

# **An Overview of Multidisciplinary International Studies on Deep-Sea Reefs in the Gulf of Mexico with Preliminary Observations from Vioska Knoll**

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Lophelia II = DISCOVRE =  
**Diversity, Systematics, & Connectivity of  
Vulnerable Reef Ecosystems**

See: <http://fl.biology.usgs.gov/DISCOVRE/index.html>

A 4-year integrated approach by USGS and collaborators to understand organizing/structuring mechanisms and basic community ecology on continental slope habitats covering regional and ocean basin scales.

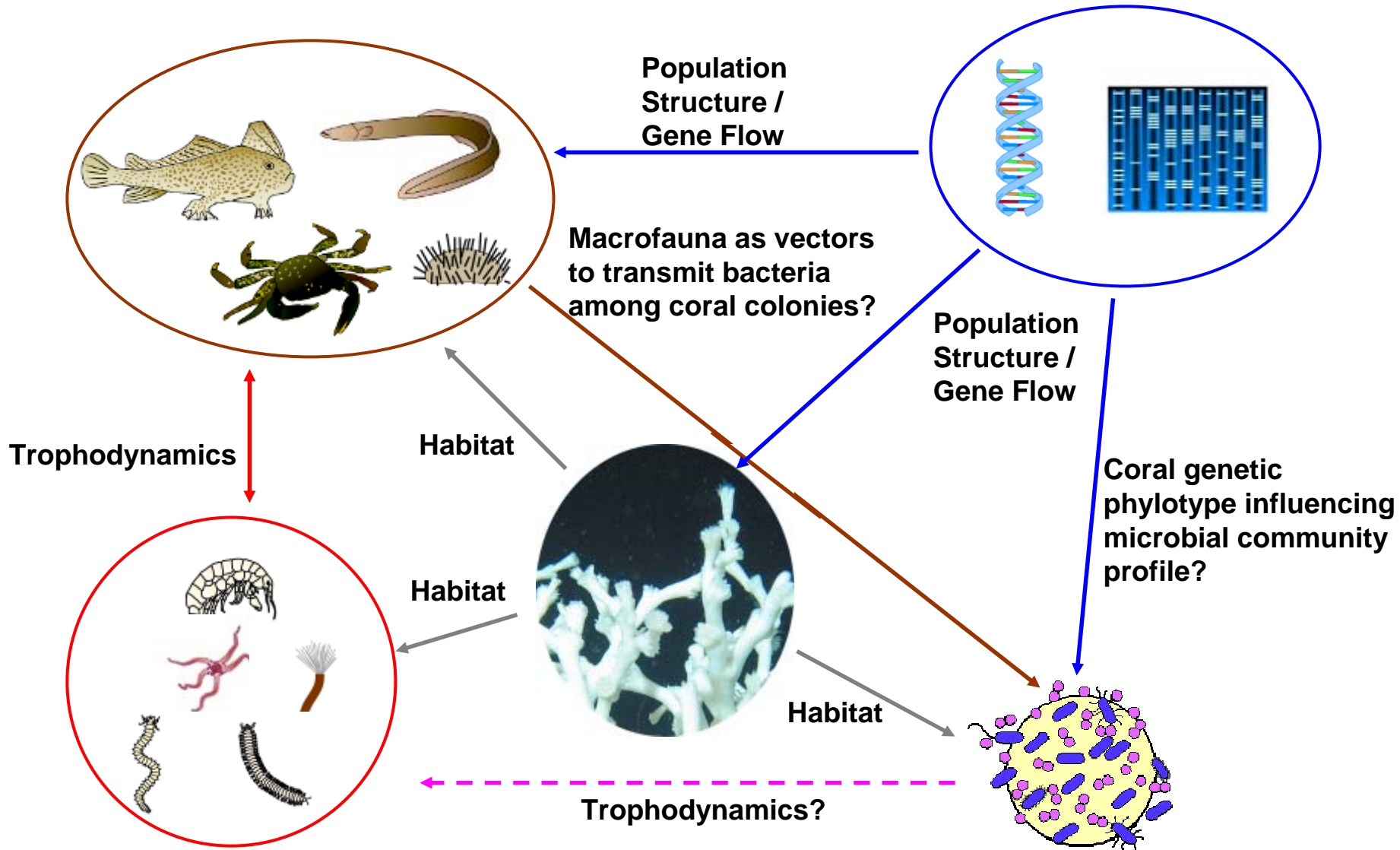
Coordinating with companion project funded by MMS.

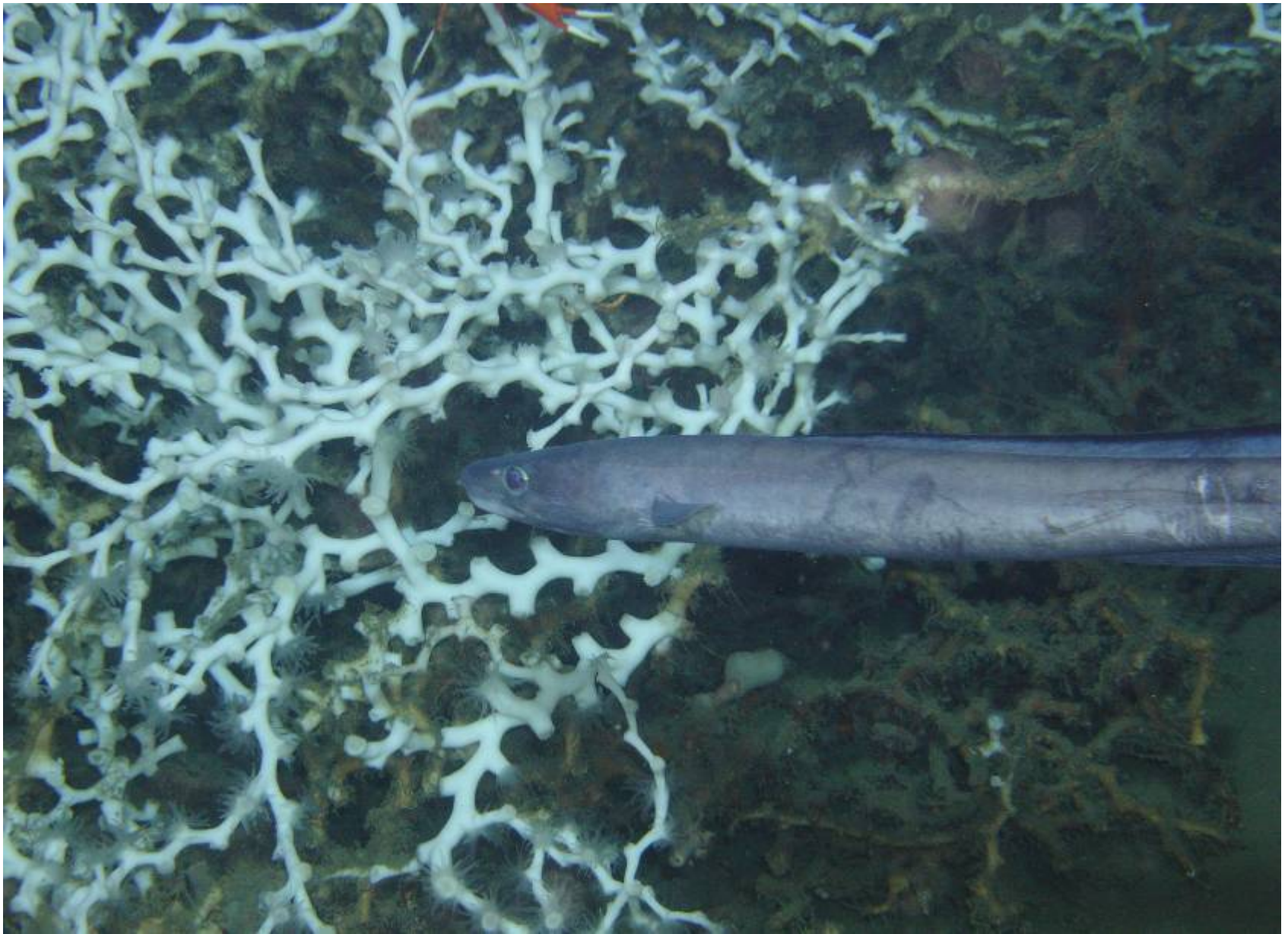
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# USGS TEAM STUDY TOPICS

- Community Structure & Diversity (by habitat, by region) - multiple targets (macrofauna, benthos) & approaches
- Population evaluation (structure, connectivity, relationships, taxonomy) – genetic approaches, emphasizing corals, but also other fauna
- Trophodynamics (benthic/demersal emphasis) – multiple approaches
- Microbiology – coral emphasis, + other fauna
- Habitat Discovery & Mapping
- Outreach/Education (field & later)

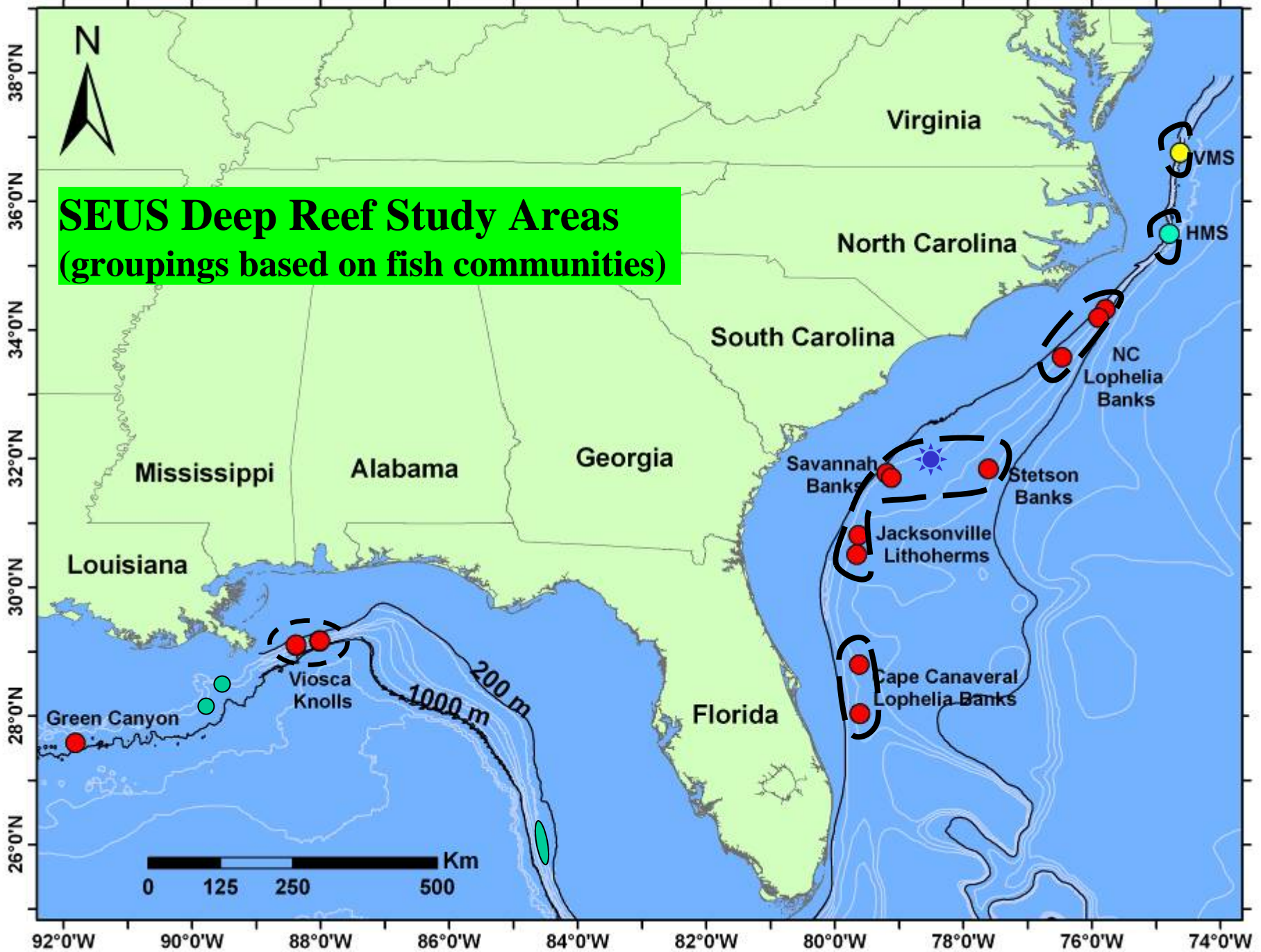
# Continuity & Diversity – Study Topic Interactions





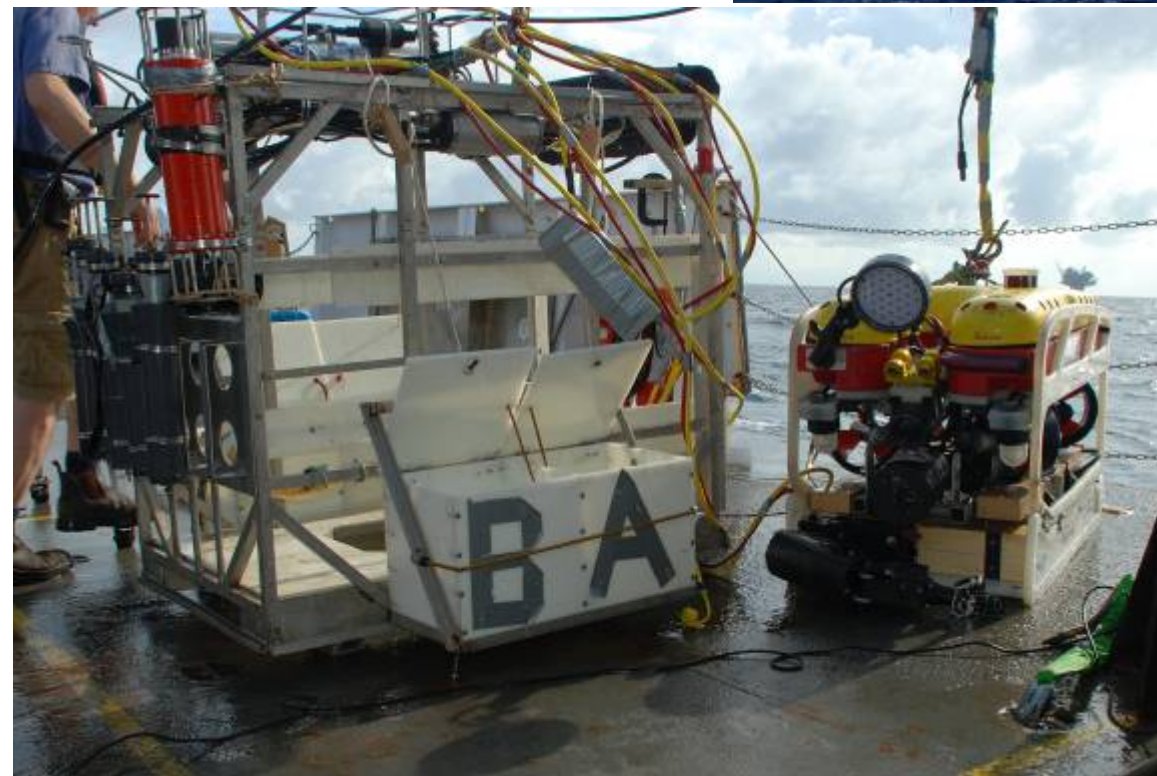
Note scarring on conger eel body. This fish may be a vector for transferring microorganisms between “hosts.”





## 2008 Field Plan:

19 days of NOAA vessel  
Nancy Foster time in  
Oct 08.



SeaVison provided  
the SeaEYE Falcon  
DR ROV

# 2008 DISCOVRE CRUISE

- LEG I (5–13 Oct 2008)
  - Benthic Lander Operations – short & long-term
  - ROV Operations – 10 hr daily ops when possible
  - Midwater & Benthic net sampling – mostly at night
  - CTD profiles – periodic transects and profiles
- LEG II (19–23 Oct 2008)
  - Multibeam sonar mapping: West FL slope



VK826

29°11'N

29°10'N

29°9'N

88°3'W

88°2'W

88°1'W

88°0'W

87°59'W

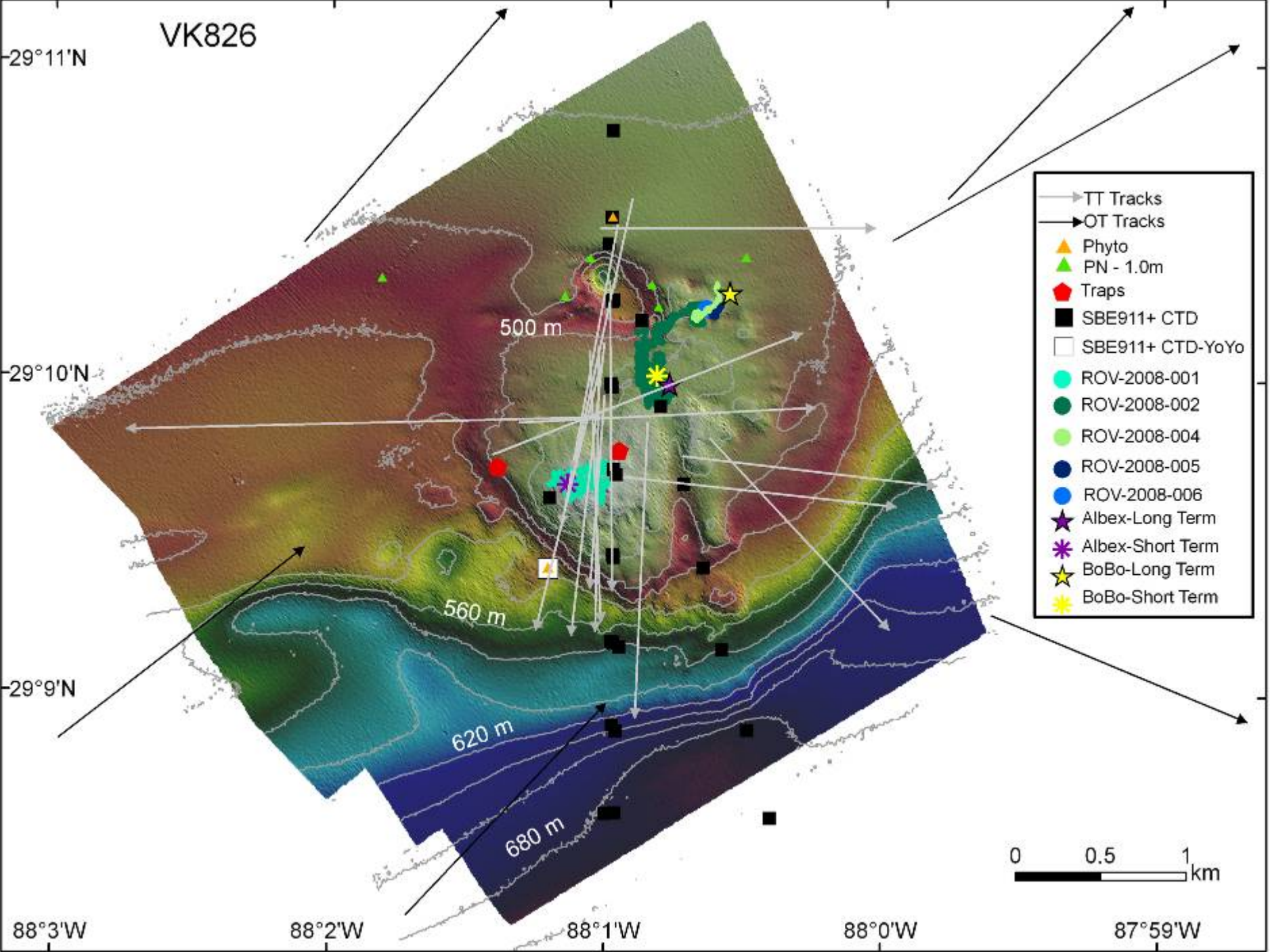
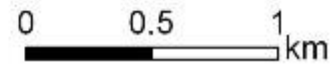
500 m

560 m

620 m

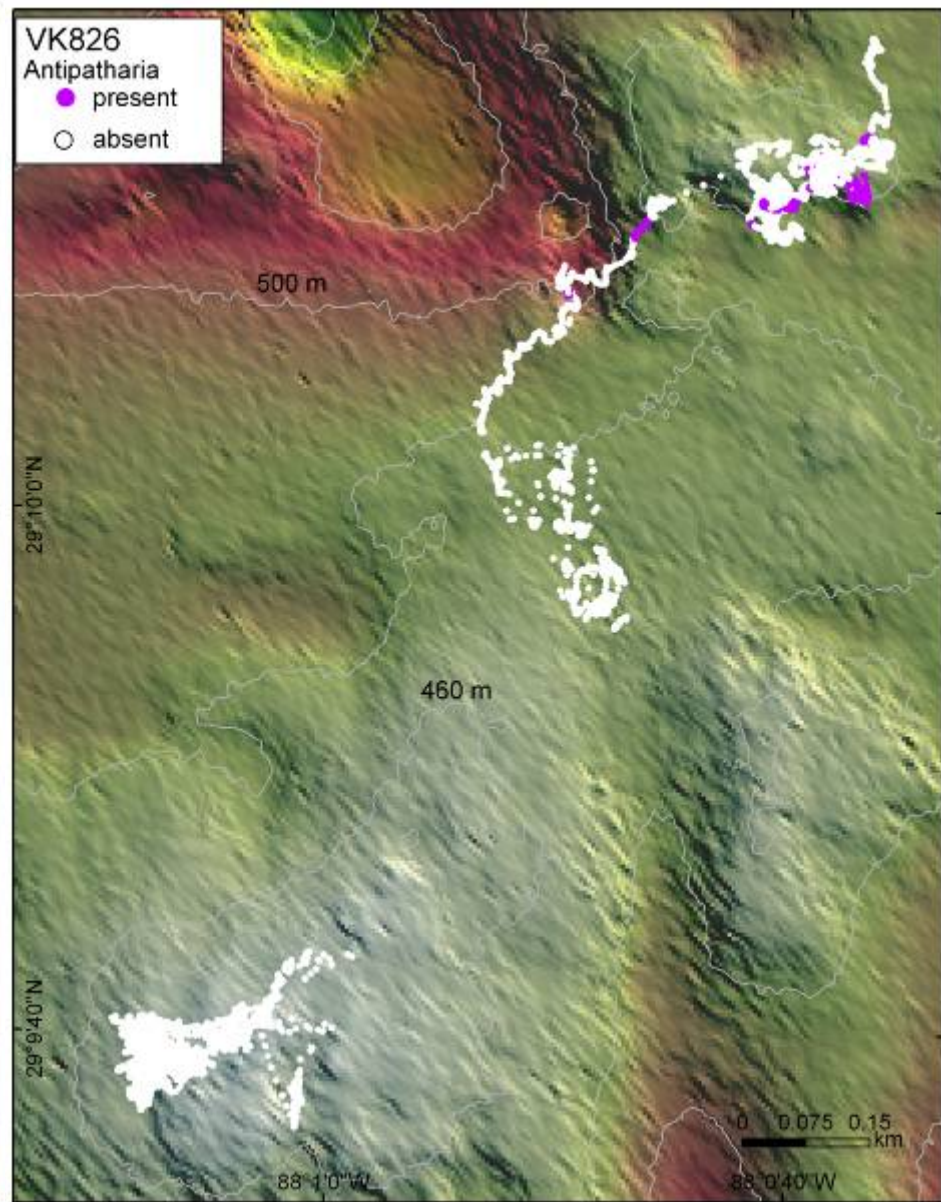
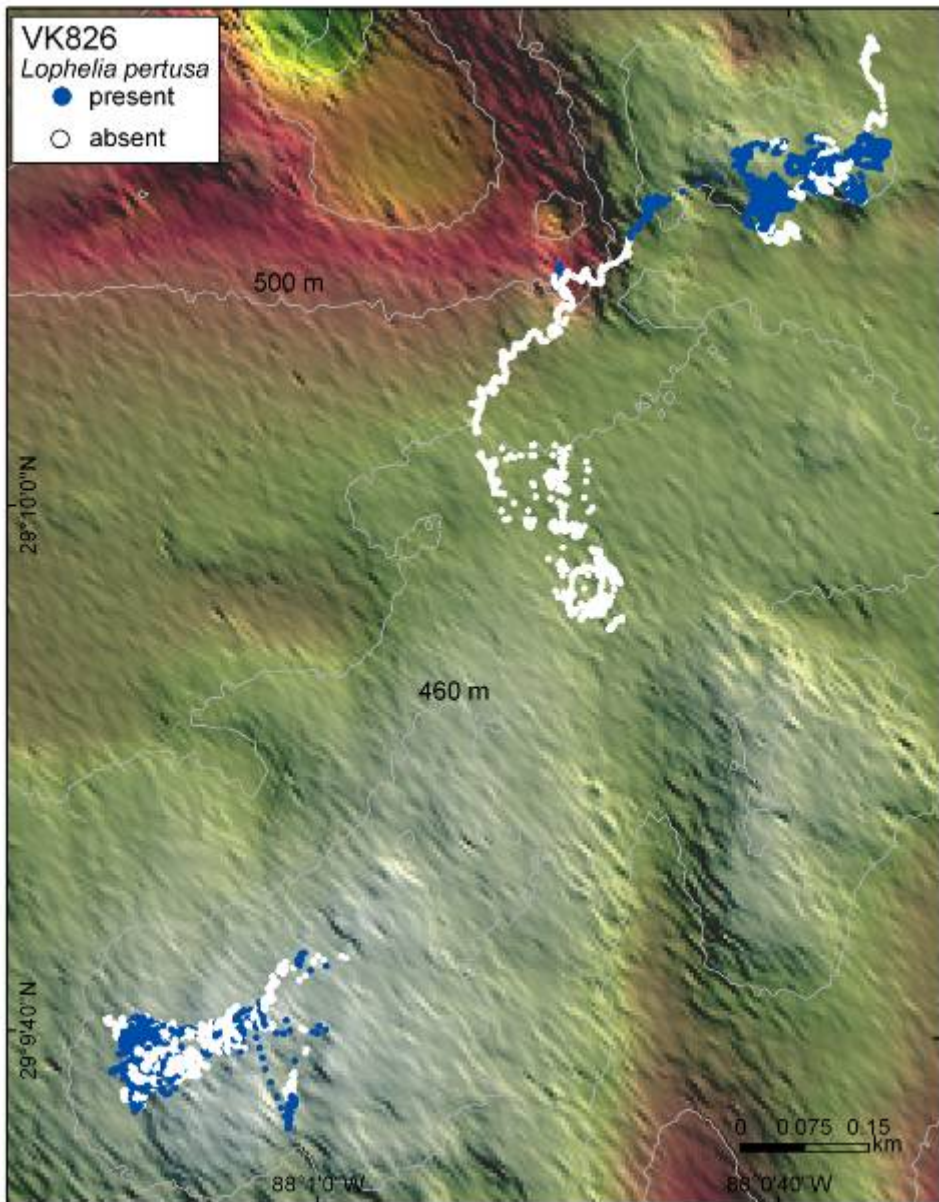
680 m

- TT Tracks
- OT Tracks
- Phyto
- PN - 1.0m
- Traps
- SBE911+ CTD
- SBE911+ CTD-YoYo
- ROV-2008-001
- ROV-2008-002
- ROV-2008-004
- ROV-2008-005
- ROV-2008-006
- Albex-Long Term
- Albex-Short Term
- BoBo-Long Term
- BoBo-Short Term





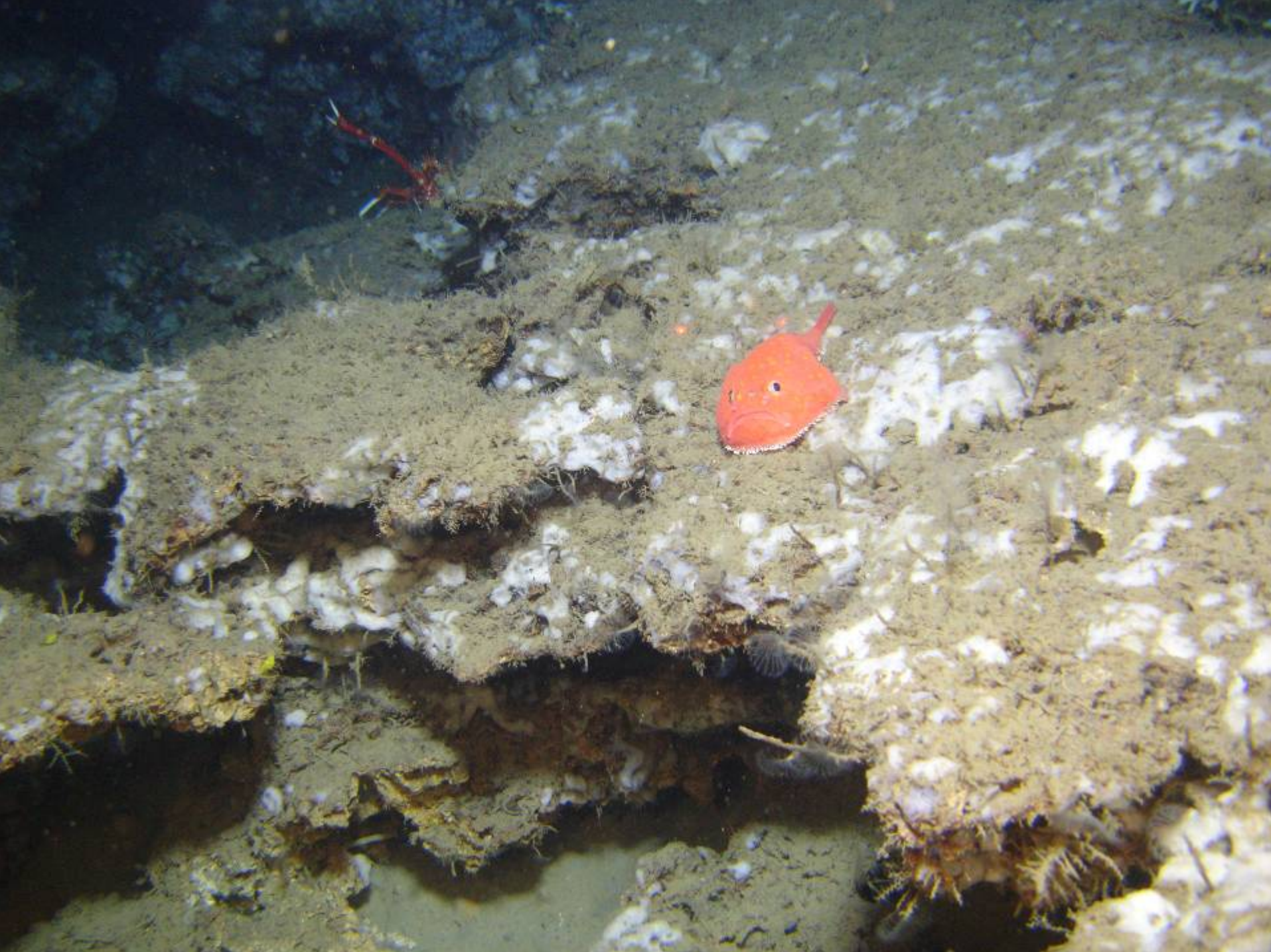
# Coral Distributions at VK 826















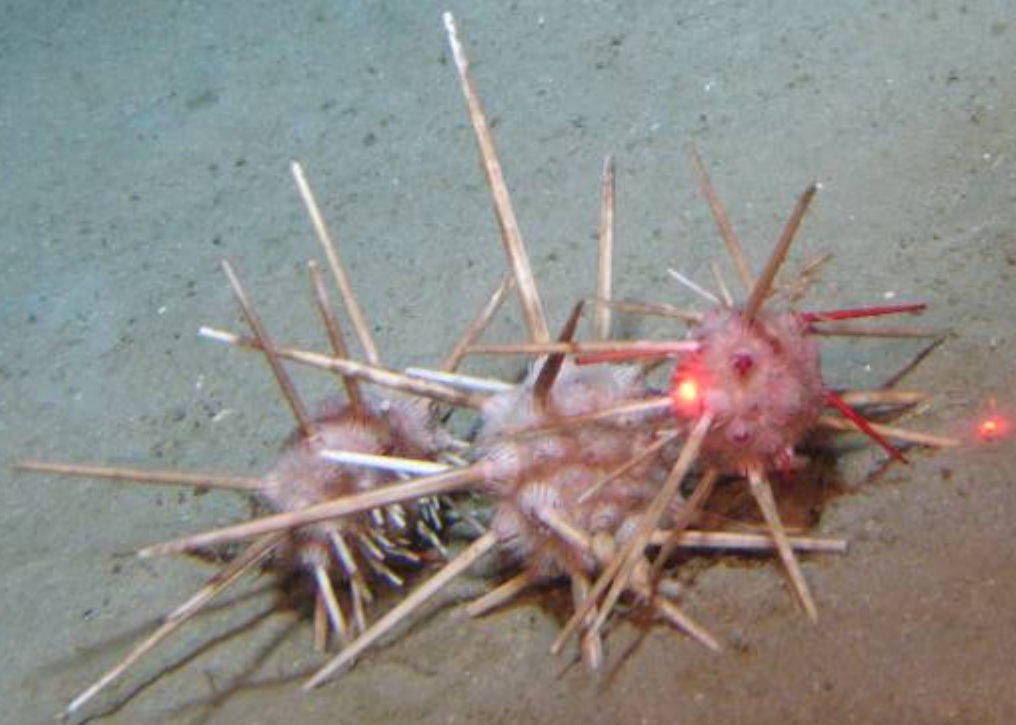




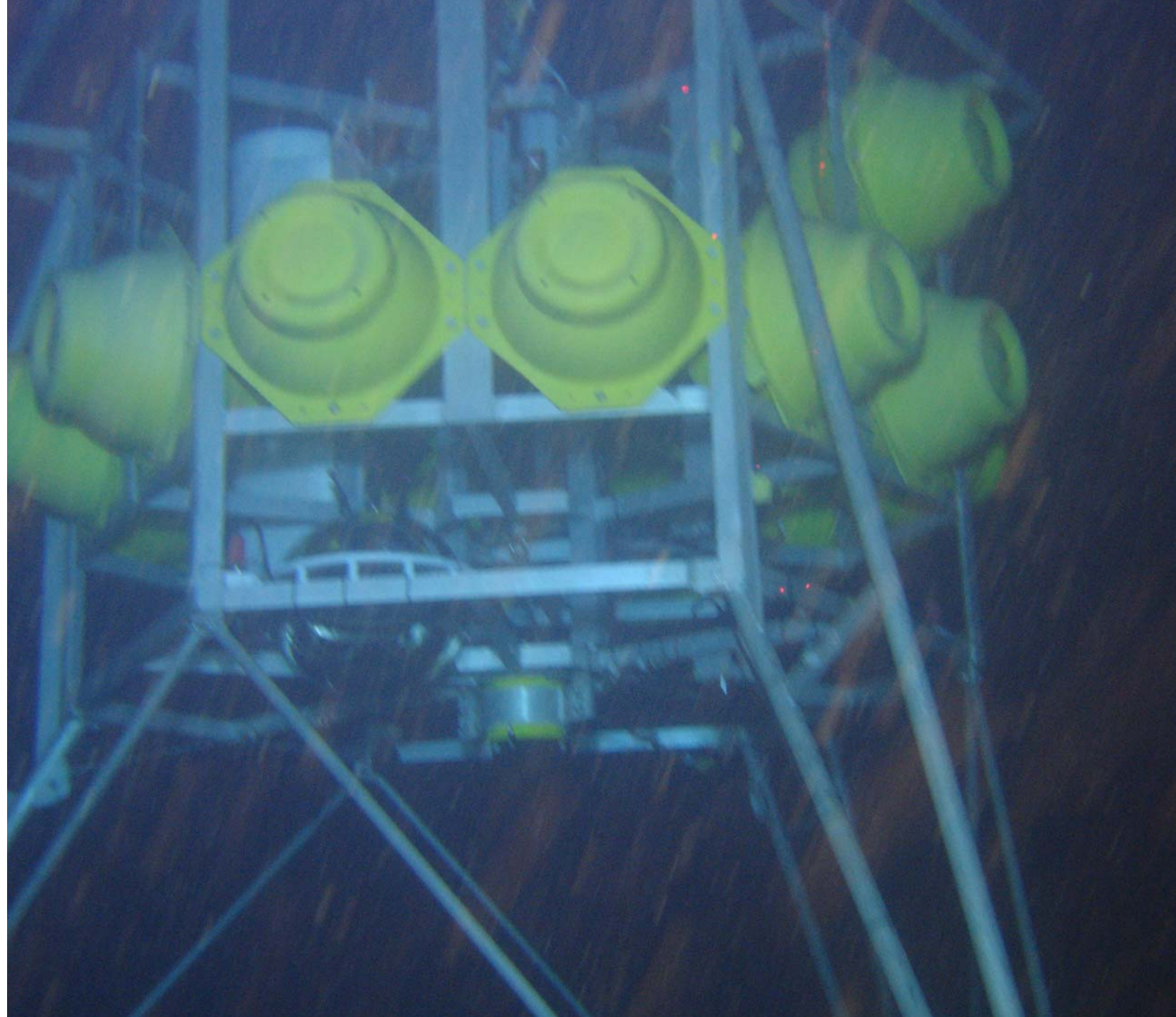


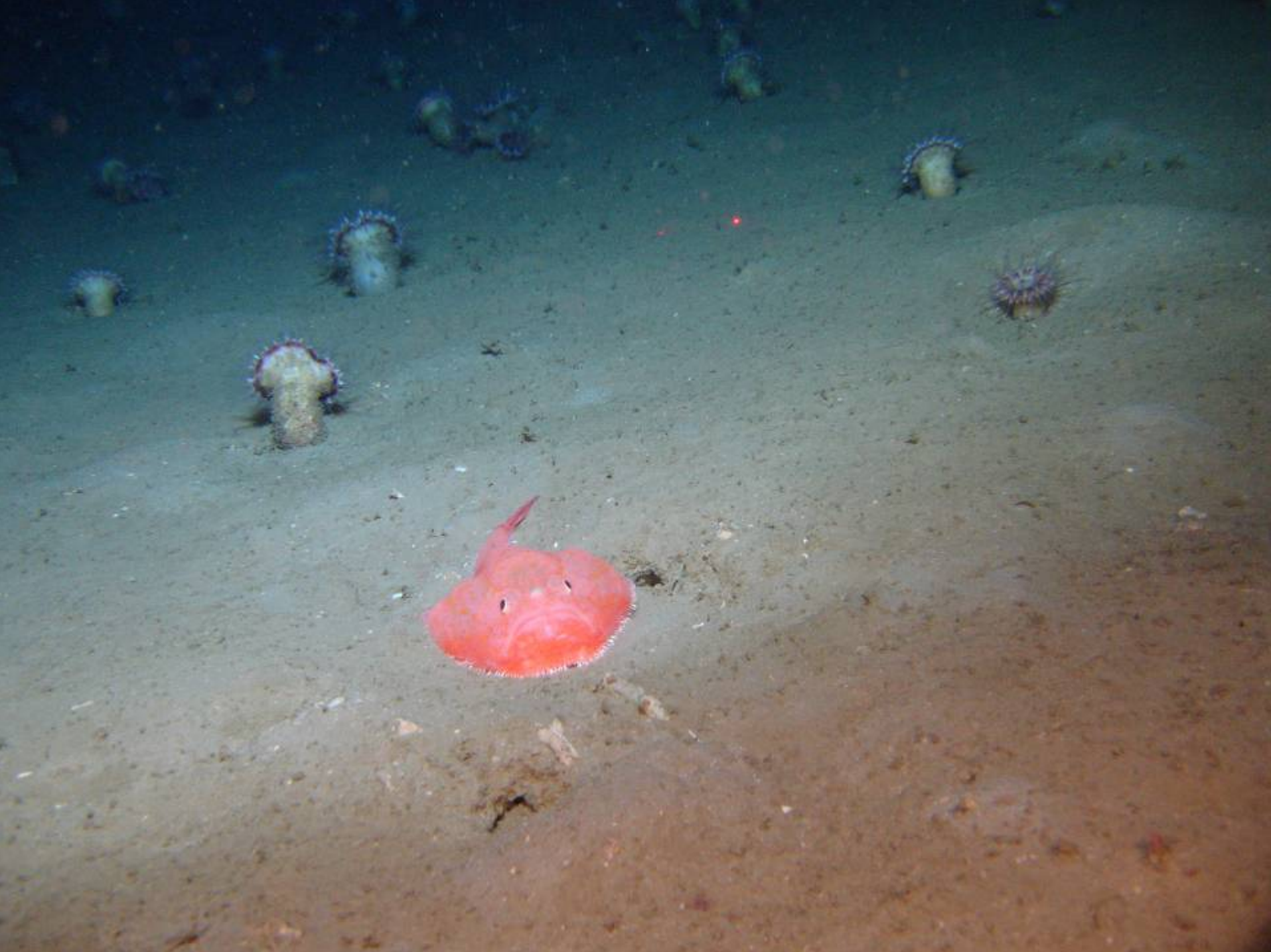




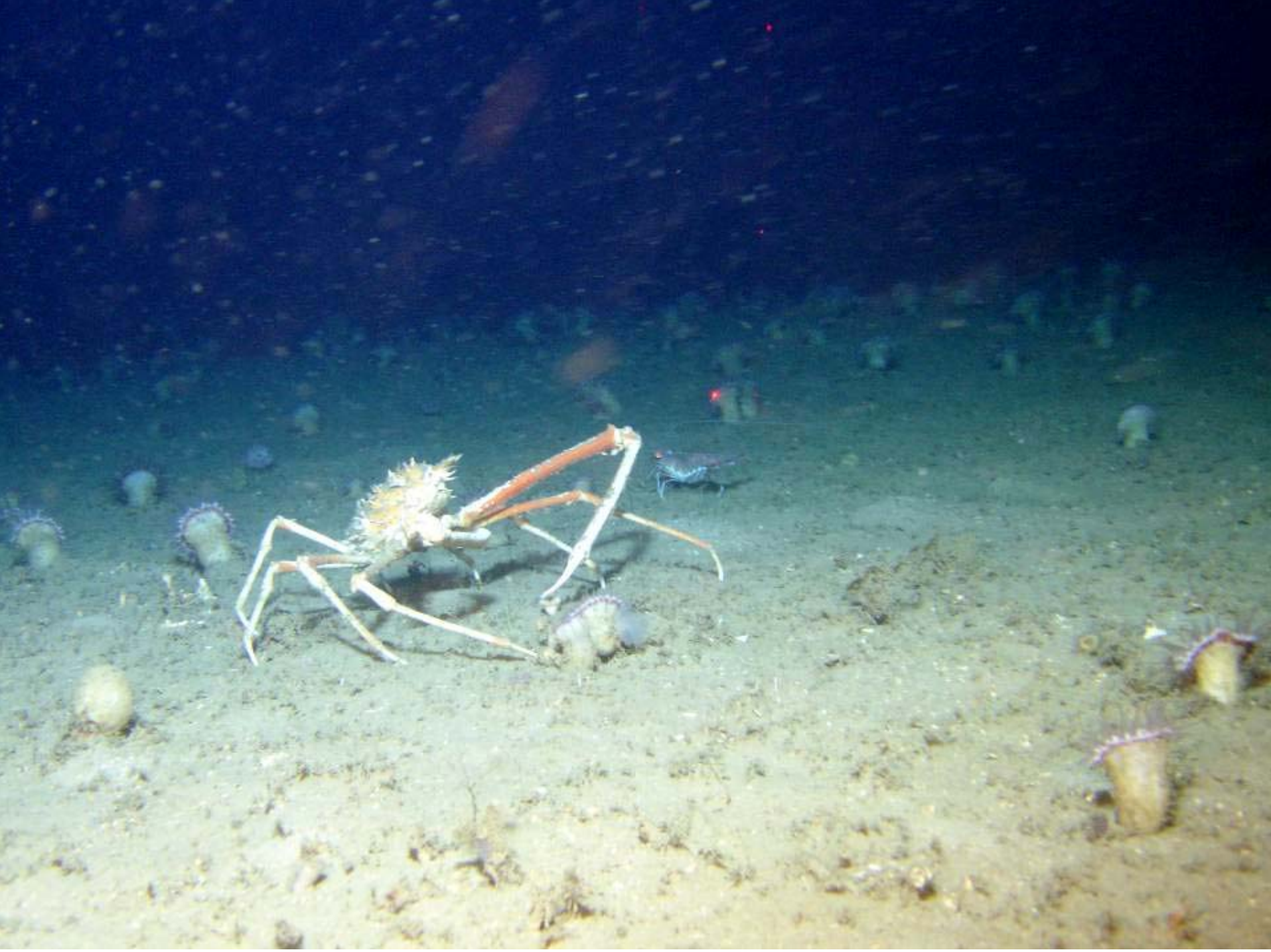




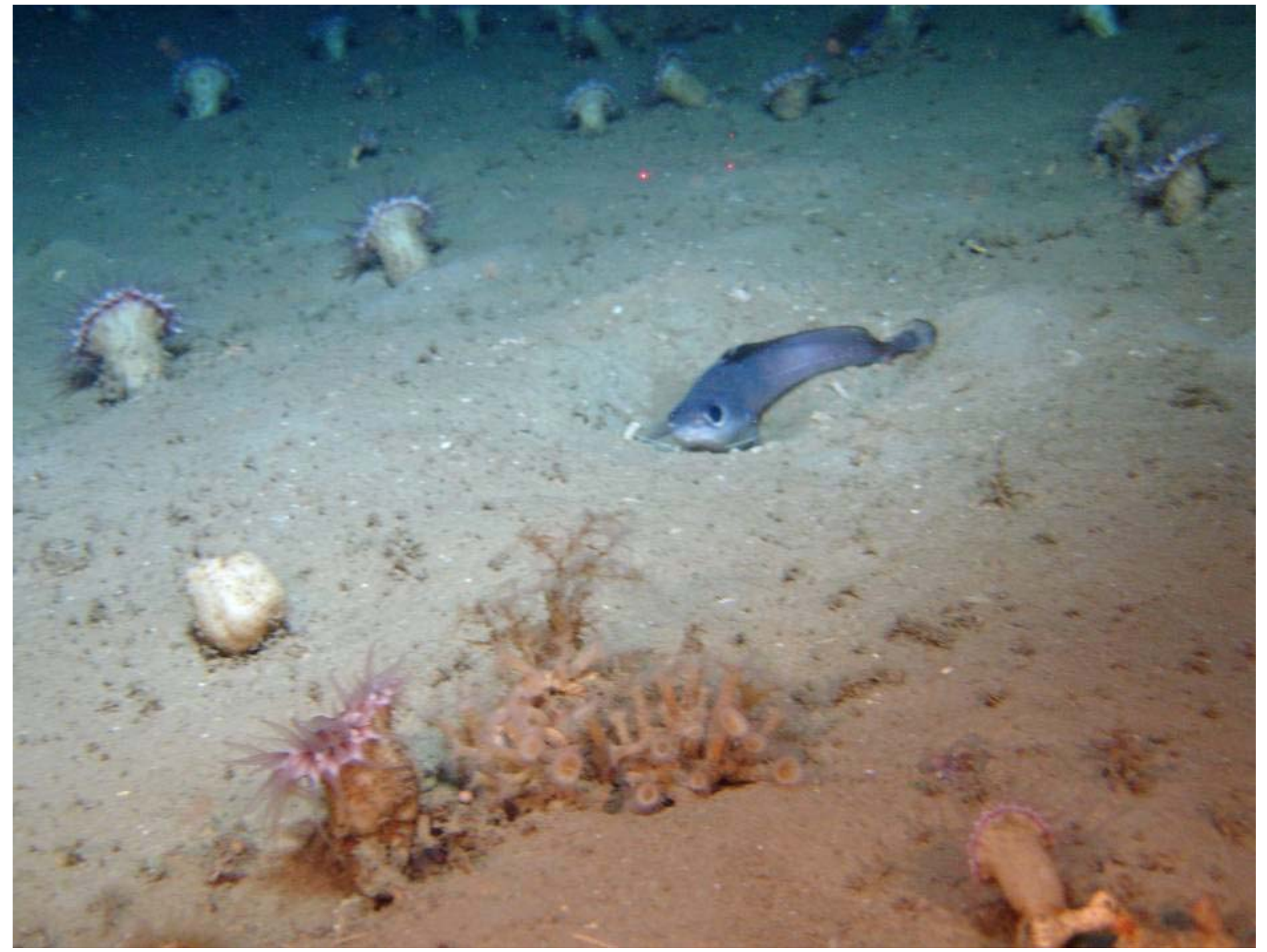




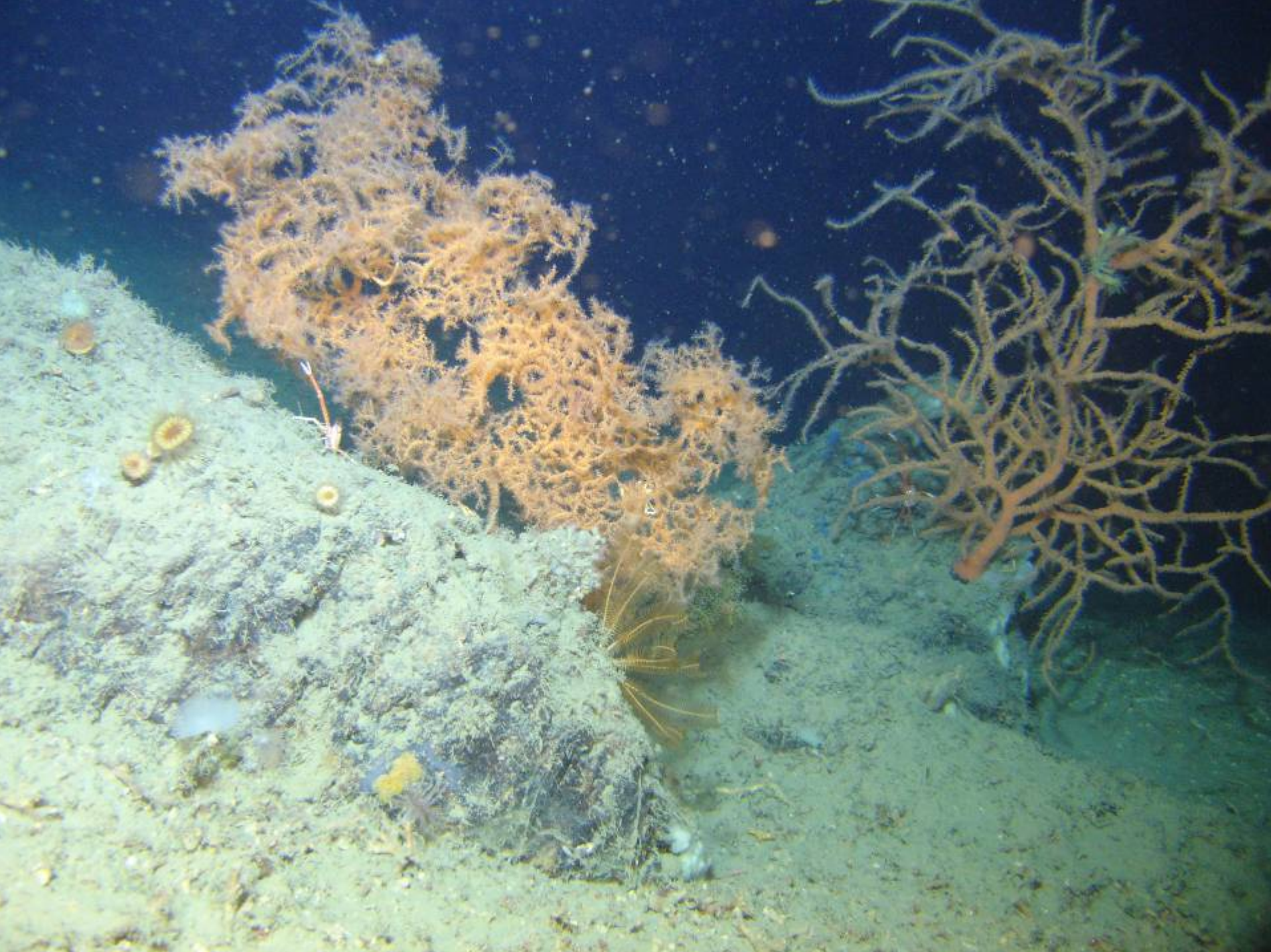






















VK862/906

29°7'N

29°6'N

29°5'N

29°4'N

88°26'W

88°25'W

88°24'W

88°23'W

88°22'W

88°21'W

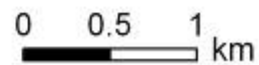
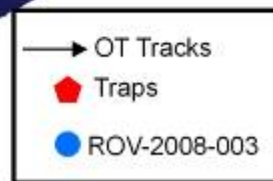
88°20'W

360 m

400 m

440 m

480 m







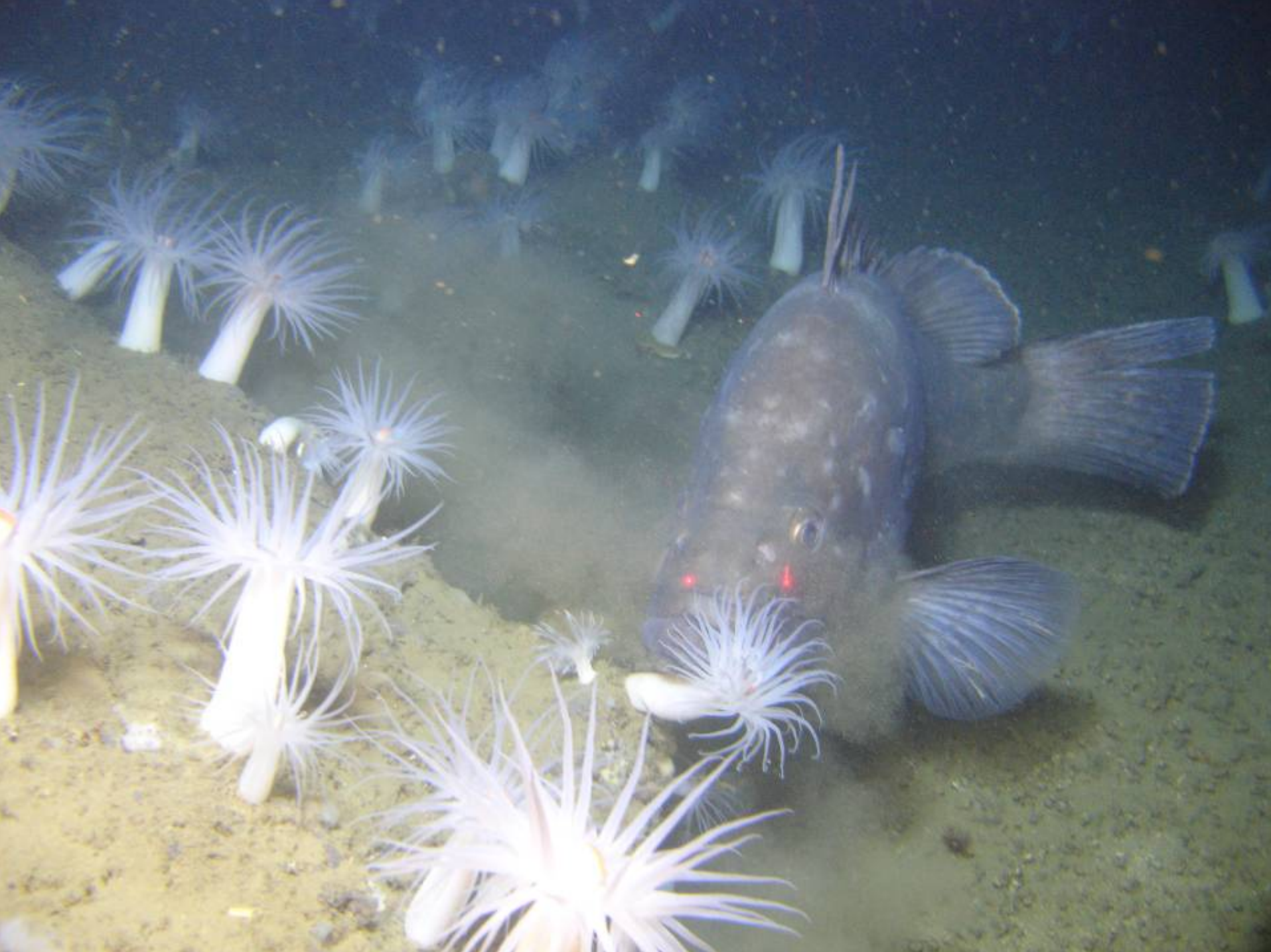




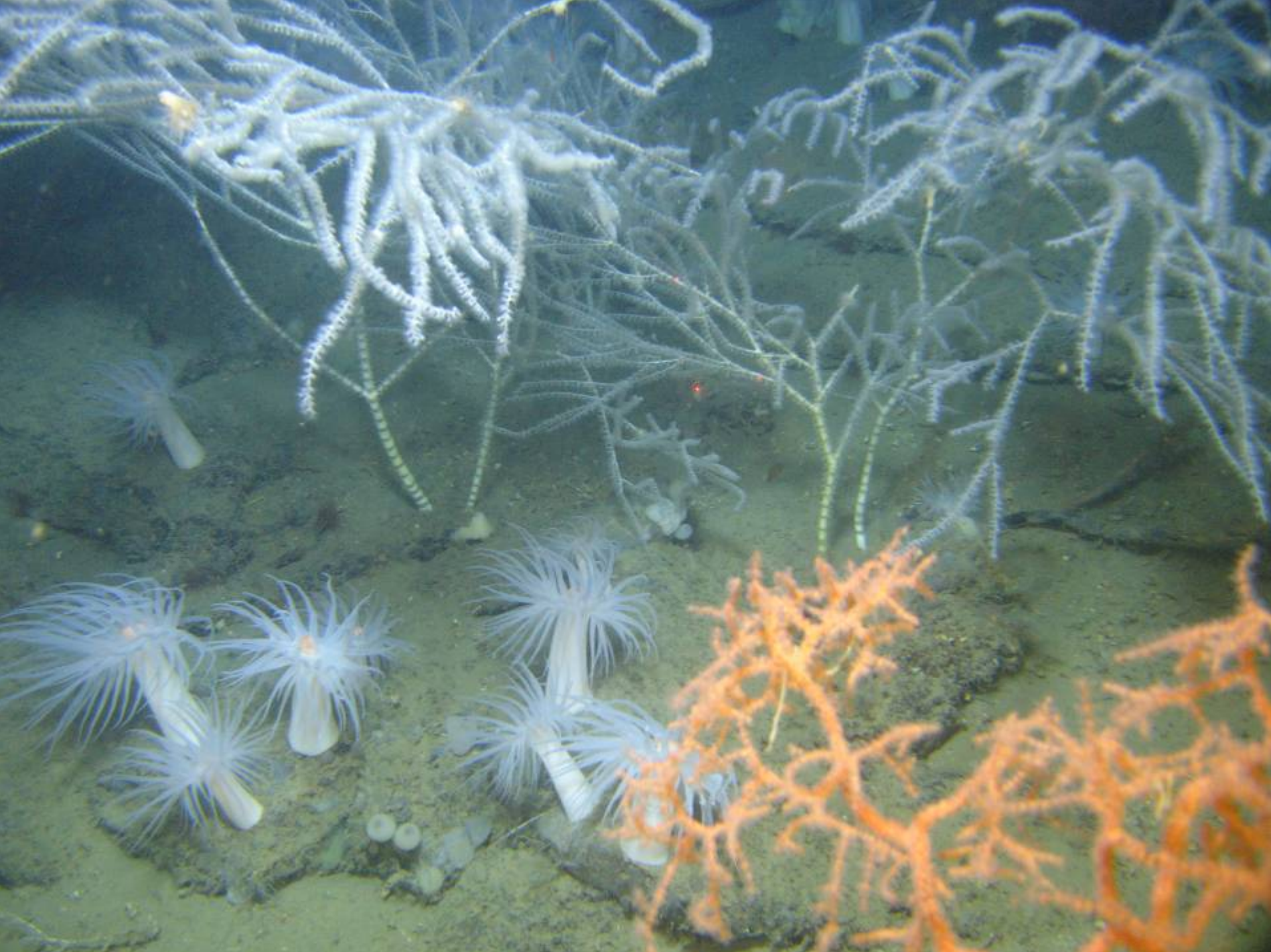


















# Station Summary

## Leg I, VK 826 & VK 906/862 (5–13 Oct)

- Benthic landers – 4 deployments, 2 short & 2 long-term
- ROV - 6 dives
- bottom trawls – 17 stations
- opening/closing midwater nets – 18 stations
- plankton nets – 11 stations
- benthic traps – 4 sets
- CTD – 32 stations
- Miscellaneous gear – light traps, settling plates

## Leg II, West Florida slope (19–23 Oct)

- 222 sq km mapped with multibeam sonar



## Benthic Landers: New Data & Research Integrators

Interdisciplinary platforms delivering high density data. 3–4 Dutch & 2 UK scientists involved.

Deploy two for 12 months at VK 826.

Expect 5–6 peer review publications from lander deployments.

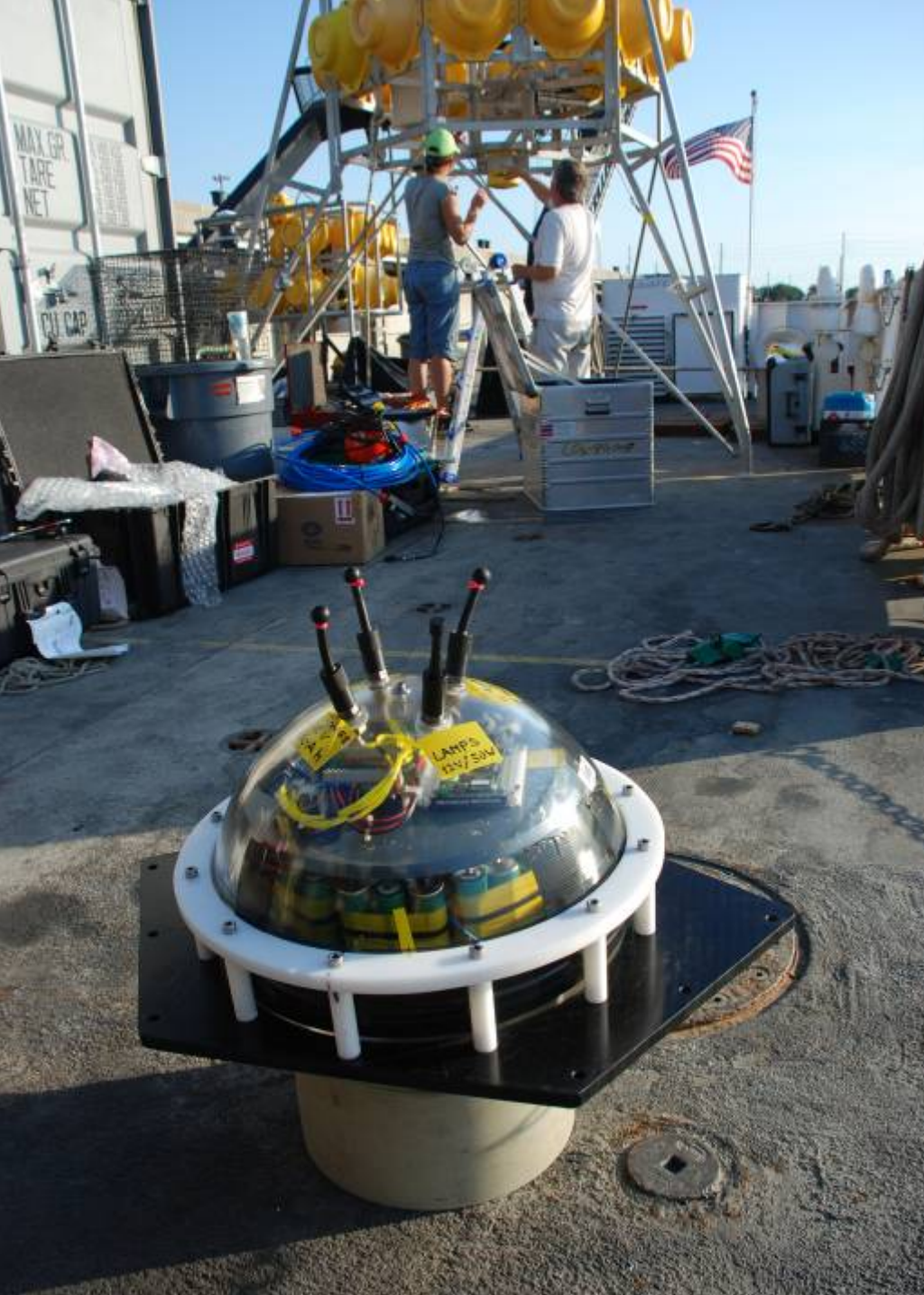








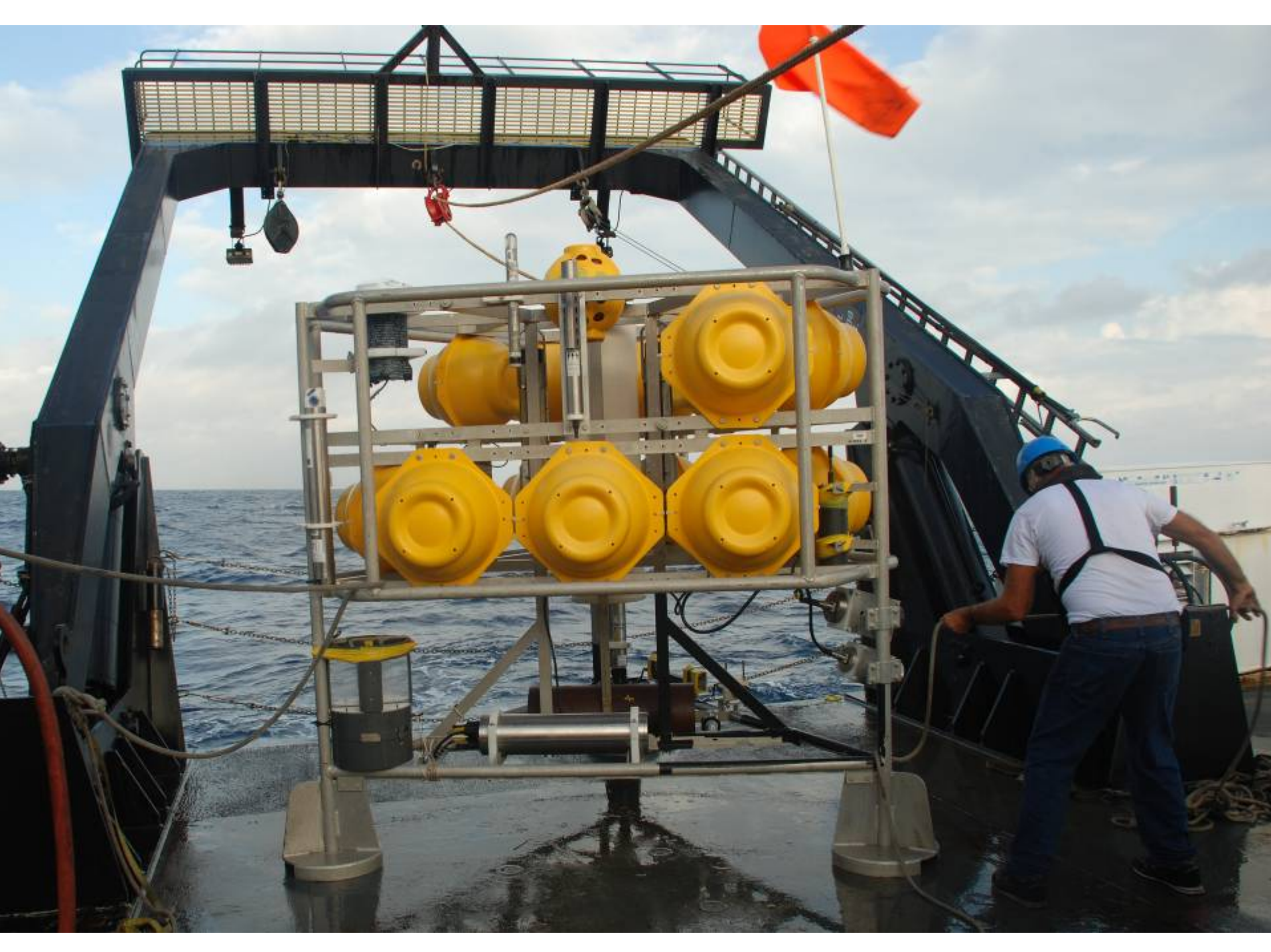






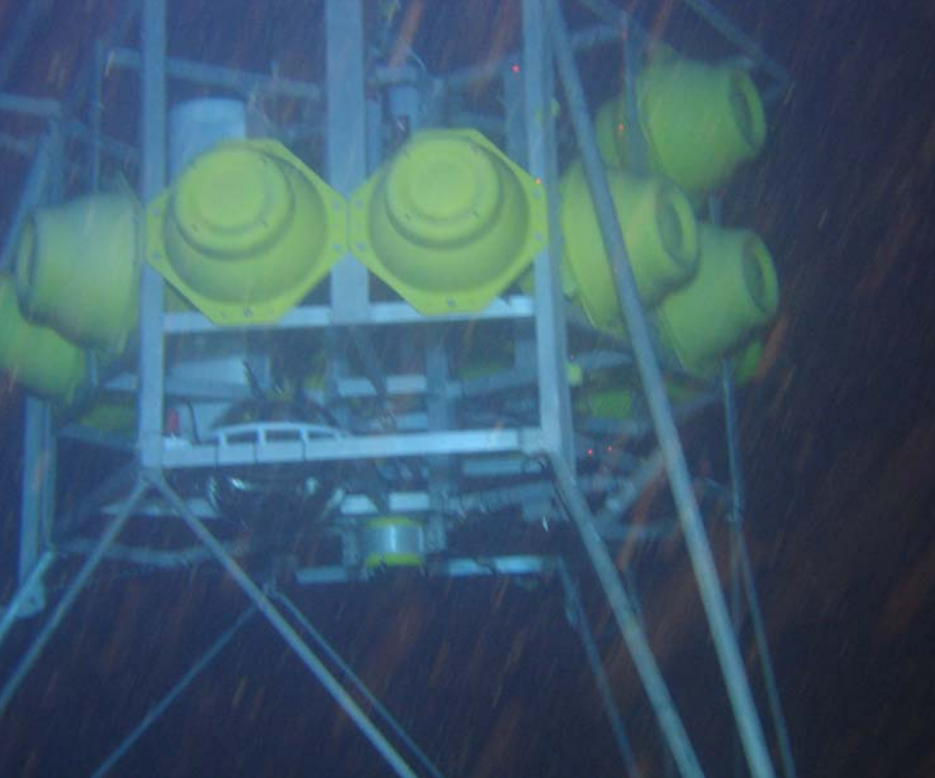
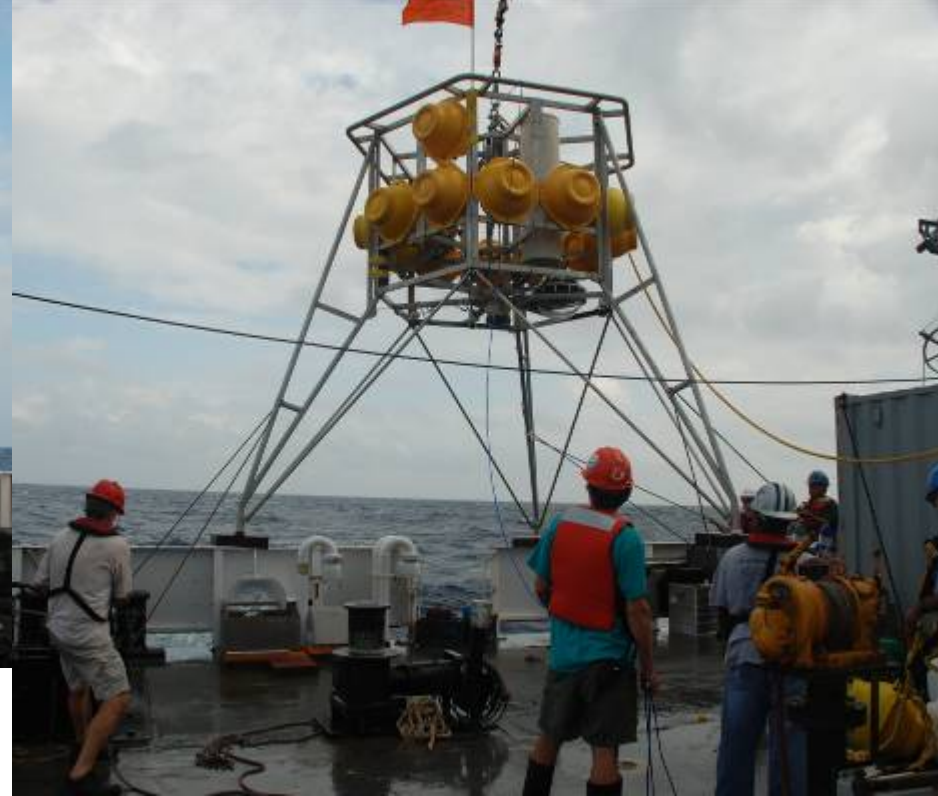
ALBEX 3







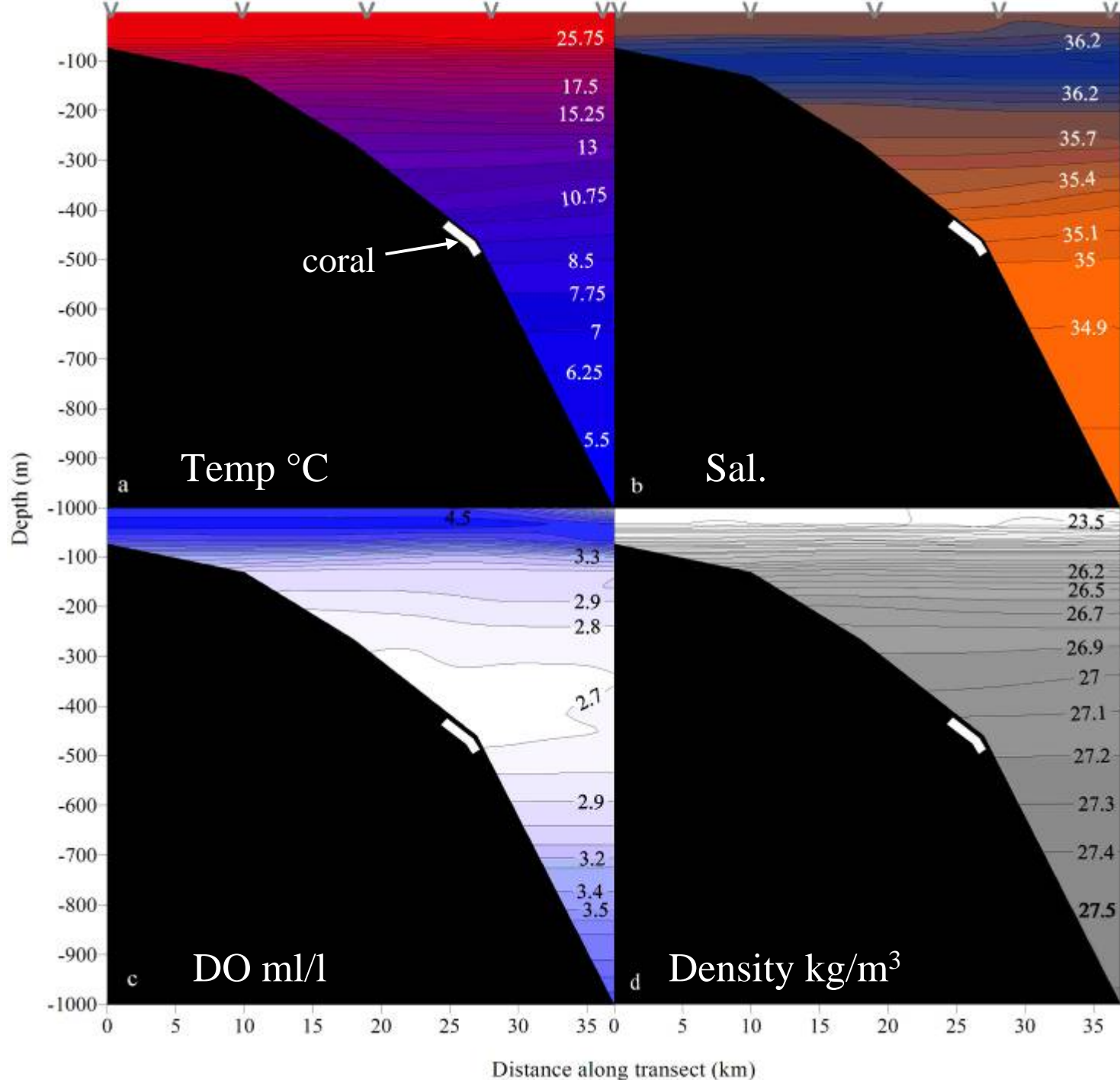




## **ALBEX & BOBO Landers**

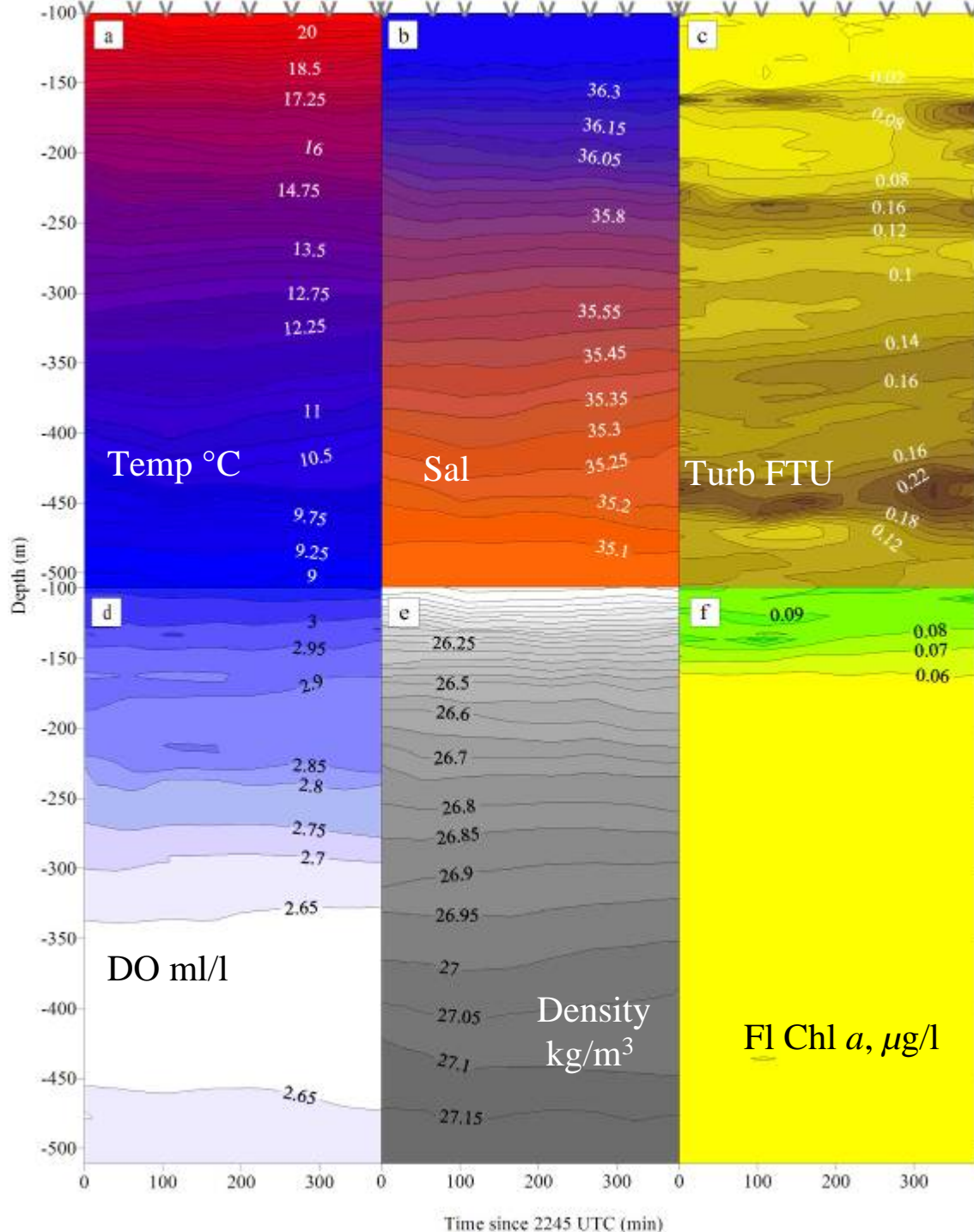
- CTD
- Fluorometer & Turbidity
- Programmed sediment traps
- Video & still photos
- ADCP & Doppler current meters
- Acoustic monitors (passive)
- Settling plate exp.

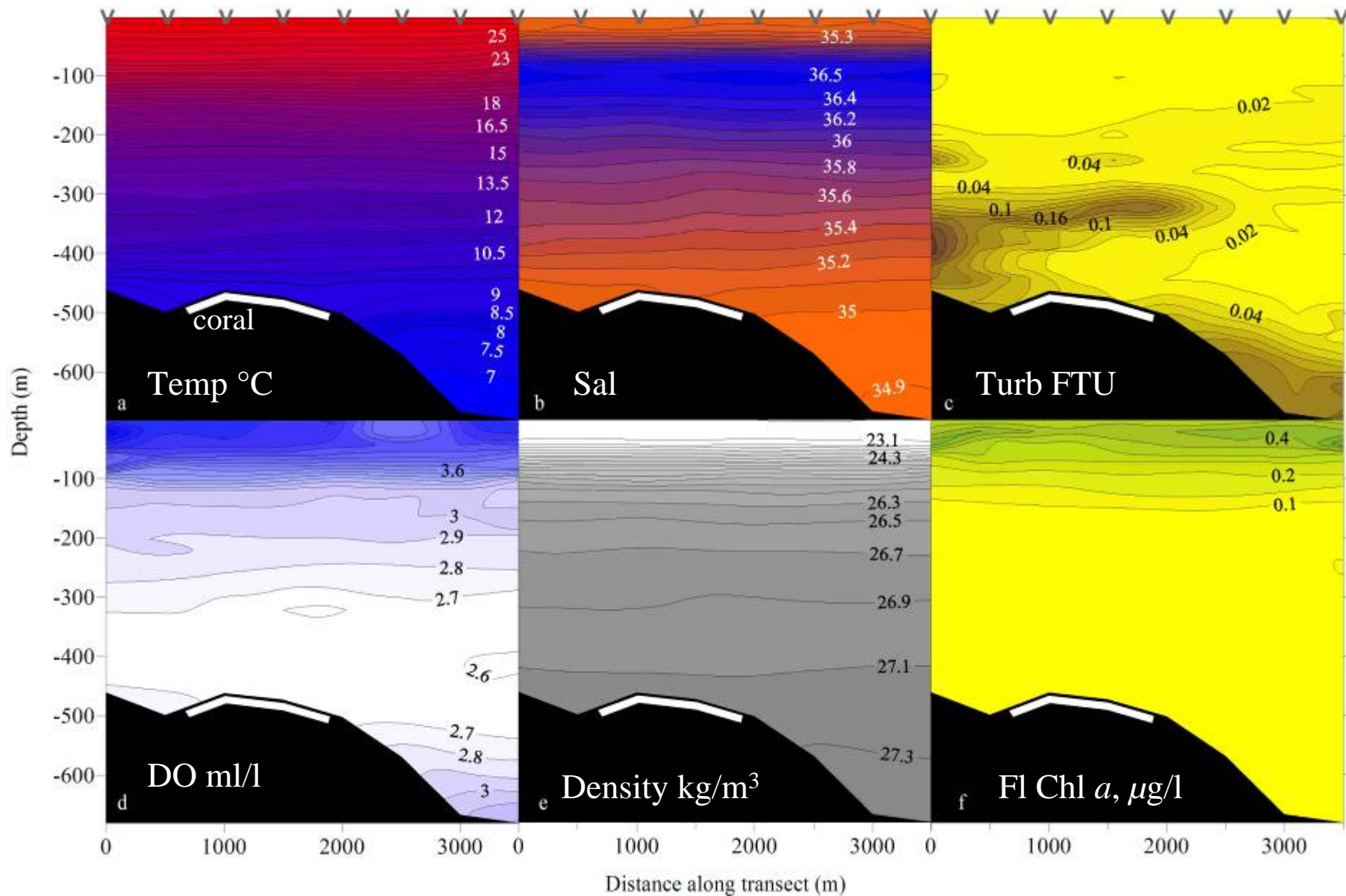
Shelf to slope  
 CTD transect  
 through Vioska  
 Knoll 826  
 (5–6 Oct 08) at  
 10km intervals





CTD yo-yo casts over one station at VK826 = 13 casts over 5.6 hr (7 Oct 08)





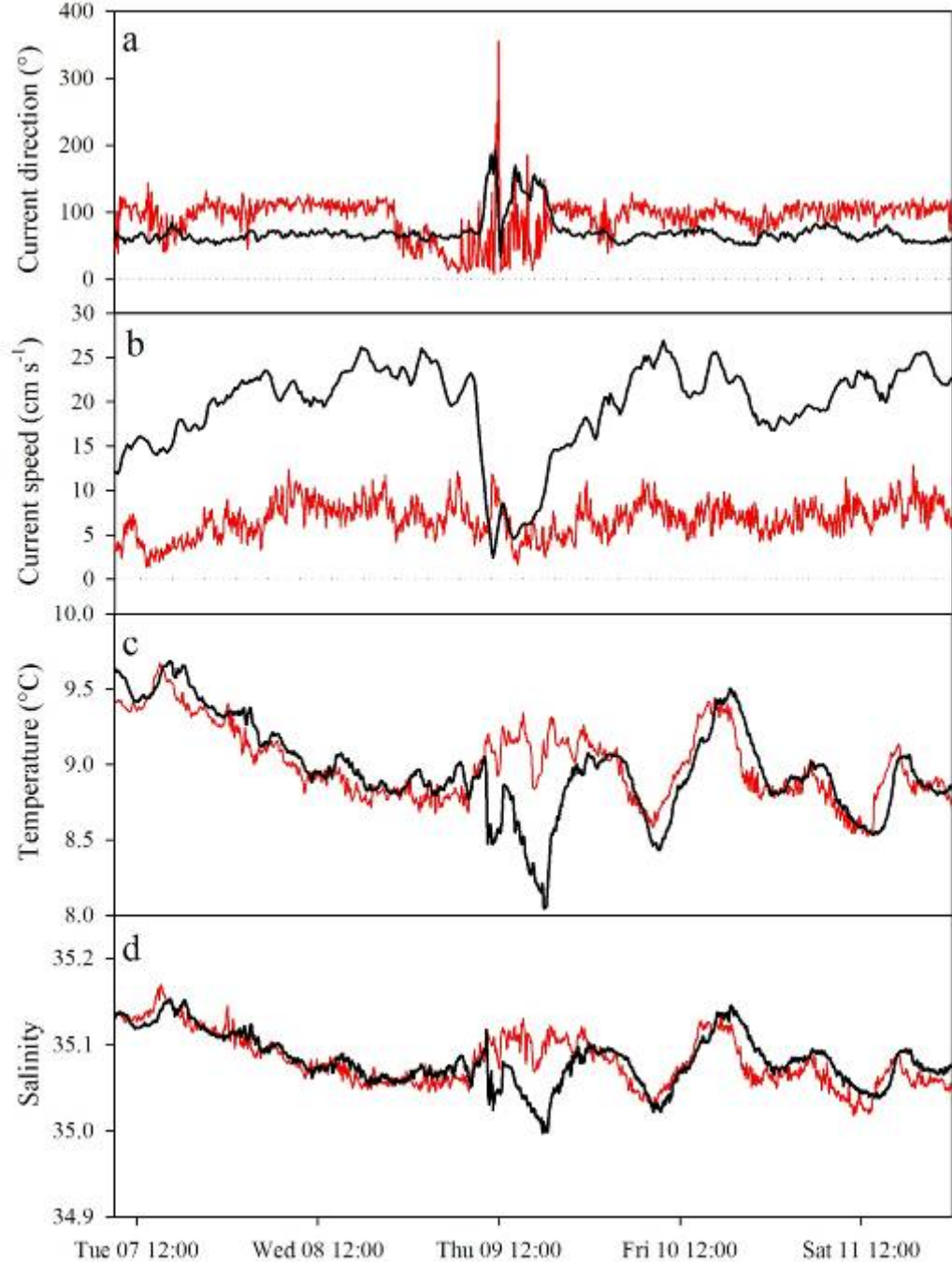
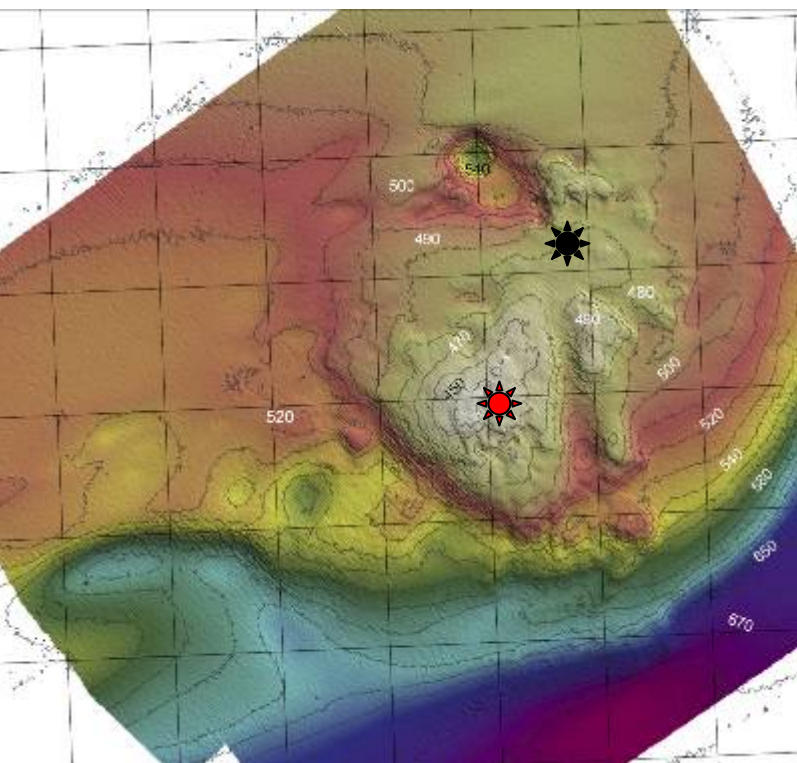
CTD transect across VK826 at  
500 m intervals (12 Oct 08)

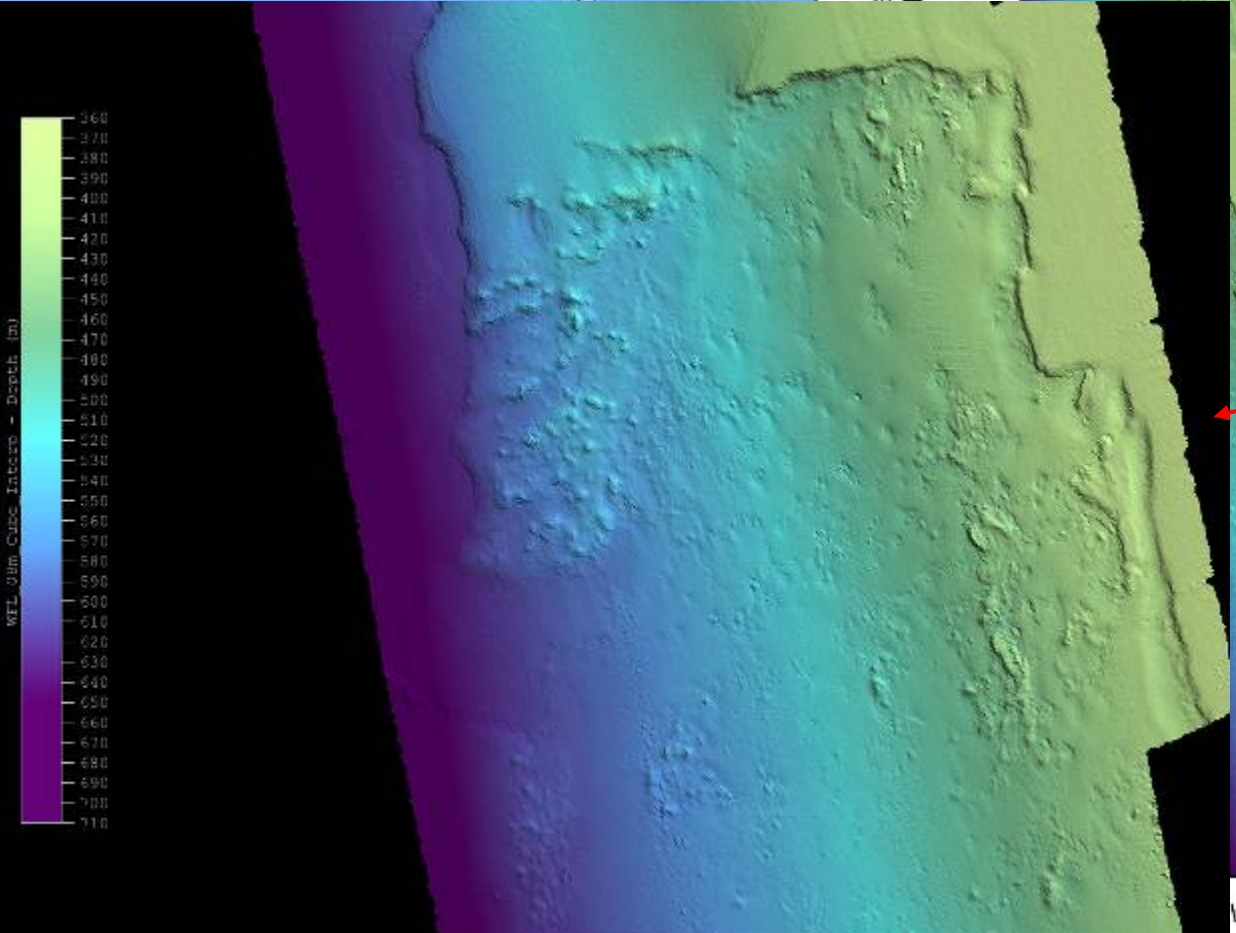
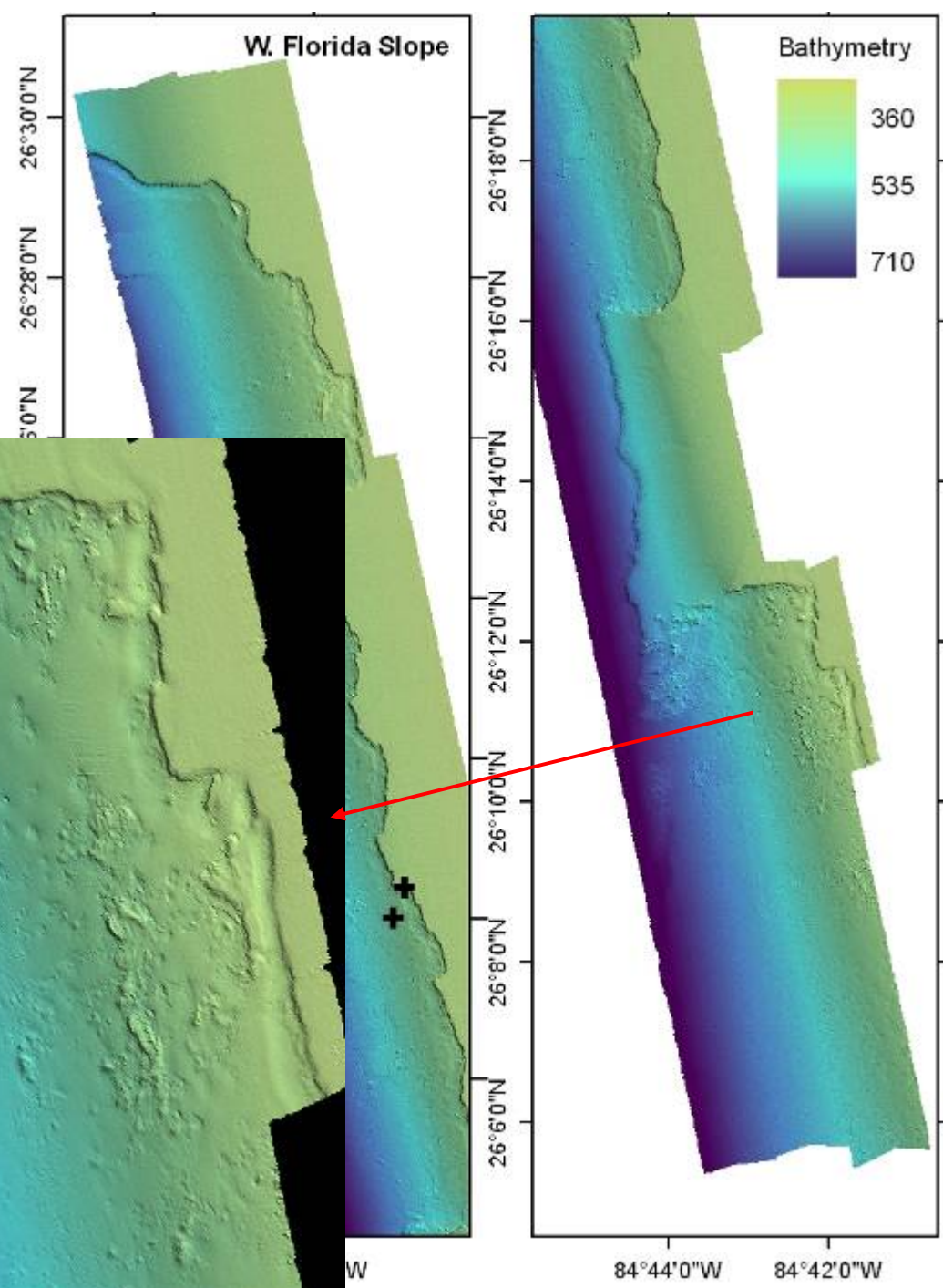
From Davies 2008



Five days (6-11 Oct 08) of current meter data on VK 826 (1 m off bottom). **Red** = Albex lander on top of mound, **Black** = BoBo off mound to the north.

Note even on Thur, 9 Oct.  
Note lag in Temp & Sal on mound.







# NEXT STEPS

- Pick up two landers at VK826 first week of Sep 2009
- Cruises planned for late 2009 and 2010
  - Survey of W. Florida slope high priority
  - Continue long-term data collection on Vioska Knoll sites
  - Sample Gulf Penn and Gulf Oil wrecks
  - Use ROVs in all areas, supplement with other methods
- Data analysis & publications in fourth year





# References

Davies, A. 2008. Personal communication. Scottish Association for Marine Science. Unpublished data.

Kellogg, C. 2008. Personal communication. U.S. Dept. of the Interior, Geological Survey. Unpublished data.