

Climate extreme events in Russia in recent decades

O. N. Bulygina, V. N. Razuvaev

All-Russian Research Institute of Hydrometeorological Information -

World Data Center, RUSSIA

(bulygina@meteo.ru / Phone: +7-48439-74673)

Daily and sub-daily data of 940 stations to analyze variations in the spacetime distribution of extreme temperatures, precipitation, and wind over Russia were used.

The total seasonal numbers of days, when daily surface air temperatures (wind, precipitation) were found to be above (below) selected thresholds, were used as indices of climate extremes.

All values falling within the intervals ranged from the lowest percentile to the 5th percentile and from the 95th percentile to the highest percentile for the time period of interest were considered as daily extremes. The number of days, N , when daily temperatures (wind, precipitation) were within the abovementioned intervals, was determined for the seasons of each year. Linear trends in the number of days were calculated for each station for the time period of interest and mapped.

The number of days with maximum temperatures higher than the 95% percentile has increased in winter (December-February) in most of Russia. The largest linear trend coefficients were obtained in the European part of Russia and in Siberia.

Using the high-quality daily and 3-hourly precipitation data set, the changes in the number of days with different sums of precipitation were assessed. It was found that there is a tendency to an increase in the number of days with heavy and very heavy precipitation, especially during the past three decades.

Changing in difference between maximum and minimum temperature may produce a variety of effects on biological systems. Usually this characteristic of climate is described by diurnal temperature range (DTR), the difference between maximum and minimum temperatures during twentyfour hours from the beginning of night and the end of the day. This difference is connected with the increasing of temperature from its minimum value in night time to maximum value in day time.

Number of days with DTR more than 95% border value and less than 5% border value was calculated for every year and each season. Linear trends in the number of days were calculated for each station.