



Predictability of blocking events over the Euro-Russian region in summer 2010

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Eastern Europe and Western Russia experienced a strong heat wave during the summer of 2010. Maximum temperatures exceeded 40°C in early August, resulting in over 15,000 deaths and many wildfires, inflicting large economic losses on Russia. The heat wave resulted from strong atmospheric blocking that persisted over the Euro-Russian region from late June to early August. The observed blocking frequency was twice or more as high as the climatological frequency. This study investigates the predictability of extreme Euro-Russian blocking events and of the blocking-induced extreme surface temperatures in the summer of 2010, using medium-range ensemble forecasts: CMC, ECMWF, JMA, NCEP, and UKMO.

The results show that the blocking in June–August (JJA) of 2010 was easily predictable, even for a lead time of +216 hr; however, the blocking that occurred over the Euro-Russian region from 30th July to 9th August, especially the western part of the blocking (30°–45°E), showed a lower predictability for lead times greater than +144 hr, compared with other blocking events during JJA of 2010. This indicated a difficulty in simulating the upstream trough of blocking. This low predictability resulted in the failure to predict the extreme temperatures associated with the mature blocking in early August. Most of the forecasts predicted a decay of the blocking earlier than that observed. This finding indicates a difficulty in simulating the maintenance and decay of blocking. Furthermore, the erroneously early decay of predicted blocking led to an early (compared with observations) decrease in surface air temperature during mid-August.