



Atmospheric circulation and precipitation regime over the Kodar Ridge, south East Siberia

Olga Osipova (1), Oksana Vasilenko (1), and Eduard Osipov (2)

(1) V.B. Sochava Institute of Geography SB RAS, Irkutsk, Russian Federation (olga@irigs.irk.ru), (2) Limnological Institute SB RAS, Irkutsk, Russian Federation (eduard@lin.irk.ru)

Mountain glacial basins are important storages of atmospheric moisture coming in form of precipitation. However, as a rule, a rare network of high-mountain precipitation gauges does not allow an adequate assessment of the spatial and temporal differences of precipitation between such basins, which makes the modeling difficult. The Kodar Ridge (up to 3073 m a.s.l.) is located in the remotest part of Asia, far from the oceans and extends about 360 km from south-west to north-east. About 40 glaciers are located in the high-mountain area at elevation range of 1900-2800 m a.s.l. These glaciers have an unique geographical position (inside the continent and at relatively low elevations), but the meteorological conditions of the glacialized basins are still poorly understood. Meanwhile, global climate change has led to a significant shrinkage of these glaciers and understanding of the climatic factors related to the glacier mass balance changes is an important task.

The purpose of the research was to identify the links between the atmospheric circulation processes and the precipitation regime over the territory of the Kodar Ridge. We used data of weather stations, high-mountain automatic weather station, ERA-Interim and NCEP/NCAR reanalysis models, daily synoptic maps, and HYSPLIT backward trajectories model. We classified the synoptic patterns according to the precipitation intensity. The study area is characterized by moderate to low precipitation in valleys and depressions and by much more substantial values in high-mountain zone. Precipitation is unevenly distributed by seasons and in space, due to the peculiarities of the regional and local atmospheric circulation. In summer, a cyclonic field with frequent fronts and air mass changes prevails and most of annual precipitation falls during this period. The most of solid precipitation occurs in the spring and fall months. The least precipitation amount falls in winter months due to the fact that the anticyclonic circulation prevails over the territory at this time (powerful Siberian High).

This study was supported by the Russian Foundation for Basic Research (project No. 19-05-00668).