

Climate Change of Franz Josef Land in the XX-XXI Centuries

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The results of climatic observations on the most northern land of Eurasia – Franz Josef Land, that was discovered in 1874, are presented. The gaps in the observations of the observatory named after Ernst Krenkel (Hayes's Island) were supplemented by calculations using reanalysis ERA Interim. It was received the positive trend in surface air temperature during 1958-2013. It is mainly achieved by increasing of the air temperature in winter but the summer trend is not statistically significant. Data of observation and reanalysis are perfectly correlated in cold period when underlying surface is uniform (correlation coefficient of more than 0.95). In summer, the correlation coefficients between the calculated and the real data are significantly lower (up to 0.68). This fact may be a consequence of the small values of the mean air temperatures of summer months (for example, during the July they varied in the interval -1-+2 degrees C.). Furthermore, it may be caused by the difficulty of model reproduction of the real state of the underlying surface, where land, ice, snow and water are chaotically combined. The analysis of circulation types by B.L. Dzerdzeevsky has shown that in the mid-XX Century, the northern meridional and western zonal types of circulation were replaced by southern meridional one, which prevailed during the first decade of the XXI too. This causes a reduction of the ice cover period, which resulted in a strengthening of the beach erosion and of slope processes. But short-term flows of warm air from the south, causing a catastrophic melting of glaciers, were also repeatedly marked in the past. This work is supported by the Russian Science Foundation (project № 14-37-00038) and by the national park "Russian Arctic".