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Dynamics in the methane hydrate system of the Arctic Ocean

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Methane hydrate formed in abundance in deep permafrost regions but little documentation exists about resource accumulation in shallow Arctic subsea areas and its evolution in time and space. Today's sub-seabed methane hydrate reservoirs remain elusive targets as a natural methane emitter that influences ocean environments and ecosystems. Rising Arctic Ocean temperatures are causing a destabilization of these reservoirs which in turn releases methane leading to geo-hazards, ocean acidification, and marine benthic reaction at unknown rates and response times. CAGE - Centre for Arctic Gas Hydrate, Environment, and Climate initiates a ten year interdisciplinary research and education program aimed at achieving a quantitative understanding of feedbacks between methane sub-seabed reservoirs, the seabed and the ocean. The Centre addresses how the coupled (reservoirs-seabed-ocean) system in the Arctic reacts and affects the future ocean, its environment and possibly the climate with focus on high resolution geophysics; seabed gas-emissions; environmental reactions; and benthic-response times. The project MOCA (Methane emissions from the Arctic Ocean to the Atmosphere) concentrates on the atmospheric component and present as well as future climate effects. Details on the CAGE research plan and organization will be presented to foster opportunities for cross-disciplinary collaboration. Based in Tromsø, at the world's northernmost University, CAGE establishes the intellectual and infrastructure resources for studying the amount of methane hydrate and magnitude of methane release in Arctic Ocean environments on time scales from the Neogene to the present (www.cage.uit.no). The Centre of Excellence is funded by the Norwegian Research Council ((grant No. 223259) over a period of ten years.