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Theme 2: Observing in Support of Adaptation and Mitigation

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Poster title (brief) Peculiarities of coarse woody debris pool in Ari-Mas – the northernmost isolated forest island in Central Siberia (Taymir Peninsula).

Abstract - text box

The predicted increase in atmospheric temperatures is expected to affect the carbon turnover in permafrost ecosystems through modifications of the productivity and decomposition rate of organic matter due to thermal regime changes. In forest ecosystems part of the photosynthetates accumulated in the wood biomass that have long turnover time due to their functions in long-live tree plants and chemical composition. During growth and development of tree stands, the death of trees supplements pool of dead wood that is a one of the sources of greenhouse gases emission due to wood decomposition.

We investigated features of the storage of coarse woody debris (CWD) in sparse larch (*Larix gmelinii* (Rupr.) Rupr) forests on Taymir Peninsula (Arctic Russia). The study site was Ari-Mas (N 72.44°, E 101.63°), that is located on the southern bank of the Novaya River and presents an interest since it is the northernmost isolated forest island in the world (N 72°30') separated by 200 kilometers of tundra from the closest forest. This area is a territory of Taymyr Nature Reserve established in 1973. The study area is situated above the treeline and located in a zone defined in the Circumpolar Arctic vegetation map as moist erect-dwarf shrub tundra (Walker et al., 2005). The growing season is delimited by the frost period and in Taimyr it lasts for about 2.5 months on average.

Due to the wood deficit in this region, before the reserve was established local population cut trees on this forest island and actively utilized the most portion of dead standing trees appearing as a result of natural death. This led to the decrease of the aboveground CWD stock. This stock consist mostly of stumps and coarse branches in contrast to the CWD stock in northern boreal larch forests. The main part of dead wood pool in these forests situated belowground.

Belowground part of CWD stock consist of not only coarse root of larch trees, it includes as well belowground parts of tree stems. This pool can be significantly larger than stock of coarse roots and aboveground stumps, branches and logs.

The results are important to comprehend the impact of ongoing climate change in the Arctic on the carbon storage and turnover at a large scale. The studies were carried out with the support of the Russian Foundation for Basic Research, grant No. 18-04-01068-a.