

Influence of Topography of Slope Terraces on the Seward Peninsula on Ground Thermal Regime, Hydrology and Development of Biogeochemical Processes

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Slope terraces 50-200 meters width with bluffs or ridges at 2 meters high are widespread feature at the Seward Peninsula. These landforms affect the redistribution of snow during winter seasons and, thus controls soil temperature and moisture regime. It affects the vegetation and the processes of soil development. We conducted our research at one of such terraces at the milepost 28 of the Teller road. Studies included soil, vegetation and snow surveys along the 70 meters long transect, biomass productivity assessment, decomposition experiment and continuous measurements of the ground temperature and soil moisture at three points located in the rear, middle and front parts of the terrace. In according to our results mean annual ground temperature at the depth of 1.2 meters in 2019 gradually decreases from 4.2°C at the rear part to 0.5°C at the terrace's edge. Such a pattern in the ground thermal regime is mostly caused by the difference in winter temperature due to snow redistribution. The soil moisture regime might be identified as *Ustic* at the rear and middle parts and *Udic* at the front of the terrace. Across the tread of the terrace vegetation changes from the grassland in the rear part to ericaceous tundra in the middle and lichen tundra at the front. Aboveground productivity increases from rear (449.6 g/m²) to front part (1099.76 g/m²) of the terrace. But it is necessary to notice that 87% of production in the frontal part represented by lichens. Significant portion (66.8%) of the total biomass of the ericaceous tundra composed by woody species, so only about a one third (816.6 g/m²) of it can be involved in the process of annual carbon turnover as a litter. Rear part is only a section of the terrace where the whole annual harvest of biomass turns in a litter. Thus, an amount of annual litter biomass decreases from the rear to frontal part. The highest rate of litter decomposition was recorded at the middle section of terrace and the lowest – at the front. Processes of the organic stabilization was the lowest at the rear part of the terrace. Combination of all about mentioned factors and processes explain the pattern in soil sequence. The most developed soil profile (*Ustic Haplocryols*) can be found at the rear part of the terrace replacing by the *Typic Humicryepts* at the middle and *Typic Dystrogelepts/Haplogelepts* at the front.