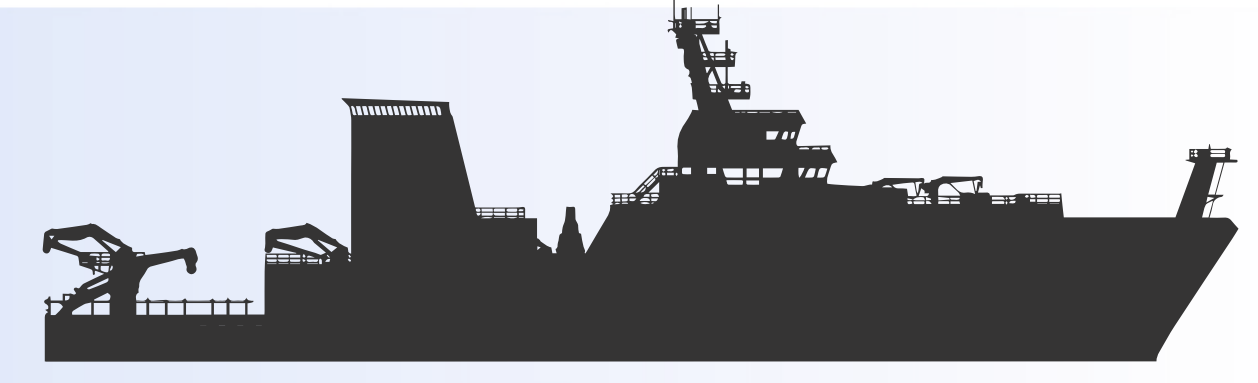




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GEOZENTRUM HANNOVER

EXPLORING THE INDIAN OCEAN - RESULTS FROM CRUISE SO271/2

Introduction

Cruise SO271/2 was the second Leg of expedition INDEX2019 of BGR with TFS SONNE and was dedicated to geophysical investigations in the German license area for polymetallic sulfides in the Indian Ocean. The cruise focused on the detailed electromagnetic exploration of four known sulfide areas in the clusters #04 and #05 of the German license area with the electromagnetic profiler GOLDEN EYE.

The work was accompanied by high resolution deep-tow bathymetric and magnetic measurements. An array of 16 Ocean Bottom Seismometers was deployed for a long term monitoring of the local seismic activity along the southernmost part of the Central Indian Ridge.

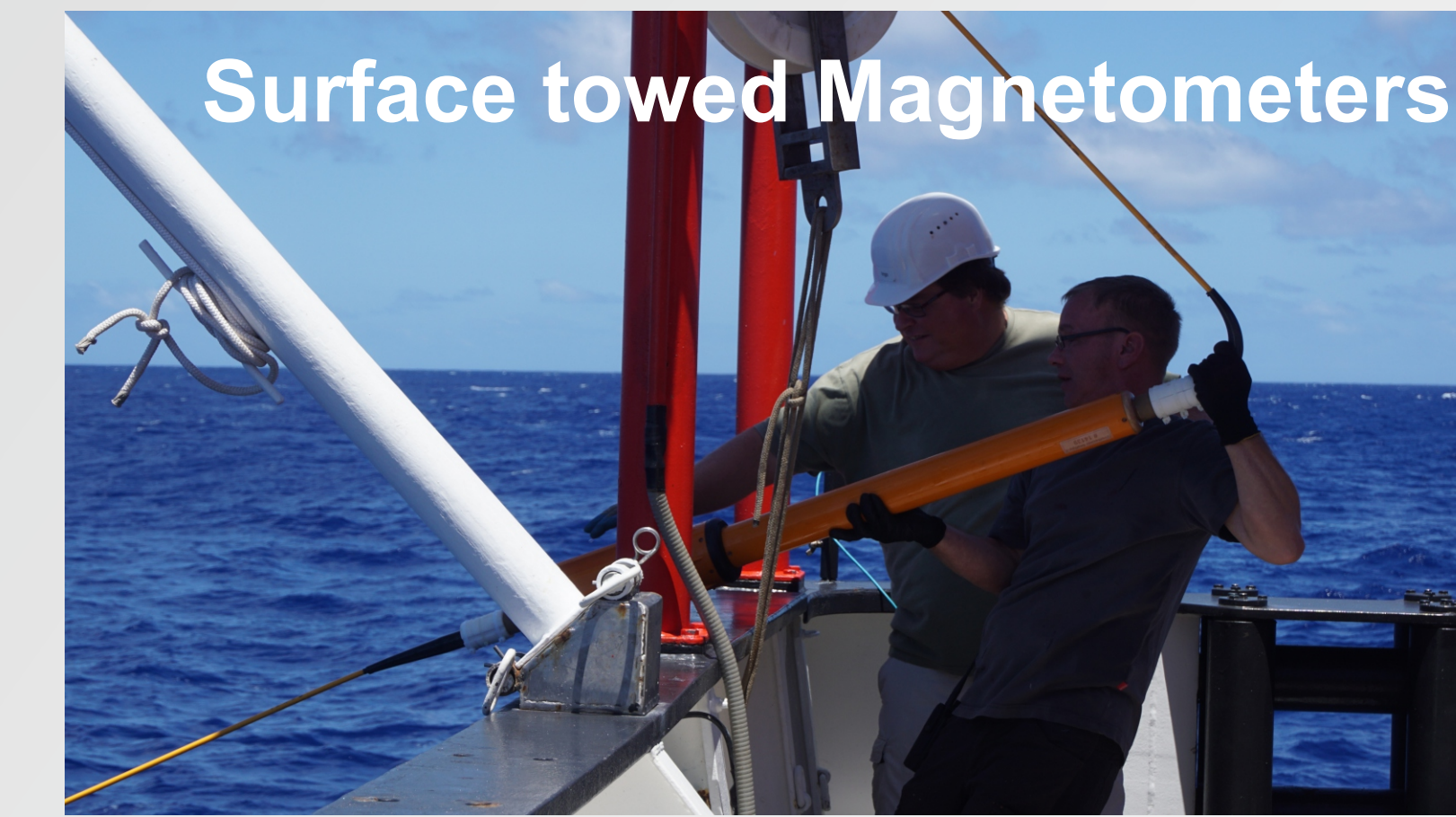
Systematic mapping of the seafloor around the four sulfide areas, investigated with a high resolution camera, contributed to the faunal census.

SO271/2 cruise track



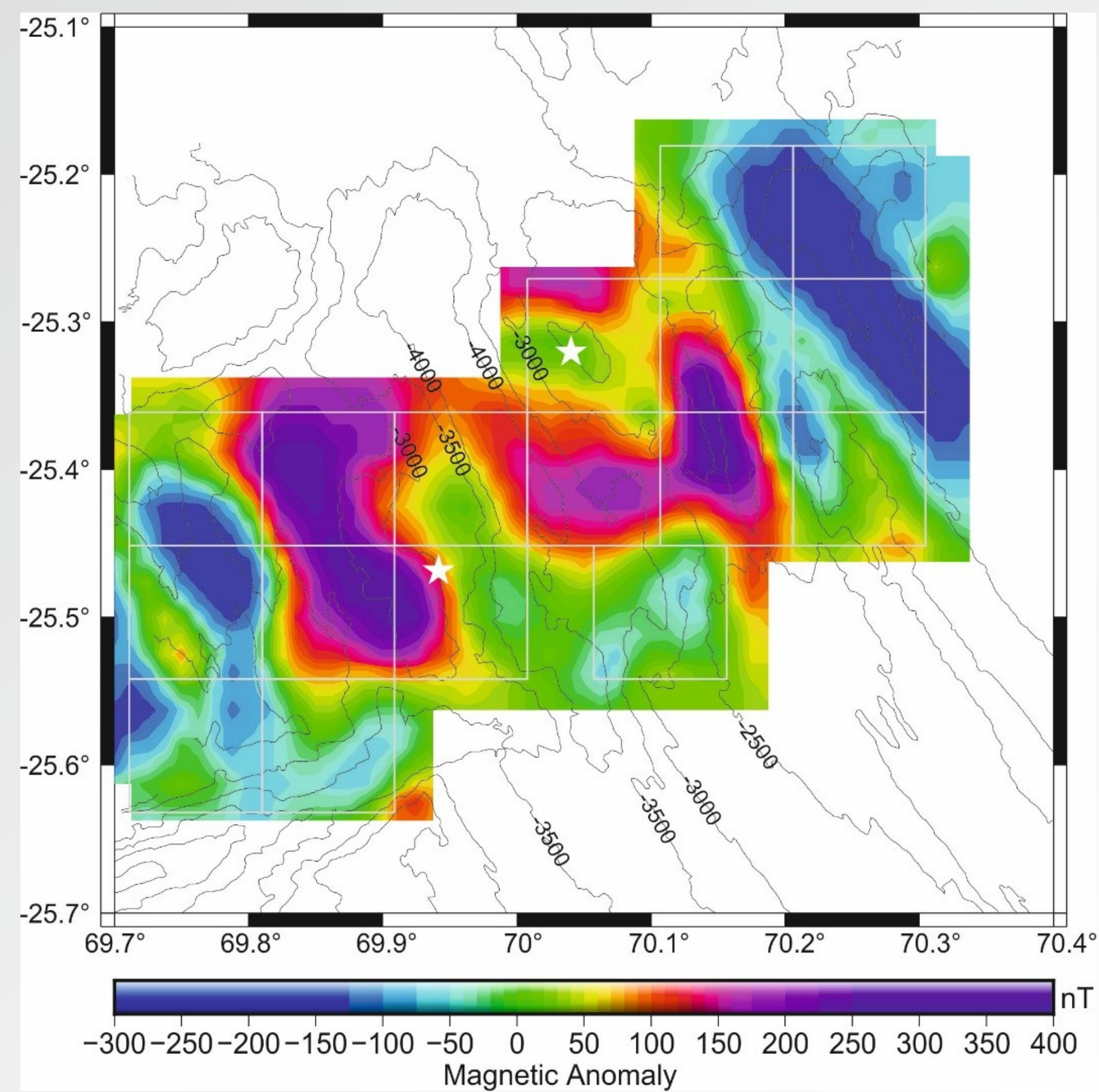
Cruise plot for SO271/2 (INDEX2019 Leg 2), and courses along the southern Central Indian Ridge, Central Indian Ocean. The cruise started and ended in Port Louis, Mauritius. Numbers refer to dates in December 2019 and January 2020.

Instruments



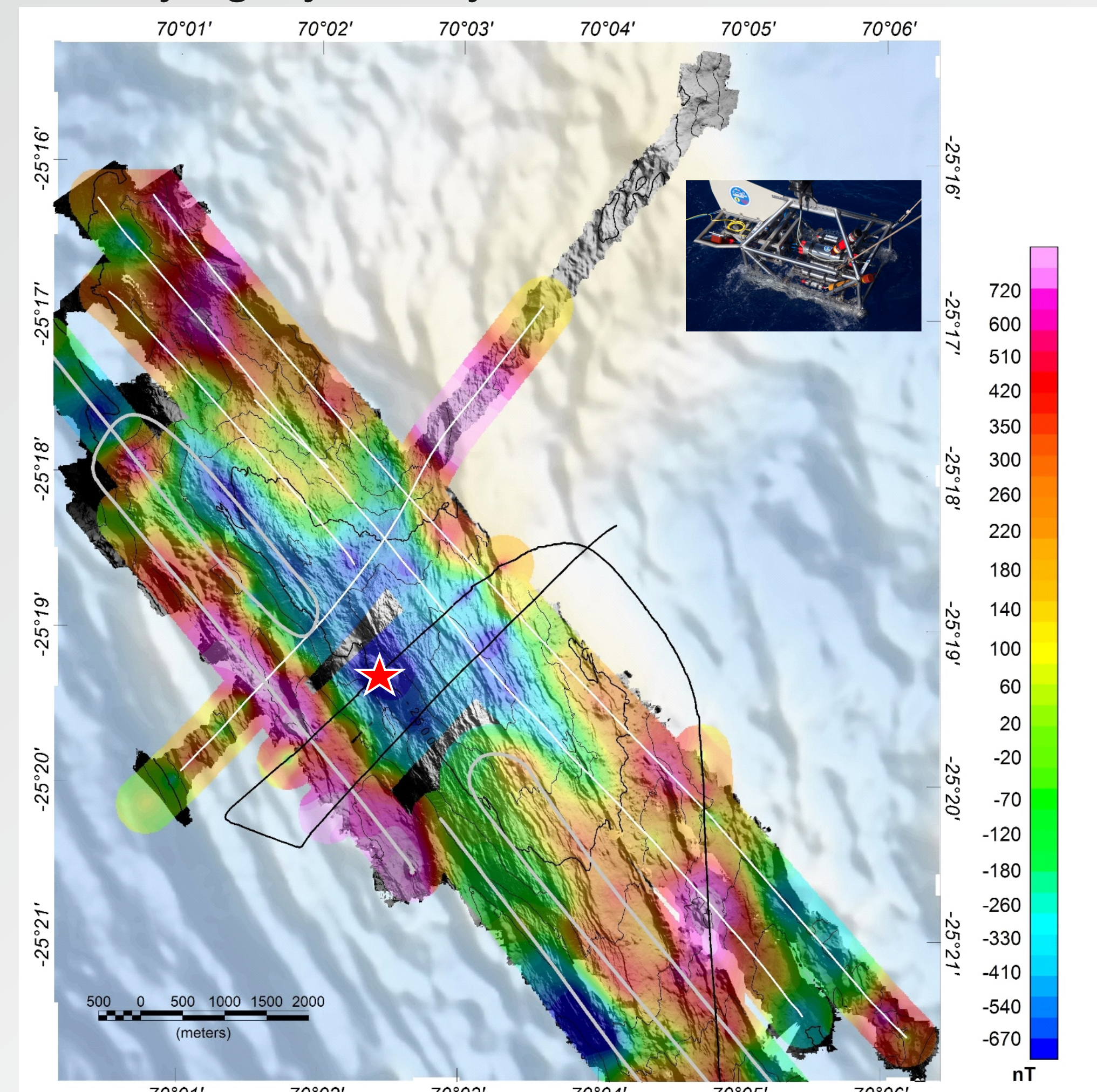
Gravimetry and magnetics

Magnetic anomaly map of cluster #05 just north of the Rodriguez Triple Junction. Data acquired during Cruise SO271/2 (INDEX 2019 Leg 2) with TFS SONNE.



High-resolution bathymetry and magnetics

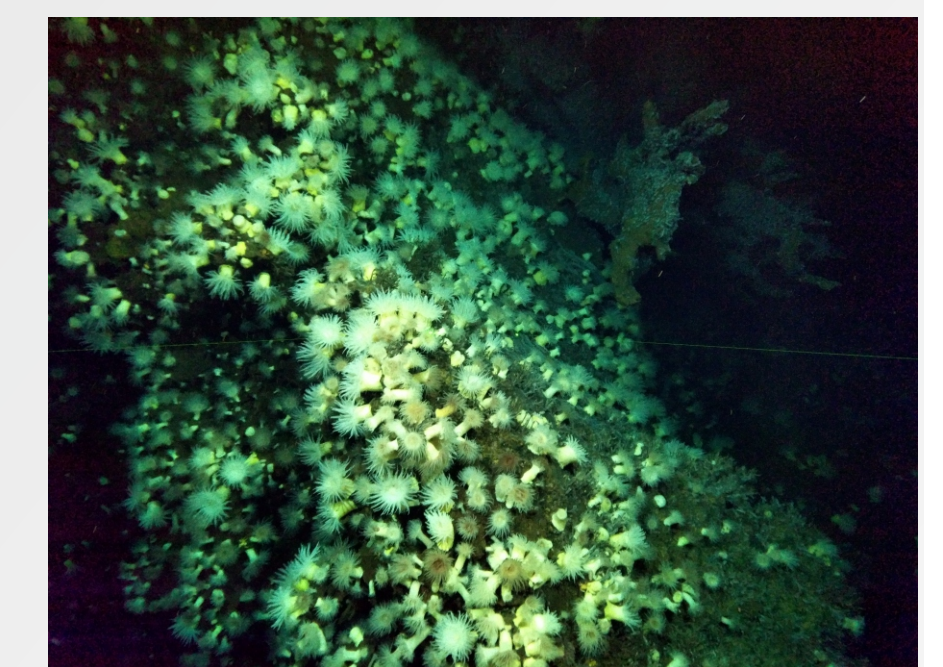
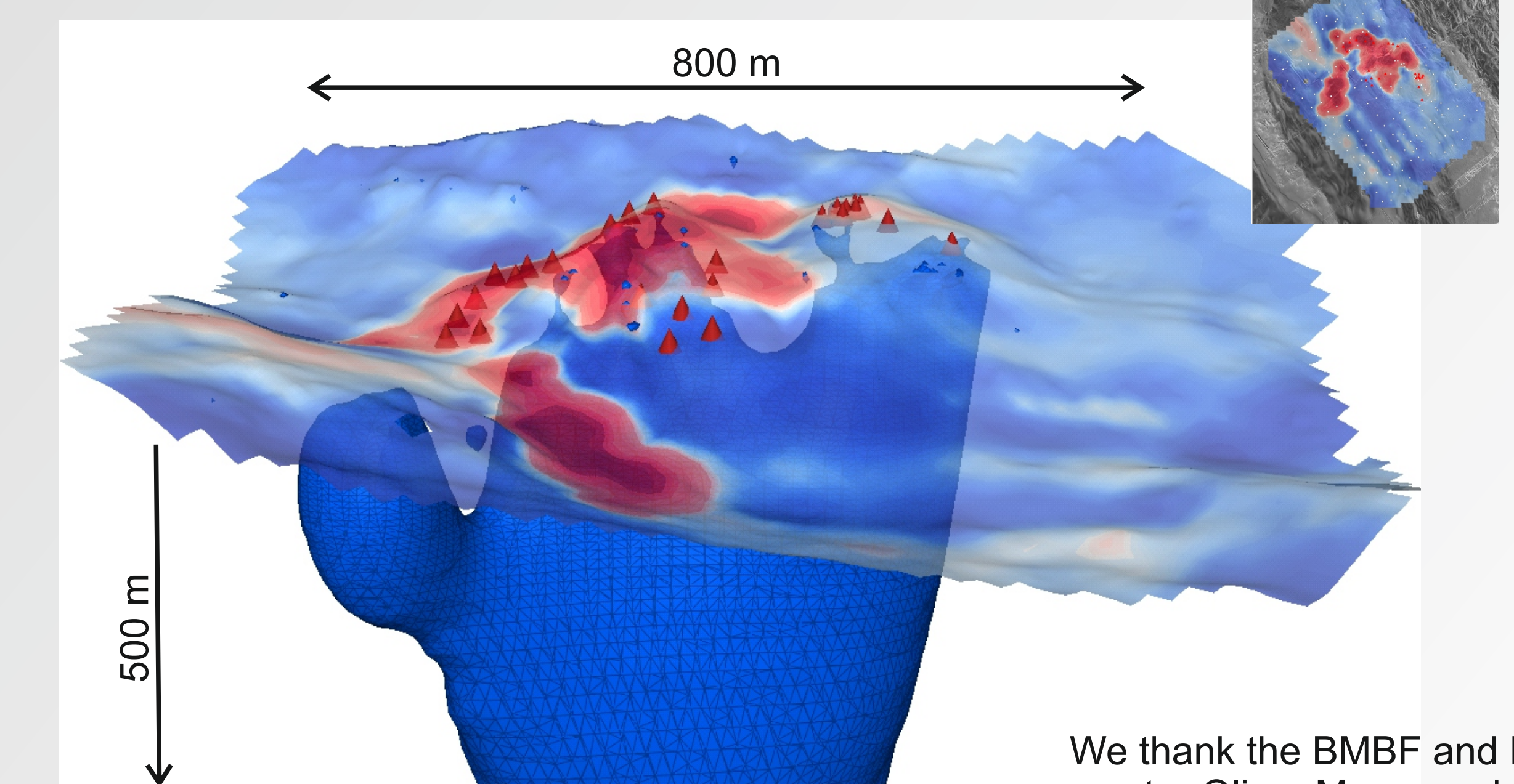
High-resolution magnetic data collected with HOMESIDE depict that the Kairei HTF is embedded in a characteristic magnetic low, owing likely to a thin extrusive overlying layer or hydrothermal alteration.



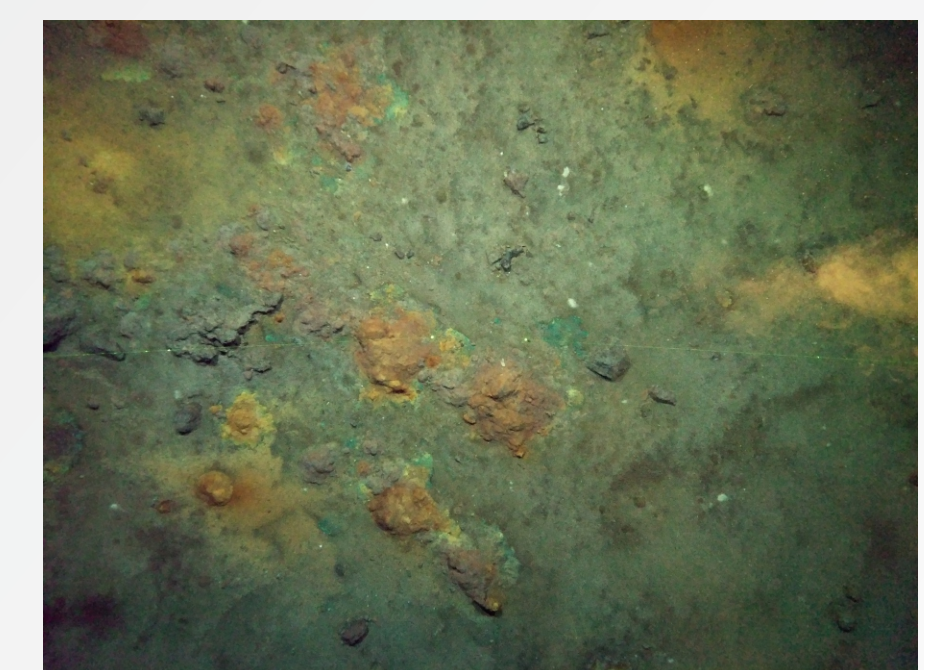
Electromagnetic and magnetic modelling

GOLDEN EYE electromagnetic map and magnetic model of the hydrothermal system below the Kairei HTF. The 3D model recovers a single elongated poorly magnetic body (<2 A/m), connected with areas of high-electric conductivity (red) and visual sulfide observations (triangles).

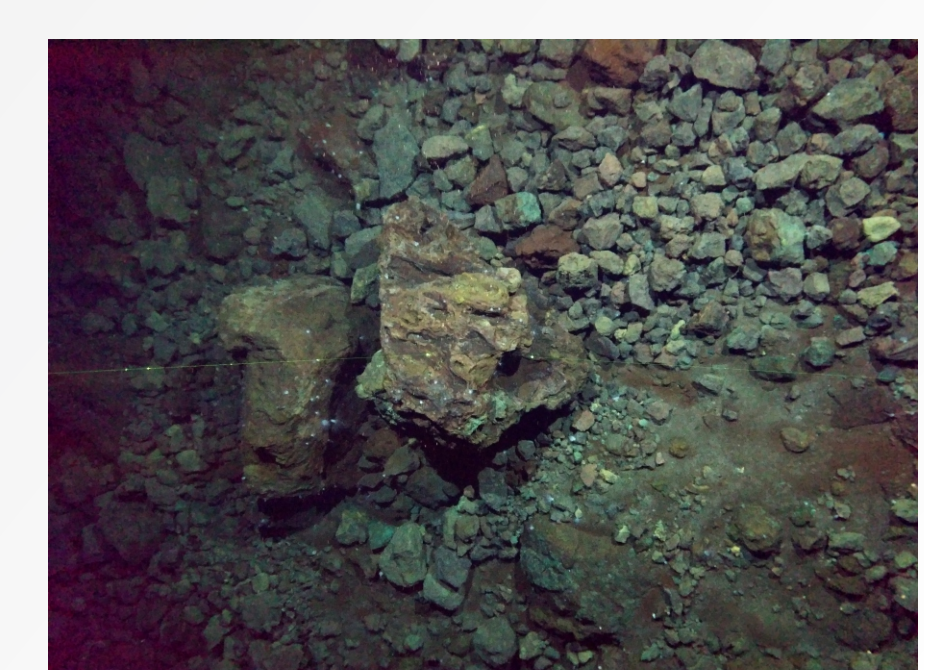
Geophysical mapping is accompanied by high-resolution video imaging and environmental/biological observation (see exemplary GOLDEN EYE pictures).



Kairei HTF - field of Maractis (anemones) in front of active hydrothermal vent



Oxidized sulfides



Basalt talus with sulfides and anemone field

We thank the BMBF and PTJ for providing the shiptime and master Oliver Meyer and the ship's crew for their support.