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High methane emission from Siberian river floodplains

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Methane contributes significantly to global warming. Methane emission is essentially the net result of a balance between CH4 production by methanogenic bacteria in anaerobic soil zones, and CH4 oxidation by methanotrophic bacteria in aerated soil zones and plants. Arctic and sub-arctic permafrost holds a large amount of climate vulnerable carbon. In particular river floodplains are carbon-rich soils. River floodplains in this area are periodically or permanently submerged. The occurrence of flooding decreases soil oxygen availability, providing an ideal anaerobic environment for methane generation.

Here we compare the chamber measurements of the methane flux from tundra and floodplain of the Kytalyk site in Northeast Siberia. Model experiments on this site have also been carried out in order to better explain spatial and temporal variations in methane emissions from northern permafrost. This serves as a basis for further model development including modeling of the flooding regime on the floodplain.