



## Higher Methane Emissions in Regions of Sea Ice Retreat

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In recent decades, the Arctic has lost more and more sea ice, which has concurrently led to higher temperatures across the high latitudes (Screen et al., 2012). Although increasingly strong evidence exists for this link between sea ice and temperature, the extra step of linking sea ice retreat - through these climatic changes - to a change in greenhouse-gas exchange is much less clear. Recently, however, it has been suggested that methane emissions have increased while sea ice declined (Parmentier et al., 2013).

This initial analysis compared average methane emissions for the Arctic Region with anomalies in the average sea ice extent, which evens out regional differences. Year-to-year variations in sea ice extent are different from region to region and would therefore impact methane emissions - through temperature - differently, too. Our goal is therefore to evaluate, with the use of models, whether methane emissions are more strongly correlated to sea ice in areas of high retreat rather than in areas that have seen little variation in sea ice.

For this use, the output from three regional methane models (LPJ-GUESS WhyMe, Peatland-VU and TEM6), designed to be applied to the Arctic Region, are compared to sea ice decline. A similar spatial response to sea ice retreat by these models will increase our confidence that methane emissions in the Arctic are indeed spatially linked to sea ice decline.

### References:

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