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The reasons for the occurrence of a severe heatwave in Krasnoyarsk have been studied, and the accuracy of the forecasts of the WRF-ARW regional model has been assessed. Four episodes of hot weather in 2020, 2021, and 2023 have been analyzed. The heatwave in June 2023 was especially intense and met the criteria for a severe weather event. All examined cases were associated with the intense advection of warm tropical air in the leading edge of the upper-air trough. The formation of the urban heat island has been investigated, and its intensity in the nighttime was found to be 6.5°C. During daytime hours, the heat island was weaker than at nighttime. It has been determined that on the second day of forecasting, the WRF-ARW model accurately reproduces the urban heat island and the impact of the Yenisei River, although it underestimates the predicted amplitude of daily temperature variations. The absolute error in air temperature predictions for the time moments close to the time of daily maximum temperatures was 2.6°C (33 hours of model time).

Keywords: numerical prediction of temperature, severe heat, WRF, urban heat island, Krasnoyarsk

Tab. 6. Fig. 10. Ref. 26.