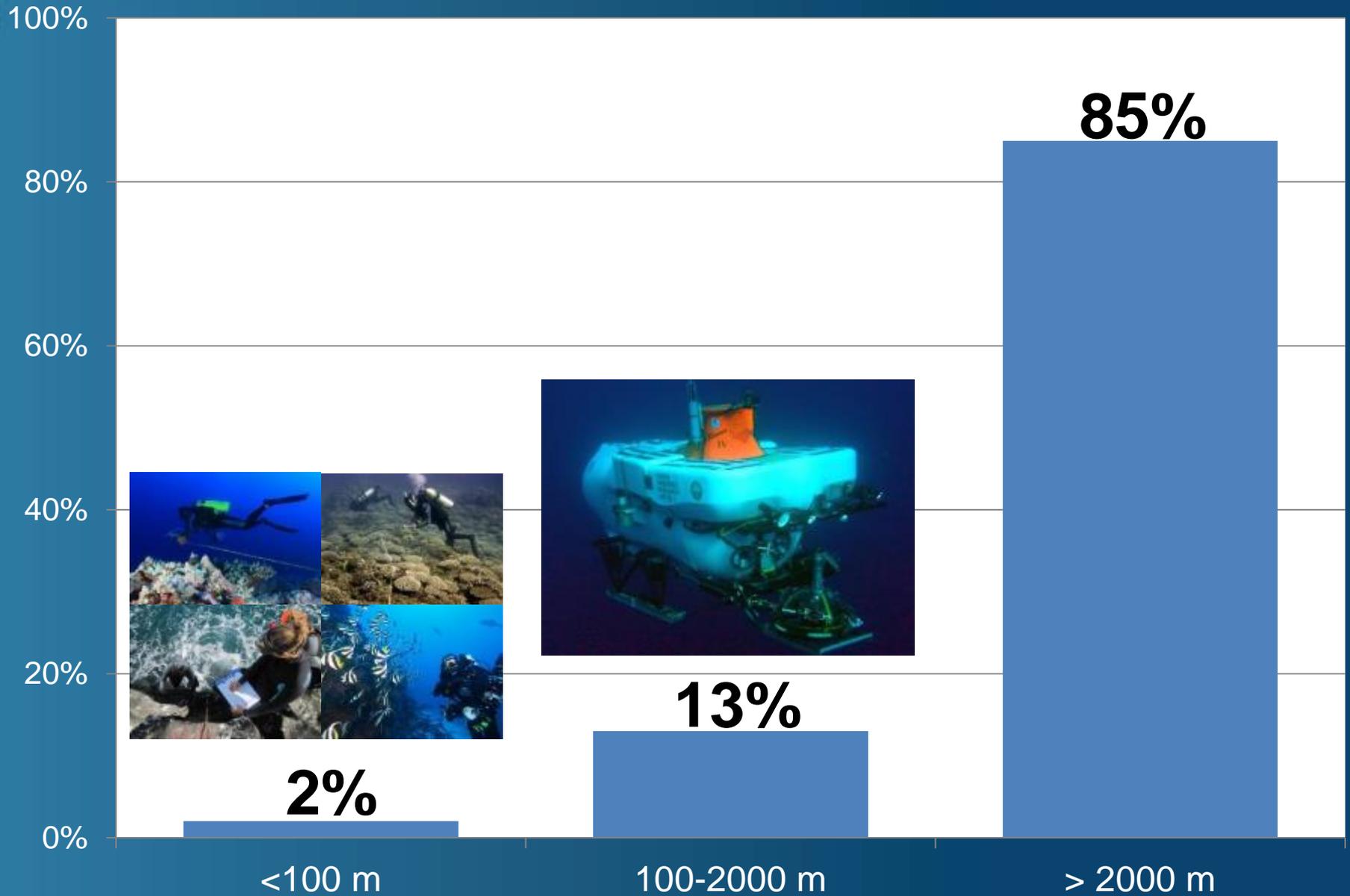
PMNM by Depth



PMNM by Depth



PMNM by Depth



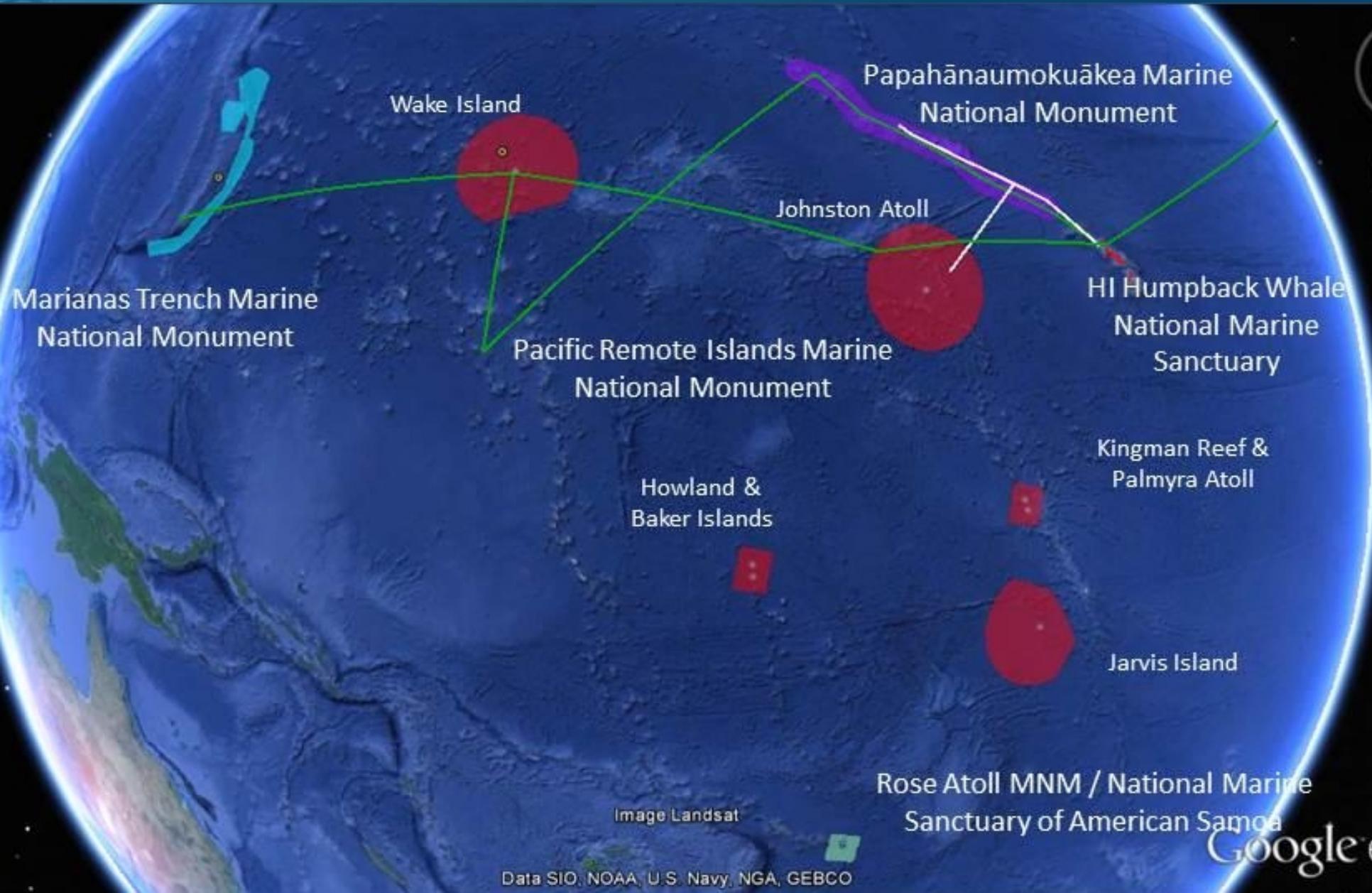


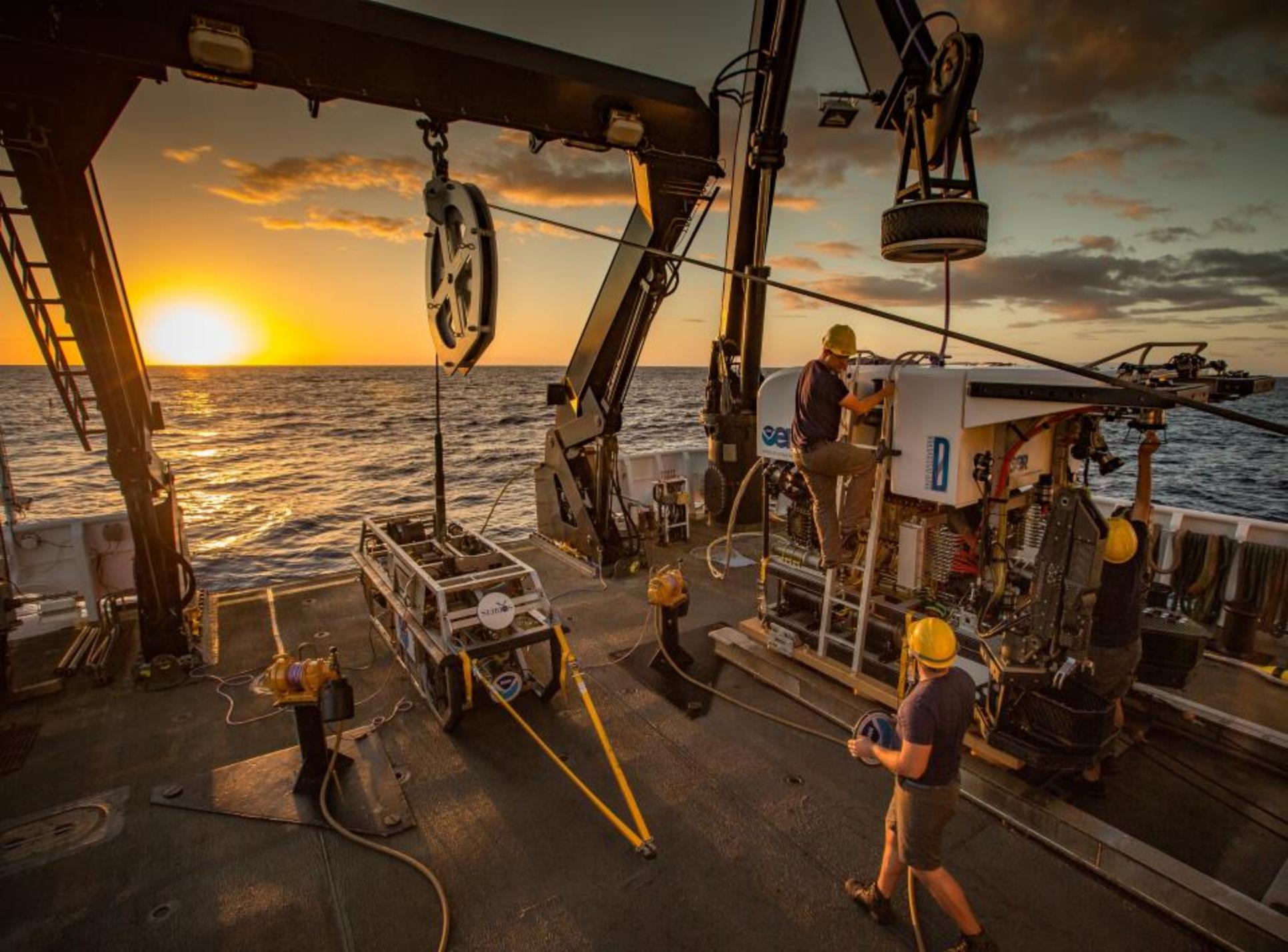
2 Expeditions

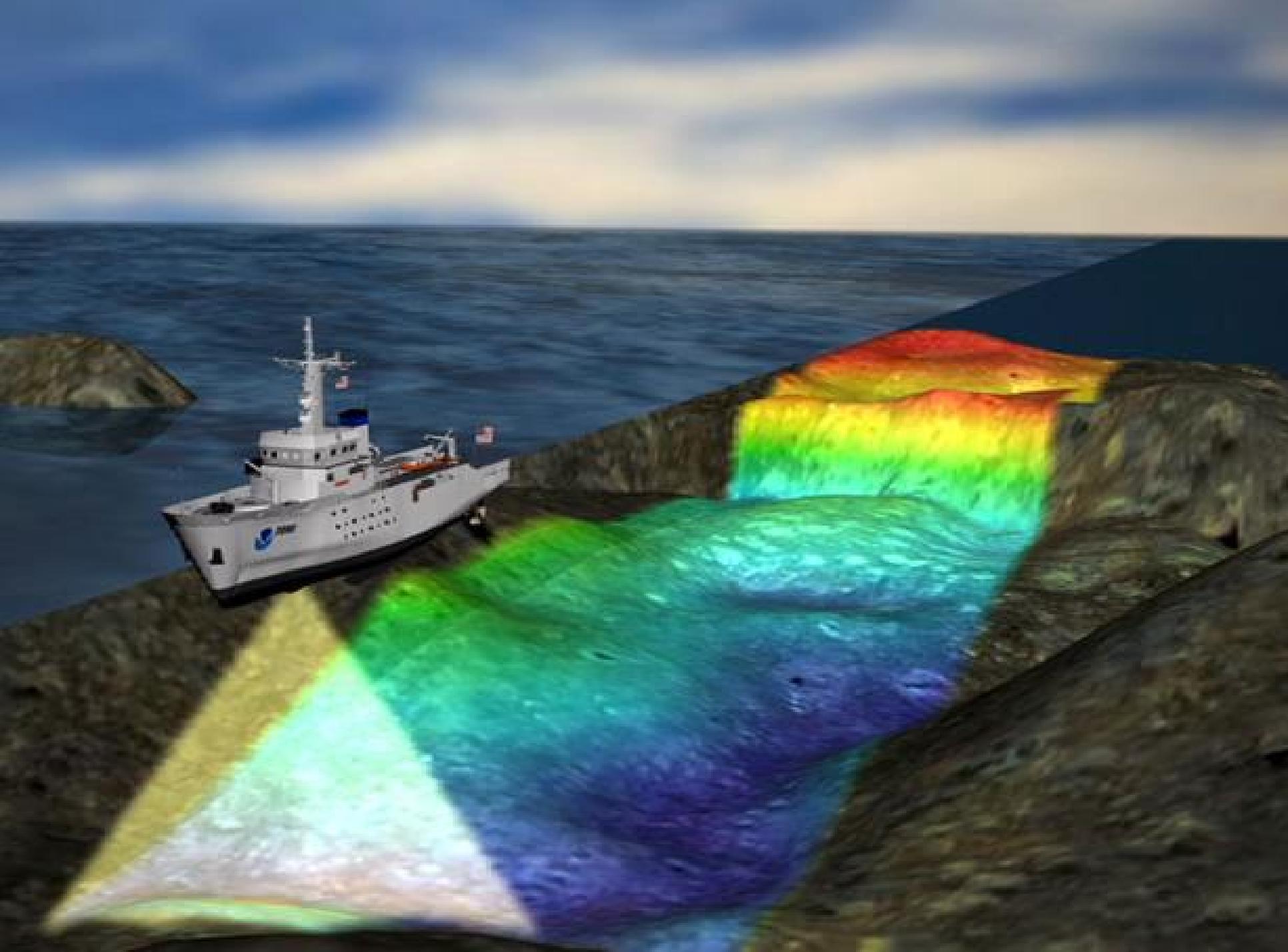
- 2015: 24 days (Honolulu – Honolulu)
- 2016: 23 days (Honolulu – Kwajalein)



CAPSTONE: 2015-2017









1M08835619

NOAA
R 334

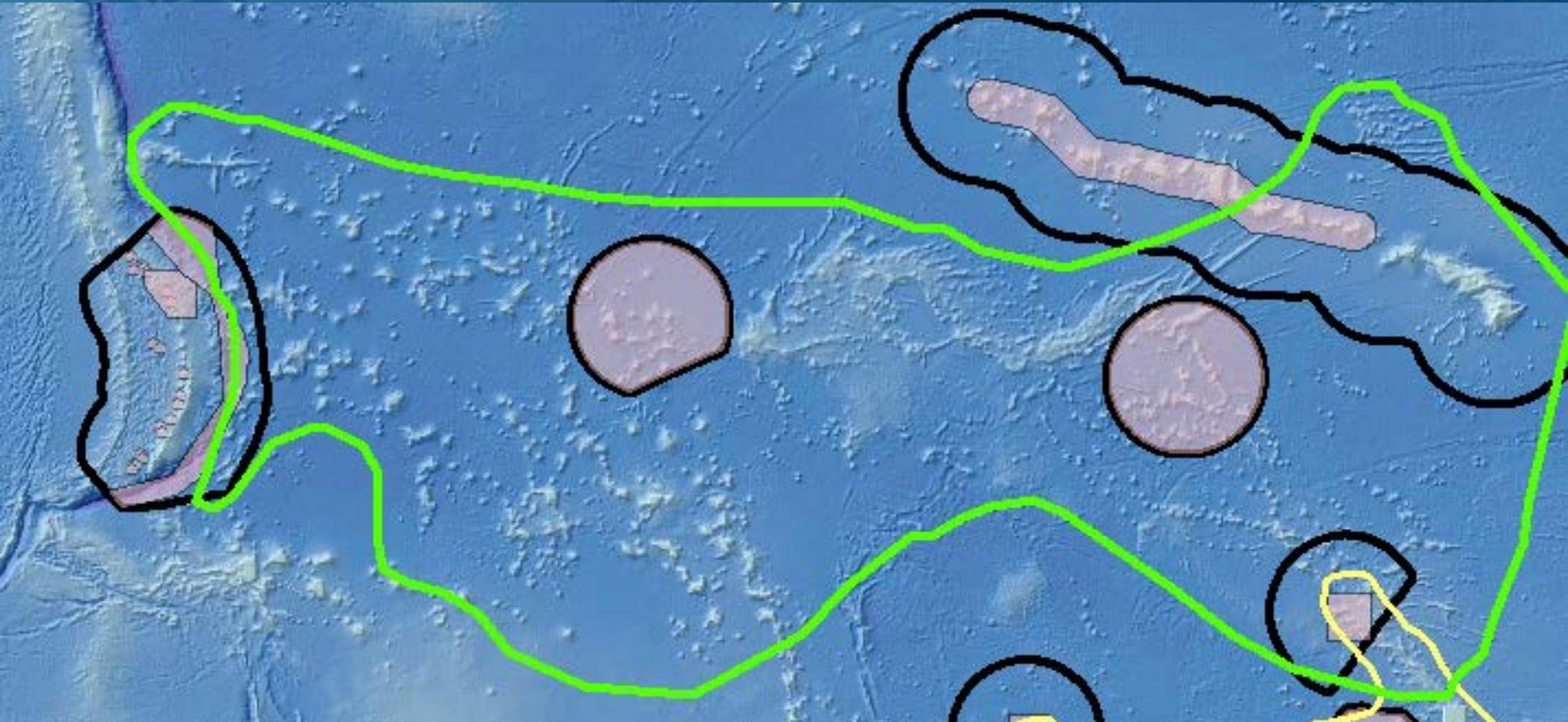
High-Density Biological Communities

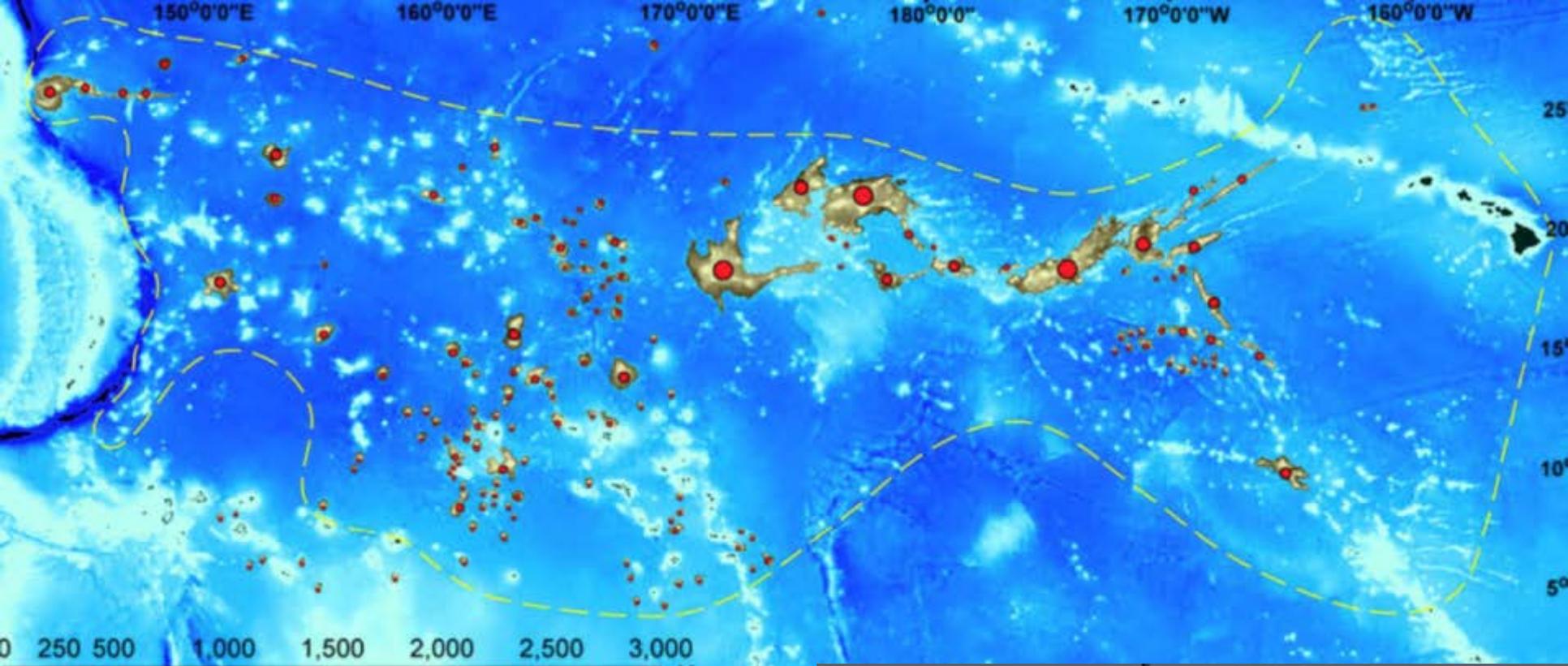


Vulnerable Communities



Prime Crust Zone

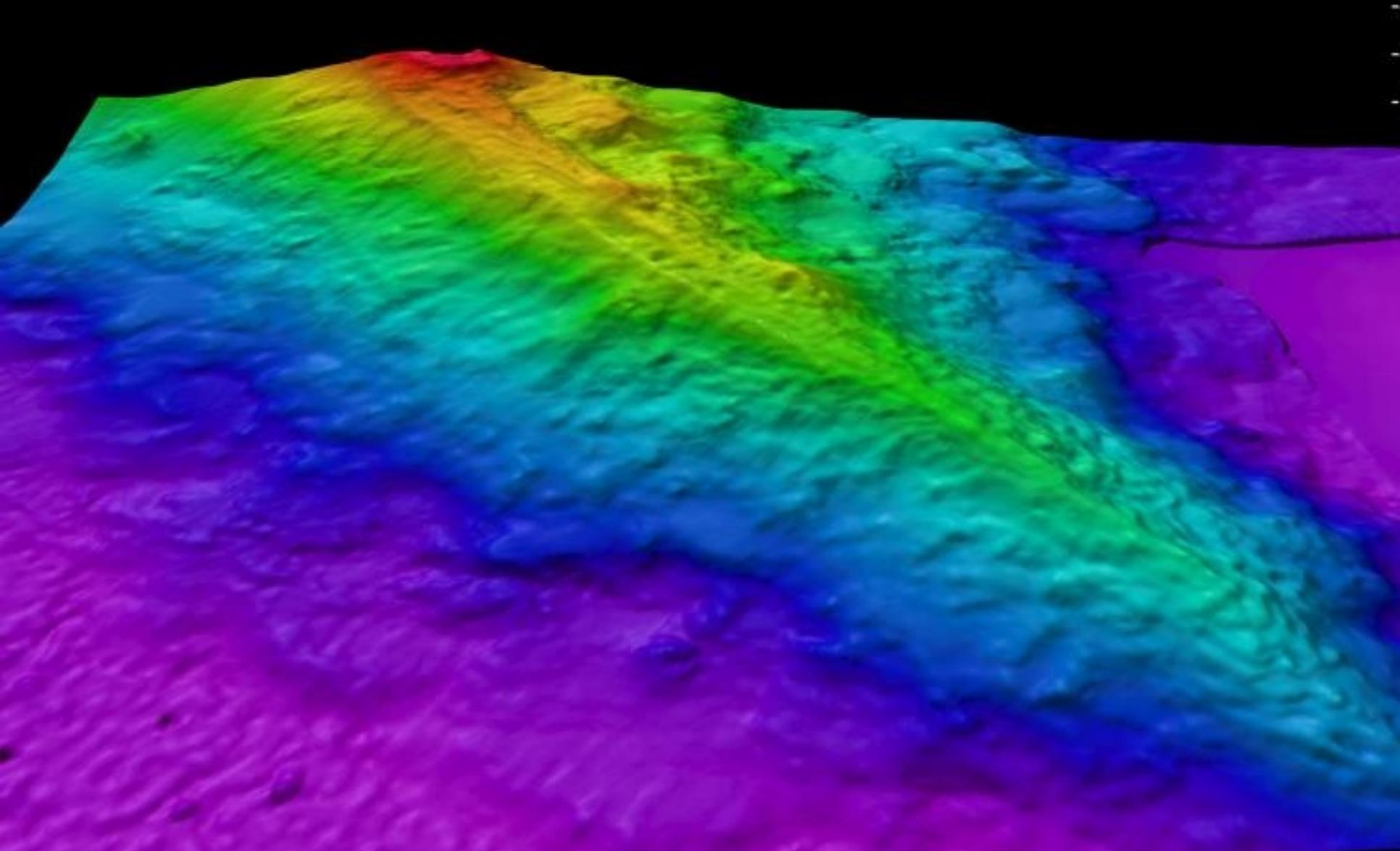




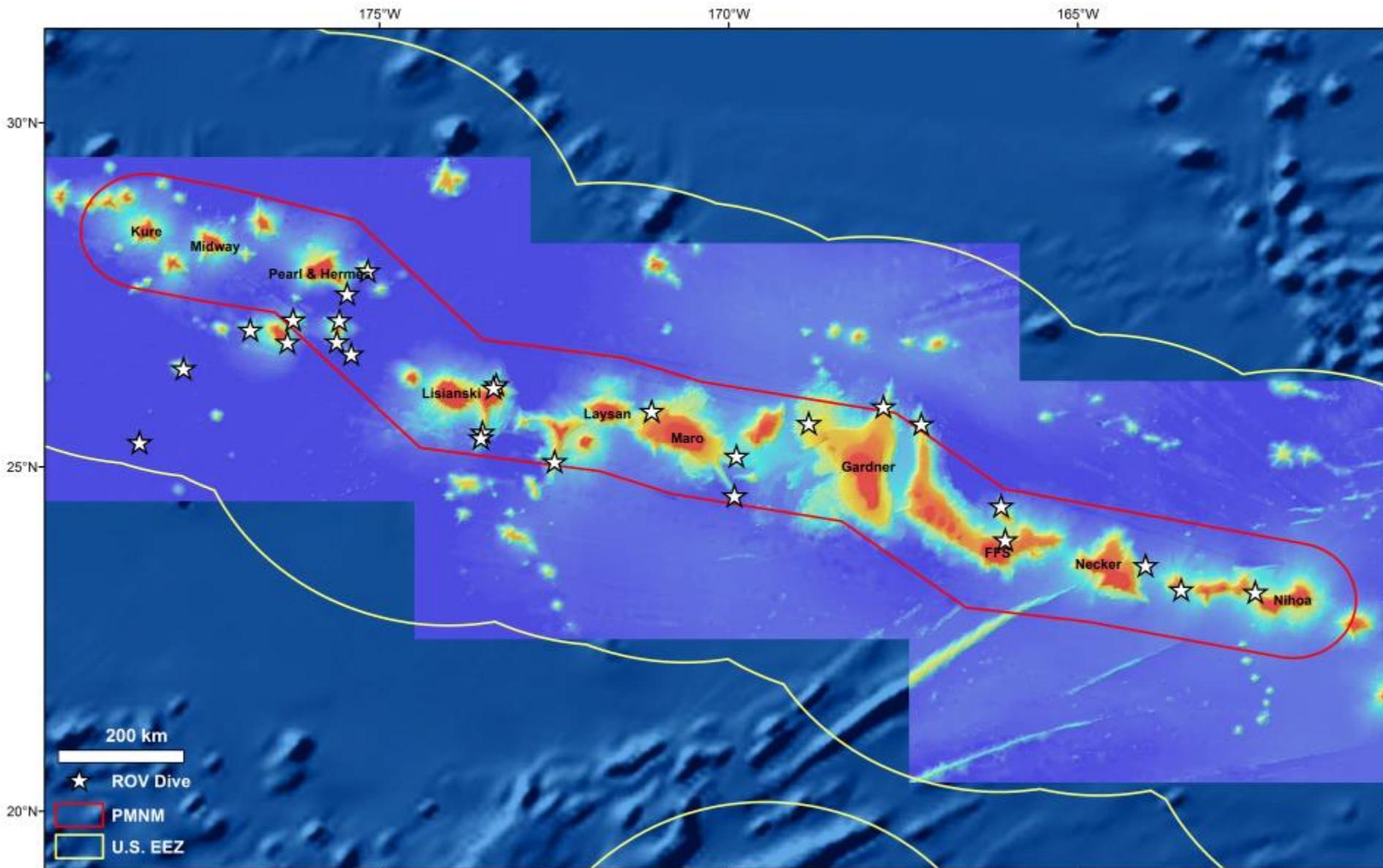
High-Density Biological Communities



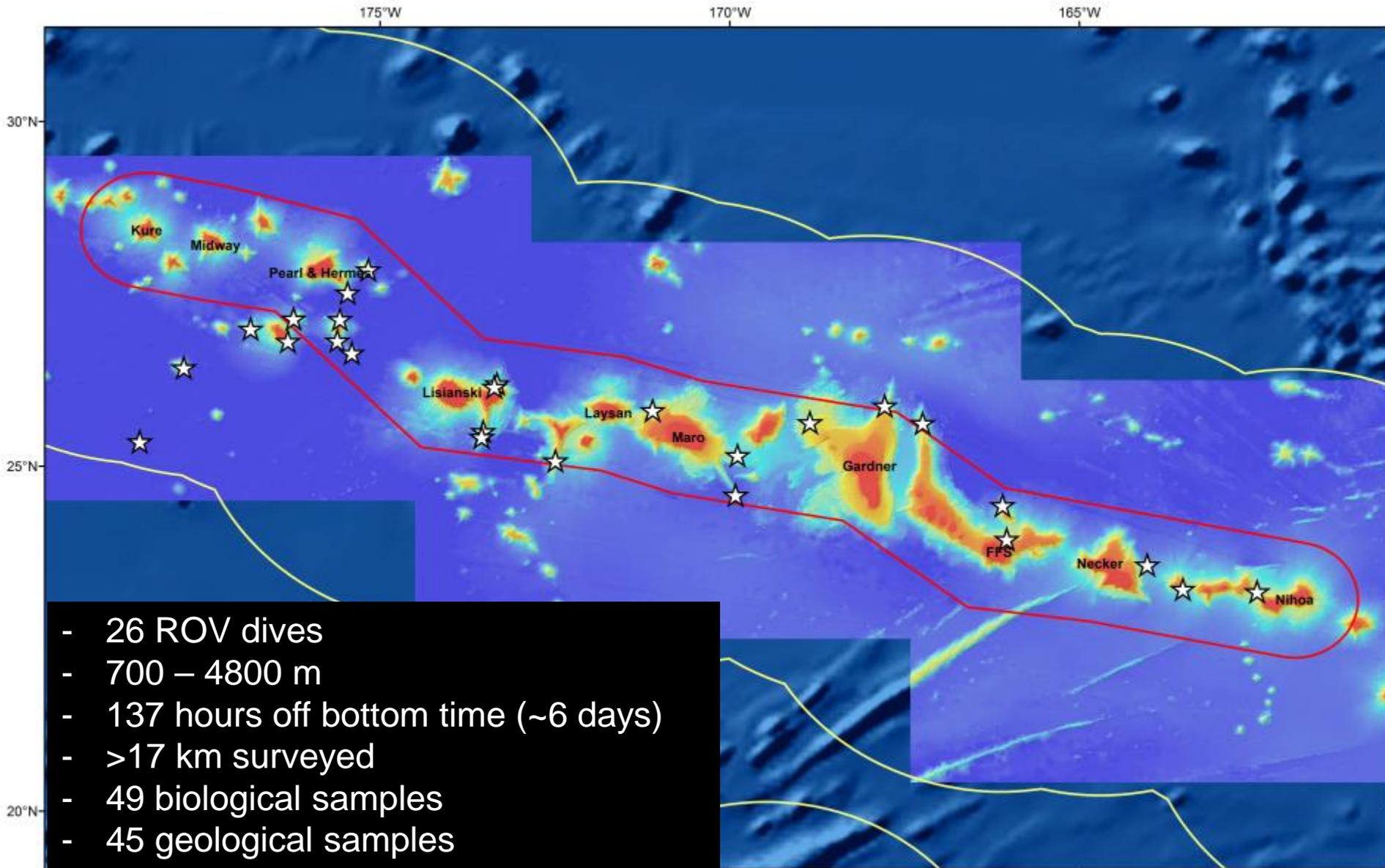
Steep Ridge Topography



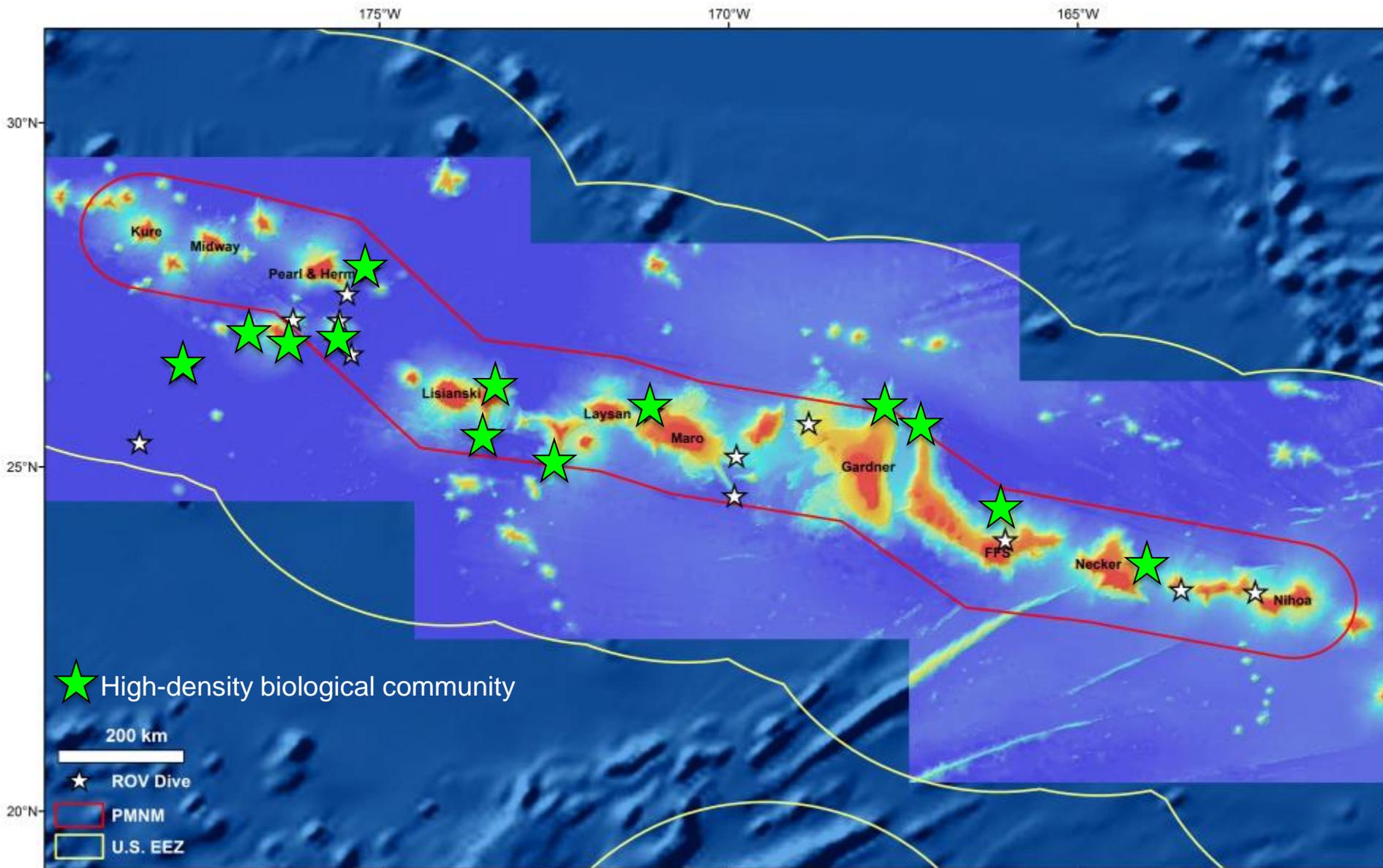
ROV Dive Locations (2015 & 2016)

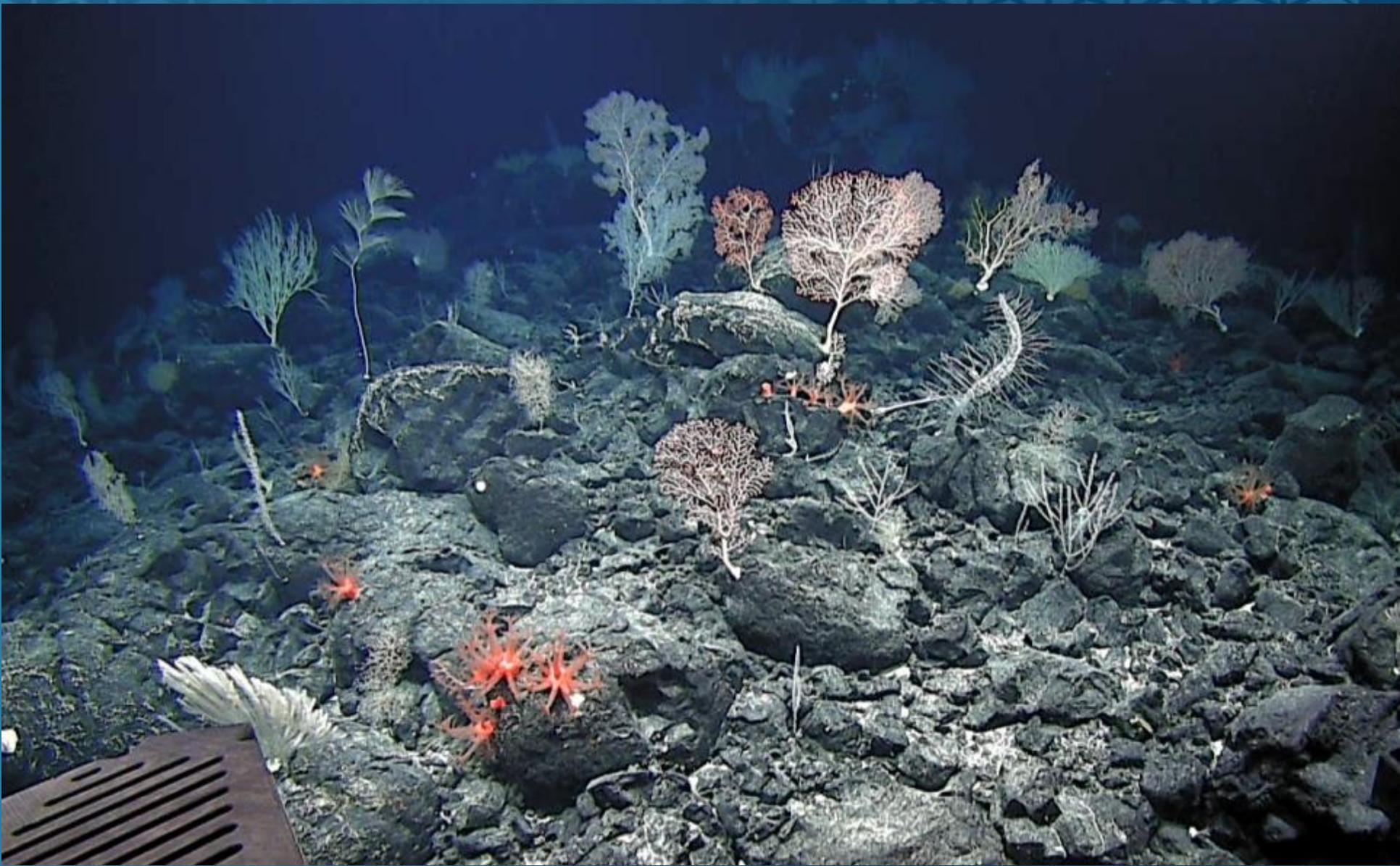


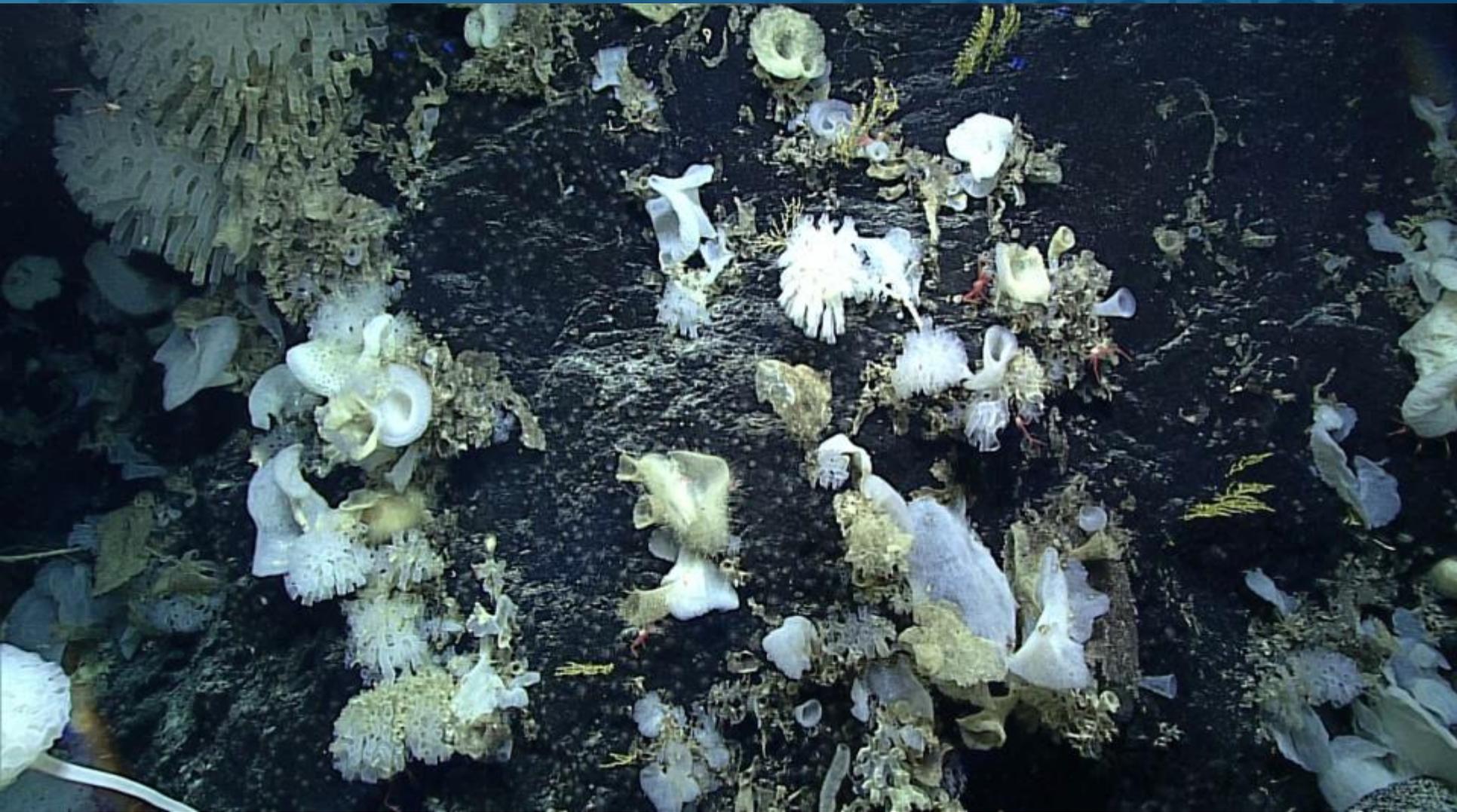
ROV Dive Locations (2015 & 2016)



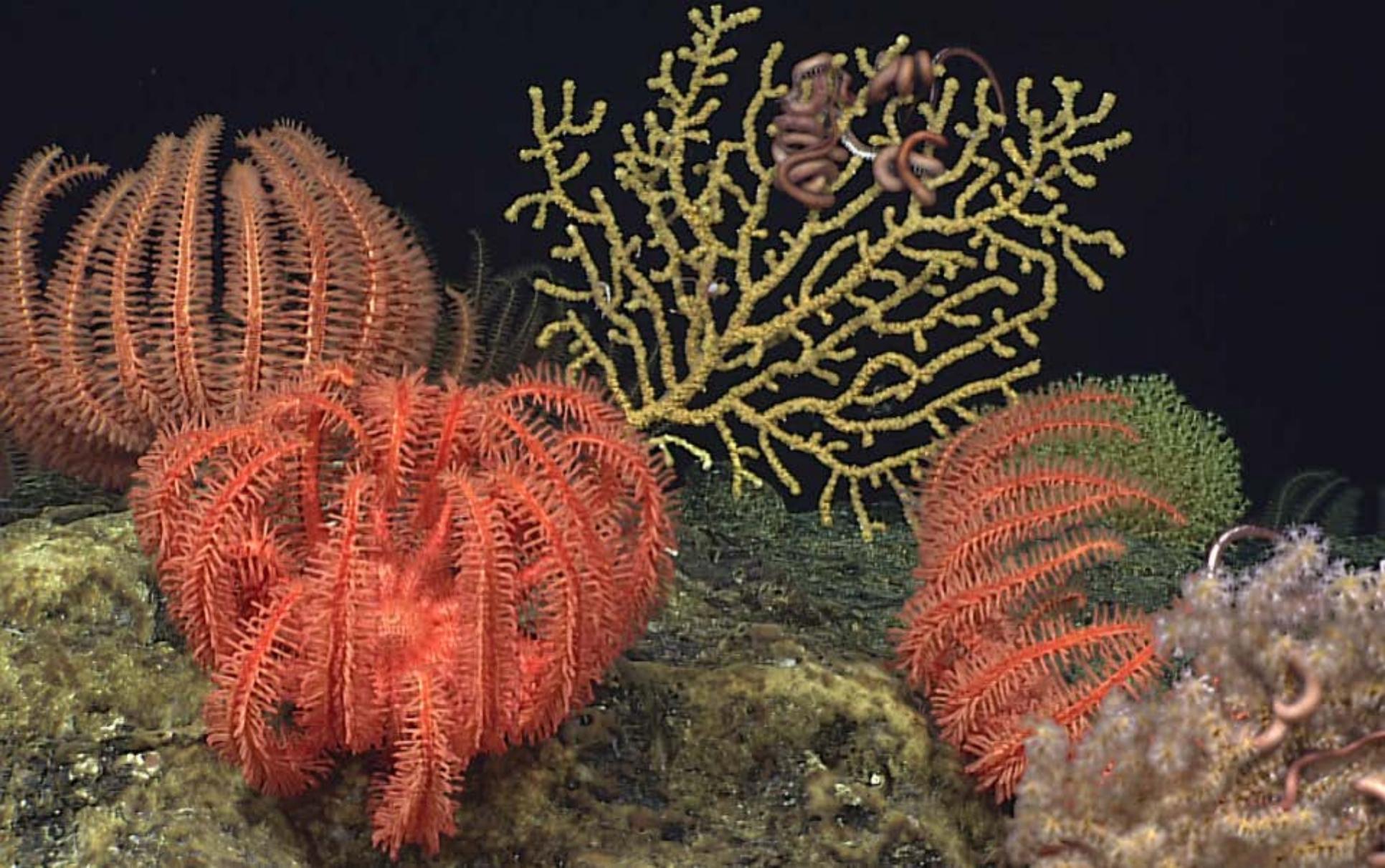
High-Density Communities Discovered



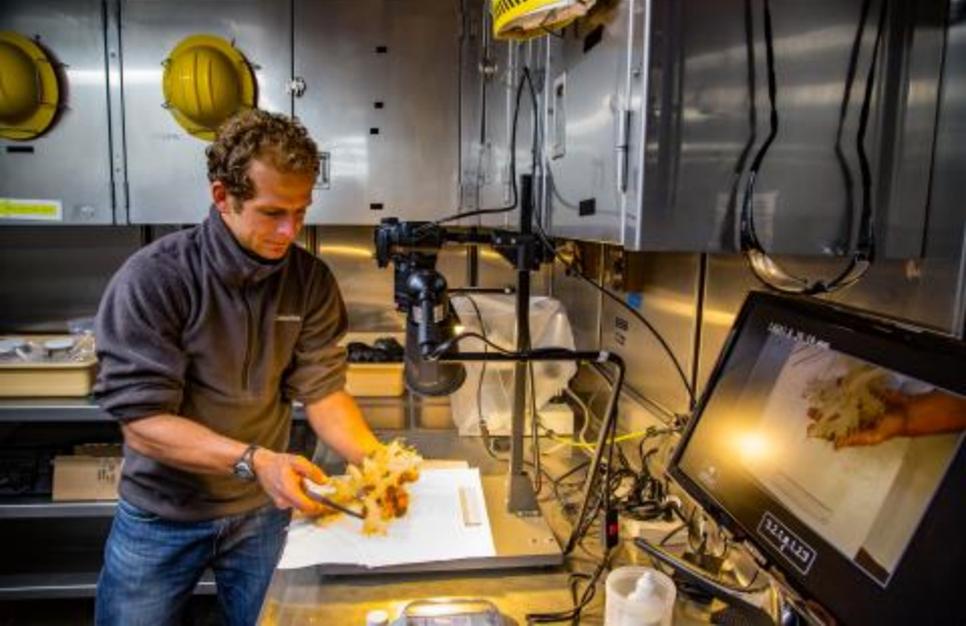
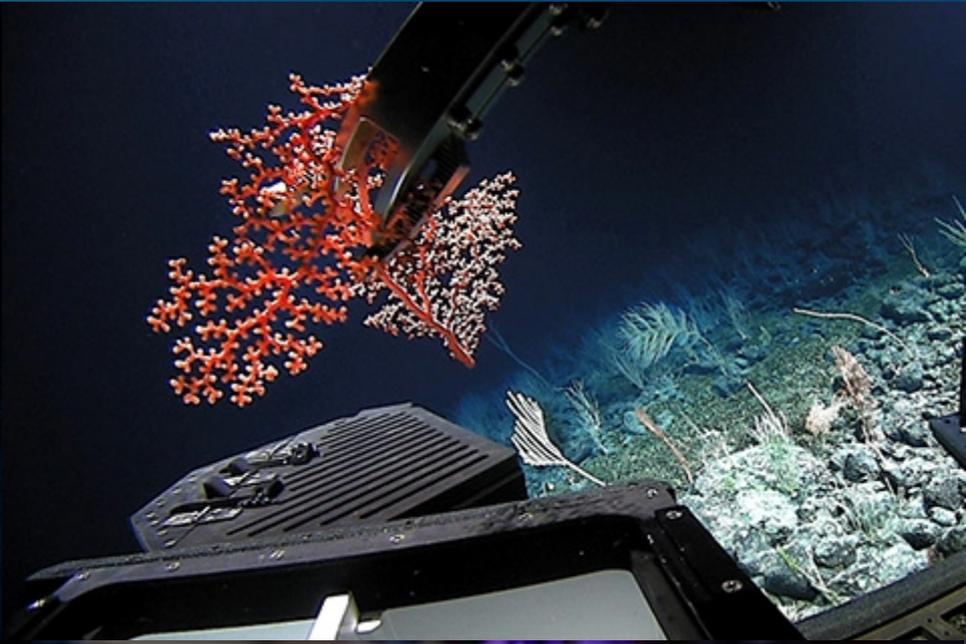
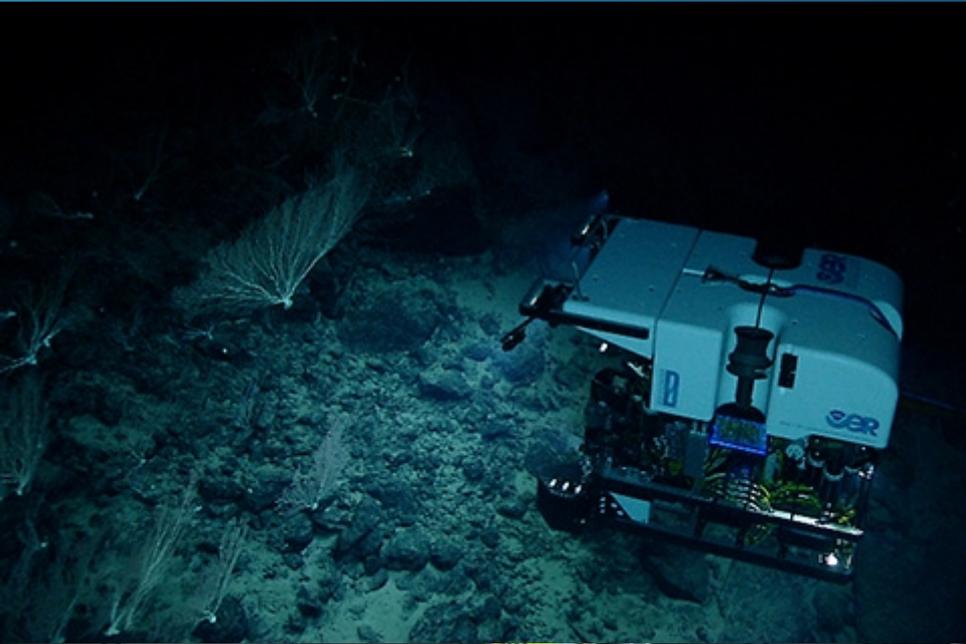




- Largest known in Central Pacific (>10 miles; 1800-2200 m)
- Deepest known in the World (4000 m)



Specimen Collections

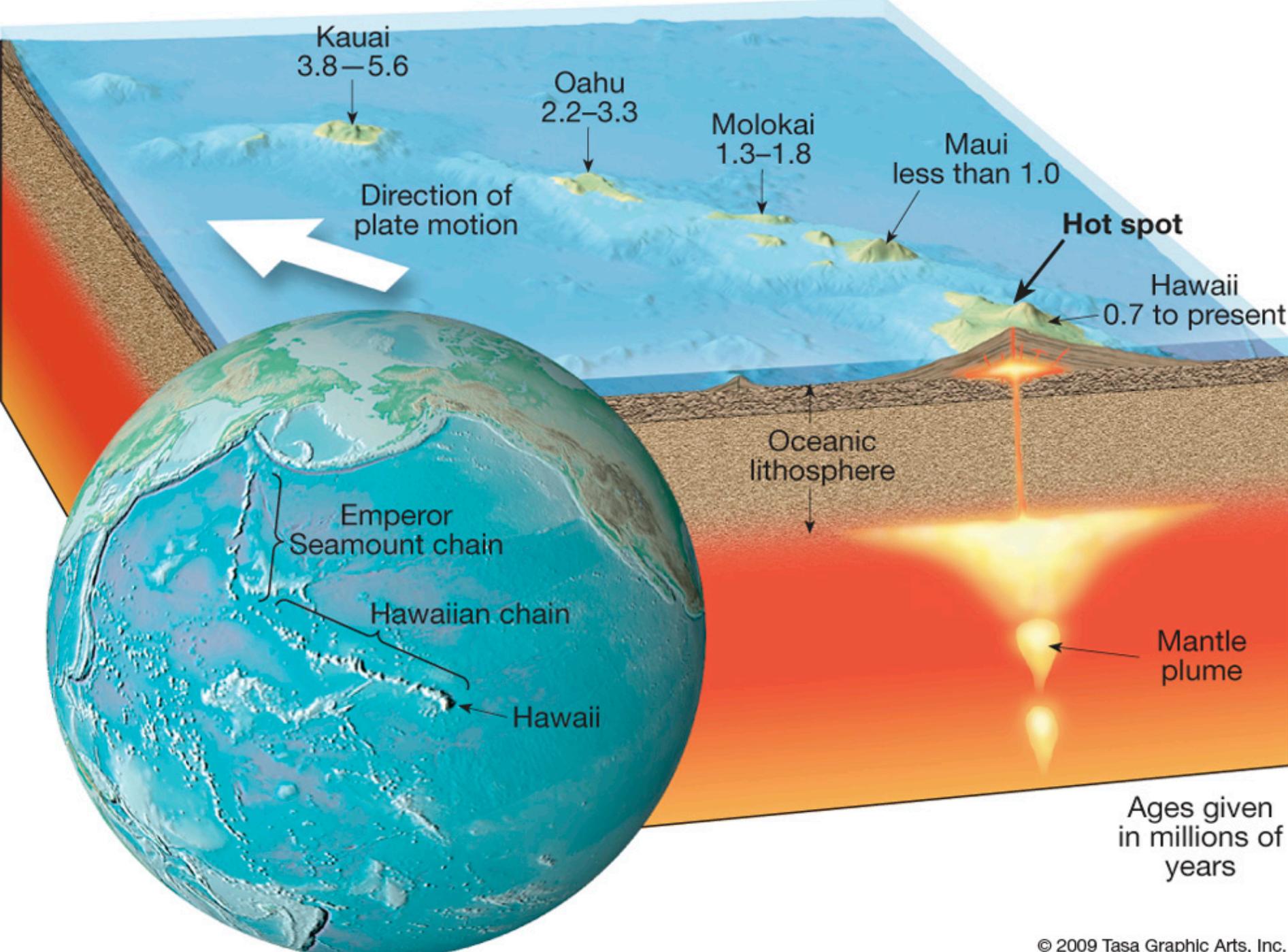


Biological specimens (N=49)



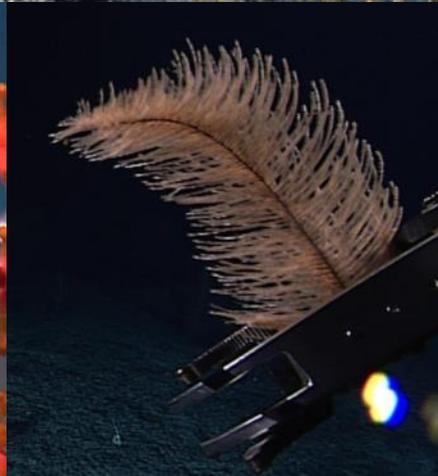
Geological specimens (N=45)



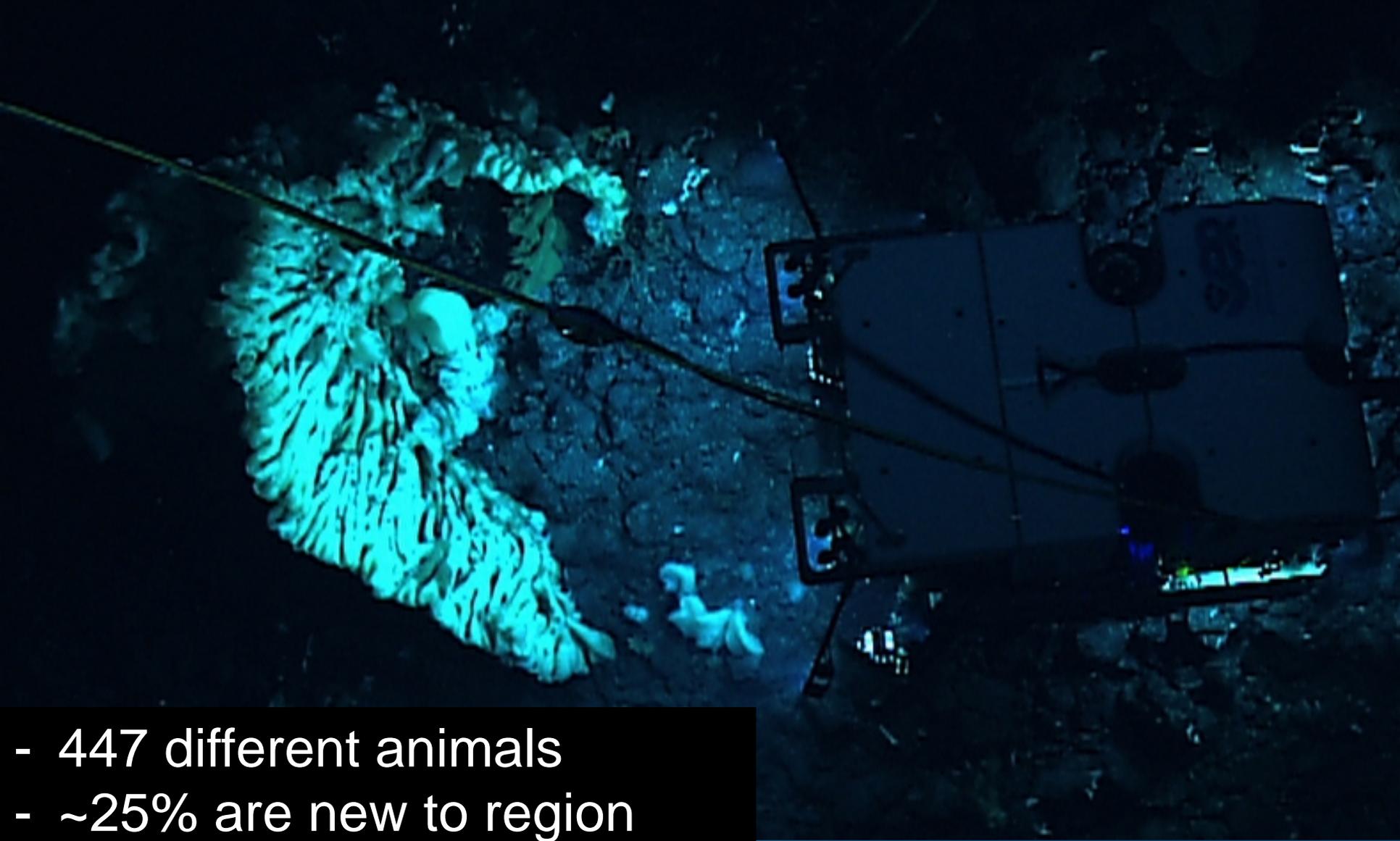


Ages given in millions of years

Imaged animals

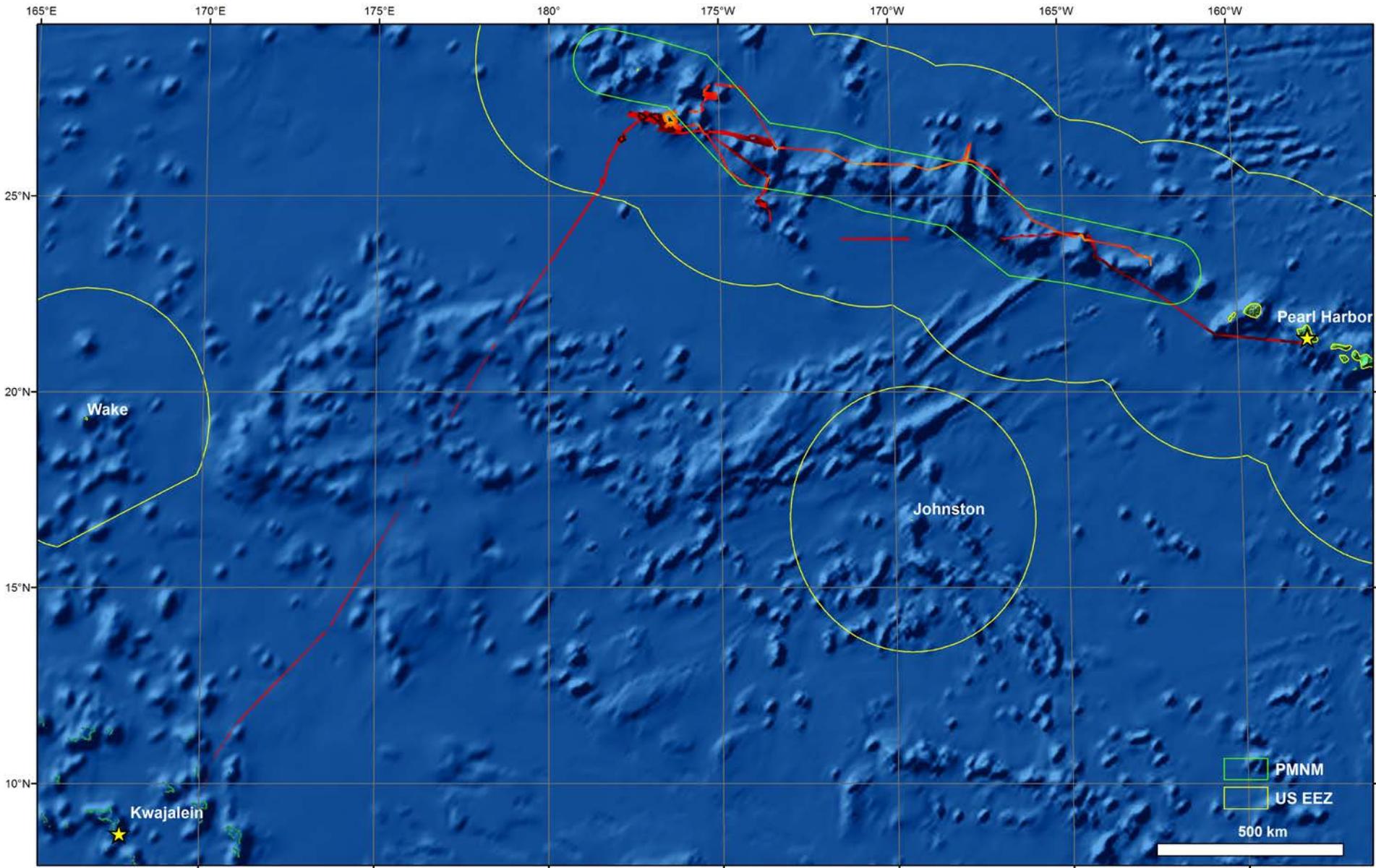


Imaged animals

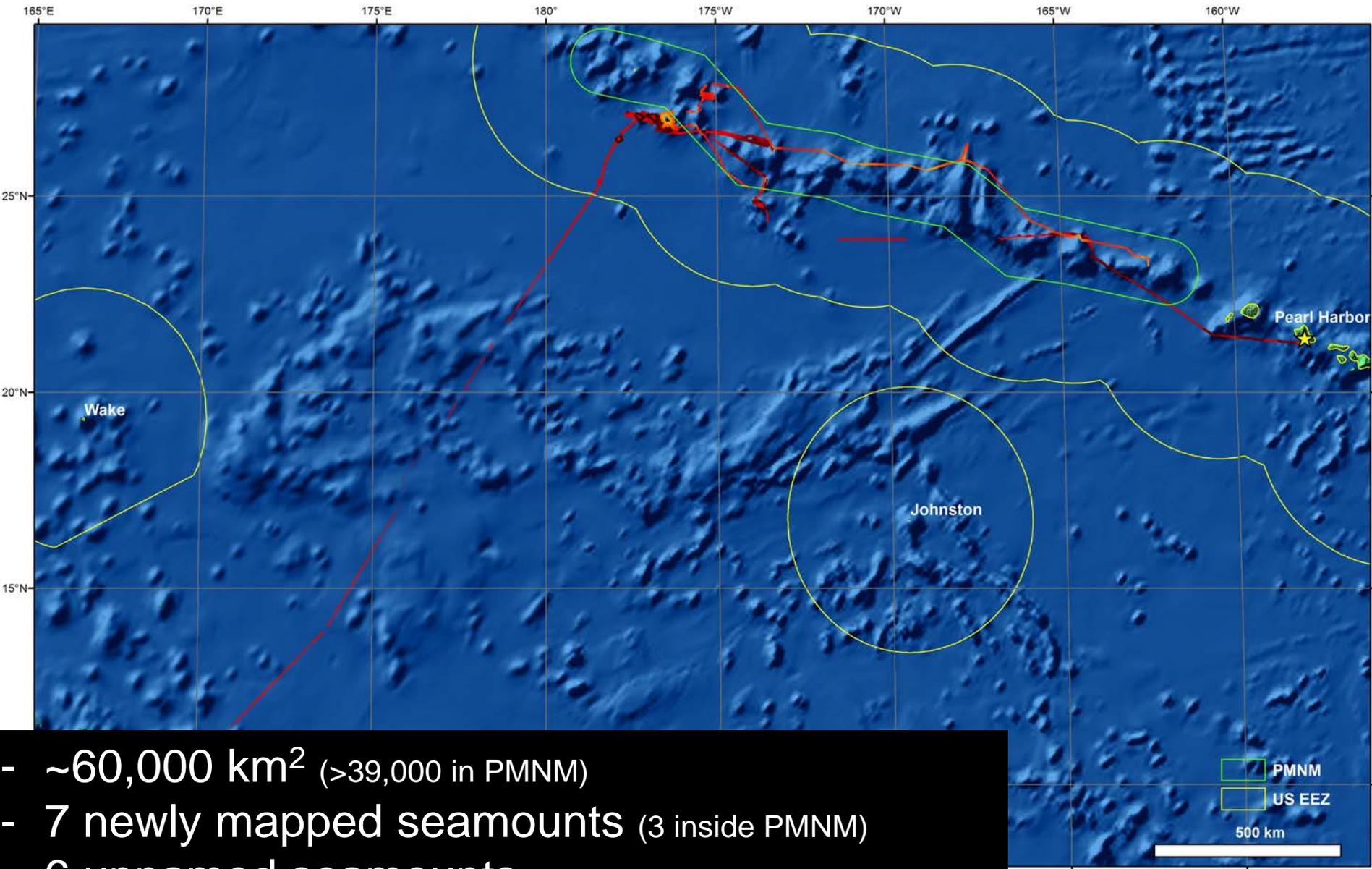


- 447 different animals
- ~25% are new to region
- Largest sponge in the world

Mapping

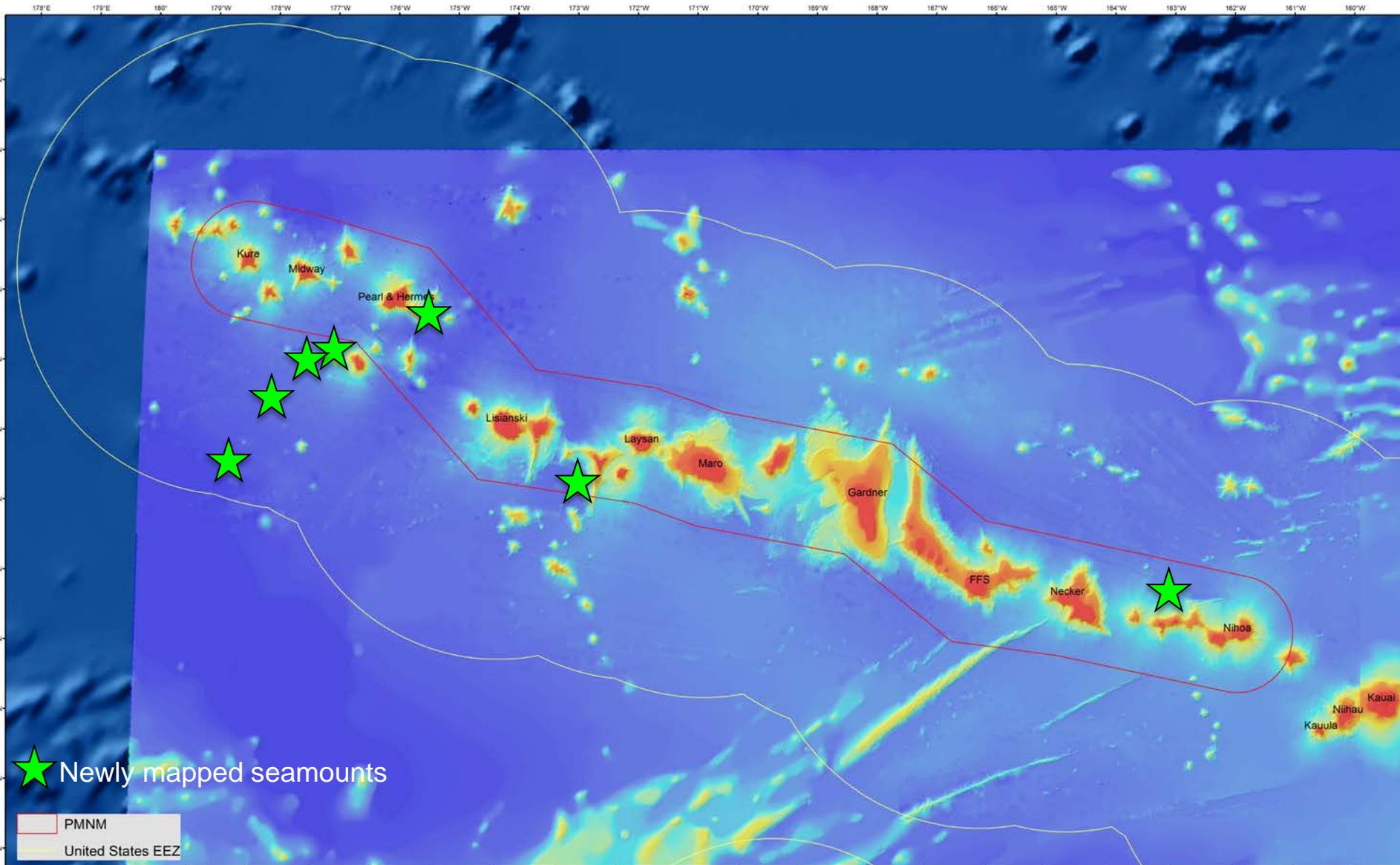


Mapping

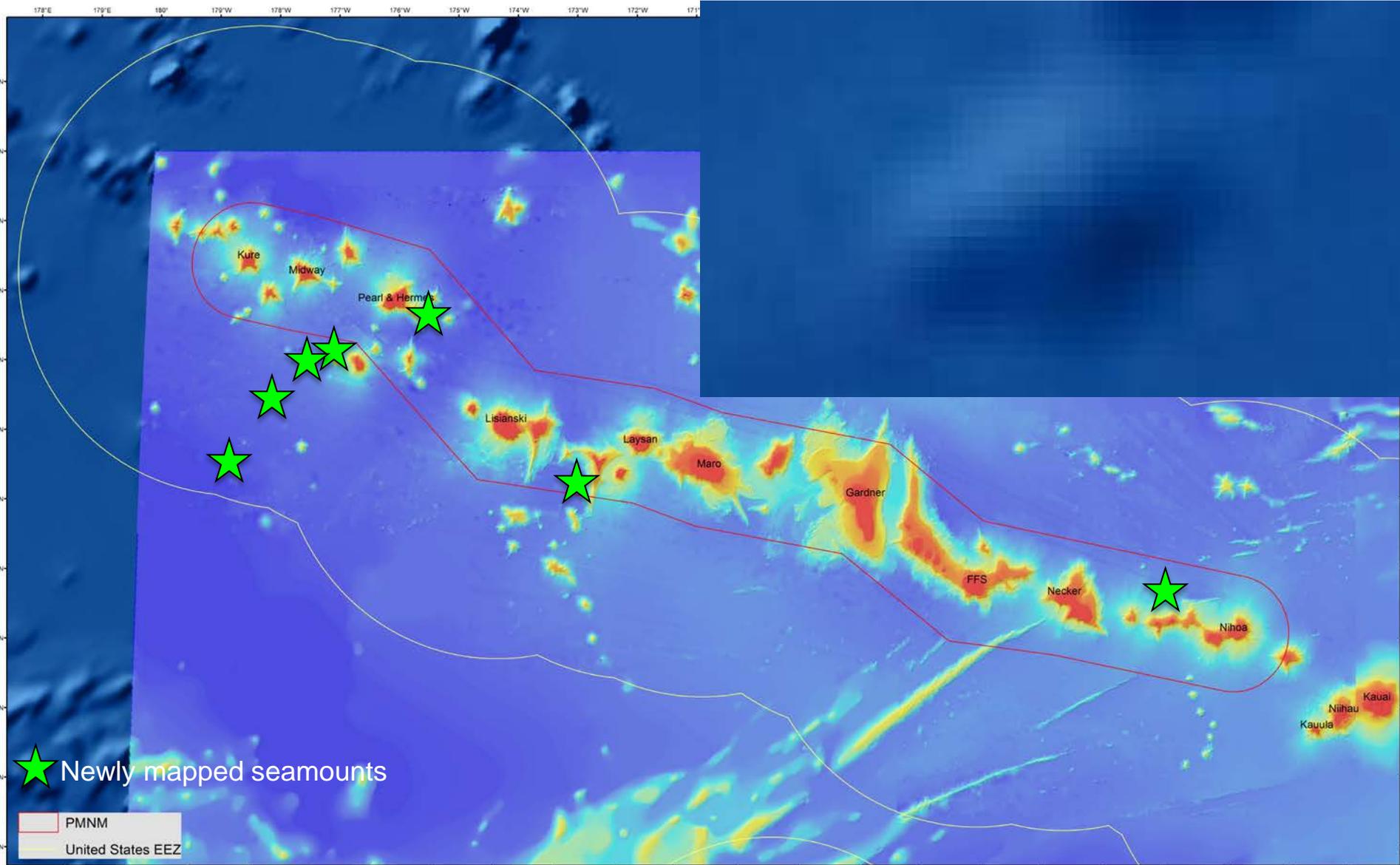


- ~60,000 km² (>39,000 in PMNM)
- 7 newly mapped seamounts (3 inside PMNM)
- 6 unnamed seamounts

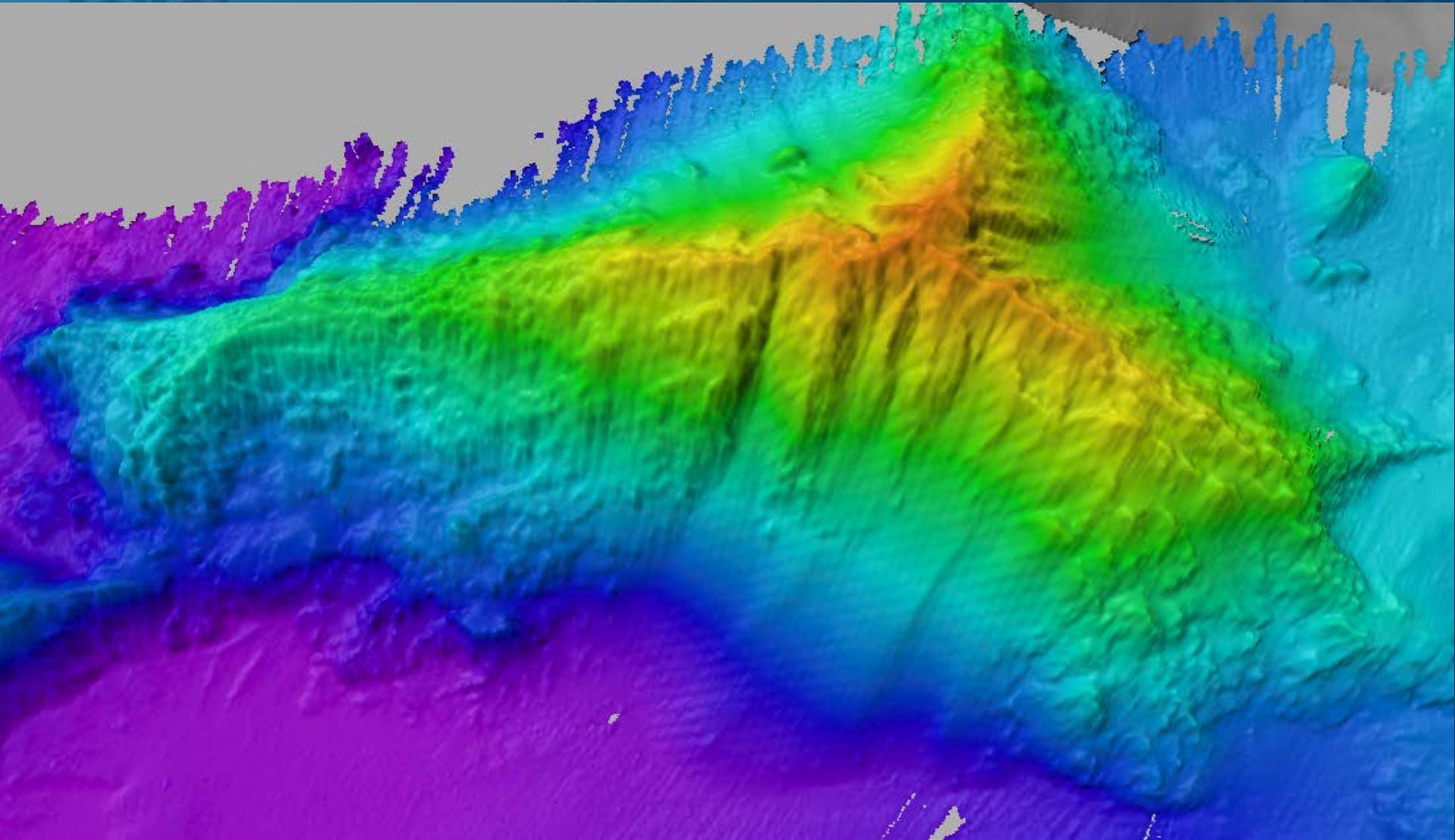
Newly mapped seamounts



Newly mapped seamounts

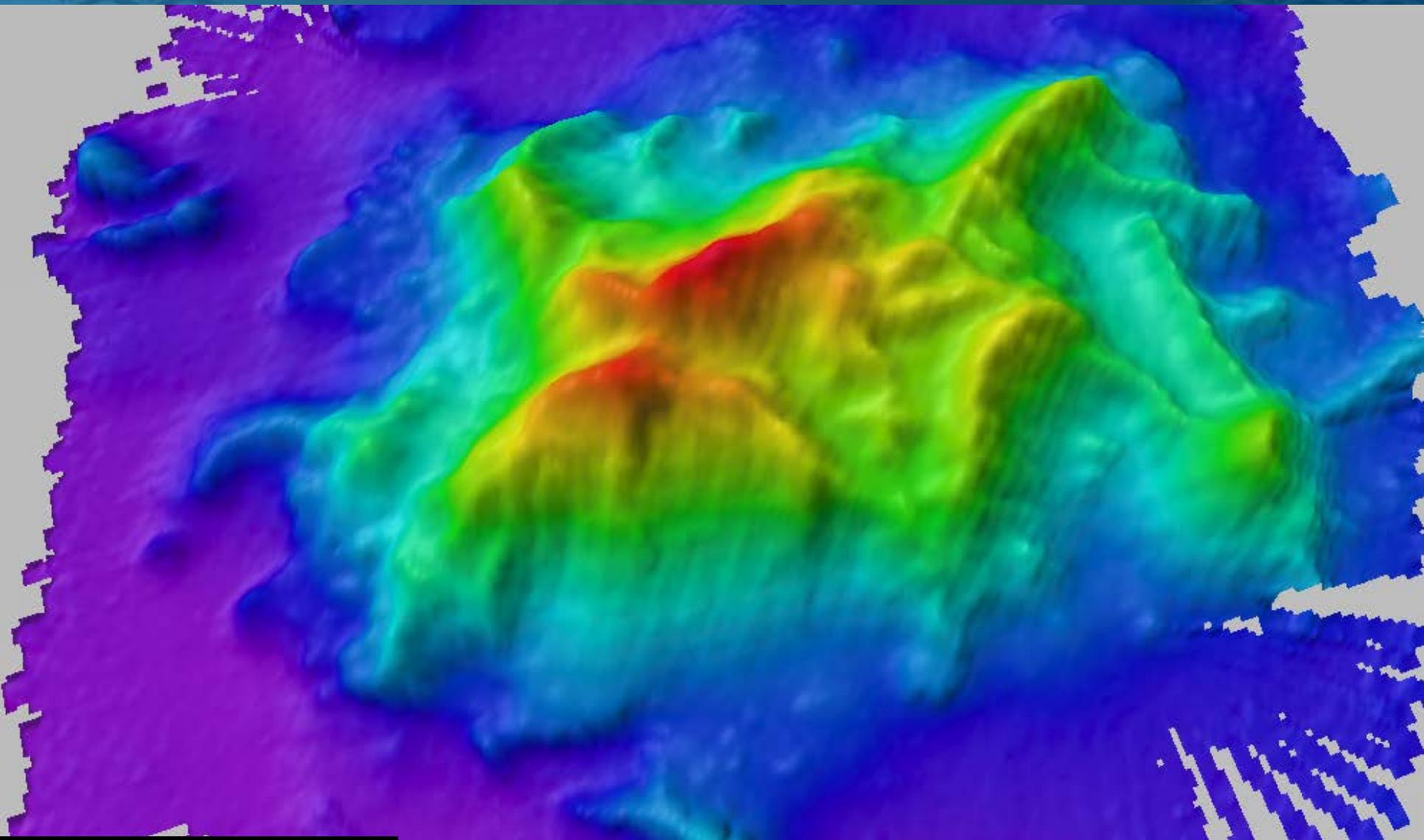


Newly mapped seamounts



~13,800 feet

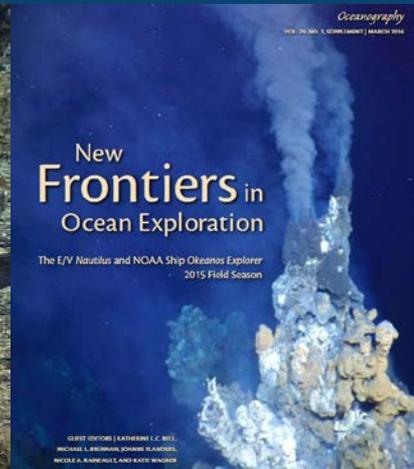
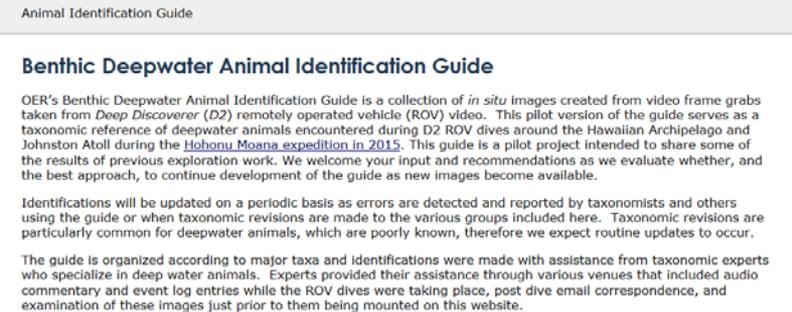
Newly mapped seamounts



~4,600 feet

Science Highlights

- 26 ROV dives (700-4800 m+, deepest dives in PMNM)
- >17 km of deep-sea seafloor surveyed during 137 hours
- Discovered 10 new high-density communities
- Extended range of 3 previously known high-density communities
- Surveyed high-density communities include deepest and largest in the world
- Imaged 447 different animals (~25% new to region)
- Mapped over 60,000 km² of seafloor (2/3 inside PMNM)
- Mapped 6 seamounts for the first time (3 inside PMNM); these do not yet have names
- One peer-reviewed article summarizing results published; another article in review
- Published online deep-sea animal identification guide
- First-ever specimen collections by *Okeanos Explorer*
 - Collected 49 biological samples (all new species or new records)
 - Collected 45 geological samples
- Over 40 shore-based scientists participated regularly
- All data is publicly available



Media coverage



Outreach and Education Highlights

- Over 800 media stories published
- Live video feeds received over 550,000 views
- Live video feeds streamed at Waikiki Aquarium, Mokupapapa Discovery Center, Maui Ocean Center and Aquarium of the Pacific
- Two new exploration command centers brought online (UH, IRC)
- 2015 expedition featured as cover story of Honolulu Advertiser
- 2016 expedition featured on Discovery Channel's show *Daily Planet* (>2 million viewers)
- Produced 40 highlight clips for outreach (all available online)



Mahalo!



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