

HIRLAM Activities in Met Éireann

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1 Operational HIRLAM System

1.1 Main HIRLAM: Data Assimilation

- 3D-Var (version 5.1.1) 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.
- ATOVS data (EARS) currently being evaluated for inclusion in assimilation.

1.2 Main HIRLAM: 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 ($\delta t = 225$ secs).
- Physics: CBR turbulence scheme; Sundqvist/STRACO condensation scheme; Savijärvi radiation scheme.

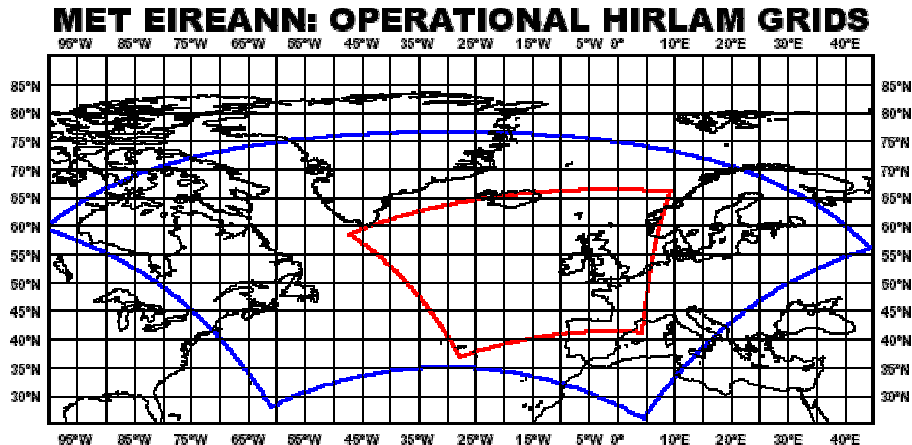
Forecasts out to 48 hours are produced from the 00, 06, 12 and 18 UTC cycles.

1.3 Main HIRLAM: Lateral Boundary Treatment

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

The main operational area is shown, marked in blue, below.

2 Nested System



The nested system (area marked in red above) differs from the main system as follows:

- HIRLAM version 5.1.4 with ISBA surface scheme.
- 3D-Var version 6.1.0 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 27 hours at the 'intermediate' hours 03, 09, 15 and 21 UTC to complement the main HIRLAM system. Boundary fields are provided by the main operational HIRLAM.

An old nested system, based on HIRLAM 4.9 and using OI for the analysis, is still run operationally. With a 1-hour cycle and a cut-off window of around 30 minutes it is used to provide near real-time analyses over Ireland/UK and local coastal waters.

3 Research Activities

- Treatment of the lateral boundaries in HIRLAM (ongoing).
- Making more effective use of radiosonde data (in progress).