Use of pilotless aerial vehicles in environment monitoring by the example of glaciers

Davit Svanadze

E-mail: dato.svanadze@ens.tsu.edu.ge;

Department of geography, Faculty of exact and natural sciences, I. Javakhishvili Tbilisi State University
3, I. Chavchavadze Ave., Tbilisi, 0179, Georgia

Permanent observations of constituent components of geographical envelope and their ongoing processes in most cases is very labor-consuming process, frequently with limited possibilities. Conducting of observations of high scientific value is possible only in specific observation point and material expenditures, observation time and other parameters increase in parallel with growth of observed points density per unit of area. Remote process monitoring is the best possibility of observations at large areas, in hardly accessible or heavy-going places. It can be conducted with the use of satellite, aerial photography, surface observation tools and methodologies or through their joint use. Increase in accessibility of use of pilotless aerial vehicles and in parallel improvement of their flying parameters and growth of methodological possibilities of observations sharply increased the range of their application. It is frequently used for apprehension of practical or scientific tasks, such as: forest fires, landslide and mudflow processes, agriculture, glacier dynamics monitoring, lakes and reservoirs monitoring and many others.

In August-September of 2017, with the use of pilotless aerial vehicles and methodology of close range remote sensing (probing) we have conducted the glacier monitoring of Svaneti and Racha segments of Greater Caucasus mountain range that allowed us to determine with high accuracy the surface morphology of glaciers at the certain sectors of their ice tongues, current state of ice tongue in the gorge, rate and scope of different processes taking place in recent period in periglacial zone that without any doubt is linked with global climate changes running on the earth from Little Ice Age up to our days and proceeding from this fact, with clearance of significant part of the gorge from ice cover.