Long-term multibeam monitoring of natural methane seepage offshore Prins Karls Forland, Svalbard

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Natural methane seepage from the seafloor to the hydrosphere occurs worldwide in marine environments, from continental shelves to deep-sea basins. Depending on water depth, methane fluxes from the sediment to the water column and mixing rate of the seawater, methane may partially reach the atmosphere where it could contribute to the global greenhouse effect. This can be observed from hydro-acoustic systems during research surveys. However, natural gas emission is not a continuous process and may vary in intensity and frequency. It is therefore necessary to study the temporal variability of methane seeps using long-term observation methods. One sensitive, accurate and reliable way to do this is by hydro-acoustic systems mounted on ocean observatories.

Here we present new long-term hydro-acoustic monitoring data from a known highly active seepage site offshore Prins Karls Forland, Svalbard. The data were acquired by a horizontally looking M3 multibeam echosounder system that was mounted on a benthic ocean observatory from October 2016 to July 2017. Our preliminary results show the presence of several individual seeps in the vicinity (<40 m) of the observatory throughout the observation period. Their activity patterns vary from non-existent to constant phases. We present the frequency of appearance and changes of the observed seeps over time. The first results confirm that methane seepage is not a constant process and emphasize the importance of long-term monitoring of methane seeps with regard to reliable flux rates estimates for a more accurate impact assessment on the climate.

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