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SEEP – Seabed baseline conditions for platform abandonment

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Seabed leakage of hydrocarbons to the marine environment is a concern associated with abandonment of North Sea oil and gas fields. In order to take the necessary precautions during the field closure and optimize plans for post-abandonment monitoring, it is important to understand the occurrence of natural seepage both regionally and locally. The aim of the SEEP project is to Develop a toolbox that contains the necessary tools for establishing a baseline that distinguishes between natural conditions and anthropogenic impacts on the shallow subsurface.

This baseline describes the typical migration pathways in the area, and potential local migration pathways through interpretation of geophysical data. This data includes multibeam echosounder data for surface geomorphology/dynamics, subbottom profiler and ultra-high-resolution seismic data for shallow and intermediate depths, and existing deep seismic data. The baseline also describes the character of gas that is migrating through the sediments and discerns whether it is biogenic or thermogenic, through analysis of bivalves and foraminifera living in the sediment and bacterial analyses and application of various geochemical proxies, e.g. $\delta^{13}C$.

Geophysical data and sediment core analyses are carried out in areas within and outside hydrocarbon fields to illuminate potential impacts linked with production as opposed to natural seepage. By combining all SEEP data with existing stratigraphic knowledge, we generate a geological model that includes the relevant baseline parameters, allowing the shallow subsurface to be understood in detail.