

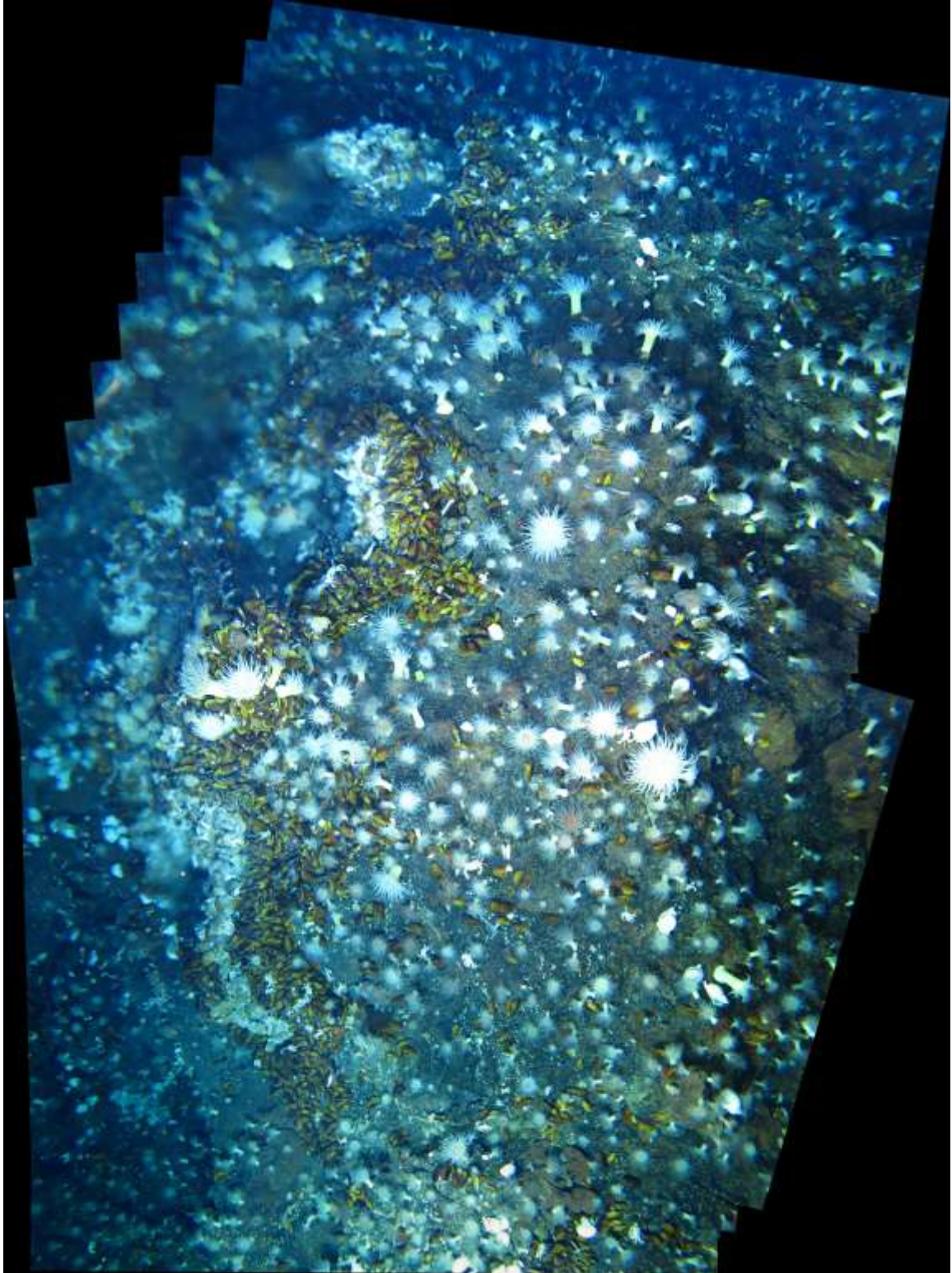
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01.10.2017

With the deployment of the last sediment trap mooring out of five and the subsequent petrological sampling of the axial graben and the eastern graben flank of cluster 10, we finish the station work in the license area tomorrow morning and leave for the 2900 nm transit to Cape Town, South Africa.

The beginning of the last week focused on station work in cluster 11 and the search for the origin of hydrothermal anomalies in the water column along the eastern graben flank. There is a notable lack of particle anomalies – generally a significant proof for the discharge of metalliferous fluids in the water column. Instead, significant redox anomalies exist, which originate from chemically reduced compounds (Fe(II), H₂S) emanating from hydrothermal vent fields. A STROMER video sled deployment in the area, however, did not confirm a hydrothermal source as there were no indications for a vent field. During a Golden Eye electromagnetic survey along the eastern graben flank communities of a distal hydrothermal vent fauna associated with a second plume anomaly were observed. A subsequent STROMER survey identified hydrothermal activity, which we named after our platform `New SONNE` field. The hydrothermal activity in the `New SONNE` field is characterized by multiple diffuse discharge of clear hydrothermal fluids attesting to the lack of a particle plume anomaly in the water column. We observed copper-rich secondary mineral phases in the video suggesting high fluid temperatures in the subsurface. The coincidence with a relatively shallow water depth may suggest phase separation processes and hydrothermal `boiling` with efficient formation of metal-rich sulfides and intense emanations of H₂S. The observed discharge areas are densely populated with a characteristic hydrothermal vent fauna. We will study and sample the `New SONNE` field during upcoming exploration cruises. The `New SONNE` field is only the second hydrothermal vent field along the entire Southeast Indian Ridge, after the PELAGIA field, identified during cruise INDEX2014.



Diffuse fluid venting and hydrothermal vent fauna in the 'New SONNE' hydrothermal vent field.

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Following a series of rock sampling stations with wax corer, dredge and TV grab and a sensor sled survey along the western graben flank, we finished our exploration work in cluster 11 for this cruise on Wednesday night. We continued with bathymetric, magnetic and gravity measurements over a distance of 98 km in cluster 10. The subsequent survey of the 50km long axial graben for anomalies in the water column did not identify new potential active sites. Water column studies with the CTD rosette and sediment stations with gravity corer and multicorer were used to prepare the deployment of this year`s fifth and last sediment trap mooring for environmental studies. The trap were deployed successfully this afternoon and will start its sampling routine over one year on October 3rd , together with the other four sediment trap moorings in the clusters 1, 4, 7 and 12.

Despite the long 39 days at sea, there is still a very good spirit on the vessel. The participants, however, await tomorrow`s departure and transit to Cape Town after very intense station and data work.

Best regards from TFS SONNE,
Dr. Ulrich Schwarz-Schampera, Chief Scientist

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