

SESSION: (A5) Land initialization and processes

(A5-03)

An improved approach to land-surface initialization in the Met Office's Global Seasonal Forecasting System (GloSea)

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The land surface is a crucial component in the climate system; the exchange of heat and moisture flux between the land and atmosphere has an important impact on near-surface temperatures and precipitation.

Here, we describe experiments to initialize the land surface (notably soil moisture) in the UK Met Office's (MO) state-of-the-art Global Seasonal Forecasting System (GloSea). GloSea employs a coupled atmosphere-ocean model, using MO's Unified Model and Nucleus for European Modeling of the Ocean. Land interactions are modeled using the Joint UK Land Environment Simulator (JULES).

Due to the challenge in obtaining consistent information for both the historical and real-time periods, we have to resort to using a climatology for both hindcasts and forecasts. Inconsistencies in the initialization (and therefore the forecast/ hindcast model climatology) can result in a biased forecast. This work hopes to improve the current initialization scheme.

Owing to the availability of real-time data, we investigate land-surface initialization using the Japanese 55-year Reanalysis Project (JRA-55), provided by the Japanese Meteorological Agency. Our goal is to replace the existing climatology used for the forecasts with soil moisture calculated from the daily data. Hindcasts, as for our experiments, will be initialized using a time-series from a JULES reanalysis forced with the JRA-55 data.

We discuss the impact of the new initialization scheme on standard skill scores, as well as case studies of the European and Russian heat-waves of 2003 and 2010.