



Contour map of free gas in sediments of the Skagerrak - Baltic Sea region

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A GIS map showing the depth contours of sub-seafloor gas in marine sediments of the Skagerrak -Baltic sea region, was constructed from existing acoustic data as part of the EU METROL project. The purpose of the map was to identify suitable locations for investigation of possible methane emissions to the atmosphere including studies of the methane sulfate transition zone, which generally acts as a barrier against methane emission from the seabed. Furthermore, knowing the minimum depth of free gas below seafloor also help to constrain geo-microbial modeling regarding methane fluxes, which is a second task of the METROL project.

The resolution of the acoustic data did not allow construction of gas contour intervals better than 2 meters, and mapping indicates that the top of the free gas zone exist 2-4 m below seafloor in most gassy areas. Free gas causing acoustic turbidity is mostly observed in thick deposits of fine grained Holocene sediments, yet methane in pore-waters most likely exists in a much wider area. It appears that formation of free gas due to super-saturation mostly occurs when the thickness of the sediment exceeds 10 - 25 m, depending on hydrostatic pressure and rate of methane formation.

Gas plumes from older and deeper sediments are seen along the Danish coast in a 1-2 km wide zone in northern Kattegat. Methane emissions have also been observed in this zone.

Due acoustic blanking it not possible deduce the total thickness of gassy sediments, however, seismic data indicate a maximum thickness of 100 - 150 m in the northern Kattegat area.

The organic matter content of the gassy sediments in the area usually vary from 1 - 5 %

TOC, yet presence of free was indicated in rapidly accumulating sediments containing as little as 0.3 % TOC.