

### **Dynamic Response of Gas Hydrates to Lithological Changes: Evidence from the Mid-Norwegian Continental Margin**

Waldmann, Nicolas <sup>1</sup>; Hafliðason, Hafliði <sup>1</sup>; Zühlsdorff, Christine <sup>1</sup>; Hjelstuen, Berit Oline <sup>1</sup> (1) Department of Earth Sciences, University of Bergen, Bergen, Norway.

Unconventional petroleum resources, including gas hydrates, offer particular challenge for future production. These resources are developed and stored in ways that make many of the conventional methodologies less applicable. Development of a comparable set of theories and methodologies for commercial viability of gas hydrate as an energy source has lagged behind, despite the great importance of new alternative resources for potential future exploitation. Gas hydrate is stable in marine sediments on sub-Arctic and Arctic continental slopes under present temperature and pressure fields. The extent of these deposits can usually be inferred from seismic imaging, in which the base of the methane hydrate stability zone is frequently identifiable by a bottom simulating reflector (BSR).

New insights from extensive coverage of 2D/3D seismic data have confirmed the spatial distribution of gas hydrates on the mid-Norwegian continental margin. Supplemental shallow boring datasets provides essential information about the lithological and sedimentological constrains of gas hydrates. Off mid-Norway, wedges of thick glacial units were deposited during past glacial intervals and covers older sequences of fine-grained hemipelagic siliceous ooze. This stratigraphic architecture combined with subsidence, large amount of biogenic methane, deep thermogenic methane reservoirs and thermal processes, provide a natural laboratory where to study the development and dynamics of methane hydrates through time. Due to the high stratigraphical resolution and good data coverage in this site, amalgamation of seismic and core data offer an unusual opportunity to investigate the dynamic behavior of gas hydrates bearing reservoirs and their relationship with slope stability and methane release through time.