Towards the Operational Implementation of the Canadian Land Data Assimilation System

Bernard Bilodeau[a], Marco L. Carrera[b], Dorothée Charpentier[c], Mario Lépine[b] and Stéphane Bélair[b]

[a] *Meteorological Research Division, Environment Canada, bernard.bilodeau@ec.gc.ca*
[b] *Meteorological Research Division, Environment Canada,* [c] *Canadian Meteorological Centre*

Initial conditions of soil moisture and surface temperature are known to have a strong impact on the forecast accuracy of surface and boundary layer variables. Several national meteorological prediction centres have implemented analysis schemes that generate increments of surface temperature and soil moisture that are correlated with errors in the forecast of screen-level air temperature and humidity. In the Canadian Land Data Assimilation System (CaLDAS), the method is further refined by making use of dynamic correlations generated by perturbing precipitation, radiation and temperature forcings in the context of an Ensemble Kalman Filter. Pre-implementation tests have been conducted in offline mode for the year 2008 on a global 33-km latitude-longitude grid. More recently, extensive tests have been run in coupled mode with the EnVar atmospheric data assimilation system, for the year 2011, on a global 25-km latitude-longitude grid. Final tests have been run again in coupled mode for the same year on a global 15-km Yin-Yang grid. Surface analyses have been generated for series of 120 cases in both summer and winter and their impact on numerical weather prediction will be shown using objective evaluation based on upper air and surface observations.