

Meteorological conditions of 2015/16 ablation seasons at the Glacier No. 18 (East Sayan, southeast Siberia)

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Glacier mass-balance and hydrological cycle in high-mountain glaciated catchments significantly influenced by meteorological conditions closely related to global, regional and local climate change. The hydro-meteorological processes in such environments are characterized by strong spatial heterogeneity and therefore in situ data are very important to calibrate glacier-climate modeling results. In July-August of 2015/16 we measured meteorological characteristics (temperature, humidity, precipitation, atmospheric pressure, solar radiation, wind speed and direction) using automatic weather station installed on cold-based Glacier No. 18 (Topographov Peak massif, East Sayan Range, continental Siberia), at its mean elevation (2550 m above sea level). The study glacier is located on the northeast slope of the massif and is the second largest glacier (0.93 km²) of the East Sayan Range. We found that the air temperature and precipitation time series are in good correlation with those of the nearest low altitude weather station (Orlik) and meteorological conditions of the glacier are closely related to atmospheric circulation over the study region. With using ablation stakes and meteorological data we also measured surface melting of the glacier and assessed energy fluxes at the glacier surface. Stratigraphy and chemical composition (major ions) of glacier snow/firn/subsurface ice suggest that melt water infiltration is a leading process of ice formation. This study was supported by the Russian Foundation for Basic Research (project No. 15-05-04525).