



## **Changes in cloudiness and cyclonic/anticyclonic activity over Russia during last decades from observations and reanalyses data**

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Extreme weather and climate events are associated with cyclonic and anticyclonic activity (CAA) in the atmosphere. The clouds, whose formation is remarkably related to cyclonic activity, have a key influence on radiation fluxes. Changes in clouds can enhance or reduce temperature variations.

Data based on 3-hourly ground-based observations from more than 1600 Russian meteorological stations and satellite observations (ISCCP and Patmos-X) were used to assess cloudiness changes over Russia during last decades. Geopotential data from NCEP/NCAR reanalysis were used for CAA evaluating over Russia. An analysis was carried out for different seasons (summer/winter). Cloudiness changes and its connection with changes in different CAA characteristics (e.g. number of cyclonic/anticyclonic days, intensity and area of cyclones and anticyclones) were assessed.

Different observations show the total cloud amount decrease in winter in the northern part of Siberia and Far East region (down to -0.01 per decade) and its increase in south regions of Russia (up to 0.03 per decade in the south of European part of Russia). In summer, noticeable positive trend becomes apparent only in the Far East region (up to 0.02 per decade). Statistically significant positive correlation between cloudiness and cyclonic activity was revealed in summer over Russia (excluding south of Far East region where clouds correlates with cyclones mostly in winter). General negative correlation between cloudiness and anticyclonic activity was revealed in winter as well as in summer.