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TITLE: NEW RESULT ON METHANE EMISSIONS FROM THE EAST SIBERIAN ARCTIC SHELF

ABSTRACT BODY: Methane release from thawing Arctic permafrost is one of the few carbon-climate mechanisms that could change projected climate forcing substantially in this century. Venting of methane to the atmosphere in the East Siberian Arctic Shelf, the world's largest yet shallowest shelf, was recently shown to be ubiquitous. Here we report results of multi-year investigations performed in the coastal East Siberian Arctic Shelf (ESAS), where invasion of relatively warm seawater occurred most recently. Observational data and simulation of the warming effect of seawater on subsea permafrost suggest that disintegrating subsea permafrost allows formation of migration pathways for methane bubbles released from the sea floor. Sonar data collected in the coastal area and in the mid-outer shelf area together with data, obtained using high-resolution high-speed video camera, enabled area-weighted methane fluxes to be estimated. New factors controlling spatial and temporal variability of methane fluxes on the ESAS were found. In the outer shelf, it was shown that methane releases from the seabed via strong flare-like ebullition that produces fluxes much greater than on the shallow shelf, where largely frozen sediments restrict fluxes. The coastward progression of thawing subsea permafrost in a warming Arctic could potentially result in a significant increase in methane emissions from the East Siberian Arctic Shelf.

CURRENT SECTION/FOCUS GROUP: Global Environmental Change (GC)

CURRENT SESSION: GC049. Environmental, Socio-Economic and Climatic Changes in Northern Eurasia and their Feedbacks to the Global Earth System

INDEX TERMS: 0475 BIOGEOSCIENCES Permafrost, cryosphere, and high-latitude processes , 1605 GLOBAL CHANGE Abrupt/rapid climate change, 3004 MARINE GEOLOGY AND GEOPHYSICS Gas and hydrate systems, 4219 OCEANOGRAPHY: GENERAL Continental shelf and slope processes.

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