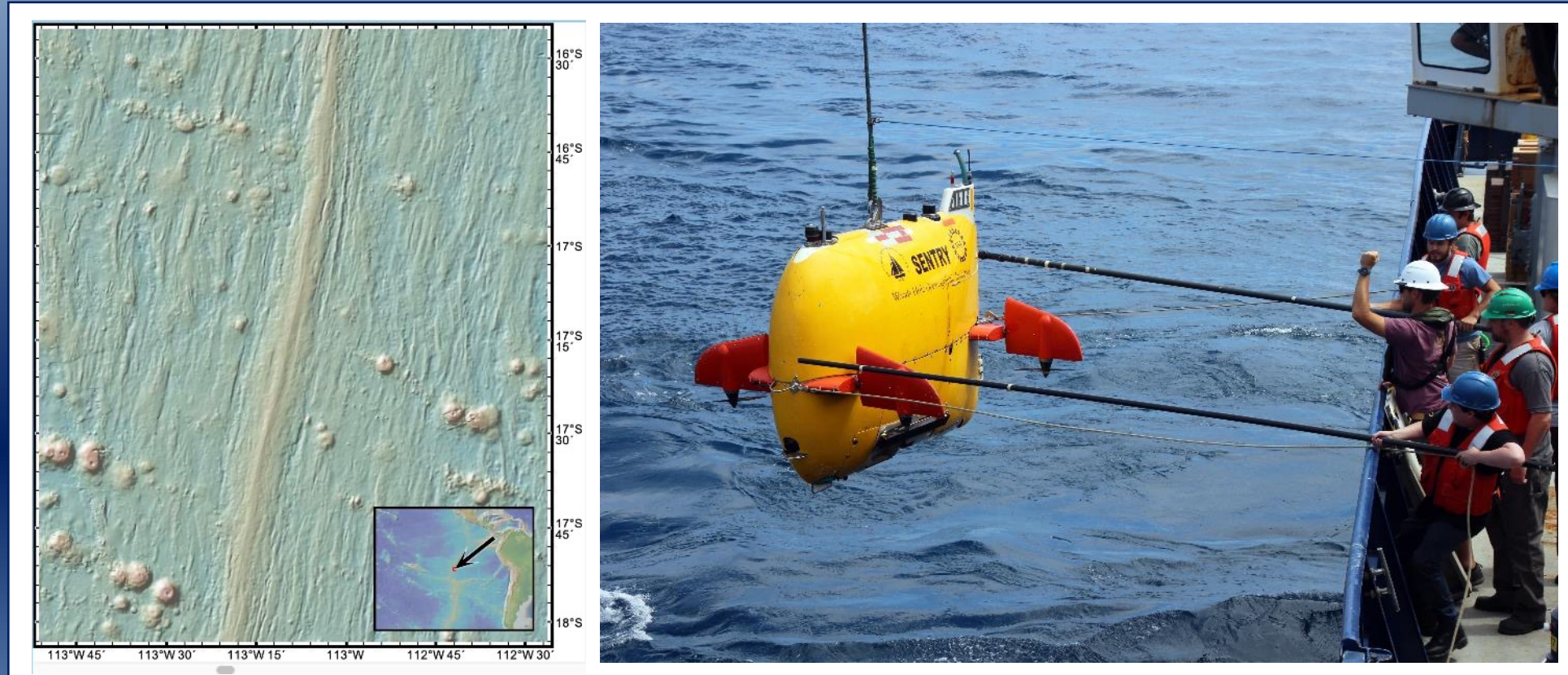


# Investigating Seafloor Venting at the Southern EPR using the Sentry AUV



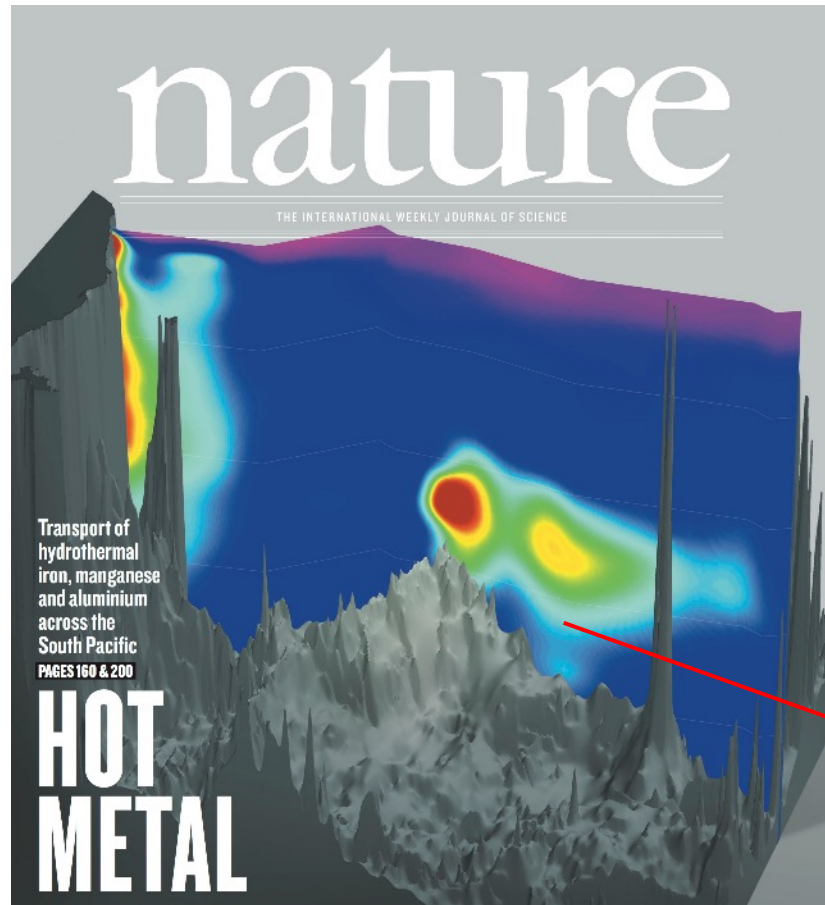
Joe Resing (NOAA-PMEL), Chief Scientist  
Chris German (WHOI), Co-Chief Scientist  
Scott White (U of SC) presenting

# LETTER

doi:10.1038/nature14577

## Basin-scale transport of hydrothermal dissolved metals across the South Pacific Ocean

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## Hydrothermal Fe cycling and deep ocean organic carbon scavenging: Model-based evidence for significant POC supply to seafloor sediments



C.R. German<sup>a,\*</sup>, L.L. Legendre<sup>b,c</sup>, S.G. Sander<sup>d</sup>, N. Niquil<sup>e</sup>, G.W. Luther III<sup>f</sup>, L. Bharati<sup>g</sup>, X. Han<sup>h</sup>, N. Le Bris<sup>i</sup>

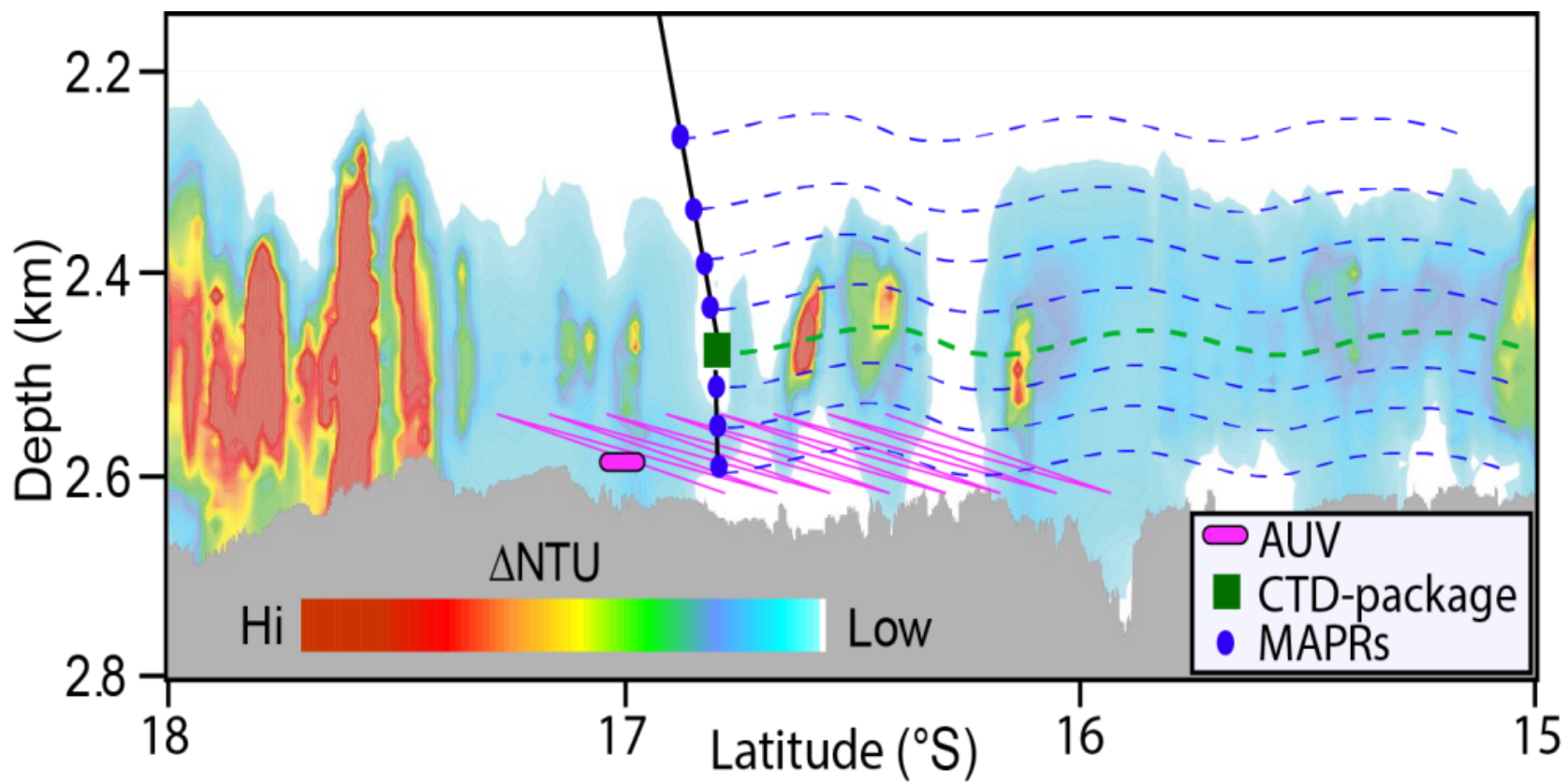
**Table 7**

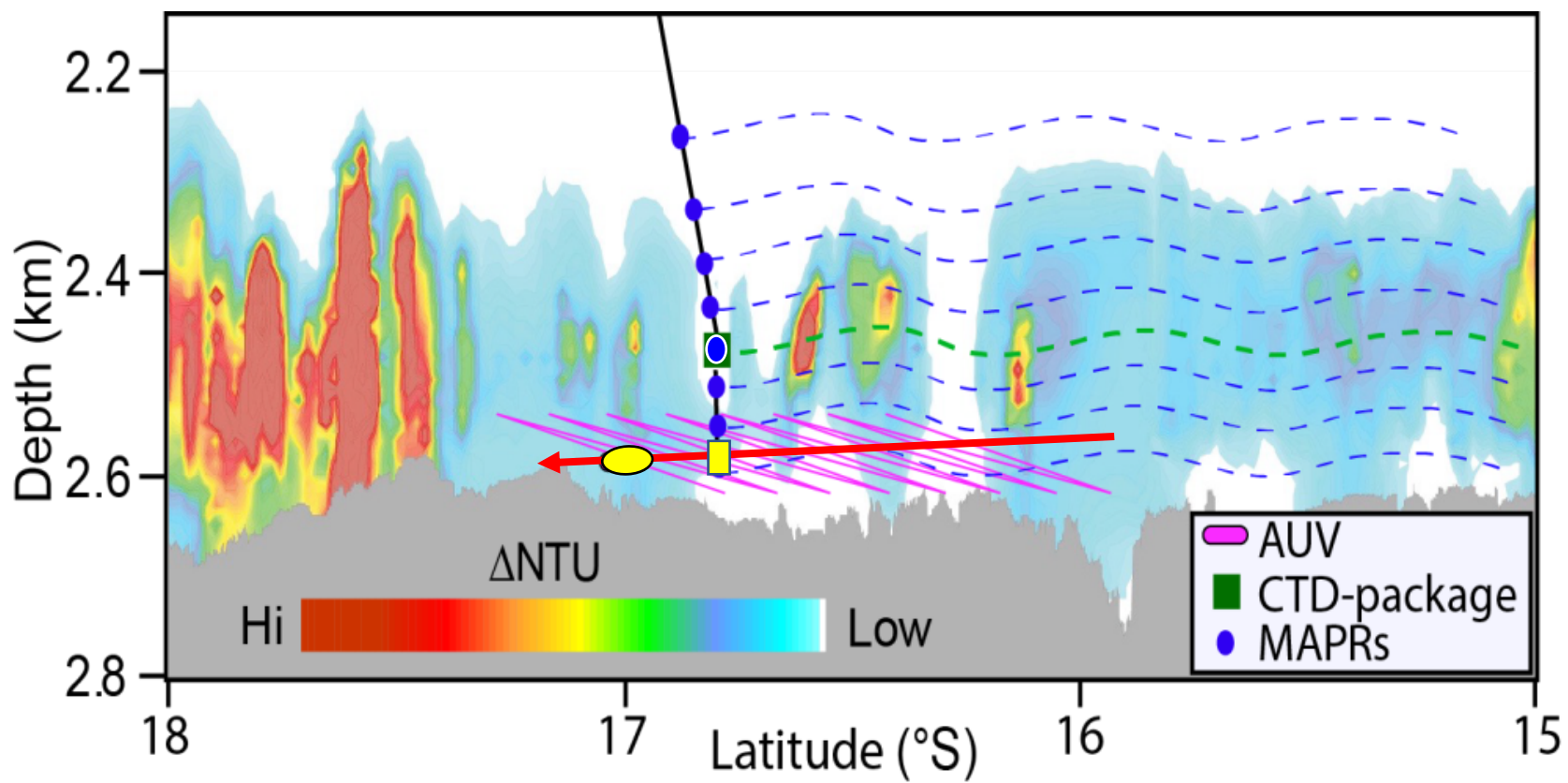
Summary of values for a range of key parameters derived from model calculations of Fe and C<sub>org</sub> cycling in submarine hydrothermal plumes.

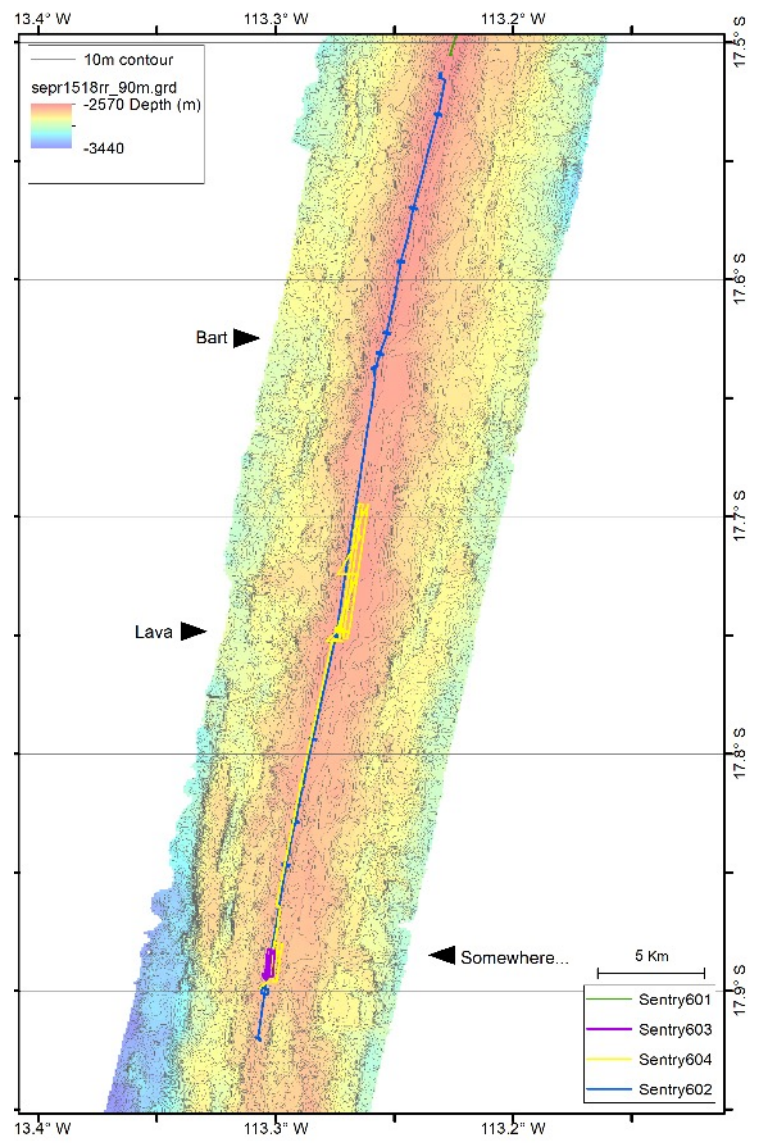
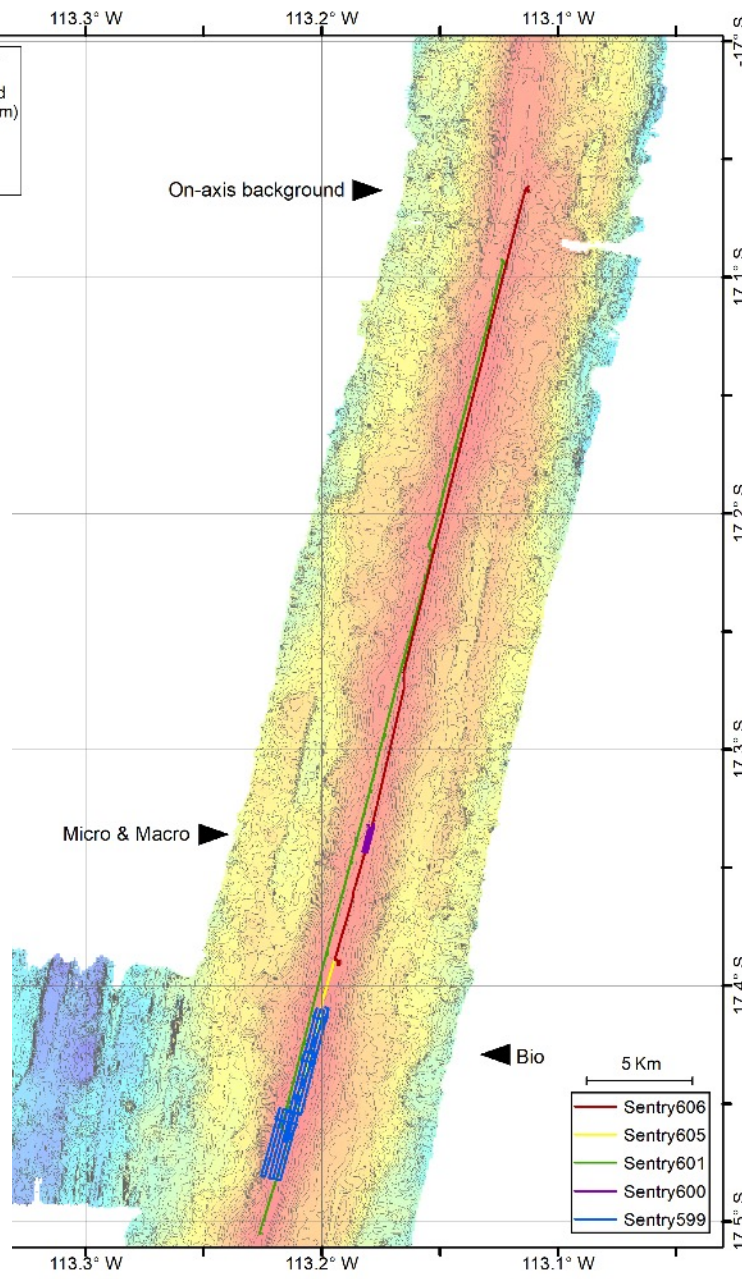
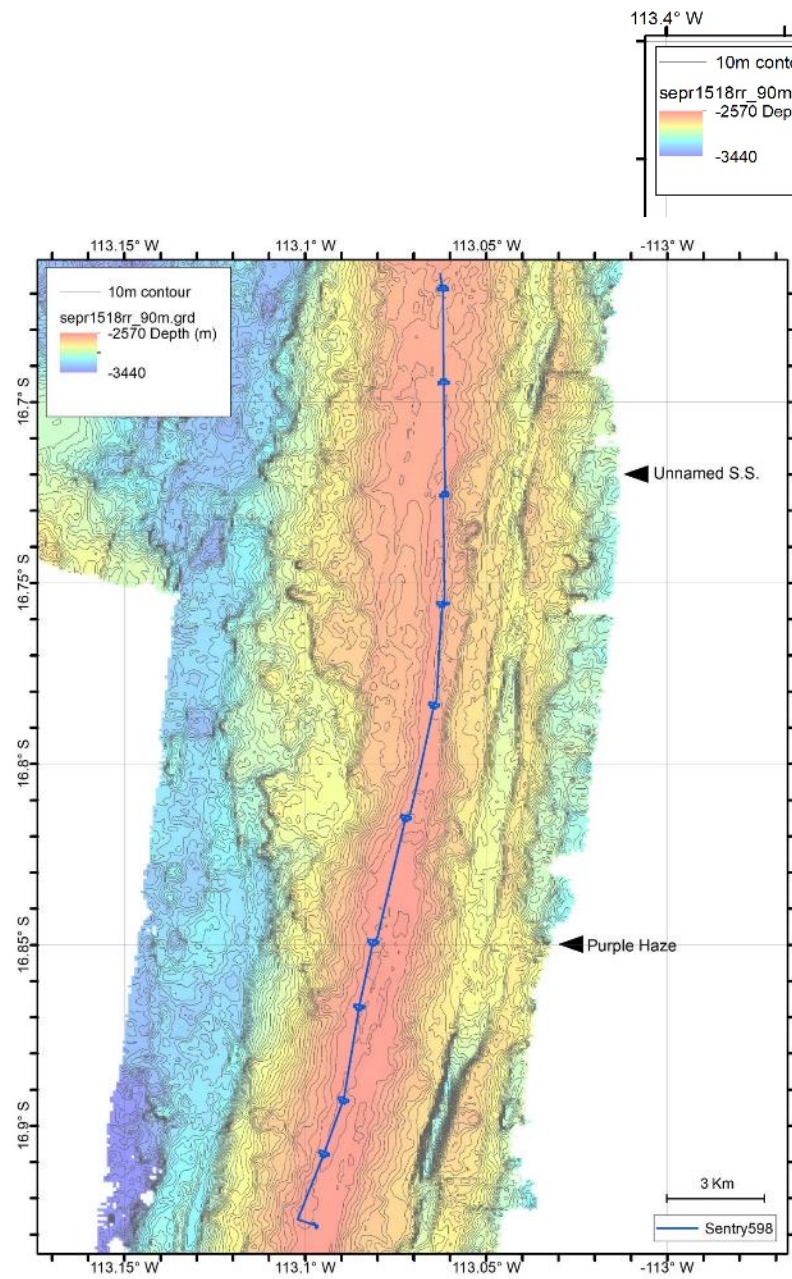
Parameter	Range	Units
Axial hydrothermal Heat-Flow Ratio (HFR) values	0.1–0.5	Dimensionless
Fraction of Fe delivered to non-buoyant plumes from hydrothermal venting that persists in dissolved form as it disperses into the ocean interior.	1.0–4.0	%
Concentration of dissolved Fe in diffuse flow [Fe <sub>2</sub> ]	19–92	μmol kg <sup>-1</sup>
Fraction of Fe export flux derived from diffuse flow <sup>a</sup>	78–99	%
Predicted POC flux, from hydrothermal scavenging, that is delivered to seafloor sediments across the global deep ocean <sup>a</sup>	0.010–0.007	g C y <sup>-1</sup>

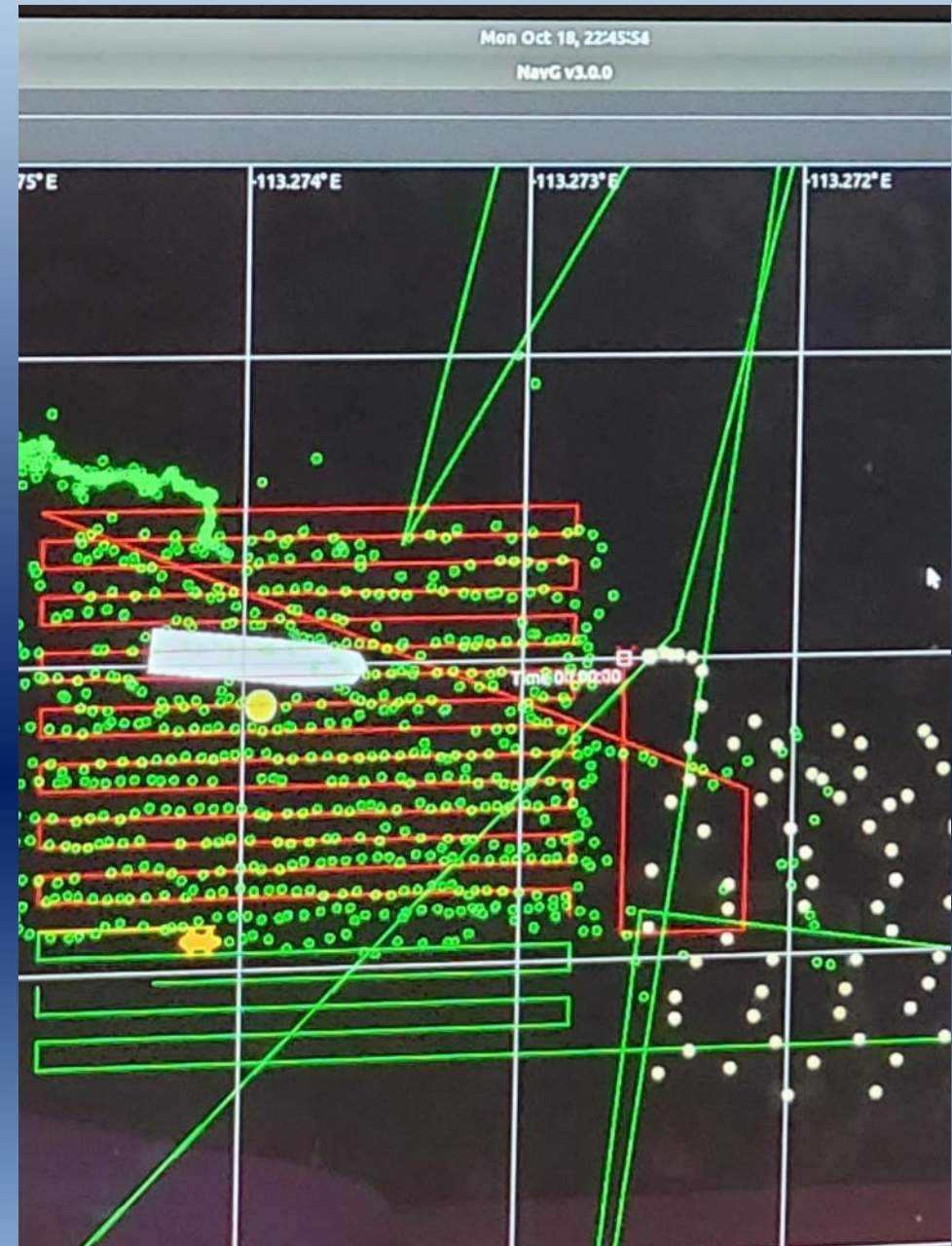
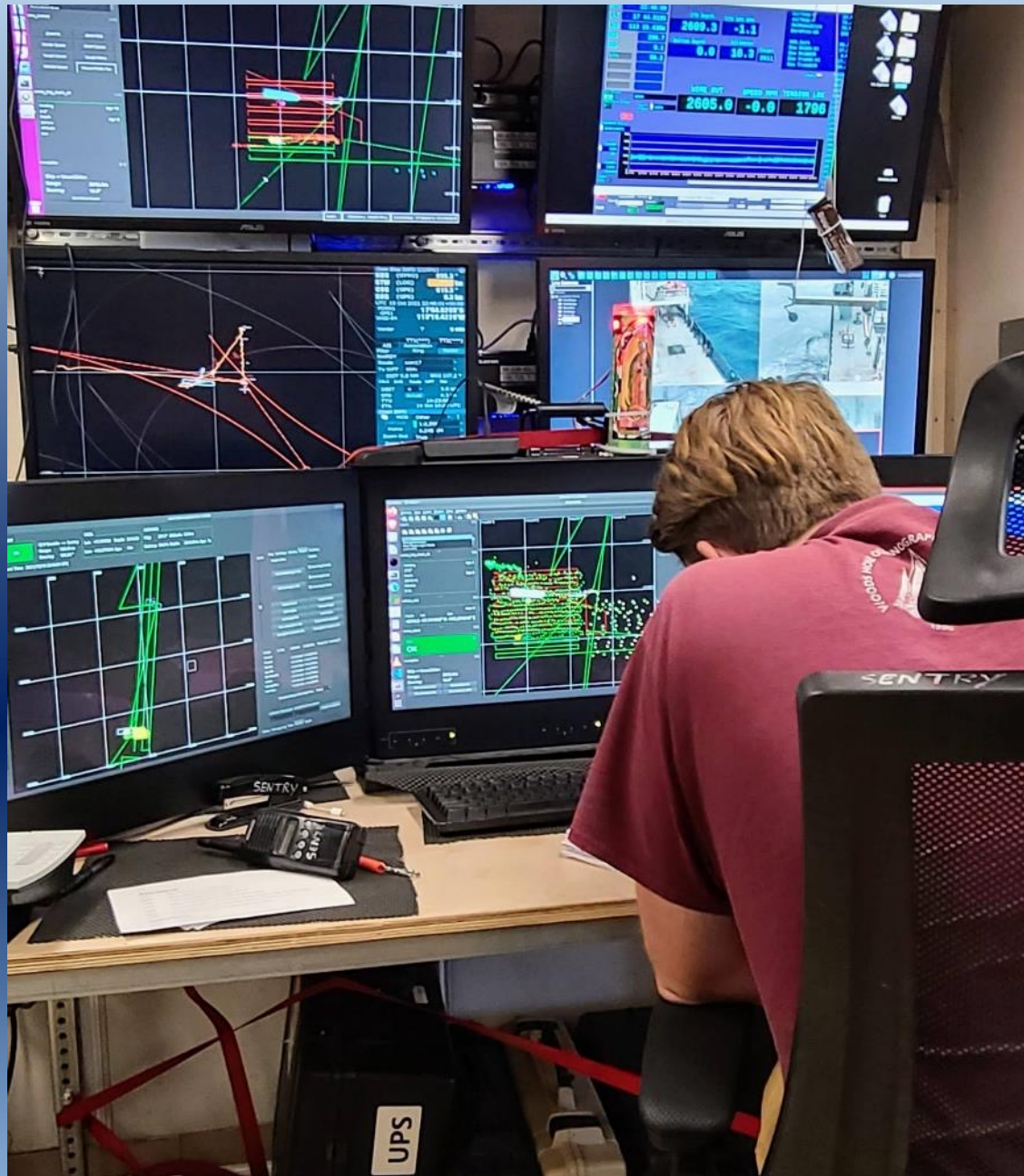
<sup>a</sup> For the case in which 1.0–4.0% of total vent-supplied Fe persists in dissolved form in dispersing, non-buoyant hydrothermal plumes (see Discussion for details).

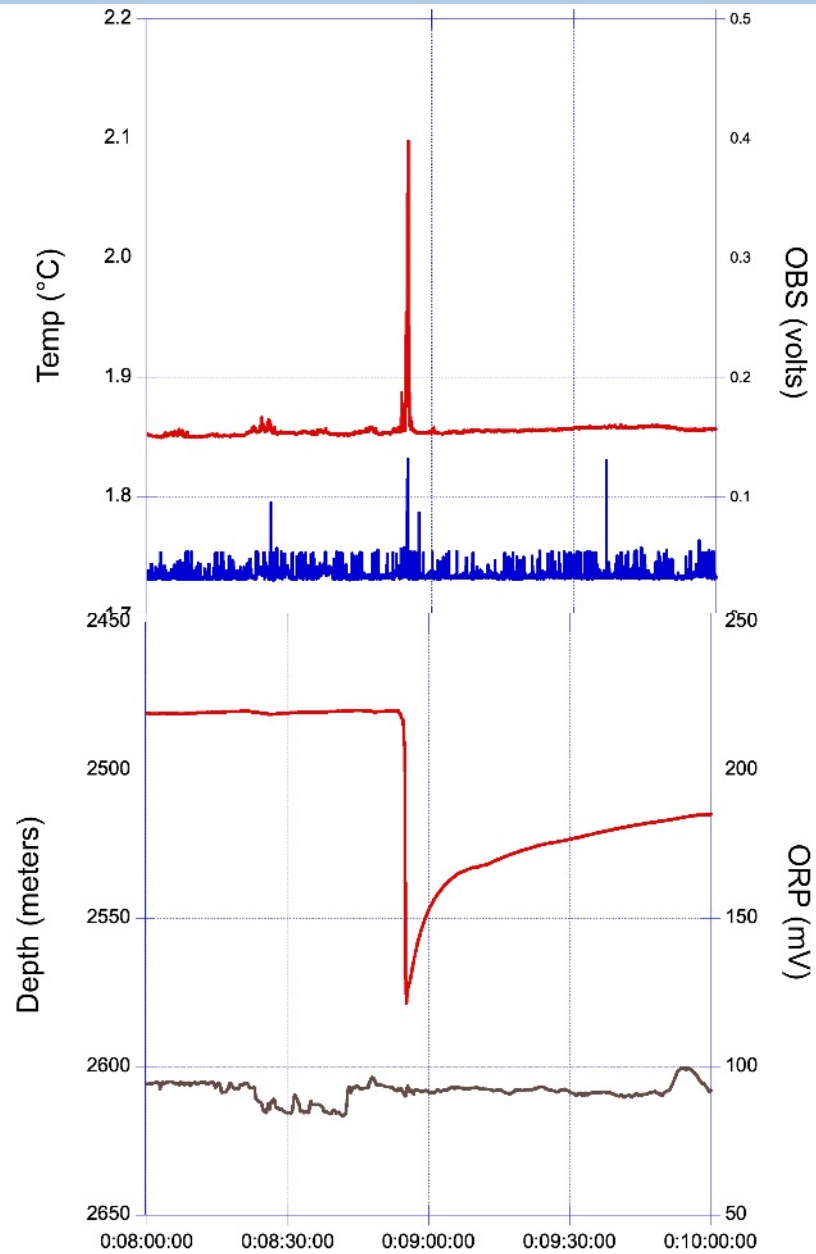
Could all this becoming from something **OTHER** than “black smoker” high temperature venting?







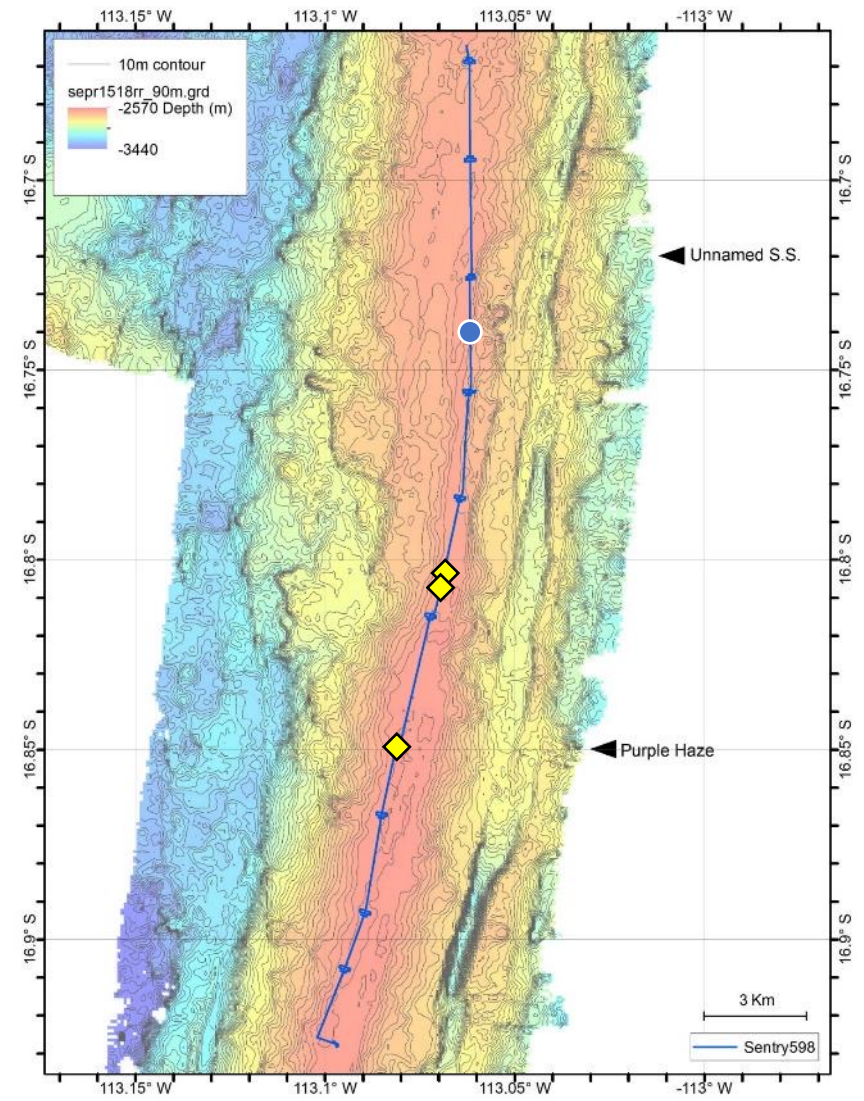
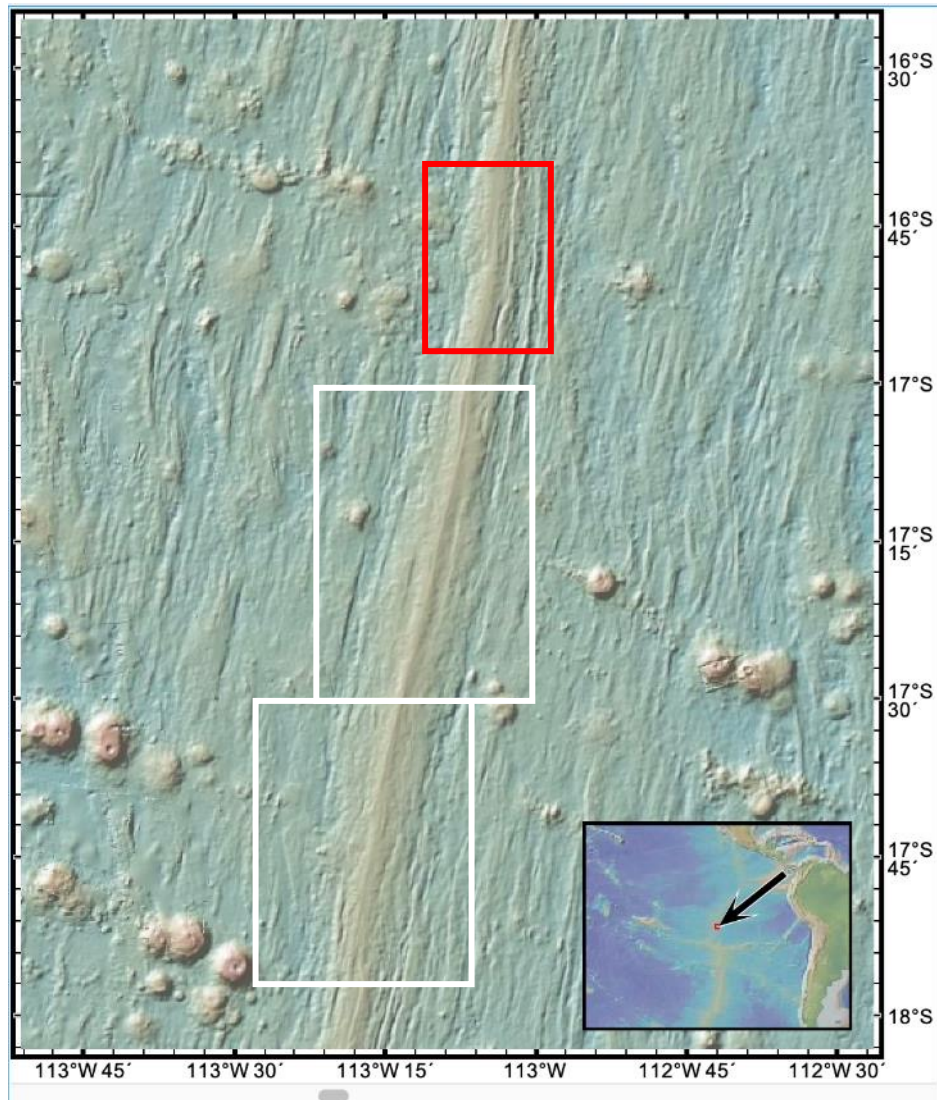




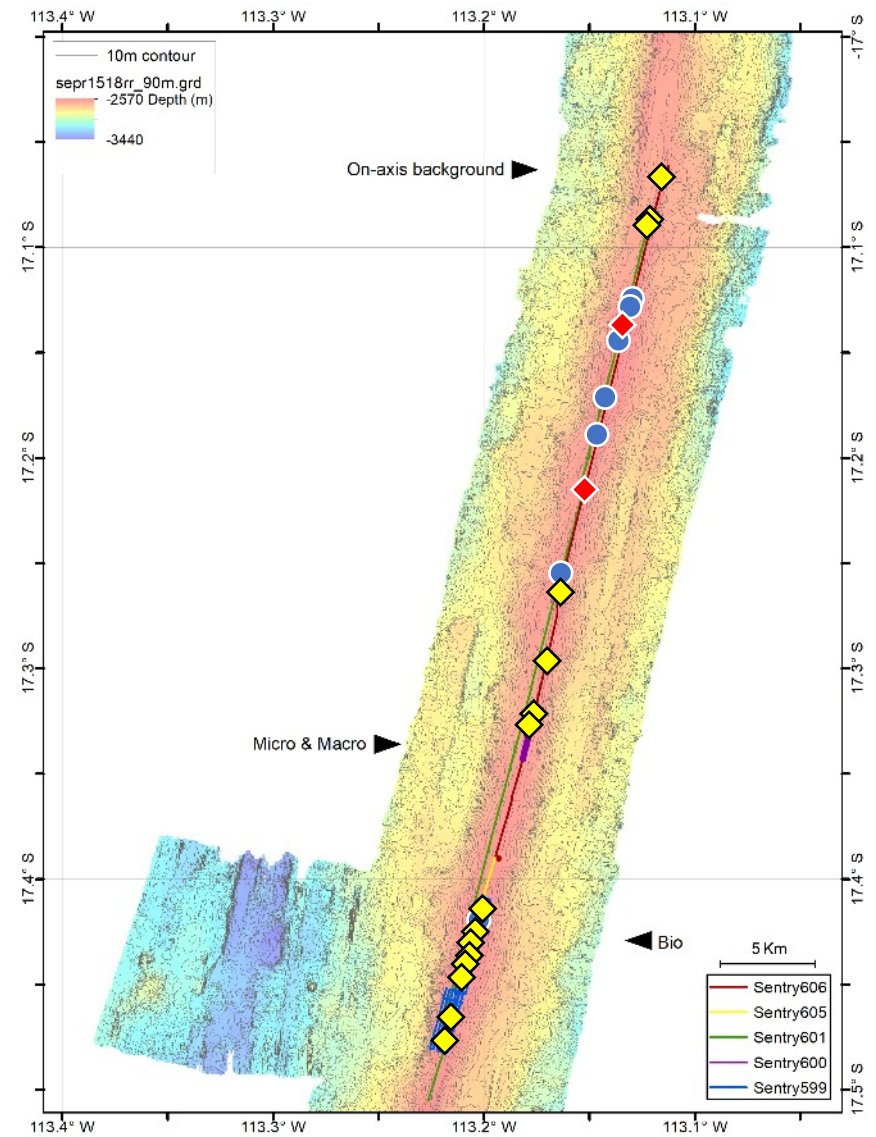
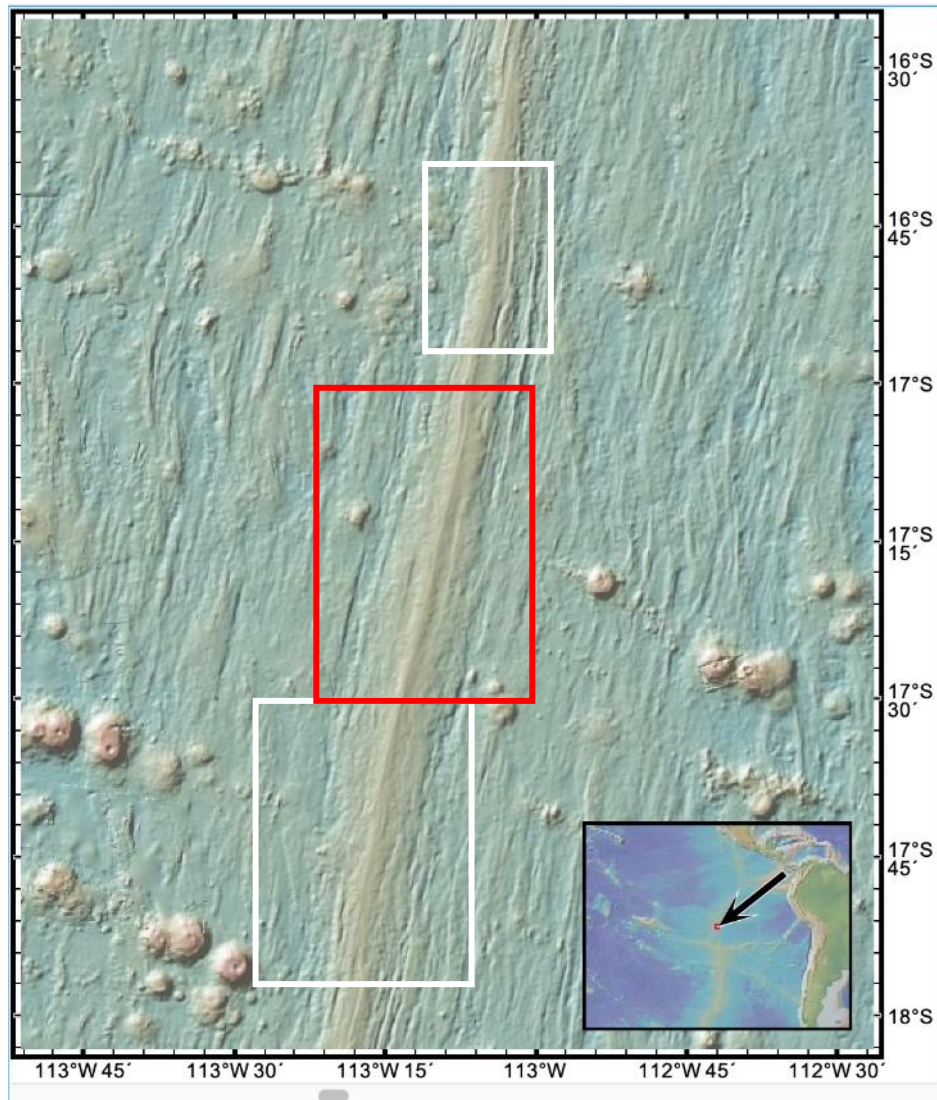
Temperature

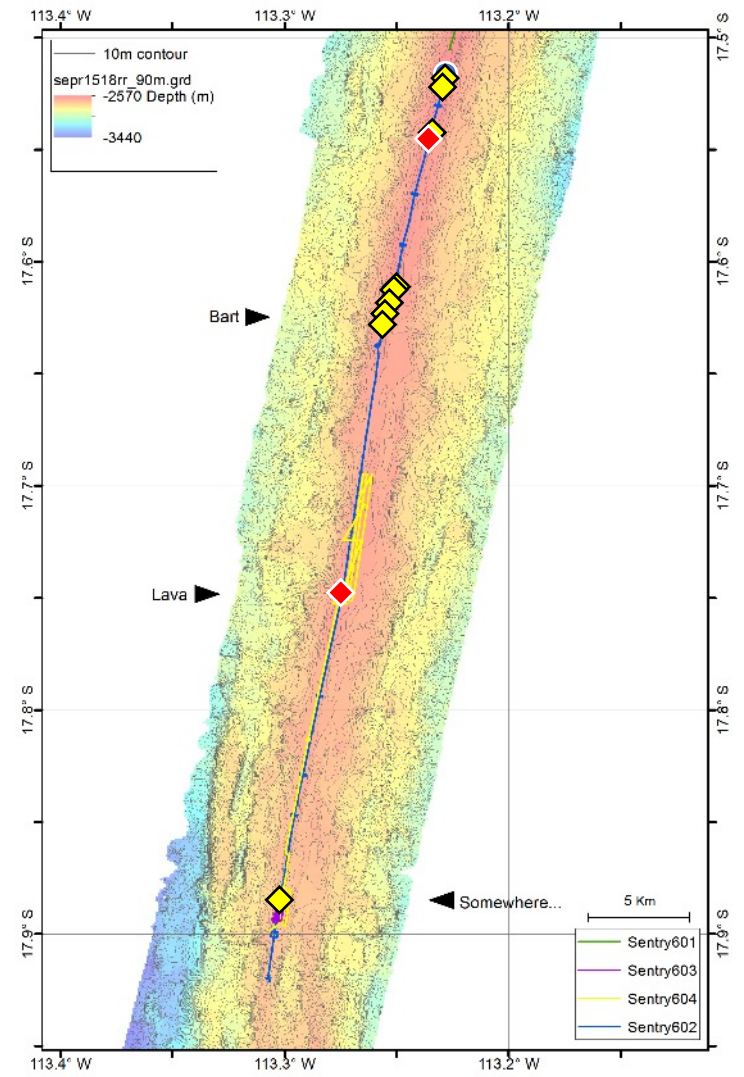
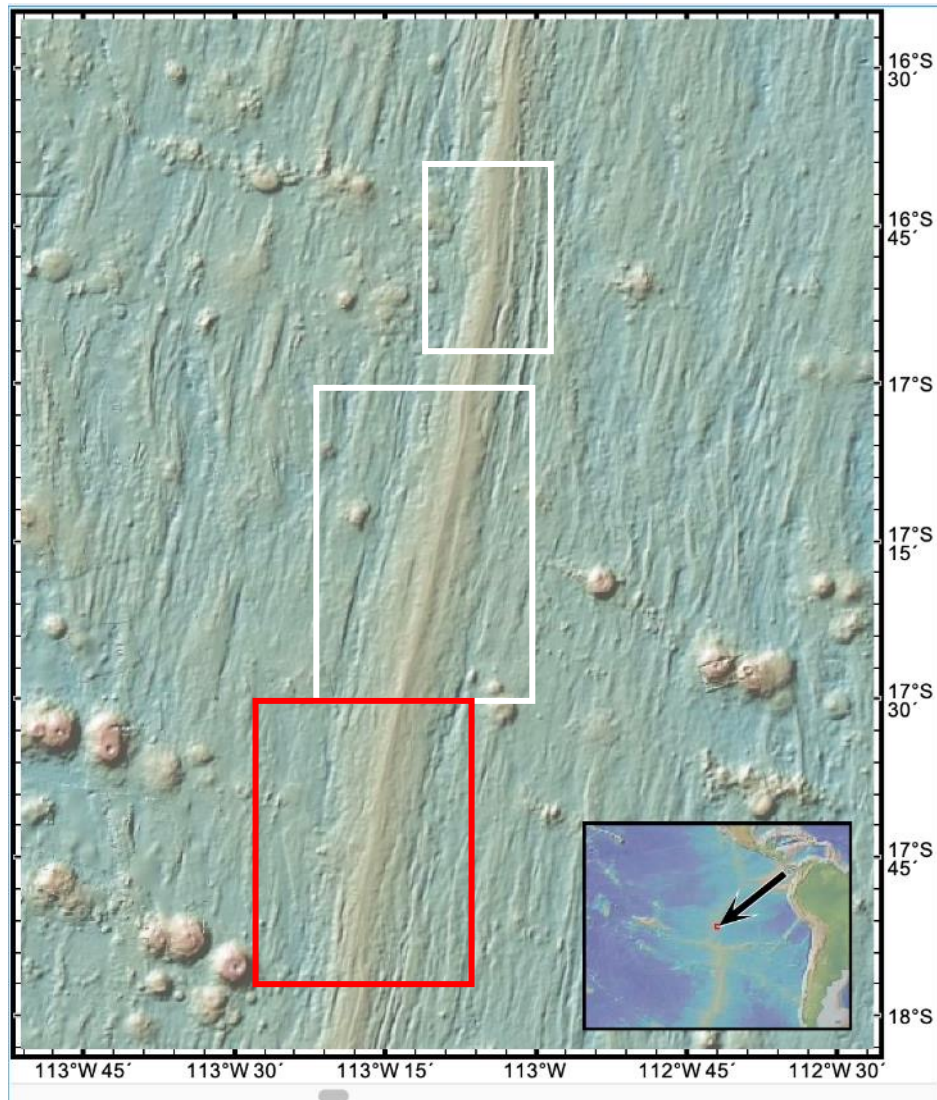
Optical Backscatter

Oxidation-Reduction Potential

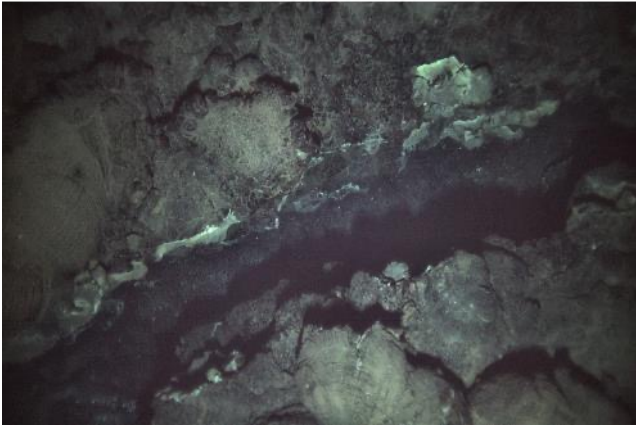




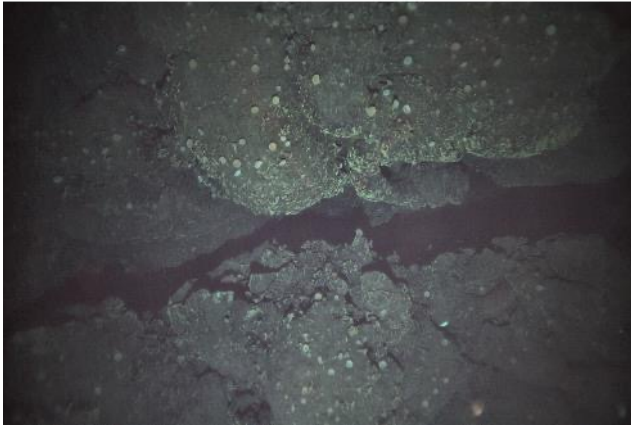




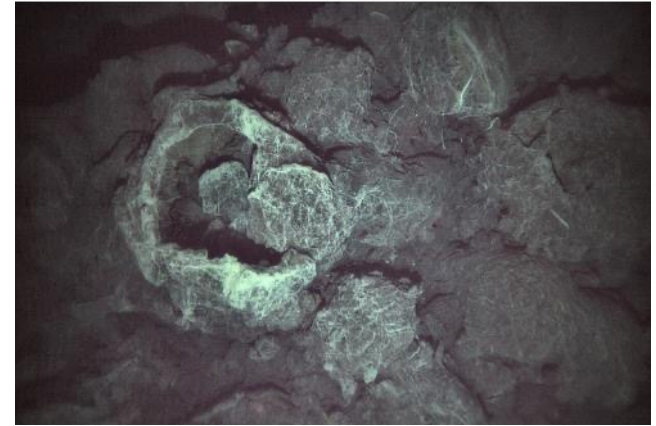
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TEMP: 1.85 SAL: 34.67 OPT: 142.62 ORP: -8.686e-05V/s OBS: 0.0270



sentry.20211010.121324090634.8193.tif 2021/10/10 12:13:24 UTC  
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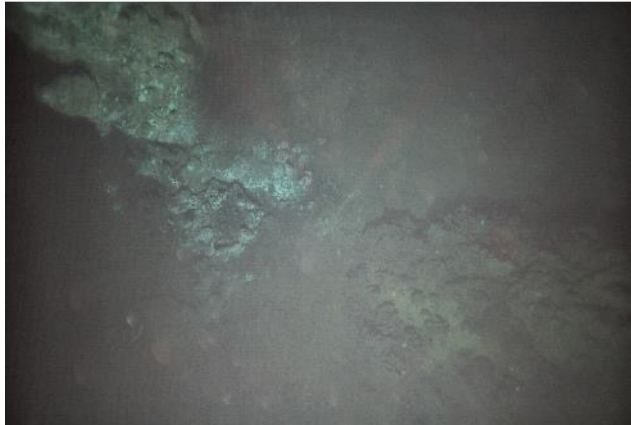
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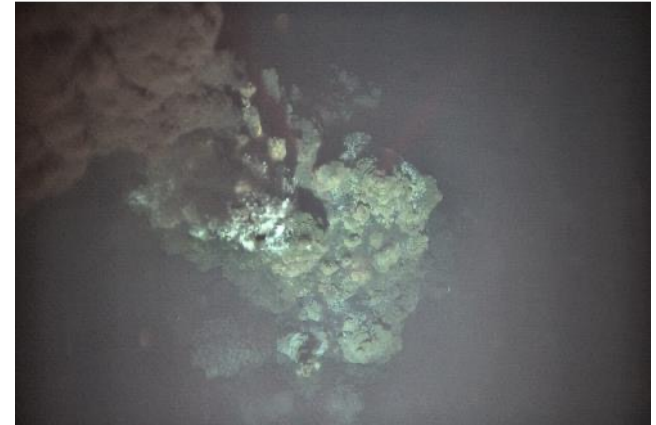
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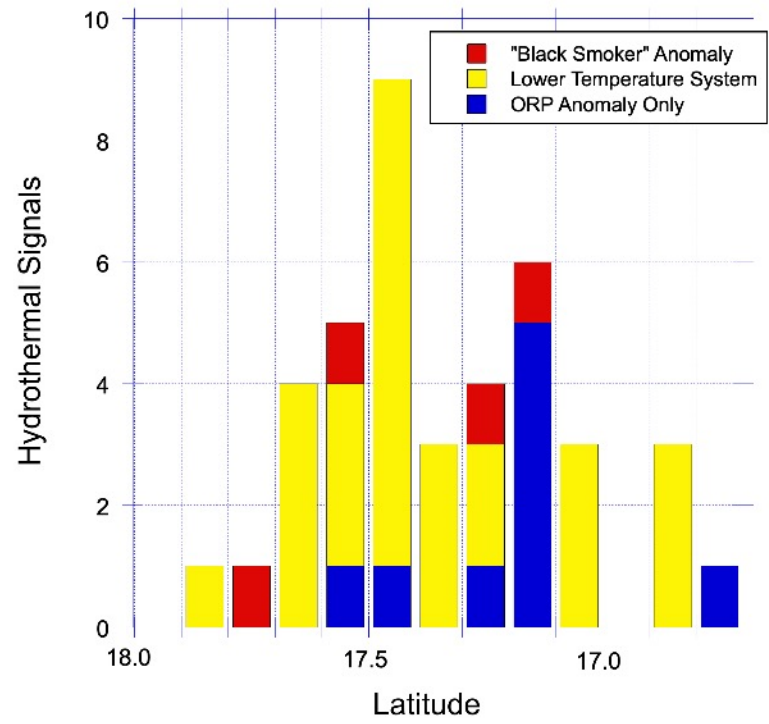


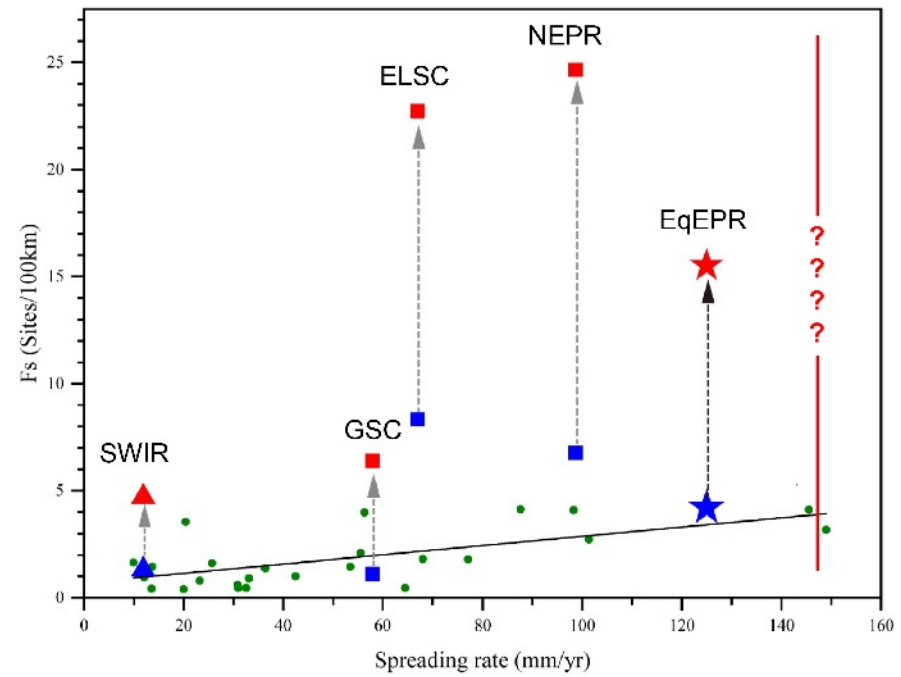
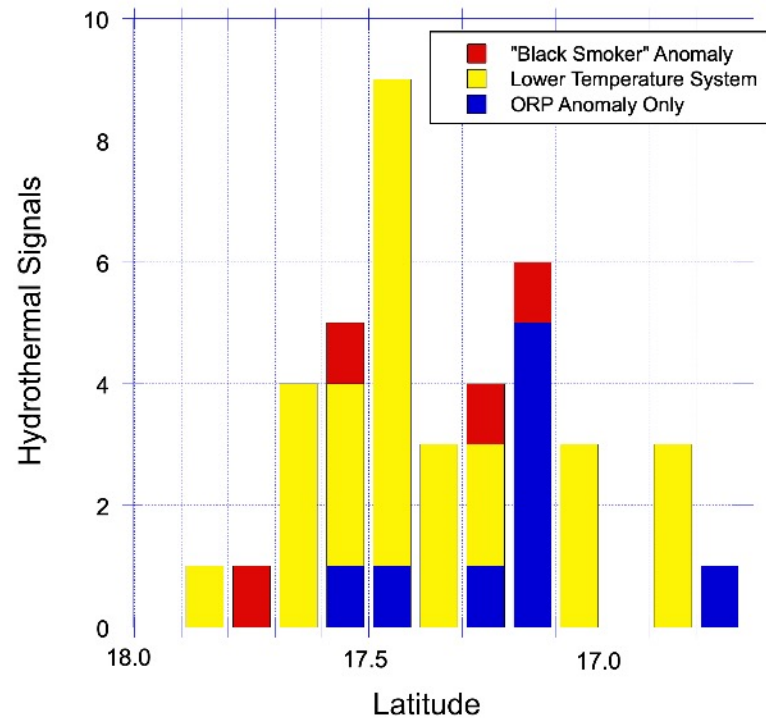
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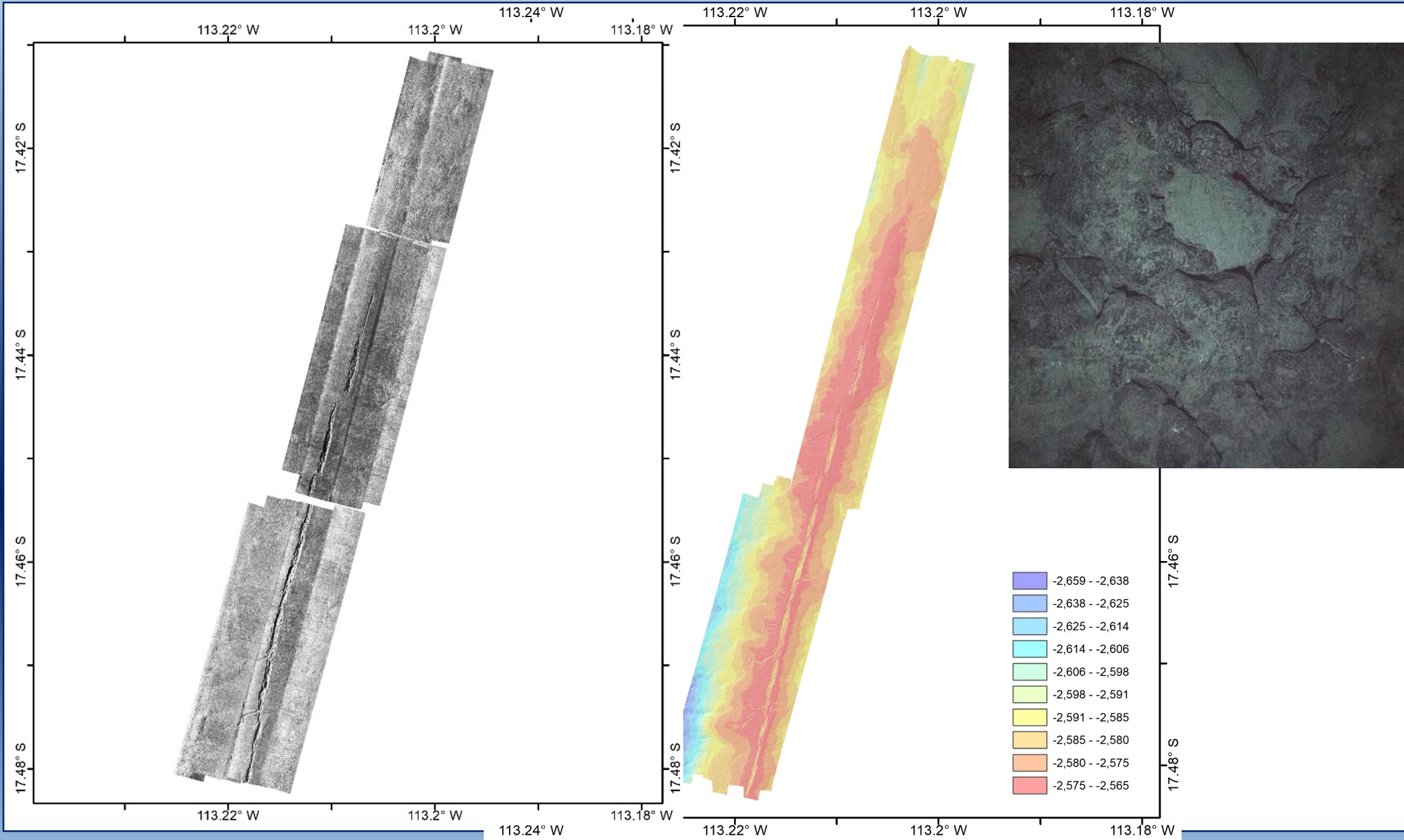


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**SOUTHERN EPR SEPT-OCT 2021**

88 CTD Rosette Hydrocasts  
10 AUV Sentry Dives  
Wave Glider