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# 2.5 years of CarboPerm: achievements and further steps of an interdisciplinary Russian-German project on the formation, turnover and release of carbon in Siberian permafrost landscapes

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Permafrost-affected soils of the northern hemisphere have accumulated large pools of soil organic carbon (SOC) since continuous low temperatures in the permafrost prevented organic matter (OM) decomposition. According to recent estimates these soils contain 1300 $\pm$ 200 Pg of SOC, or about twice as much the carbon within the global vegetation. Rising arctic temperatures will likely result in increased permafrost thawing with the consequence of increased mobilization and degradation of formerly frozen OM. This degradation process will presumably result in an increased formation of trace gases such as methane and carbon dioxide which can be released to the atmosphere. Rising trace gas concentrations due to permafrost thawing would thereby induce a positive feedback on climate warming.
CarboPerm, is a joint German-Russian research project funded by the German Federal Ministry of Education and Research. It comprises multi-disciplinary investigations on the formation, turnover and release of SOC in Siberian permafrost. It aims to gain increased understanding of how permafrost-affected landscapes will respond to global warming and how this response will influence the local, regional and global trace gas balance.
CarboPerm strengthens permafrost research in underrepresented areas which are hardly accessible to international researchers. The obtained results improve our understanding of the future development of the sensitive and economically relevant arctic permafrost regions.
With this contribution we want to inform the interested community about the new knowledge resulting from results of all scientific work packages: (i) the origin, properties, and dynamics of fossil carbon, (ii) the age and quality of organic matter, (iii) the recent carbon dynamics in permafrost landscapes, (iv) the microbial transformation of organic carbon in permafrost, and (v) process-driven modeling of soil carbon dynamics in permafrost areas.