

R/V Roger Revelle RR2102

24 Mar - 25 Apr 2021

Team Geology, Co-Chief Scientist: Dan Fornari

Team Biology, Co-Chief Scientist: Lauren Mullineaux



RUTGERS



WOODS HOLE
OCEANOGRAPHIC
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NSF-OCE 1948580: The Predictive Nature of Microbial Biofilms for Cuing Larval Settlement at Deep-Sea Hydrothermal Vents

Field Colonization Experiment @ 9° 50'N East Pacific Rise



WWU Postdoc, Tanika Lad



Co-PI, Lauren Mullineaux

Biofilm characterization

Statistical modeling

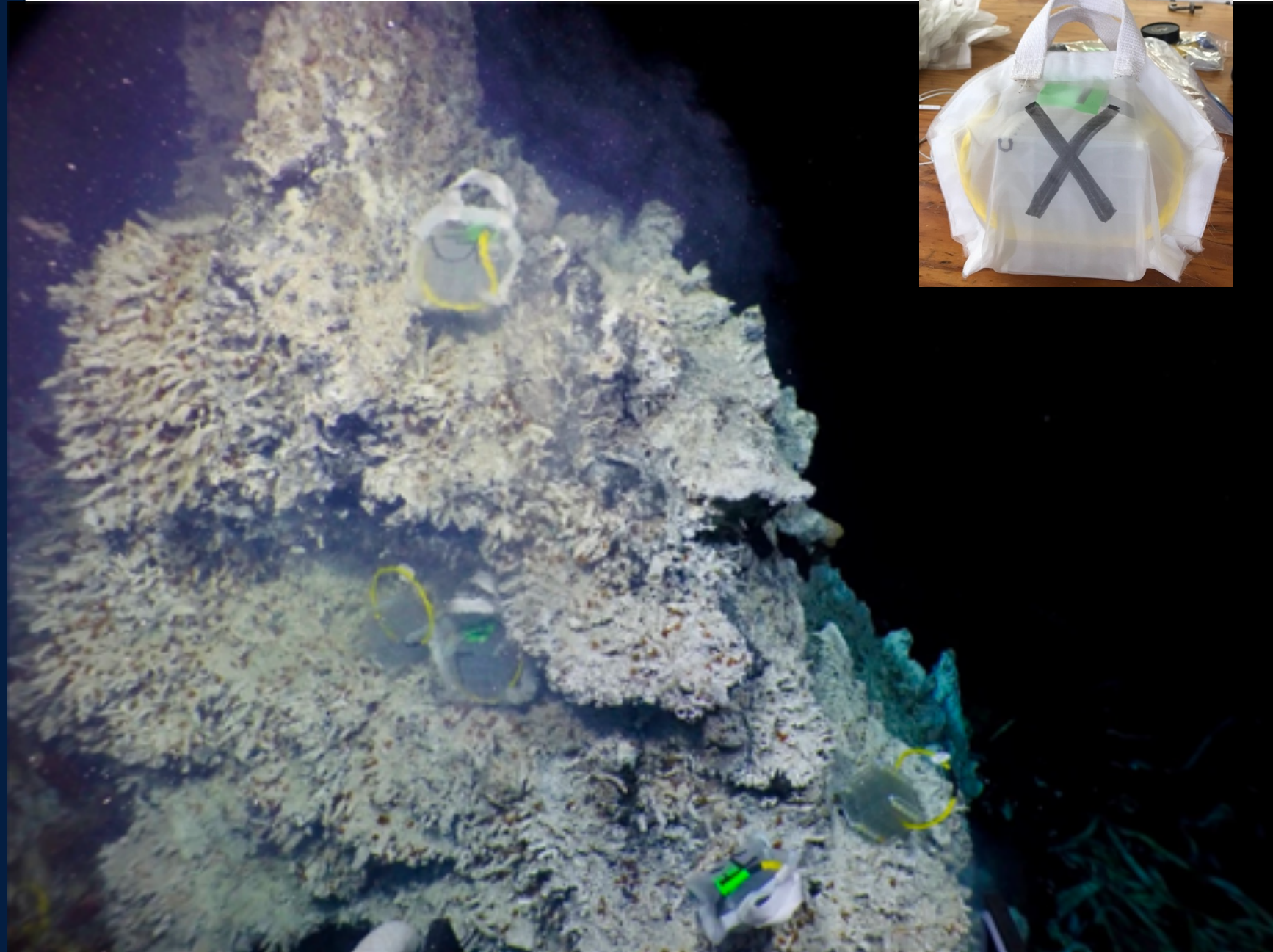
Shipboard Behavior Experiments



Co-PI, Costa Vetriani
collaborator, Donato Giovanelli

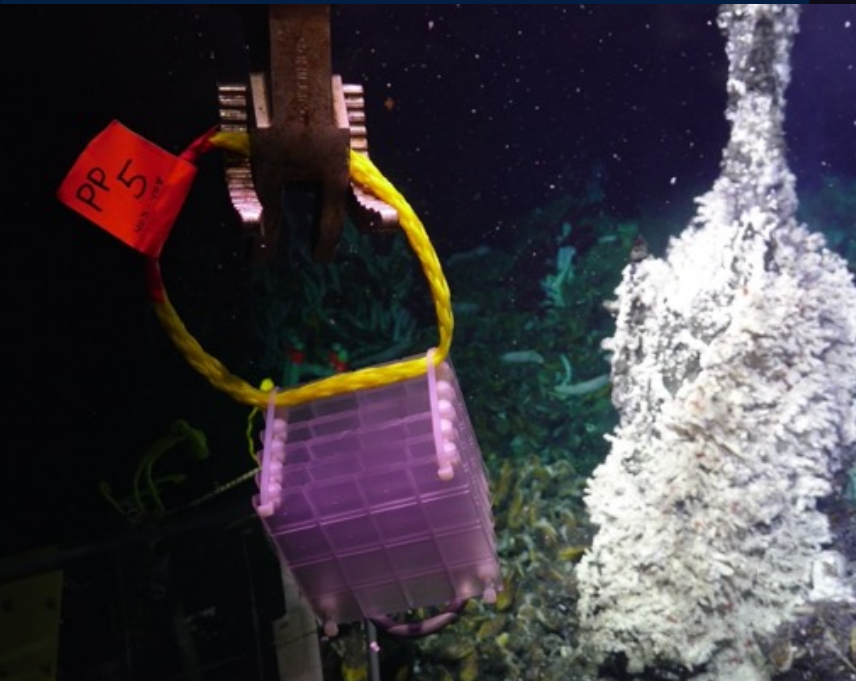
R/V Atlantis AT42-21
17 Dec 2019 - 07 Jan 2020
DSV Alvin

- 4 replicate “pursed” sandwiches
- 3 zones: Alvinellid, *Riftia*, mussel
- 2 sites: Tica, *Riftia* Mound

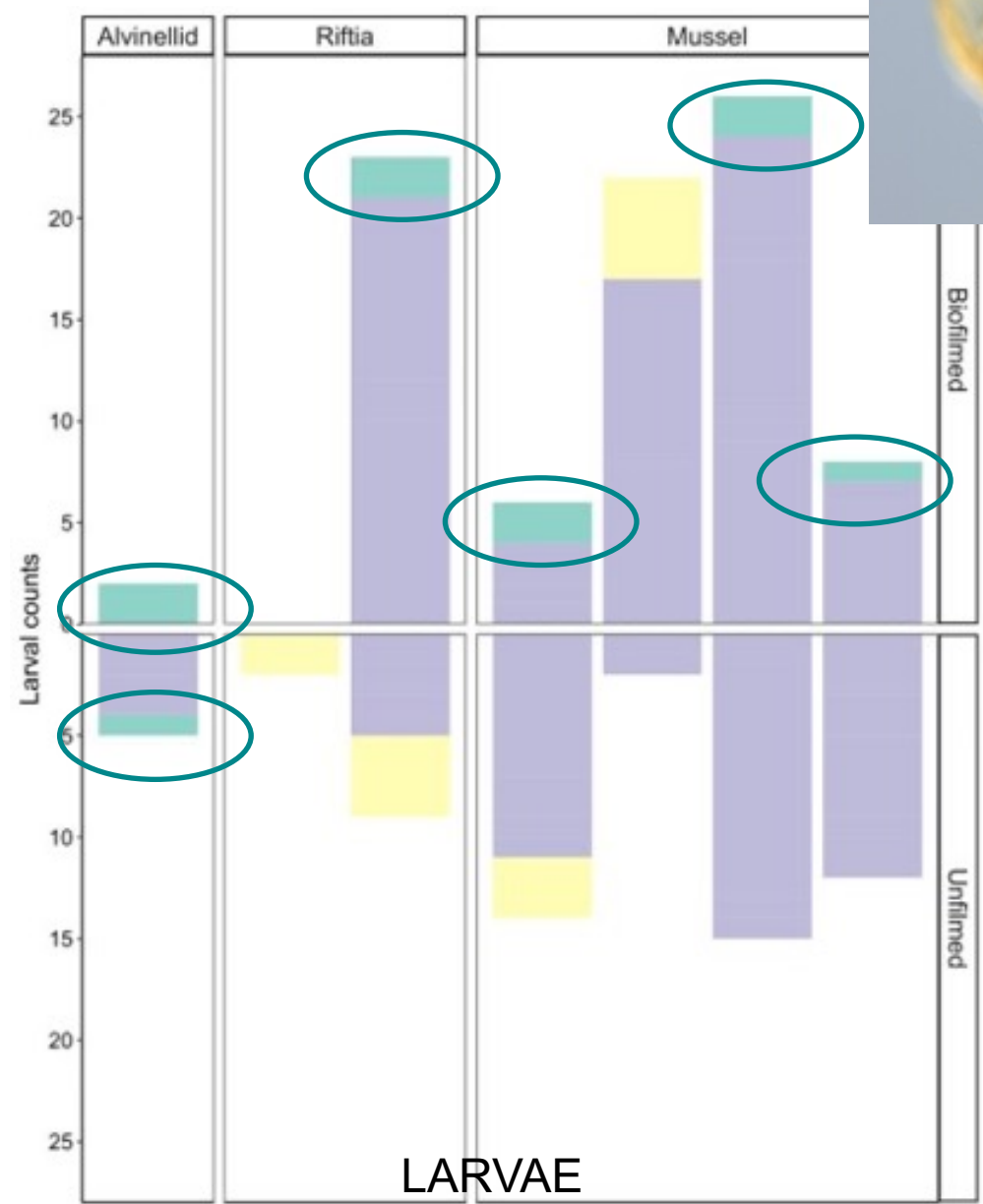
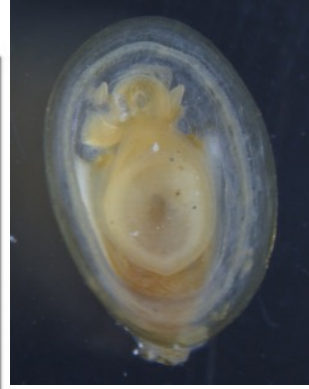
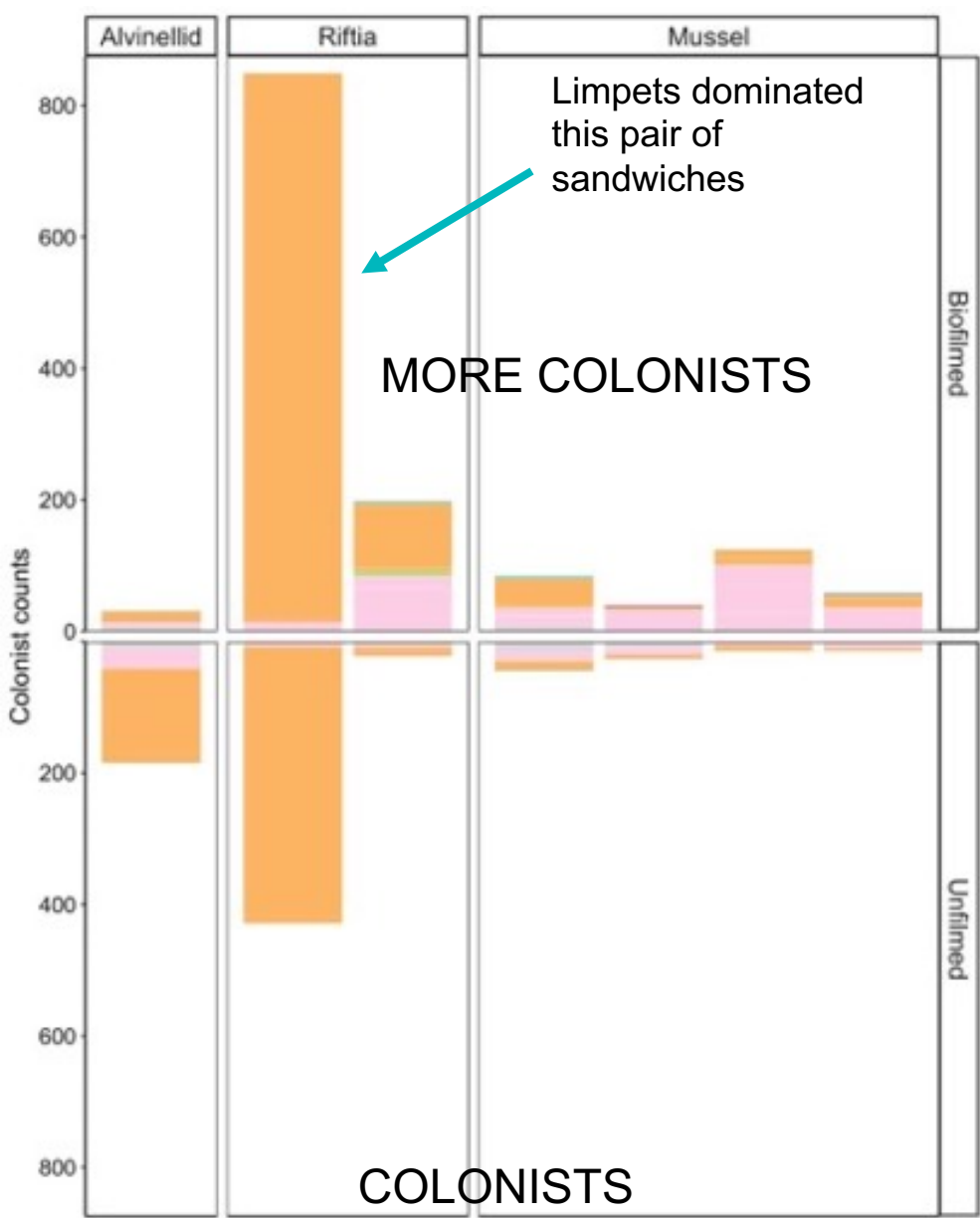
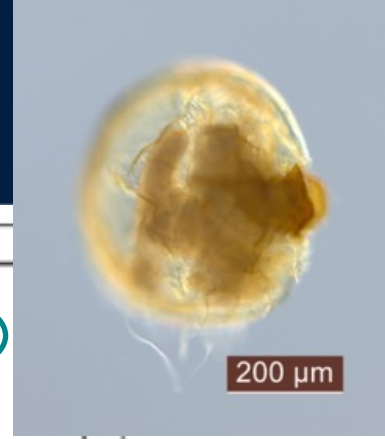


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Mar - 25 Apr 2021
ROV Jason

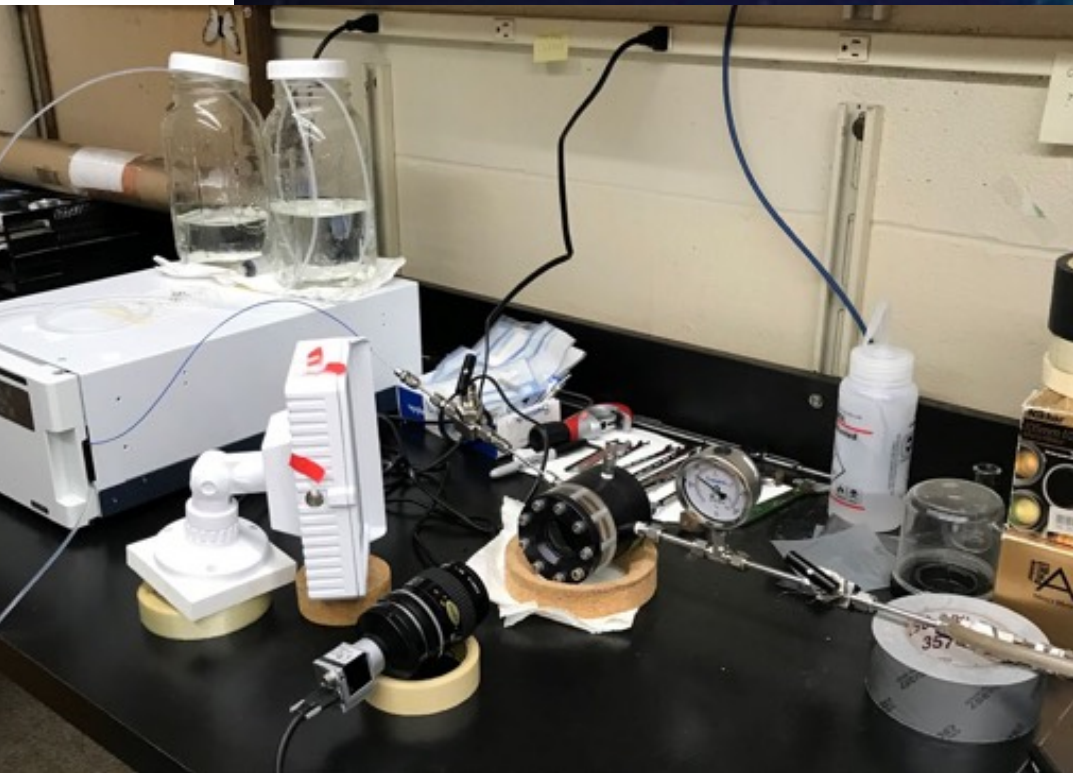
- “unzipped” all sandwiches
- Exposed to larval settlement
~2 weeks
- At Tica only:
 - 2 paired “naked” sandwiches per zone
 - 1 tube traps per zone



Pilot Results (credit: Tanika Ladd and Dexter Davis)



Larval Behavior



Distinct fauna on inactive sulfides contributes to biodiversity on the East Pacific Rise



Michael
Meneses



Ayinde
Best



Lauren
Dykman



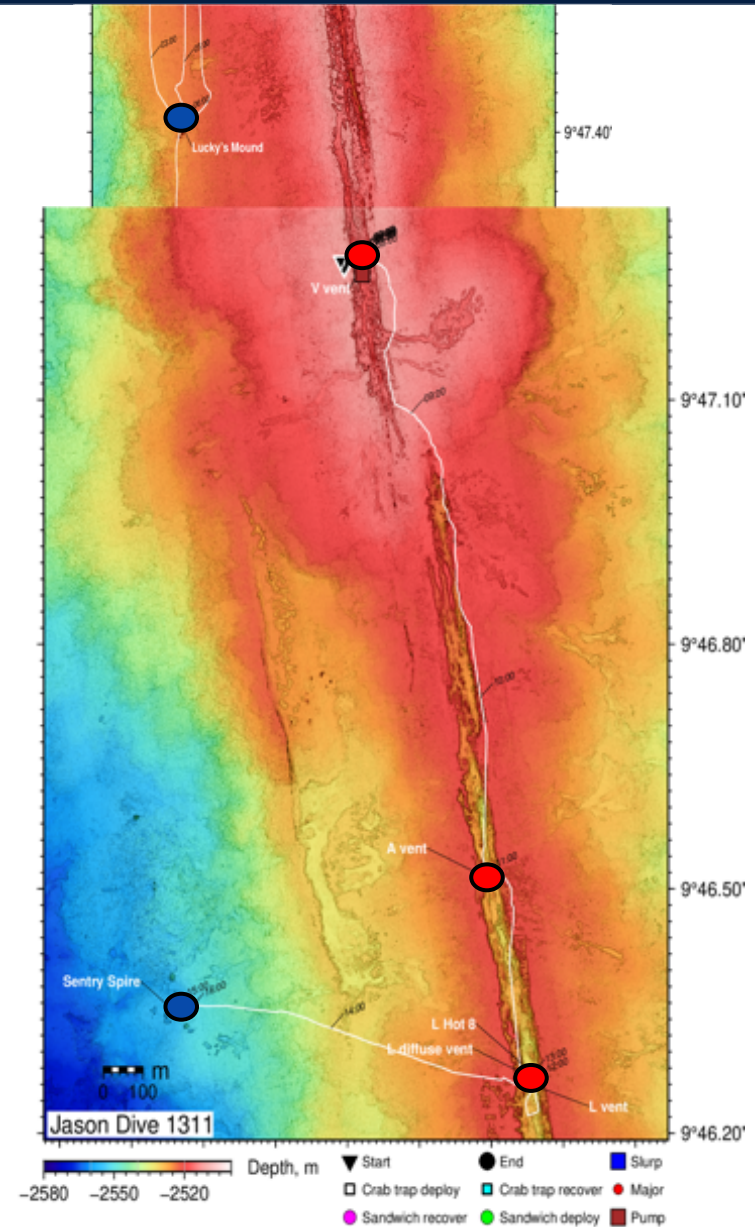
Susan
Mills



EPR well-studied for active hydrothermal vents, but many unexplored inactive sulfides

Inactive sulfides occur at variable distance from the axial summit trough (AST). We explored two:

- **Lucky's Mound (discovered AT42-21)**
~500 m west of AST,
near V vent at ~9°47'N
- **Sentry Spire (discovered RR2102)**
~800 m west of AST,
near L vent at ~9°46'N



Methods to explore inactive features



ROV Jason
imaging an
active site

D. Fornari - MISO Facility
and WHOI-NDSF Jason Team

Megafauna

1. Down-looking, high-resolution (24 MP) still images* for manual annotation using ImageJ software
2. Oblique, HD (1080p) video for context
3. 4K video for close-ups
4. Sampling with manipulator

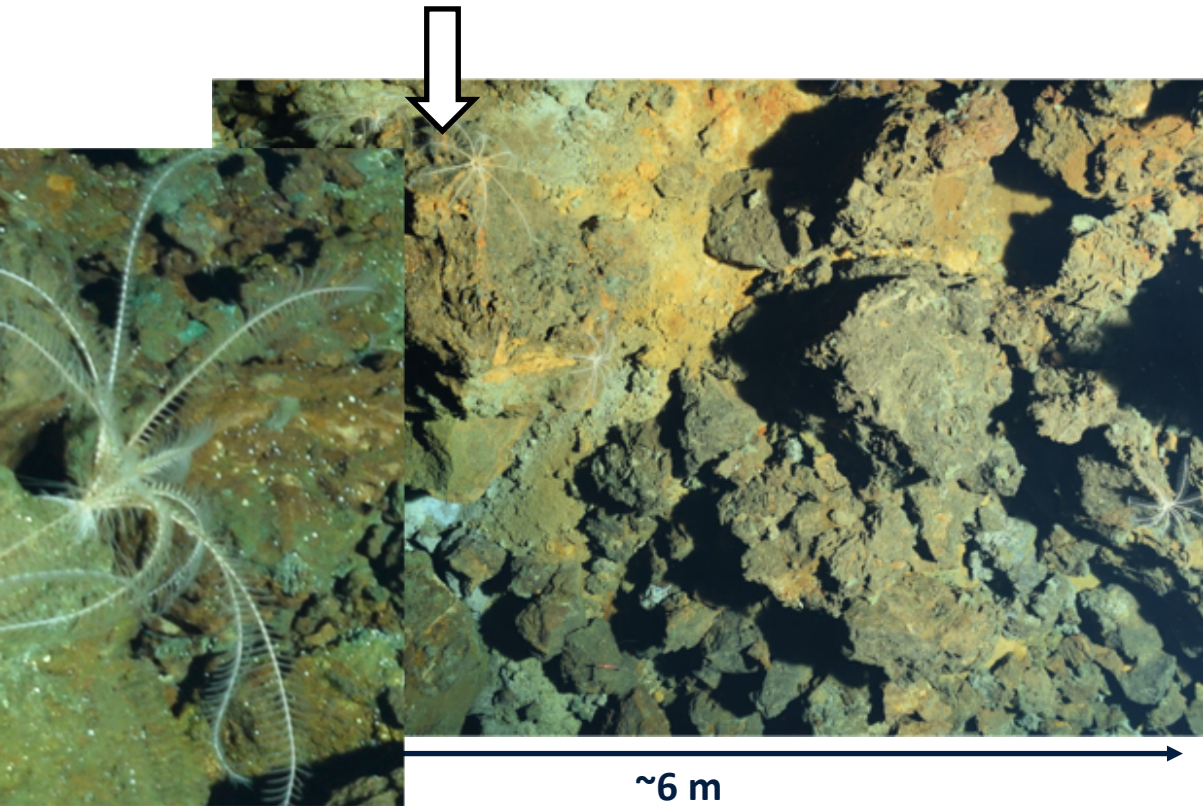
Macrofauna

* Ocean Imaging Systems (OIS) deep-sea digital camera - MISO Facility

Lucky's Mound megafauna

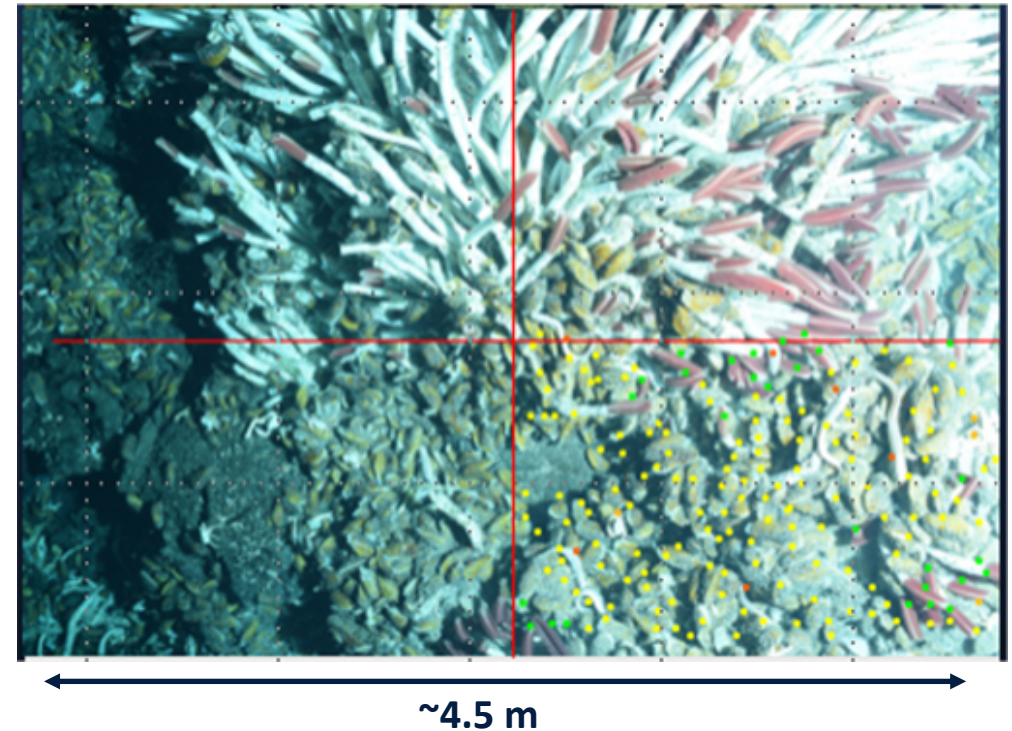
Biodiversity

Different species at
inactive vs. active vent



Functional traits

More feeding strategies at
inactive vs. active vent



| Sentry Spire macrofauna

No evidence yet for distinct megafauna taxa

Limpets (white dots) on Sentry Spire

Prior to this discovery, our group had only observed larvae, but not adults, in genus *Neolepetopsis*

