Geochemistry of pore water, dissolved gas, and sediment from offshore Hidaka area, Hokkaido

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Precise acoustic investigations resulted in the wide distribution of gas chimney structures accompanying high backscatter anomalies, which indicates strong methane migration from deep sediments to the seafloor and the potential formation of gas hydrate/carbonate near the seafloor in the offshore area of Hidaka, Hokkaido. We have deployed gravity corer and collected sediments to analyze compositions of sediment, pore water, and dissolved gas for characterizing geochemical system related to the high methane environments near the seafloor.
Concentrations of sulfate dissolved in pore waters just on the gas chimney show rapid decrease with depth. Concentration of methane and the depth of sulfate-methane interface, indicative of methane flux, locates at 74 to 420 cmbsf, equivalent to the shallow gas hydrate area in the eastern margin of the Japan Sea. Carbonates are observed only at the western slope region where the moderate methane flux is estimated. Geochemical environments are different among the locations reflecting subseafloor structures.
This study was conducted as a part of the shallow methane hydrate exploration project of METI.

