

Flood affects vegetation at plant species level to regional level: *Arctagrostis latifolia* increased one year after flooding in Indigirka lowland, northeastern Siberia

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In June-July 2017, unusual extensive (~10000 km²) and long-time (~2 months) river floods were observed at coastal lowlands in northeastern Siberia. We focused on vegetation covered with dwarf shrub, sparse larch and polygonal wetlands, which were affected by the extreme flooding. We investigated plant species composition and in-situ phenology at site, and clarify the vegetation change after the flood in Indigirka river lowland, eastern Siberia (70°N, 148°E) for 2009-2018 July summer. We also recorded timing of leaf opening (greening) after flooding by digital time-lapse camera (GardenWatchCam, Brinno), and visible-near-infrared band satellite images (Landsat 8 OLI, USGS). In the field, forbs and graminoids (e.g. *Arctagrostis latifolia* as indicator of disturbance in arctic tundra) were increased among plots after the flood. On the other hand, dwarf shrubs (i.e. *Vaccinium vitis-idaea*) and moss species (i.e. *Hylocomium splendens*) were declined. The timing of leaf opening was delayed in the field. Fraction of leaf coverage per plot surface area were estimated from photo images. Leaf coverage on shrub were significantly smaller in 2017 summer (5.6%) than those in 2012-2016 (37%) in the plots (n=3, $p < 0.005$). Satellite images also supported that the greening of vegetation was delayed, and vegetation cover was declined in the region in 2017. Damaged moss cover and organic layers were remained to be exposed mud / bare soil in August 2018 (1 year after flood). However, leaf covers were even increased in some sedge-wetland plots, because of the increased growth of graminoids (e.g. *Arctagrostis latifolia*), forbs and sedges. Replacing to more graminoid might affect carbon and energy balances, and even might triggering permafrost thaw in some parts. Therefore, process changing and recovering from flood should be monitored in temporary and spatially multiscale.

Keywords: Vegetation, Environmental monitoring, Leaf Area, Flood, Tundra