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CHANGES IN THE AVERAGE ANNUAL AIR TEMPERATURES AND THE ANNUAL PRECIPITATION ON MUSALA PEAK

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An important event was celebrated on 02.10.2012 – 80 years since the formal inauguration of the weather observatory on the highest peak in South East Europe, *Musala*, Rila Mountain. The idea of building a high-mountain meteorological station belongs to Austrian and German meteorologists and dates from the late 19th century. The first intention was to locate the station on Cherni Vruh peak, but in 1928 the officials from the Central Meteorological Institute accepted the suggestion of the great Bulgarian climatologist Kiro Kirov to construct the station on Musala peak. In 1929 the 7th Conference of Directors of Meteorological Services in Copenhagen decided to hold a Second Polar Year in 1932 and 1933. When the Head of the Bulgarian delegation informed his colleagues about the new station at Musala hut, the Chairman of the Conference and Director of the Danish Meteorological Service Prof. Kour made a request to set up a meteorological station on Musala peak as well. The formation of a Special Committee "Musala Observatory" in 1931 launched a rapid and effective implementation of the idea. The necessary amount of 350 000 leva was collected from voluntary donations of many people and organizations led by the great merchant and lawyer Jacques Aseov, who donated over half of this sum. Just for one summer (the summer of 1932) the station on the peak was built with volunteer labour and donated materials. During the first year the observations were not regular because they were made once a day as the voluntary observers had to climb from the hut to the top. Since the beginning of 1934 the observations have been regular and have provided an overall picture of the climate on the summit.

Proceeding from the usual period for meteorological data averaging (which is 30 years), chosen to fully reveal climatic characteristics, the author averaged the mean annual temperatures and the annual precipitation on Musala peak by applying the method of 30-year moving averages. The obtained 49 consecutive 30-year average annual air temperatures from 1934-1963 to 1982-2011 show the following tendencies (Fig. 1). The first 30 periods from 1934-1963 to 1963-1992 did not experience significant fluctuations and changes – the long-term average

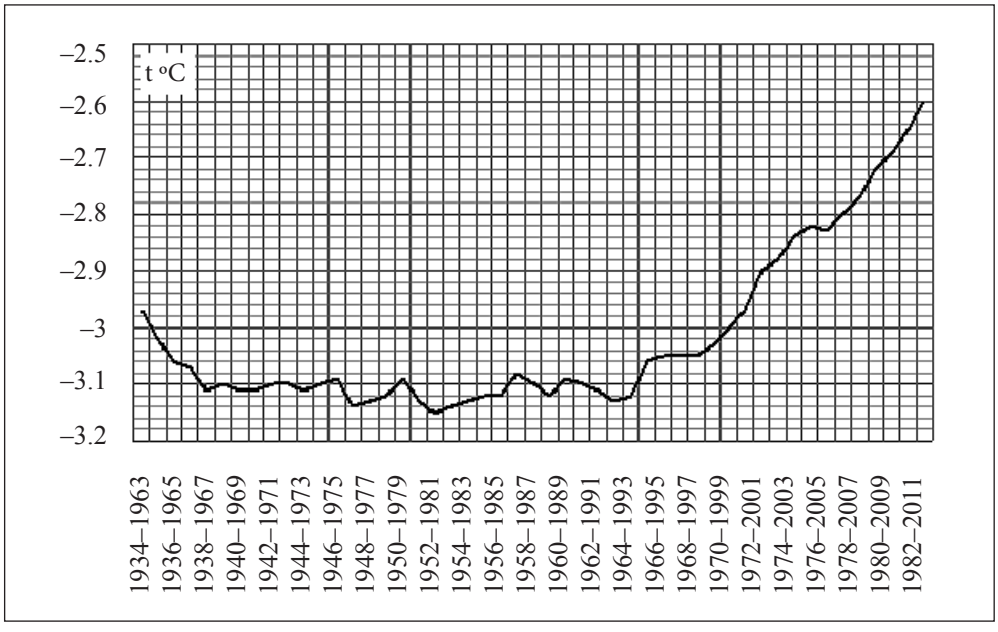

Fig. 1. 30-years oving averages of mean annual temperatures of peak Musala (1934-2011)

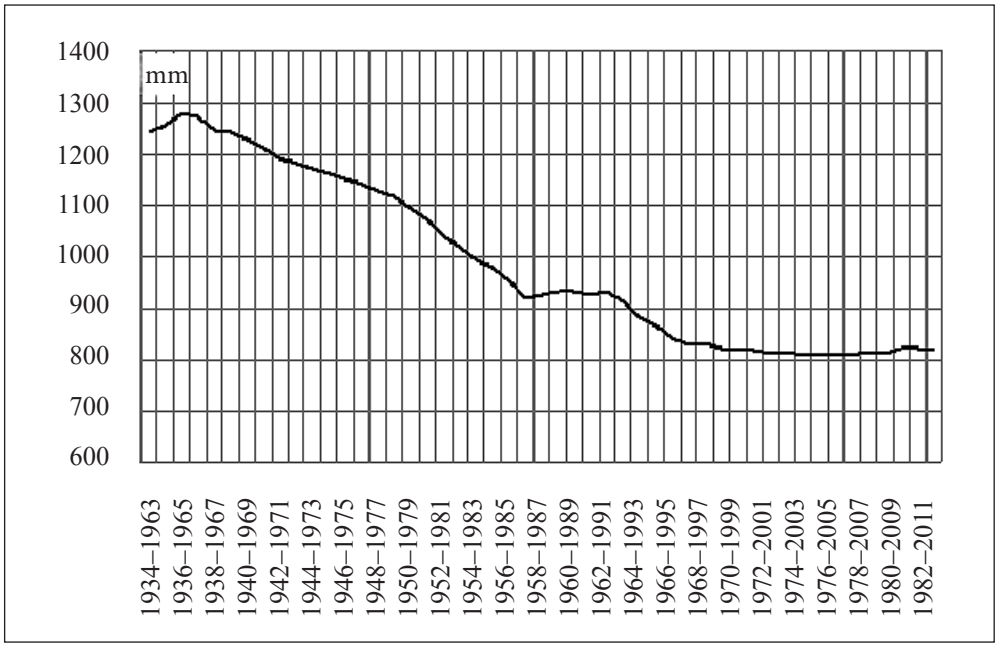

Fig. 2. 30-years moving averages of annual precipitation of peak Musala (1934-2011)

air temperature was -3.1°C. During the next 19 periods from 1964-1993 to 1982-2011 the air temperature was continuously rising but the rate of increase reached its culmination towards the end of the period. In the last 30 years (1982-2011), embracing the last two decades of the 20th century and the first decade of the 21st century, the average annual air temperature was -2.6 °C. This means that over the entire 79-year period of observations, which started with the opening of the station, the average annual air temperature increased by 0.5 °C. The trend towards warming was available all the year round but it was most perceptible in winter and summer and weaker in spring and autumn. The fact that to a certain degree the station can be defined as a station in the free atmosphere together with the stability of the indicator "average annual air temperature" makes the temperature rise seem considerable. It sufficiently correlates with the global average temperature increase during the second half of the 20th century (by 0.74 °C approximately), specified in the IPCC reports.

A reverse trend is observed with the annual precipitation. The 30-year moving averages demonstrate a drastic decrease in precipitation, which was most marked during the first half of the observation period (Fig. 2). From 1934-1963 to 1965-1994 the annual precipitation amounts dropped from 1250 mm to about 850 mm. Then, until the last 30 years (1982-2011), they remained unchanged. Droughts occurred throughout the year. They were best expressed in winter and spring, less pronounced in autumn and most insignificant in summer

Both types of changes (warming and setting of dry conditions) are consistent with the observed changes on a regional and global scale.

Департамент География при НИГГГ – БАН

ПРОМЕНИ В СРЕДНОГОДИШНИТЕ ТЕМПЕРАТУРИ НА ВЪЗДУХА И СРЕДНОГОДИШНИТЕ ВАЛЕЖИ НА ВР. МУСАЛА

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(Р е з ю м е)

С помощта на тридесетгодишни плъзгащи се средни се разглеждат промените на температурата на въздуха и валежите на първенеца на Балканския полуостров – връх Мусала (2925 m) за периода 1934–2011 г. Констатира се увеличение на средните годишни температури от –3,1 до –2,6 °C и намаление на годишните валежи от 1250 на 830 mm.