Glass sponge environments in the Weddell Sea, Antarctica

Motivation & Objective
Glass sponges (Porifera, Hexactinellida), one of the oldest existing animal groups, play an important ecological role in Antarctic shelf regions. These marine sessile filter feeders can form vast sponge beds and dominate the benthic biomass in some areas. They provide habitat for a diverse associated fauna and play a significant role in silicon cycling and bentho-pelagic coupling. It is still unknown, however, which factors determine their distribution and, therefore, how environmental changes may affect glass sponge communities. The aim of our study was to characterize environments with and without glass sponges—therefore, how environmental changes may affect glass sponge communities. The filter feeders can form vast sponge beds and dominate the benthic biomass in Antarctic shelf regions. These marine sessile

Methods
We conducted video transects with a remotely operated vehicle (ROV) and measured various environmental parameters at corresponding stations in the Weddell Sea during expedition PS82 with RV Polarstern in January/February 2014. To gain a first impression of glass sponge abundance, 20 images from the first hour of each of six transects were randomly extracted, measured and animals were counted. Temperature was derived from CTD measurements and water samples were analyzed for dissolved silicate (dSi) concentration and bacteria abundance. All results shown here are preliminary.

Results
Station A (12.5 m²)
- Depth 410 m
- Gravel/mud/debris
- Strong current
- No sponges, few cnidarians and mobile benthos

Station B (14.4 m²)
- Depth 220 m
- Spicule mats/debris
- Many sponges, bryozoans, ascidians, otoctornals and echinoids

Station C (10.7 m²)
- Depth 280 m
- Gravel/stones
- Extremely high bryozoan cover, many sponges with holothurians and crinoids

Conclusions
- Bottom water temperatures and dissolved silicate lower at stations with glass sponges than at stations without them
- No obvious differences in bottom water bacteria abundance between stations
- Highest sponge diversity at stations with hard substrate or sponge spicule mats

Community composition and abundances

Glass sponge diversity

References