



Centre for Geobiology

## CGB research featured in PNAS

### CGB research featured in highlights of PNAS early edition, demonstrates geo-bio linkage in deep-sea sediments

A multidisciplinary team of researchers at the Centre for Geobiology (CGB) have published their findings about how the geochemical stratification in seafloor sediments correlates with stratification within microbial communities also found there.

While this idea seems straightforward enough, it has not been easy to demonstrate quantitatively. However, the team of researchers were able to capitalize on the special conditions in the sediments near the Loki's Castle hydrothermal vent fields, which Centre researchers discovered in 2008.

In addition to the hydrothermal activity, this area, located at the bend between the Mohns and Knipovich Ridges has been affected by sediment input from the nearby Bear Island fan. Geological research via seismic and coring activity into the seafloor has revealed a strong layering, or stratification, of the sediments, caused in part by alternating hydrothermal and sediment input.

The microbes living in the seafloor sediments in the deep sea obtain their energy from chemical reactions, in particular from the coupling of reactions that release (oxidation) or gain (reduction) electrons; redox reactions. For example, organisms use materials such as iron oxide as electron acceptors and organic carbon as electron donors. Thus particular layers with sufficient quantities of redox compounds can support the growth of microbial communities: different geochemical micro-environments supporting differently structured microbial communities. Knowing something about the geochemistry of particular layers enables researchers to predict the kinds of reactions - and therefore the kinds of microbes - that might be found there.

One of CGB's goals as a centre for research excellence is to develop multidisciplinary research teams that combine approaches from different fields to address large system-scale geo-biological questions. In this case, understanding the geochemical reactions ongoing in the deep sea and in geological "hot-spots" such as spreading ridges and venting systems, while simultaneously understanding the interaction and impact of this geochemical sphere with the significantly-sized biological sphere of the sub-seafloor. The results will provide new information that is relevant for the understanding of global element re-cycling.

Their article is featured in highlights of early edition, published October 1 in PNAS (Proceedings of the National Academy of Sciences). It is entitled: "Correlating microbial community profiles with geochemical data in highly stratified sediments from the Arctic Mid-Ocean Ridge".

The author team wrote a summary of the paper. Another short summary was written by the PNAS news office. Access the full article online as well as its supplementary information.



*deploying the gravity corer*  
Foto: Steffen Jørgensen



Foto: Steffen Jørgensen

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