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Results from the GLACE2 experiment for Europe

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The second Global Land-Atmosphere Coupling Experiment (GLACE2) aimed at assessing the degree to which realistic initial conditions of soil moisture leads to improved forecasts of surface temperature and precipitation up to a 2-months lead time. A recent publication by Koster et al (2009) focuses on first results over the US, demonstrating that realistic soil moisture conditions do improve temperature forecasts at long lead times. Conditioning on extreme soil moisture conditions shows even better skill improvements, and also precipitation forecasts appear to be positively affected. In the present paper the results are discussed for Europe. Verifying observations are taken from the E-Obs dataset assembled in the ENSEMBLES project. Apart from squared correlations, also probabilistic ROC-scores are evaluated. The results show that like in the US better temperature forecasts up to 6 weeks ahead are attained using the realistic soil moisture initialization, particularly in the higher regions of central Europe (Germany, Poland, Eastern Europe). ROC scores are also improved, but the significance of this improvement is limited. For precipitation the improved squared correlations point at better capturing multi-day precipitation amounts, but probabilistic scores show virtually no skill improvement. The results imply that initializing seasonal forecasts with realistic soil moisture conditions may upgrade the forecasting skill in this difficult region.

Koster, R., and CoAuthors, The Contribution of Land Surface Initialization to Subseasonal Forecast Skill: First Results from the GLACE-2 Project; in press, Geophys. Res. Lett., 2009.