HIRLAM Operational Activities in Met Éireann

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1 Main HIRLAM

1.1 Data Assimilation

- 3D-Var with a 3-hour cycle; 2-hour data cut-off 'window'.
- Conventional obs (no SATEM/TOVS or SATOB).
- Creation of "feedback" files every cycle for data monitoring.

1.2 Forecast Model

HIRLAM version 5.0.1

- Rotated grid (nlon x nlat x nlev = 438 x 284 x 31); 0.15° x 0.15° horizontal grid.
- DFI initialisation.
- Two time-level three-dimensional semi-Lagrangian semi-implicit scheme (δt = 225 secs).
- Physics: CBR turbulence scheme; Sundqvist/STRACO condensation scheme; Savijärvi radiation scheme.

Forecasts out to 48 hours are produced from the 00, 06, 12 and 18 UTC cycles.

1.3 Lateral Boundary Treatment

ECMWF "frame" fields on 0.3° x 0.3° rotated grid. Frames are updated 4 times per day.

2 Nested System

The old nested system, using an OI analysis scheme with a 1-hour assimilation cycle, has been essentially replaced by a new system implemented in late 2002. Compared with the main system the chief differences are as follows:

- HIRLAM version 5.1.4 with ISBA surface scheme.

- 3D-Var version 5.1.1 (recently upgraded to version 6.0.0) using FGAT option; 3-hour assimilation cycle; 1.5-hour data cut-off 'window'; analyses repeated later to pick up late observations.

- Rotated grid (nlon x nlat x nlev = 222 x 210 x 40); 0.12° x 0.12° horizontal grid.

- Kain-Fritsch/Rasch-Kristjansson convection/condensation scheme.

The nested system produces forecasts out to 24 hours at the 'intermediate' hours 03, 09, 15 and 21 UTC to complement the main HIRLAM system.

3 Postprocessing

A considerable amount of work has gone into validating the nested system forecasts using local observations. Postprocessing tools (e.g. MOS, Kalman filter) are applied to the model output to provide site-specific forecasts of temperatures, winds (including wind gusts) cloud and precipitation.