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CONTROL ID: 1798500

TITLE: Permafrost carbon pools in a larch-dominated watershed in northeast Siberia

ABSTRACT BODY: As the climate warms, the large pool of carbon (C) stored in permafrost is at risk of being thawed, decomposed, and transferred to the atmosphere, which may shift the arctic region from a C sink to a source by the end of the 21st century. Despite the importance of permafrost C as a potential positive feedback to climate change, large uncertainties remain in estimating the size of the frozen C pool. Measurements of plant, soil and permafrost C stocks, particularly in under-sampled regions of Siberia, are needed to help constrain estimates of the current C pool size and the potential magnitude of climate feedbacks. Here we present above- and below-ground C stocks from a larch (Larix cajanderi) dominated sub-catchment in northeast Siberia. This fire-prone system is underlain by Pleistocene-aged loess deposits. The high ice (50-90%) and organic matter content of these yedoma deposits, makes this region particularly vulnerable to ground subsidence and highly relevant in terms of permafrost-climate feedbacks. We sampled thawed and frozen soil horizons from 24 permafrost cores to 1-m depth, as well as from two 15-m-deep permafrost cores, and estimated ice content and C pools across the depth profiles. These permafrost samples were collected at 10 sites where we also quantified stand characteristics including larch biomass and density, understory plant composition, organic matter depth, and thaw depth. These results will help constrain estimates of permafrost C stocks by linking above- and below-ground C dynamics and evaluating spatial variability in permafrost C pools across the landscape.

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INDEX TERMS: 0475 BIOGEOSCIENCES Permafrost, cryosphere, and high-latitude processes .

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