Session title: Modeling of permafrost-climate feedbacks in future scenarios

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Summary: Under global warming, permafrost degradation may accelerate climate change through increasing atmospheric CO2 and CH4 concentrations. Furthermore, the thaw of permafrost affects climate via numerous physical feedbacks leading to changes in water and energy fluxes to the atmosphere. Large inter-model differences in climate model projections indicate substantial uncertainties in the treatment of fundamental processes in Arctic regions, with permafrost areas as a significant contributor to this uncertainty. Depending on global warming trajectories, as in continuous-, zero- or overshoot emission scenarios, there is a wide range of possible permafrost futures - some of which may lead to irreversible changes in permafrost landscapes, altering feedbacks to the global climate. Understanding the combined impacts of permafrost physical, biogeochemical, and hydrological processes on regional and global ecosystem structure, functioning and interactions is of high interest to quantify uncertainty in future scenarios better and to reduce that uncertainty with improved modeling approaches. This session aims to bring together newly available projections of permafrost future scenarios and permafrost-climate interactions, with a particular focus on the modeling of biogeochemical and physical land surface dynamic. We invite all contributions that advance our understanding of the future of permafrost, whether by understanding cascading processes and interconnected risks, quantifying uncertainties, or making projections with improved process representation, using various methodological approaches from conceptual models to Earth system modeling.