

Influence of deep cyclones (DC) on weather conditions over the Atlantic sector of the Arctic

While changes in the pressure field over the European continent occur relatively slowly, over the northern basins of the Atlantic the development of intensive cyclogenetic processes is more dynamic and continuous. Frequency and intensity of low pressure systems characterize atmospheric circulation variability. This paper, focuses exclusively on DC defined as baric systems with the center pressure of ≤ 990 hPa (located between $67,5^{\circ}$ - 90° N and 20° W- 50° E). DC were identified using average daily values of sea level pressure, received from NCEP/ NCAR reanalysis data of a resolution of $2,5^{\circ} \times 2,5^{\circ}$ (1948-2014). The main goal of this paper is to examine the relation between intensity and vertical structure of DC and selected climatological elements. The results showed the spatial and temporal variability of occurrence of DC in the Atlantic sector of the Arctic. During 67 years, the average of 84 DC were observed per year. The increasing tendency is the dominant feature of long-term and seasonal changes (especially during the spring and summer). Through the identification of DC centers (the distance from the Svalbard border and sector where DC was situated), the author examined the impact of deep cyclones in shaping selected climatological elements (air temperature and wind velocity). The analysis showed that DC significantly design weather conditions in affected areas and to may cause occurrence of dangerous weather events.