

FROST-2014

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FROST-2014

(Forecasting and Research: the Olympic Sochi Testbed)

Participants:

Russia, DWD, ARPA (Italy), TIGGE-LAM, HIRLAM, ZAMG (Austria) ...

With contributions in data assimilation:

Environment Canada, NOAA, Russia, ...

With contributions in observations:

FMI, Uni Helsinki, Vaisala, Environment Canada.

The Canadian data assimilation contribution

Upper-air and surface initial conditions used in the tests performed in 2011 were obtained from direct downscaling of EC's current operational regional forecasting system (15km).

Progress have been recently achieved with a 10km 4DVAR assimilation system. EC scientists are confident that this approach will be used for the upcoming season (2012-2013).

Surface initial conditions should be provided by a 100m external surface system. This aspect should be ready for the upcoming season.

The contribution by NOAA in data assimilation

A hybrid 3D-Var - ensemble system will be used.

Satellite-based 0.5 km resolution snow cover and snow water equivalent analysis for the Sochi area will be produced.

Russian regional 3D-Var

Made from the global Russian 3-D filters-based 3D-VAR using stretched geometry.

Observations:

In-situ, including additional: 50 ground based AMS and several tens of AMS at different heights on cell-phone towers, one high-resolution radiosonde, several profilers.

Satellite: AMSU-A, MHS, SEVIRI, AMV-Geo, ASCAT, OSCAT.

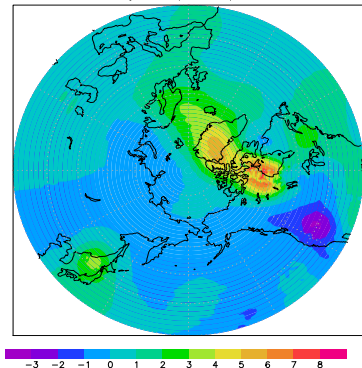
Radars: Doppler winds from one Vaisala and several Russian radars.

30 Jan 2012. In a 4-hour window, only 2000-7000 obs available (radiances not used yet). About 1000 in-situ data at most. The rest are satellite winds (AMV-GEO, ASCAT, and OSCAT).

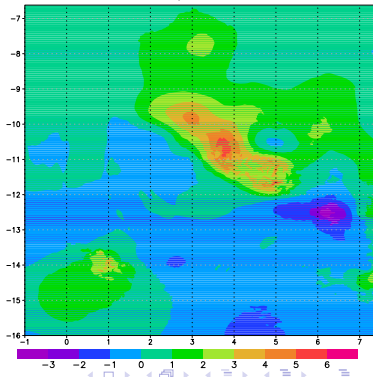
A forecast from the new analysis showed a slight improvement near surface.

Case 30 Jan 2012, 12 UTC. Low-level temperature analysis increments

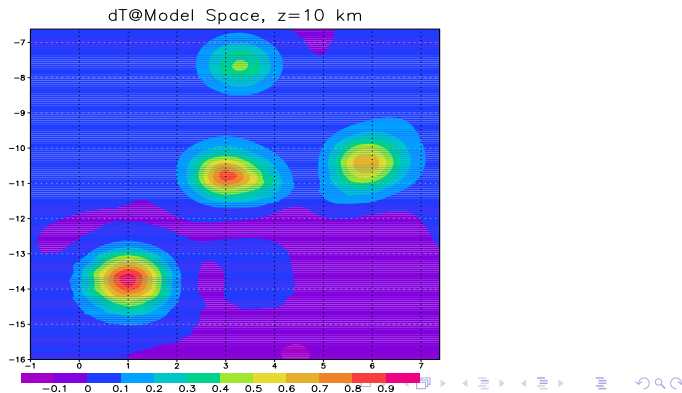
dT@Analysis Space, p=774hPa



dT@Model Space, z=1.45 km



Case 30 Jan 2012, 12 UTC. Upper-level temperature analysis increments



Conclusions

- Canadian 10-km 4D-Var is being tested for the Sochi area.
- The NOAA 3D-Var hybrid scheme will be used.
- A Russian regional 3D-Var is developed on the basis of the global analysis scheme.
- First results confirm that local observations are scarce. Radar winds are expected to improve the observational coverage.

Thank you!