METHANE SEEPS IN THE NORTH SEA : TOMMELITEN REVISITED

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North Sea sediments from pockmarks often contain high amounts of gas and oil buried in 3 to 5 km below sea floor. In the framework of the EU project METROL, the former exploration site Tommeliten was visited in 2002. The goal was to identify potential target sites with gas seepage for further study of methane emission and its control. At Tommeliten we found active venting in the form of rising gas bubbles from small seeps. Tommeliten is characterized by the presence of carbonate reefs, which are populated by a diverse benthic community. Parasound reflectivity indicated gas mounds reaching up to sediment surface. Sediment and water column samples were obtained along a transect. In the water column gas plumes (20-100 m in width reaching up to 20 m below sea surface) were observed acoustically and sampled with a CTD. Within the gas plume, high concentrations of methane were found, decreasing to background values outside of the seep area. Cores of up to 4 m length were sampled with the vibrocorer. The cores from the seeps contained free gas in the form of bubbles within sandy sediments. Along the transect, the methane sulfate transition zone deepened away from the point source, from surface to > 200 cm sediment depth. Free gas was trapped in bubbles between layers of marl and carbonates. Within the methane-sulfate transition zone, clear peaks in lipid abundance and stable isotope depletion were recognized and indicate the presence of a community of anaerobic methanotrophs. Distribution and diversity of the methanotrophic community is currently investigated.