The February 2013 Upgrade to the Canadian Operational Ensemble Kalman Filter

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The Canadian operational Ensemble Kalman Filter (EnKF) provides an ensemble of initial conditions for the Canadian Global Ensemble Prediction System (GEPS). The EnKF underwent a major upgrade in February 2013, thanks to the availability of upgraded computing facilities. The major changes include the introduction of a multi-scale algorithm and increased horizontal, vertical and temporal resolution. At the same time, a filtered topography was introduced to address an occasional instability problem seen in the previously operational GEPS. The number of assimilated radiance observations was increased via a relaxation of the data-thinning procedures. Other changes include the use of a newer version of the forecast model with improved physics, and less-biased radiance observations obtained from our center's independently improved Global Deterministic Prediction System (GDPS). With all these changes, the Canadian EnKF having 192 members is run on a 600x300 horizontal grid with 74 vertical levels. The forecast model uses a 20-minute time step. The impact of each major change was evaluated and the results will be presented. The overall impact of the upgrade will also be presented.