

Global Water and Energy Cycles in MSC's New High-Resolution Medium-Range Weather Forecast Model

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A new high-resolution atmospheric model is on the verge of being implemented at the Meteorological Service of Canada (MSC) for operational medium-range weather forecasts. In addition to the significant increase in horizontal and vertical resolution (33 km versus 100 km and 58 levels versus 28 levels), most of the physical processes related to the water cycle have been improved. The Kain-Fritsch scheme is now used for deep convection, together with a newly-developed shallow convective scheme, called Kuo Transient. Also, the ISBA land surface scheme has been implemented in this new global model, with initial conditions for soil moisture provided by a land surface sequential assimilation system. Intensive testing of this new system show significant improvements for precipitation, clouds, and surface processes. In particular, the new system is able to better capture intense precipitation events, as well as soil hydrology anomalies. These positive results will be discussed at the conference in the context of a 2-year re-analysis experiment which was done as part of MSC's contribution to the Coordinated Enhanced Observing Period (CEOP).