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CONTROL ID: 1468098

TITLE: Long-term dynamics of atmospheric circulation over Siberia and its relationship with air temperature

ABSTRACT BODY: The main objective of this study is the investigation of cyclone characteristics variability in the region bounded by the coordinates 50°-70° N, 60°-110° W which includes Western Siberia and the part of Eastern Siberia for the time interval 1976-2006, as well as the establishment of statistical relationships between the temperature conditions and the atmospheric circulation. For the dynamics of the climatic characteristics of cyclones and anticyclones over Siberia surface synoptic maps were used, and to study the trends of air temperature daily data from 169 ground-based meteorological stations and posts located in the study area were analyzed.
During the period of the modern warming the territory of Siberia was characterized by rapidly temperature increase: average annual value was 0.36°C/10 years, and average monthly value was 0.83°C/10 years. The positive trend of temperature increasing is shown for all months except November.
The total number of cyclones over the territory of under study for the period of 1976-2006 has decreased at a rate of 1.4 cyclone/10 years. For further analysis all cyclones were divided into three groups, according to their directions: north, west and south. It was found the number of south and west cyclones decreased, whole the number of cyclone from north directions increased. Such multidirectional dynamics of cyclones from different directions can be associated with the processes of strengthening and weakening of the Polar and Arctic fronts in the Atlantic sector of the Northern Hemisphere.
Among characteristics of vortex activity the pressure in the centers of cyclones and anticyclones has the greatest influence on the air temperature and the total number of cyclones has the smallest.
Multiple regression models have shown that in different months of a year the circulation can describe from 54% to 82% of temperature variability.

CURRENT SECTION/FOCUS GROUP: Global Environmental Change

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INDEX TERMS: [1620] GLOBAL CHANGE / Climate dynamics.

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