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## S1-5 Global warming and carbon dynamics in permafrost ecosystems: methane production and oxidation

D. Wagner[1], S. Liebner[1], K. Koch[1], M. Schloter[2], G. Jurgens[3], L. Ganzert[1], A. Lipski[4]
[1] Alfred Wegener Institute for Polar and Marine Research, Telegrafenberg A45, 14473 Potsdam, Germany
[2] Helmholtz Zentrum München, Ingolstädter Landstrasse 1, 85764 Neuherberg, Germany
[3] University of Helsinki, Viikinkaari 9, 00014 Helsinki, Finland
[4] University of Osnabrueck, Barbarastrasse 11, 49076 Osnabrueck, Germany

The Arctic plays a key role in the Earth's climate system, because global warming is predicted to be most pronounced at high latitudes, and one third of the global carbon pool is stored in ecosystems of the northern latitudes. The degradation of permafrost and the associated release of climate-relevant trace gases from intensified microbial turnover of organic carbon and from destabilized gas hydrates represent a potential environmental hazard.
The microorganisms, which are the drivers of methane production and oxidation in Arctic wetlands, have remained obscure. Their function, population structure and reaction to environmental change is largely unknown, which means that also an important part of the process knowledge on methane fluxes in permafrost ecosystems is far from completely understood. This hampers prediction of the effects of climate warming on arctic methane fluxes. Understanding these microbial populations is therefore highly important for understanding the global climatic effects of a warming Arctic. This talk will examine the activity and diversity of methane-cycling microorganisms in Siberian permafrost ecosystems.

## S2-1 Microbial activities and communities in alpine soils along an altitudinal gradient

R. Margesin[1], S.G. Hong[2], M. Jud[1], D. Tscherko[3], H.K. Lee[2], F. Schinner[1]
[1] Institute of Microbiology, University Innsbruck, Technikerstrasse 25, A-6020 Innsbruck, Austria
[2] Polar BioCenter, Korea Polar Research, Songdo-Dong, Incheon 406-840, Republic of Korea
[3] Institute of Soil Science and Land Evaluation, Hohenheim University, Emil-Wolff-Strasse 27, D-70599 Stuttgart, Germany

Microbial activities and microbial communities (using culture-dependent and culture-independent methods, including PLFA patterns, FISH, and metagenome rDNA analyses) were determined in soil samples collected along an alpine altitude gradient (1500 m, 1900 m, 2300 m, 2530 m; Hohe Tauern/ Gross-glockner) exposed to North and South. Altitude, exposition, and soil physical and chemical characteristics had a significant effect on a number of measured parameters. With increasing altitude, an increase in the relative amount of culturable psychrophilic microorganisms, an increase in the relative amount of the fungal population, and an increase in bacteria belonging to Bacteroidetes were found. Soil enzyme activities (dehydrogenase and lipase-esterase) were better adapted to low temperatures in soils at 2530 m compared to soils sampled at lower altitudes.