



Impact of 4D-Var on the new Canadian Regional Analysis system

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We present results of extensive evaluations of the newly developed Regional 4D-Var analysis scheme at Environment Canada (EC) in support of the Regional Deterministic Prediction System (RDPS). As an extension of the currently operational Regional 3D-Var analysis, we now run a 4D-Var scheme that allows coherent evolution in time of analysis increments within the time assimilation window. The spatial resolution of the analysis increments is now at 65 km with a 15-minute data bin size as compared to the 100 km resolution and 45 minute bin size used operationally. Besides a significant increase in the overall number of assimilated observations, a new data source has been introduced, i.e. ground based GPS. The 4D-Var system is coupled with a new 10 km GEM model (replacing GEM-15 km) which includes some upgrades of physical parameterizations. Several numerical optimizations have been implemented so as to maximally exploit the IBM Power 7 computers now available at EC. Ongoing research using an ensemble-based analysis system will also be described briefly.