Geophysical Research Abstracts
Vol. 16, EGU2014-8045, 2014
EGU General Assembly 2014


# Historical and tree-ring climatic proxies in the Western Caucasus

Olga Solomina (1,2), Nikita Lomakin (1), Yanvarby Ekba (3), and Alexandra Glazovskaya (4)

(1) Institute of Geography RAS, Glaciology, Moscow, Russian Federation (olgasolomina@yandex.ru), (2) Tomsk State University, Russia, (3) Abkhazia State University, Abkhazia, (4) Limerick Uniersity, Ireland

Western Caucasus is the land with a long and rich history of human activity and large number of potential paleoclimatic indicators (historical data since the ancient time, more than 500 caves with speleotems, several long-living tree species, numerous lakes and glaciers). In this paper we provide an overview of historical and tree-ring data and assess their usefulness for the late Holocene climatic reconstructions. The instrumental meteorological records are rather short and rare in this region, especially at the high elevation. The earliest systematic measurements date back to 1900s. However in the historical documents we found sporadic meteorological records, such as the minimal temperature of the warm season, which allow the reconstruction of summer temperature back in time for another 30 years (Timofeev, 1912). The period since 1820s is rather well covered by the historical data in the Western Caucasus (Neliubin, 1823, Gamba, 1824, Beaujour, 1829, Meyer, 1831, Eichwald, 1837, Besse, 1838 etc., periodical press «Notes on Caucaus agriculture», «Notes on Caucasus Geographical Society», «Caucasus household», reviews of official statistics, newspapers), and rather detailed climatological information can be extracted from these records. Important details can be found also in reports of different Embassy Missions, merchants and scientists traveling in the western Caucasus in 17-18 centuries (e.g. Chradin, 1672, Pimenov, 1634, Faenza, 1621, Gmelin, 1771-1785, Güldenstädt, 1787-1791, Reineggs, 1786). Turkish, Georgian, Armenian, Italian (Genova), Byzantine and Arabian historical and geographical treatises and other documents contain some the climatic evidences from the Medieval time. Some of them are translated in Russian and assembled in special volumes (e.g. Karaulov, 1908). The texts from the Antique and Pre-Antique times are of less value for our purposes due to its more general character and the lack of geographical and chronological binding. The tree-ring data set in the western Caucasus at the moment includes twenty ring width chronologies of Abies nordmanniana (Steven) Spach, Pinus Sylvestris L., Pinus brutia var. pityusa (Steven) Silba, and Fagus orientalis Lipsky. The sites are located both at the Northern and Southern slopes of Caucasus from 2 to 2390 m asl. The best climatic signal (precipitation) was detected in the Pinus ring width chronologies growing at the low elevation at the southern slope of Caucasus (R.Hantemirov, personal communication). The longest Abies chronologies (1596-2013) at the upper tree limit show a positive reaction to the minimum temperature over the year, though this correlation is not very strong (R=0.4-0.5). We are planning to extend our historical record data base and compare the two lines of records. The project is supported by RFBR Grant 13-05-90306.