EMS Annual Meeting Abstracts
Vol. 11, EMS2014-59, 2014
14th EMS / 10th ECAC

Impact of land surface initial conditions on sub-seasonal to seasonal prediction of mid-latitude summer temperature

Constantin Ardilouze, Bertrand Decharme, Sophie Tyteca, Hervé Douville, and Michel Déqué
CNRM-GAME, Météo-France and CNRS,Toulouse France (constantin.ardilouze@meteo.fr)

Land surface initial conditions have been recognized as a potential source of predictability in long-range forecast systems, at least for near-surface air temperature prediction over the mid-latitude continents. Yet, few studies have explored such an influence over a sufficient hindcast period to produce a robust quantitative assessment. In the framework of the FP7-SPECS project, the recent ERA-Interim Land reanalysis has been used to initialize boreal summer seasonal hindcasts over the 1991-2012 period. Two parallel ensembles have been achieved with the CNRM-CM5 coupled model using climatological versus interannual initial land surface conditions. Similarly to GLACE-2 (phase 2 of the Global Land-Atmosphere Coupling Experiment), several starting dates have been used from May 1st to August 1st.
Forecast scores show that a more realistic soil temperature and moisture initialization has a significant positive impact on the diurnal near-surface temperature maxima predicted over Europe and Northern America. Scores are consistently improved for the first month lead-time. In some cases the improvement persists over the whole boreal summer season.
In order to explore the role of possible discrepancies between the CNRM land surface model and the ECMWF one used in ERA-Interim Land, an additional seasonal hindcast experiment has been performed using another “poor-man” (i.e. without data assimilation) land surface reanalysis simply based on an off-line simulation of the CNRM land surface model driven by observed atmospheric forcings.