



Ocean warming-induced gas hydrate dissociation in the SW Barents Sea

Sunil Vadakkepuliambatta (1), Shyam Chand (1,2), and Stefan Bünz (1)

(1) CAGE-Centre for Arctic Gas Hydrate, Environment and Climate, Department of Geology, UiT-The Arctic University of Norway, (2) Geological Survey of Norway (NGU)

The Barents Sea is a major part of the North Atlantic where warm Atlantic water mix with the cold Arctic waters. Abundant shallow gas accumulations, fluid flow features, and gas hydrates occur in the SW Barents Sea owing to hydrocarbon leakage from deep reservoirs. Recent Ocean warming has increased the bottom water temperature in the SW Barents Sea by at least one degree Celsius. We model the gas hydrate stability field in the SW Barents Sea over the last 50 years taking in to account the lateral variations of geothermal gradient, bottom water temperature, and gas composition. The hydrate stability zone thickness is highly sensitive to the gas composition and the geothermal gradient, and show very high local variability. Seismic images show numerous gas hydrate accumulations with well-defined bottom simulating reflectors (BSR) associated with gas chimneys and leaking faults. The shallow geothermal gradient is in equilibrium showing no residual effects of last glaciations, and ceased to affect shallow hydrate stability conditions. Ocean warming primarily affects hydrate stability most likely only in the upper few tens of meters of sediments. Our results show that increasing global ocean temperatures could cause destabilization of hydrates located within 100 meters of the seafloor in approximately 200 years.