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SHRINKING GLACIERS IN SUNTAR KHAYATA, EAST SIBERIA

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Since Northern Hemisphere high latitude regions are noticeable trend of global warming and climate change, appearance of its impact is interest. Northeastern Eurasia is area of blank of observational research. One of a few regions studied in the past is Suntar Khayata in east Siberia, where Russian scientists carried out wide range of study during IGY (1957-1959). Suntar Khayata region, located in the latitudes between 62° and 63° north and in the longitudes between 140°22' and 142° east, forms a divide between the Arctic Sea and the Sea of Okhotsk. Oymyakon depression, known as the cold pole in the Northern Hemisphere, is located to the northeast. Glacier inventory of this region was prepared based on the aerial photographs taken in 1944-1947 (Koreisha, 1963). Total number and area of glaciers were 205 and 206.28 km². Three glacierized region are recognized, namely Northern massif, Central massif and Southern massif. The highest elevation of each massif is 2959 m, 2933 m and 2944 m. Glaciers observed are No. 29 to 33 in Northern massif including No. 31 which was intensively studied during IGY. We carried out glaciological observations such as mass balance (stake method), ice thickness measurement (radio-echo soundings), and topographic survey (DGPS) in July/August in 2012, 2013 and 2014. Automatic weather stations were also set on/around the glaciers. Glacier-wide mass balance in 2012/2013 was -1.04 m w.e. for a glacier complex (Glaciers No. 29, 30 and 31). This value shows more negative state than those in 1957-1959. We generated DEMs of surface and bed of the Glacier No. 31 using ice thicknesses obtained by radio-echo soundings and surface elevations by GPS survey, then we estimated the volume of the glacier to be 0.20 km³ (area: 3.02 km², mean thickness: 62 m). Ice thicknesses in its tongue reduced by 110-60 m (terminus to upstream) since 1957. Based on multi-temporal aerial and satellite imagery, 18 investigated glaciers reduced in area by approximately 36% from 1945 to 2011. Summer (July-August) air temperature observed on the glacier in 2012 and 2013 were higher than those in 1957-1959, which brought about more negative mass balance than those in 1957-1959. Superimposed ice formation was also very limited in 2012/2013. This resulted in disappearance of accumulation area. Reconstruction of long-term mass balance history is present target.