

Long term and continuous sampling of interstitial waters by OsmoSampler from active venting sites of shallow gas hydrate field, Umitaka Spur, eastern margin of Japan Sea

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Changes of the seafloor environment around the gas venting within a few days have been observed by ROV on the Umitaka Spur, Japan Sea. Geochemical environment near the gas venting including gas hydrate might have also changed within a short period compared to geological time scale. We have deployed osmotic fluid samplers ~10 m away from the gas venting site on the Umitaka Spur from September 2013 to March 2014 (160 days) and collected interstitial waters continuously for high resolution time-series analysis of interstitial waters.

Overall-trends of concentration change of major ions dissolved in interstitial waters are similar, changing periodically in 3~5 days. The interstitial waters captured saline and fresh water derived from formation and dissociation of gas hydrate in response to the change of methane flux.

Concentrations of methane in interstitial waters were increasing drastically until the 40th day. Gas hydrate formation facilitated by active gas venting might have plugged the path delivering gas-rich fluids to the seafloor, contrary, reduced gas flux (venting) had caused gas hydrate dissociation. Gas hydrate formation and dissociation controlled by gas flux has changed geochemical environments near the seafloor.

This study was conducted as a part of the shallow methane hydrate exploration project of METI.