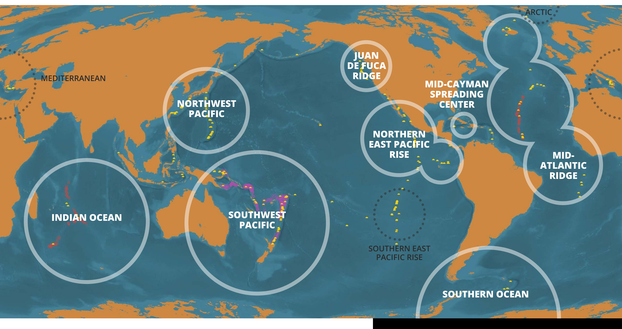
262 Voyages Beneath the Sea:
A global assessment of macro and megafaunal biodiversity and research effort at deep-sea hydrothermal vents

BACKGROUND

By reading the cruise reports from over 40 years of expeditions, we provide the first systematic assessment of **biodiversity at deep-sea hydrothermal vents** around the world adjusted for research effort.

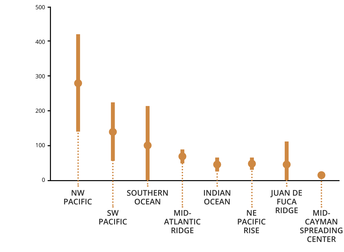
HYDROTHERMAL VENTS ACROSS THE GLOBE



FAMILY RICHNESS

We found that the **Northwest Pacific, Southwest Pacific, and Southern Ocean were regions of high biodiversity**, while the North East Pacific Rise, Northern East Pacific, Mid-Atlantic Ridge, and Indian Ocean provinces possessed a medium level of biodiversity relative to other vents systems, and the Mid-Cayman Spreading Center was a province of exceptionally low biodiversity.

FAMILY RICHNESS BY REGION



ICONIC SPECIES BY REGION
(IN ORDER OF RESEARCH EFFORT)

Mid-Atlantic Ridge: Blind vent shrimp

Northwest Pacific: Hairy snail and black snail

Southwest Pacific: Hairy snail and black snail

Juan de Fuca Ridge: Tubeworm

Northern East Pacific Rise: Giant deep-sea tubeworm

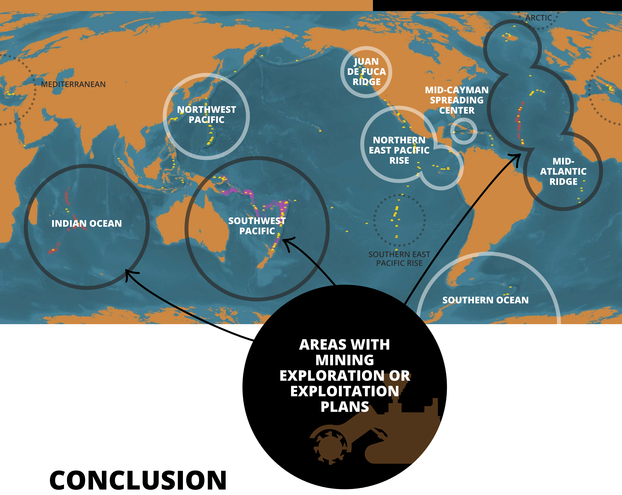
Mid-Cayman Spreading Center: Eyeless shrimp

Indian Ocean: Scaly-foot snail

Southern Ocean: Yeti crab

DEEP-SEA MINING LOCATIONS

A North/South divide exists between biological research and targets of hydrothermal vent mining, with research predominately happening in the northern hemisphere while exploitation overwhelmingly planned for the southern hemisphere.



CONCLUSION

We study hydrothermal vents ecosystems in the northern hemisphere, but we're planning to mine hydrothermal vent ecosystems in the southern hemisphere. Because of that, **we have a relatively poor understanding of the ecology of the vent systems most threatened by deep-sea mining**.

Image credits:
Hydrothermal vent chimney: Schmidt Ocean Institute
Blind vent shrimp: Station Biologique de Roscoff
Hairy snail and black snail: Ridge 2000 program
Tubeworm: Verena Tunnicliffe
Giant deep-sea tubeworm: NOAA Ocean Exploration and Research
Eyeless shrimp: NOAA Ocean Exploration and Research
Scaly-foot snail: Nakamura, K. et al. (2012). "Discovery of New Hydrothermal Activity and Chemosynthetic Fauna on the Central Indian Ridge at 18°–20°S". PLoS ONE 7(3): e32965. doi:10.1371/journal.pone.0032965 Figure 5B. doi:10.1371/journal.pone.0032965.g005. CC BY 2.5, https://commons.wikimedia.org/w/index.php?curid=49055374
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