

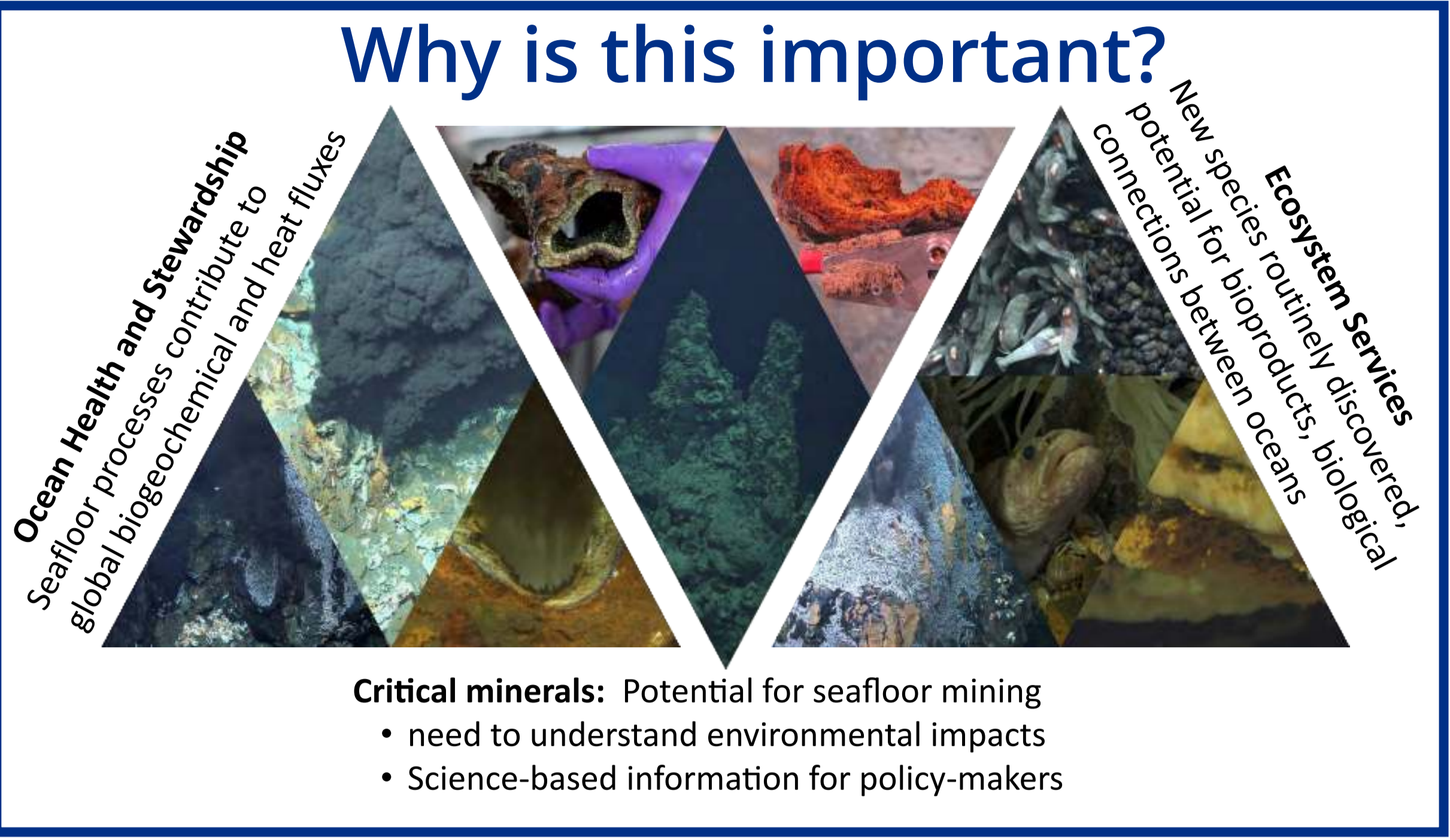
### Partnerships Accelerate Discovery with Innovative Exploration Methods

The seafloor is underexplored. With limited ship and deep-sea vehicle resources, we need strategic partnerships and innovative methods to accelerate discovery and characterization of new biological communities, critical mineral resources, and to advance integrated models of ocean biogeochemical cycles and biological connectivity.

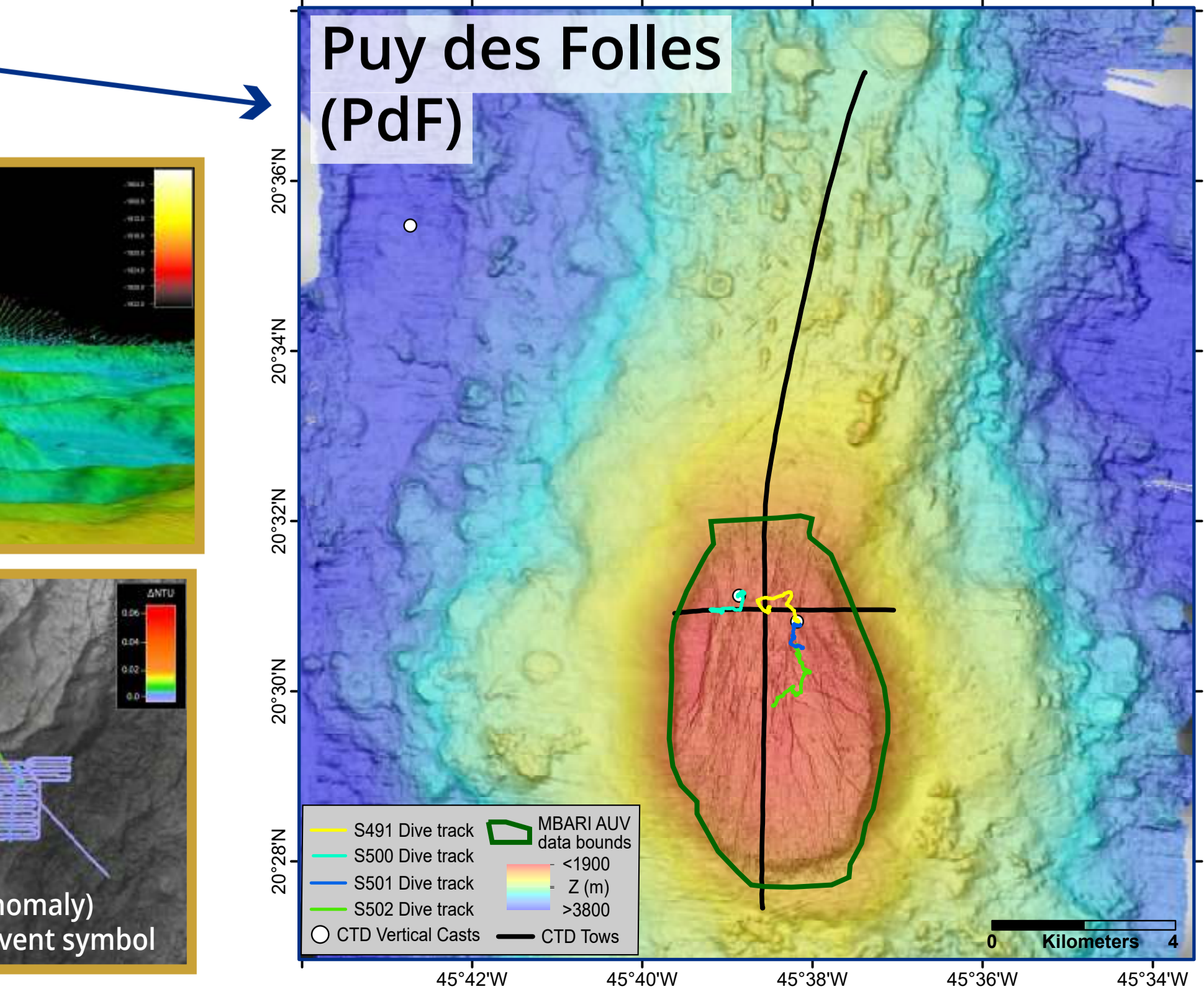
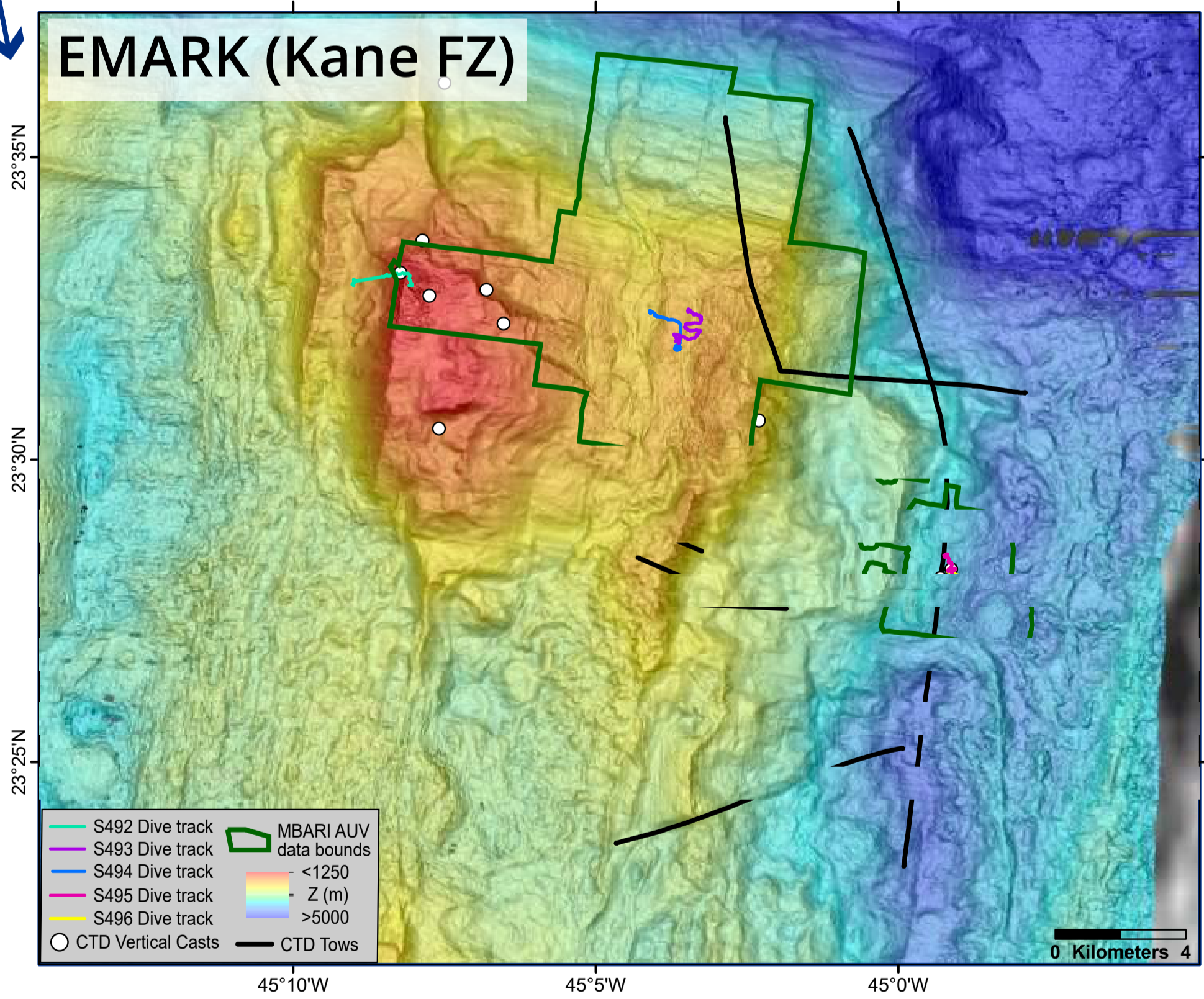
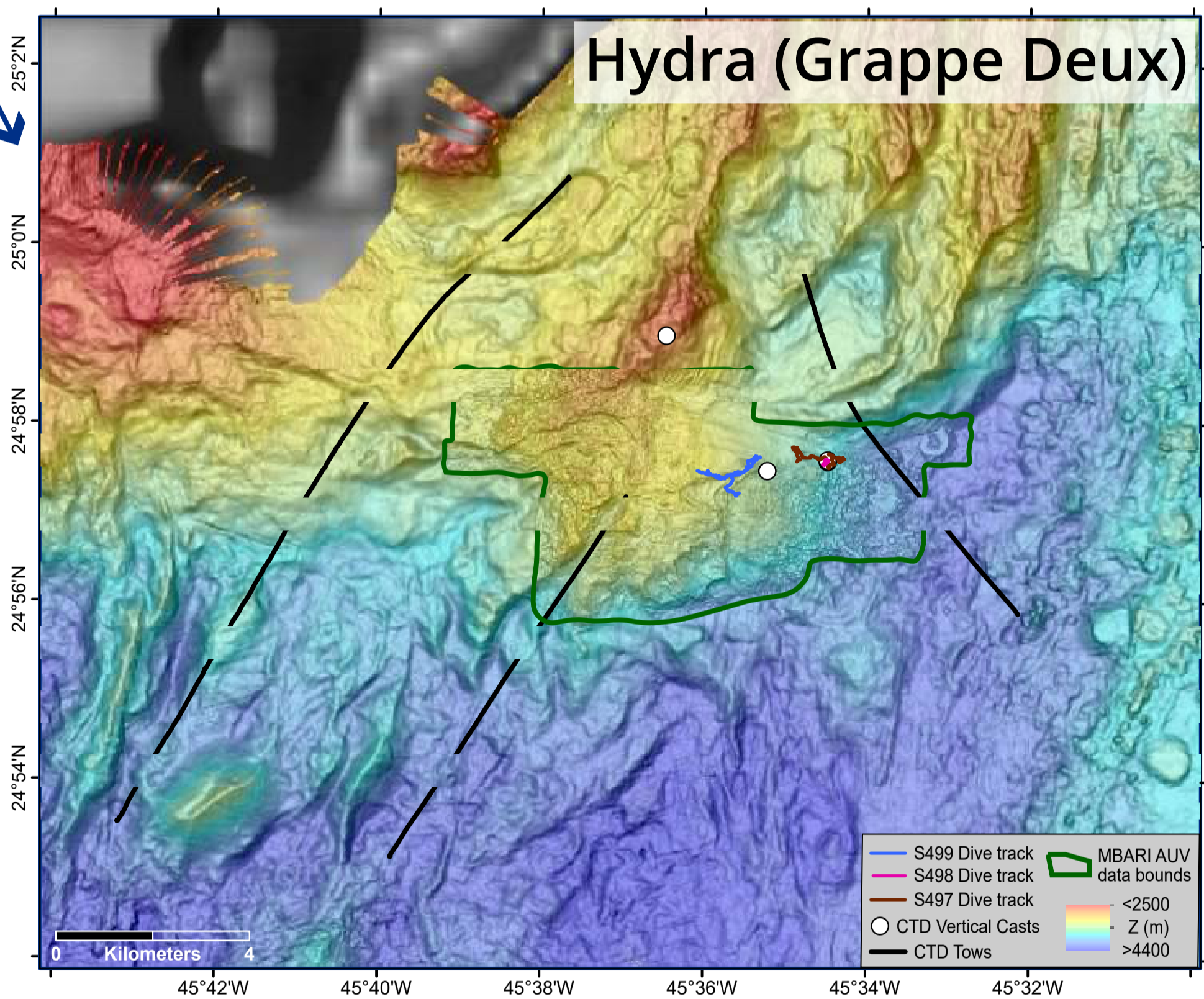
PMEL Earth-Oceans Interactions Program (EOI) led a multi-institution, international exploration of Oceanic Core Complexes on the Mid-Atlantic Ridge. With funding from Schmidt Ocean Institute (SOI), NOAA Ocean Exploration (OE), PMEL, MBARI, and the Ocean Exploration Cooperative Institute.

This expedition:

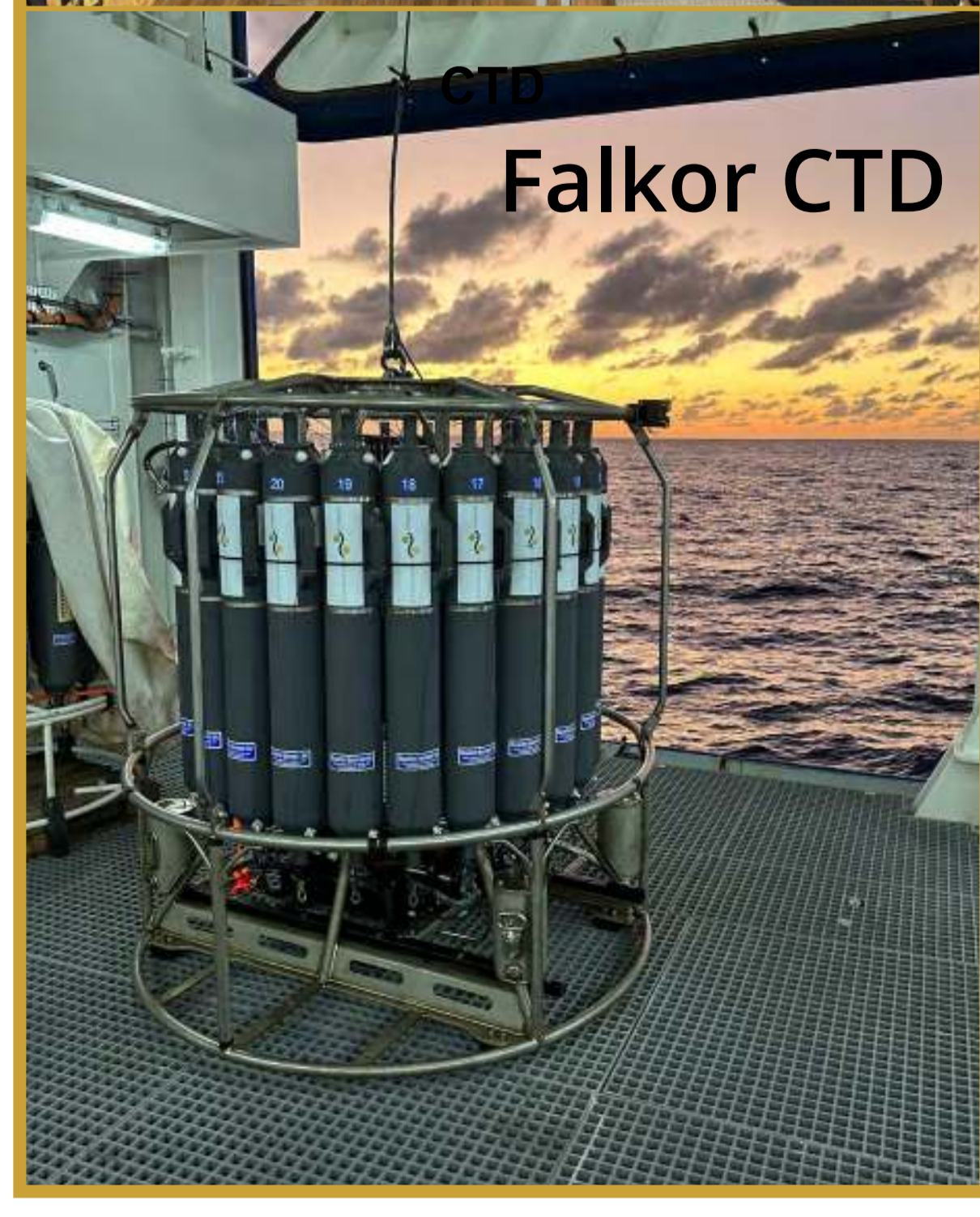
- Combined ship- and AUV-mounted multi-beam sonar, chemical and particle sensors, CTD tows and casts, and shipboard analysis of dissolved CH<sub>4</sub> and H<sub>2</sub> for rapid identification of targets for ROV dives.
- Conducted ROV geological transects, found active vents, sampled rocks, fluids, and fauna.
- Live-streamed seafloor ROV video via SOI YouTube and conducted outreach events in English and Spanish.
- Mapped 14,000 km<sup>2</sup> of seafloor at 25-m resolution with Falkor (too) EM124 and 170km<sup>2</sup> at 1-m scale with two MBARI AUVs equipped with chemical sensors and magnetometers.
- Found new hydrothermal systems in three areas.
- Collected over 100 vent fluid samples for gas and non-volatile chemistry; 120 rocks of basalt, ultramafic, and metal sulfide composition; invertebrate macro- and meio-fauna from all sites; eDNA, microbes, and virus samples.
- Provided shipboard research experience and mentorship to graduate students and early career scientists.
- Provides a model for future, accelerated exploration and discovery in a single expedition.



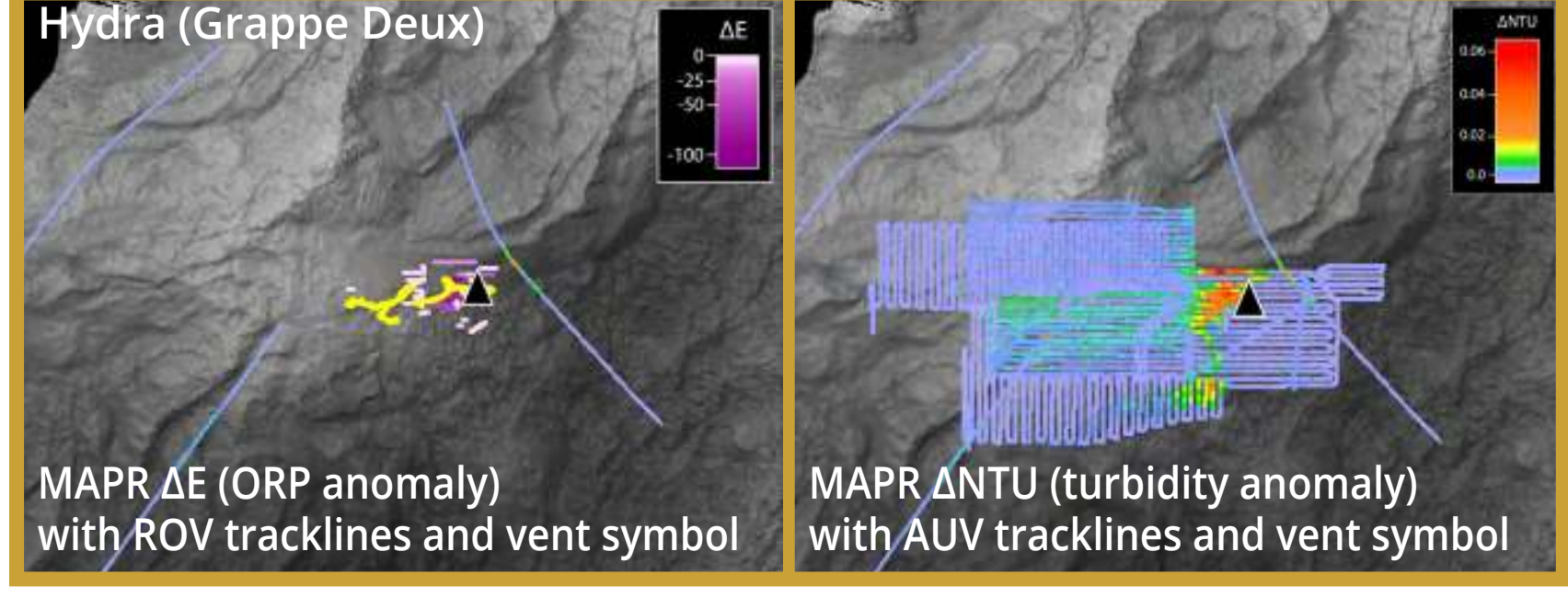
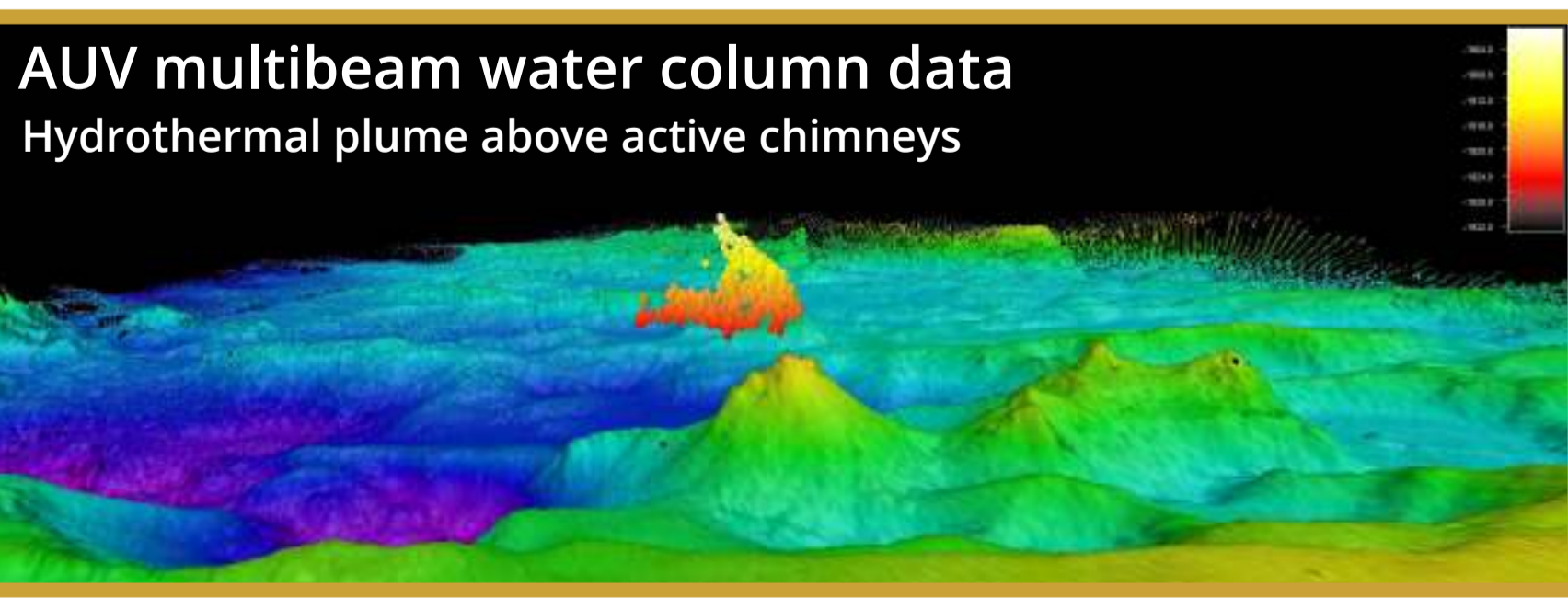
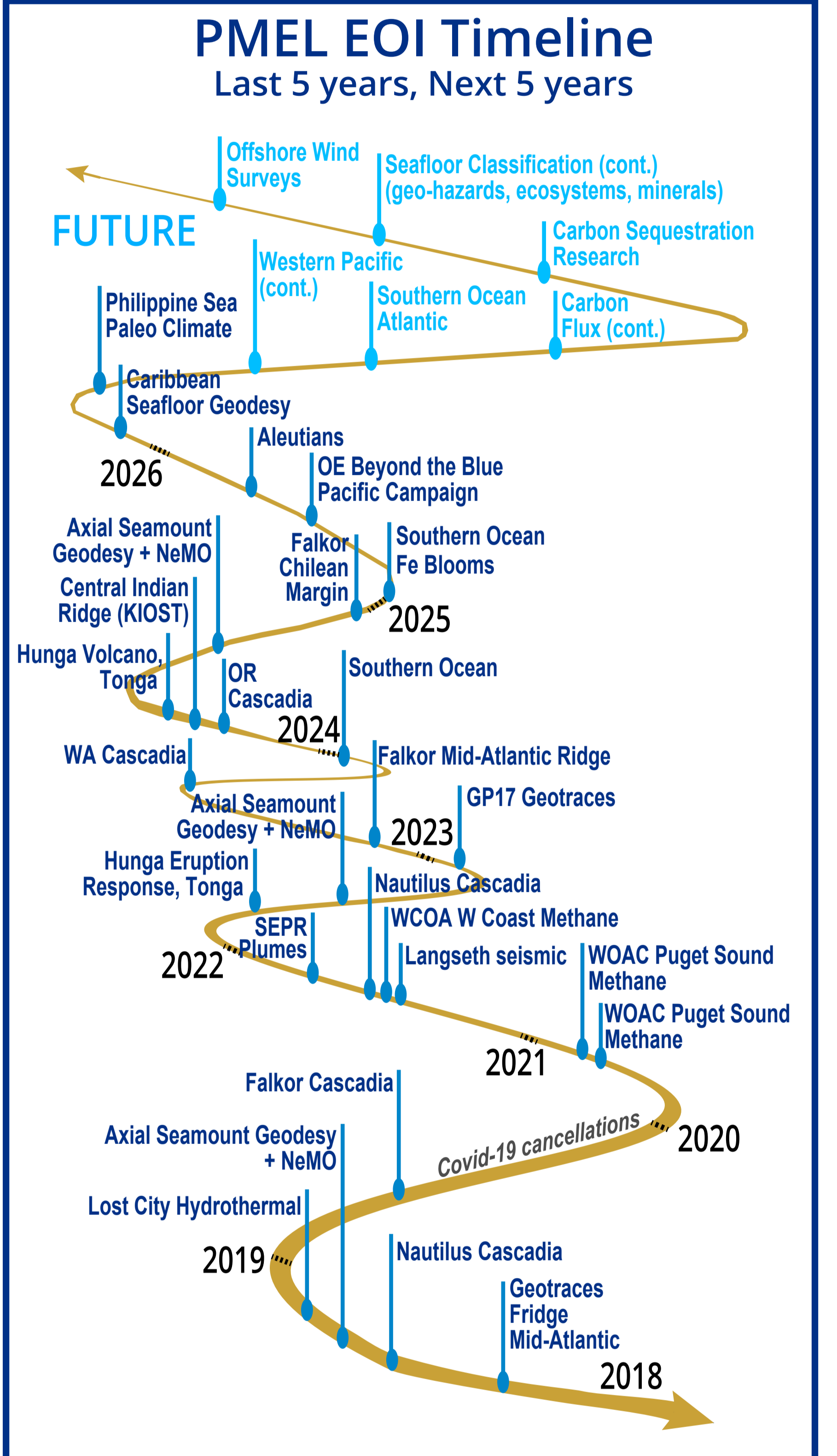
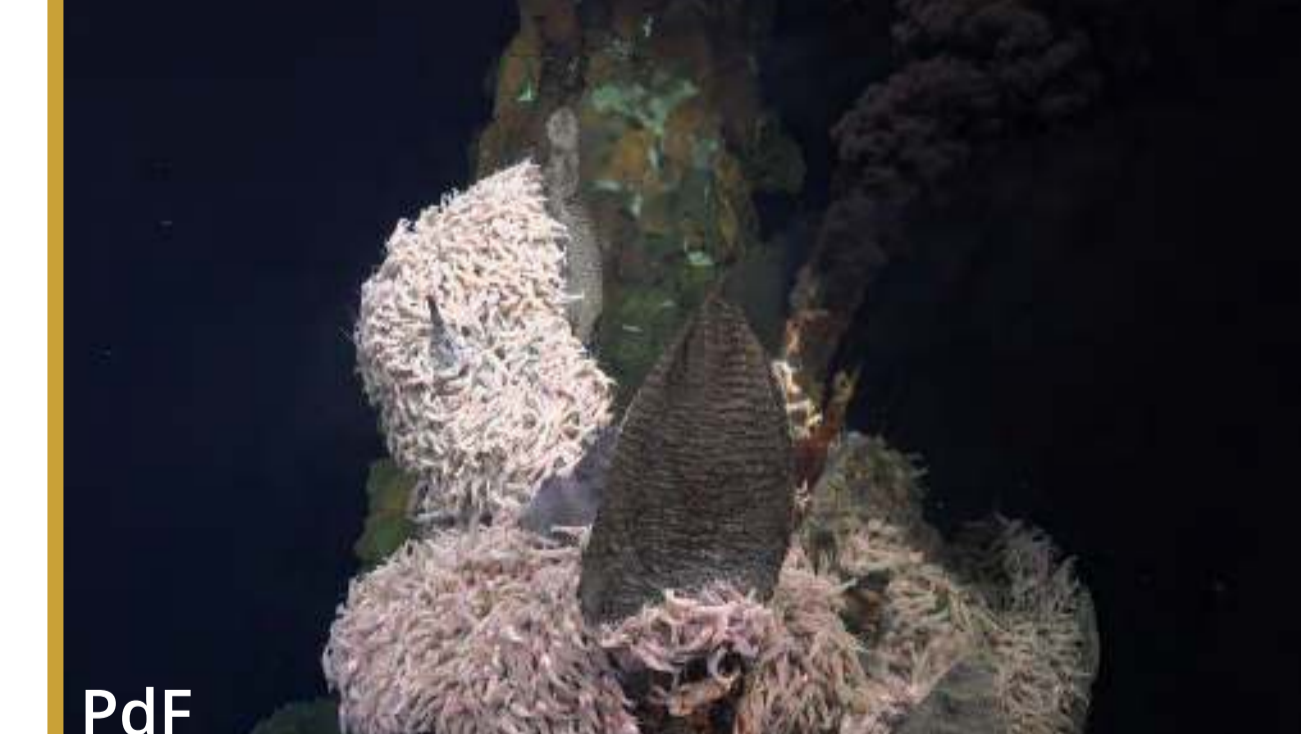
## Operations Areas



## Technology



## Seafloor Images



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<sup>†</sup>Program Leader, <sup>††</sup>Poster compilation

**MAR Expedition Collaborators:** Pacific Marine Environmental Lab, Schmidt Ocean Institute, NOAA Ocean Exploration Program, Univ. of Washington CICOES Program, Oregon State Univ CIMERS Program, Monterey Bay Aquarium Research Institute (MBARI) and many more

Huge thank you to the amazing Falkor (too) crew, marine techs, and ROV team for making the first science mission on their new ship a great success.