

GC31B-0462 Top-down versus bottom-up estimates of methane fluxes over the East Siberian Arctic Shelf

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Global methane (CH₄) emissions are currently quantified from statistical data without testing the results against either distribution of the actual atmospheric CH₄ concentrations observed in different part of the globe or the regional dynamics of these concentrations. Measurement methods despite been improved remarkably in the past few years, especially with the advent of new optical and satellite-derived methods, are limited in their applicability in the Arctic. Modeling methodologies are still under development and cannot help to evolve very coarse global-scale understanding of CH₄ sources to resolution of regional-scale emissions. As a result, contribution of the Arctic sources in the global CH₄ budget are yet to be quantified adequately. We used a decadal observational data set collected from the water column and from the atmospheric boundary layer (ABL) over the East Siberian Arctic Shelf (ESAS), which is the largest continental shelf, to determine the minimum source strength required to explain observed seasonally increased concentration of CH₄ in the ABL. The results of top-down modeling performed by implementing a simple box model show a good agreement with results of bottom-up estimates made using interpretation of *in-situ* calibrated sonar data.

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