ANALYSIS OF EVAPOTRANSPIRATION WATER FLUXES AT A FLOODPLAIN TUNDRA IN THE LENA RIVER DELTA

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Evapotranspiration (ET) plays an important role not only in coupling the water and energy supplies but also at controlling emissions of carbon from the soils in form of CO_2 or CH_4 in Arctic landscapes underlain by permafrost. Despite the fact that floodplains territories appear to be a huge carbon pool, in comparison with the ice-wedge polygonal tundra, little attention so far has been paid to them. Due to this gap, the current study is focused on the estimation and modeling of ET fluxes at heterogeneous tundra conditions of an active floodplain of Samoylov Island situated in the Lena River Delta by applying the eddy covariance technique. During the measurement campaign in 2014 and 2015, the estimated mean ET fluxes amounted to 0.057 mm h^{-1} and 0.048 mm h^{-1} respectively. These differences are coupled with lower amount of net radiation and predominance of cloudy conditions over the second observation campaign. Furthermore, a large variability in the range of ET fluxes over the seasons is linked with the unevenly distribution of ET sources at the constantly changed footprint area. In general, Priestly-Taylor (PT) approach allows getting stronger correlation between the modeled and observed values of ET than Penman- Monteith (PM) method during the measurement campaigns. Nonetheless, PT approach allows estimating better results for the first half of measurement campaigns, while the PM – for the second. Explaining this variability is based on the better performance of approaches depending on the hydrometeorological and environmental conditions. Furthermore, the deterministic model of footprint area has been enabled to estimate the ET fluxes from three vegetation classes. In turn, formed obtained values from each vegetation class have been used to estimate ET rates during the seasons for the entire floodplain territory. Thus, during the 2014 measurement campaign was observed the prevalence of ET on the precipitation, while the 2015 – the opposite. Overall, employing of obtained ET fluxes on the ecosystem scale is crucial not only for the accurately estimating of the hydrological cycle but also for modeling greenhouse gases emissions.