Operational NWP
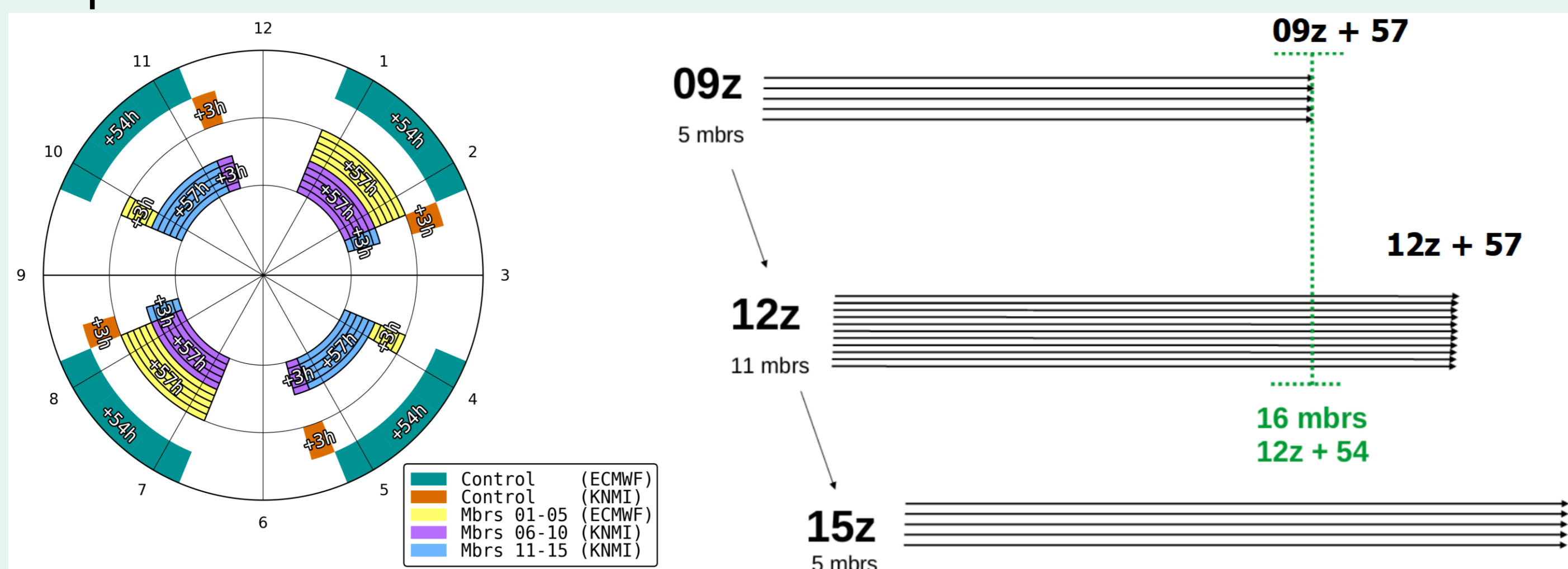## Met Éireann, the Irish Meteorological Service

Operational NWP

Met Éireann runs the HARMONIE-AROME model as part of an operational suite known as IREPS - the Irish Regional Ensemble Prediction System. Since March 2021, IREPS has been running with Cycle 43h2.1 of HARMONIE-AROME, with the configuration detailed below.

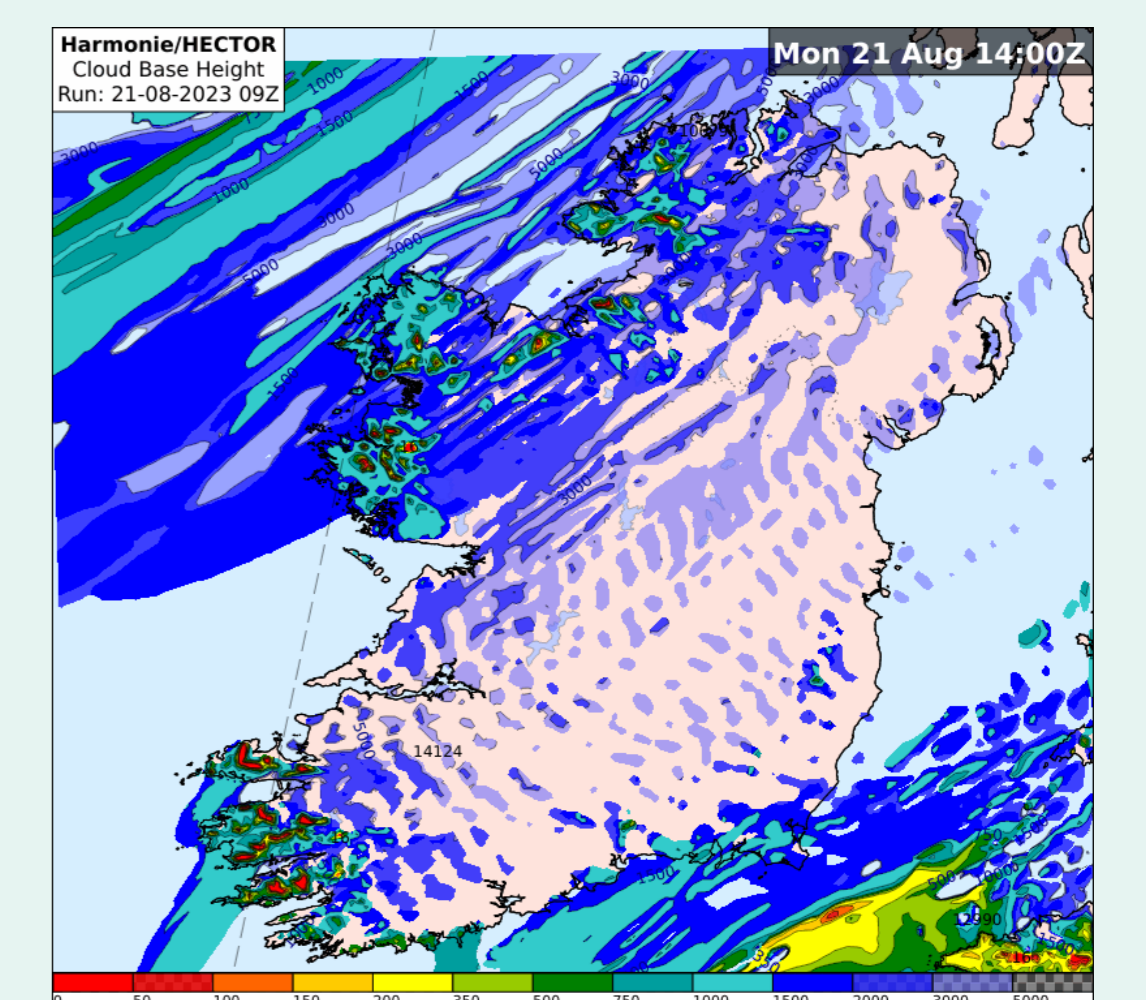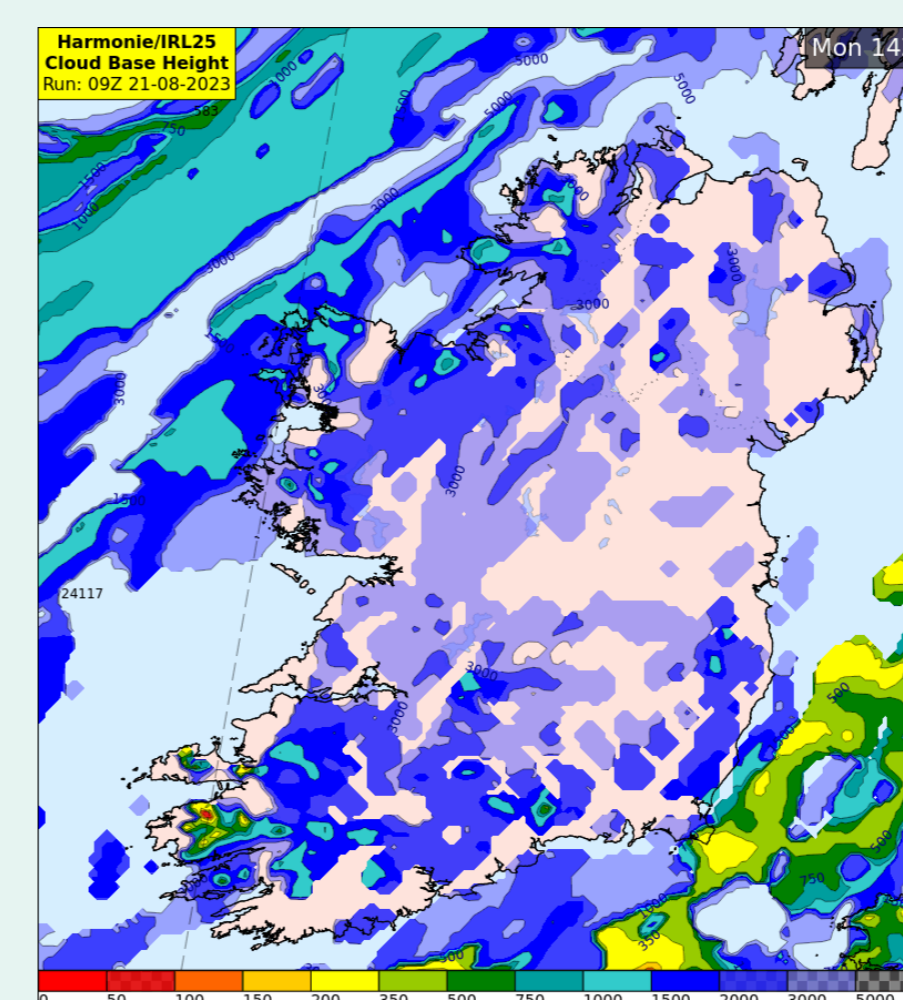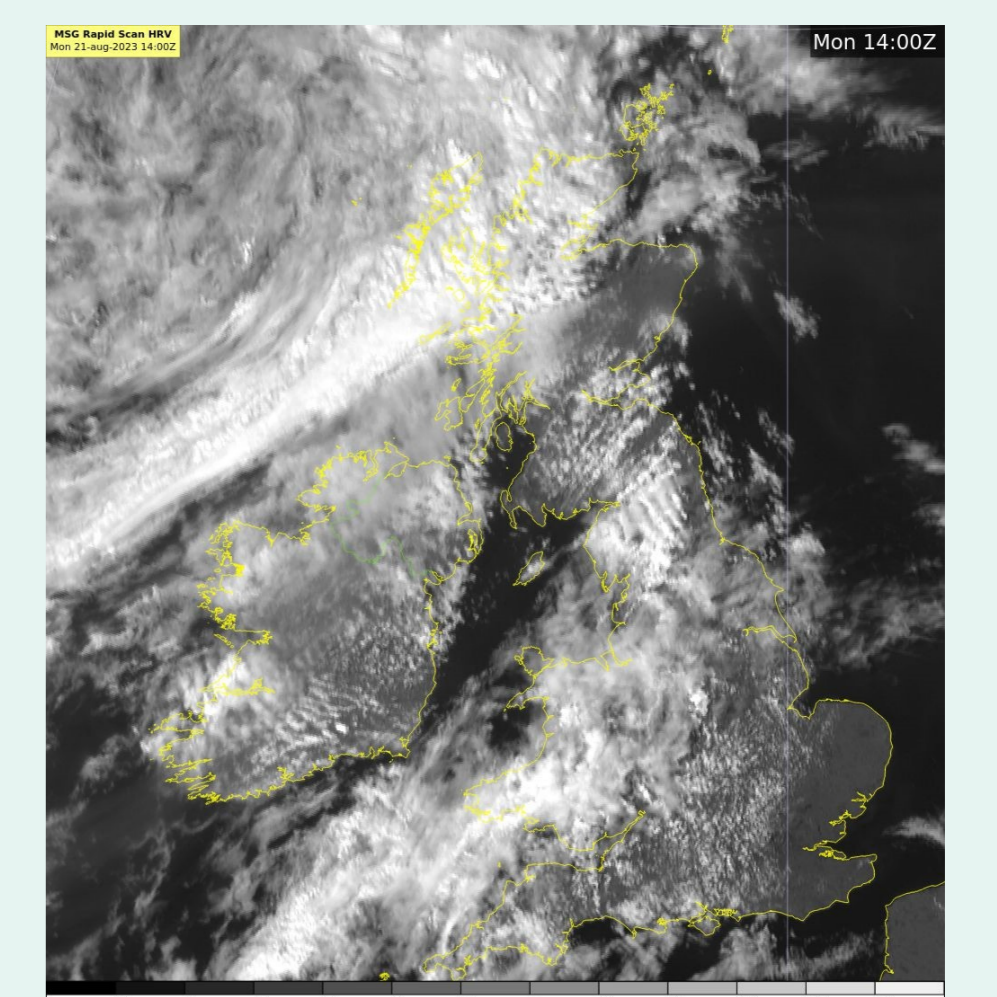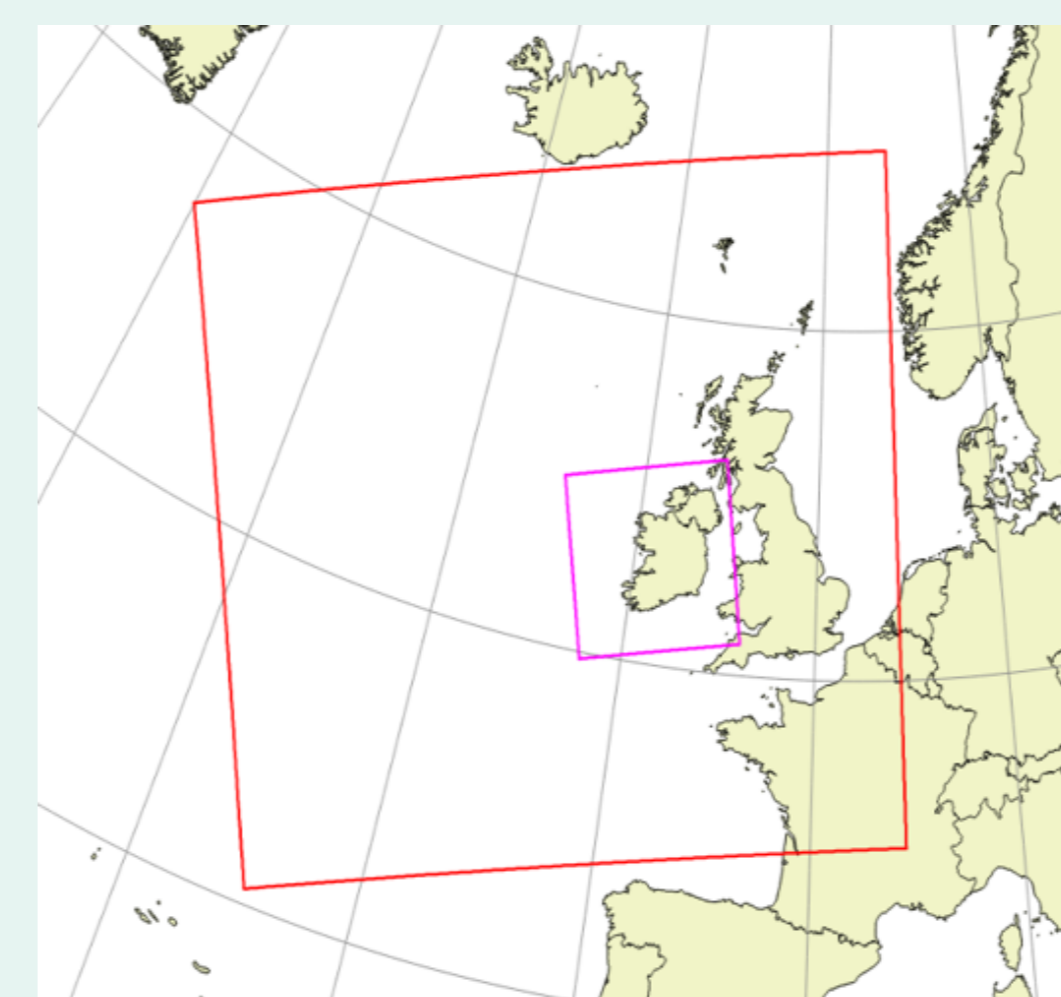|	
Data assimilation	3D-Var for upper-air and OI for surface
Observations	CONV, MODES (winds only), AMSU-A, MHS, IASI, ATMS, MWHS2, ASCAT and SYNOP RH2m/T2m
LBCs	IFS
Dynamics	Non-hydrostatic (ALADIN). Δt = 75 s
Physics	HARMONIE-AROME
Grid	2.5 km horizontal grid 65 vertical levels (first at 12 m, model top at 10 hPa)
Perturbations	EDA, SLAF boundaries, multi-physics, scale pert=yes, WG and snow perturbations off
Configuration	Lagged 1+15 EPS: • 1+10 at 0000/0600/1200/1800 • 1+5 at 0300/0900/1500/2100 UTC

Operational NWP suites run at ECMWF and KNMI HPCF

2023 Highlights

• Focus on common UWC-W development and hectometric e-suite
• Summer thunderstorms: June 12th – 25th

• First winter storm – Betty, August

Hectometric NWP – in prep.

Extensive testing of HARMONIE-AROME at hectometric resolutions has been carried out over various Irish domains. Initial experiment showed a strong boundary effect when small domains were used, particularly for cloud and precipitation.
A configuration on a 750 m grid has been proposed for e-suite, **HECTOR**: **HECTO**metric **R**esolution

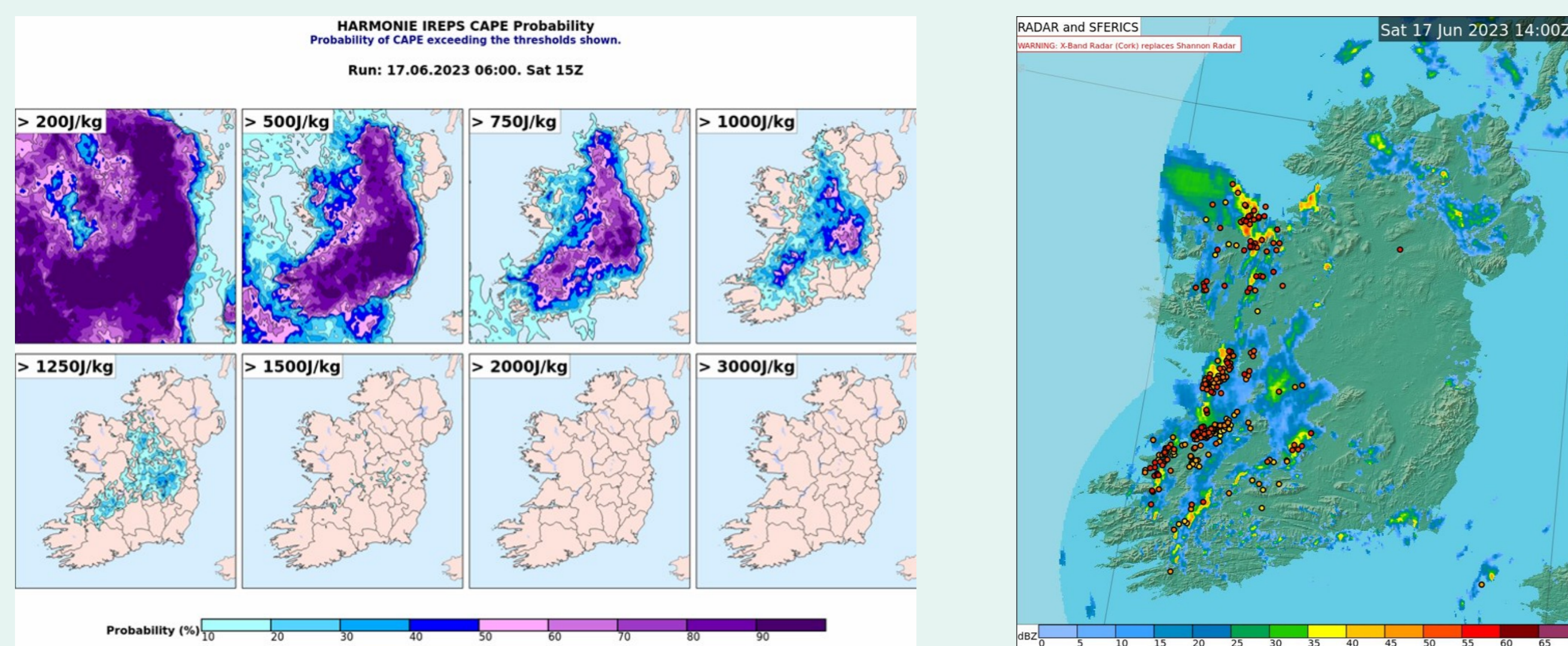|	
Data assimilation	3D-Var for upper-air and OI for surface
Observations	CONV, MODES (winds only), AMSU-A, MHS, IASI, ATMS, MWHS2, ASCAT and SYNOP RH2m/T2m
LBCs	IFS
Dynamics	Non-hydrostatic (ALADIN).). Δt = 30 s
Physics	HARMONIE-AROME
Grid	750 m horizontal grid 90 vertical levels (first at 5 m, model top at 10 hPa)
Configuration	• 36 hour forecast at 0000/0600/1200/1800 UTC • 9 hour forecast otherwise
Miscellaneous	• Horizontal diffusion increased • Cubic grid (instead of quadratic) • Host model VarBC files used in DA • 15 minute output

IREPS and HECTOR domains (top-left); HRV image for 2023-08-21 14:00:00 UTC (top-right); IREPS cloud-base height forecast (bottom-left); HECTOR cloud-base height forecast (bottom-right)
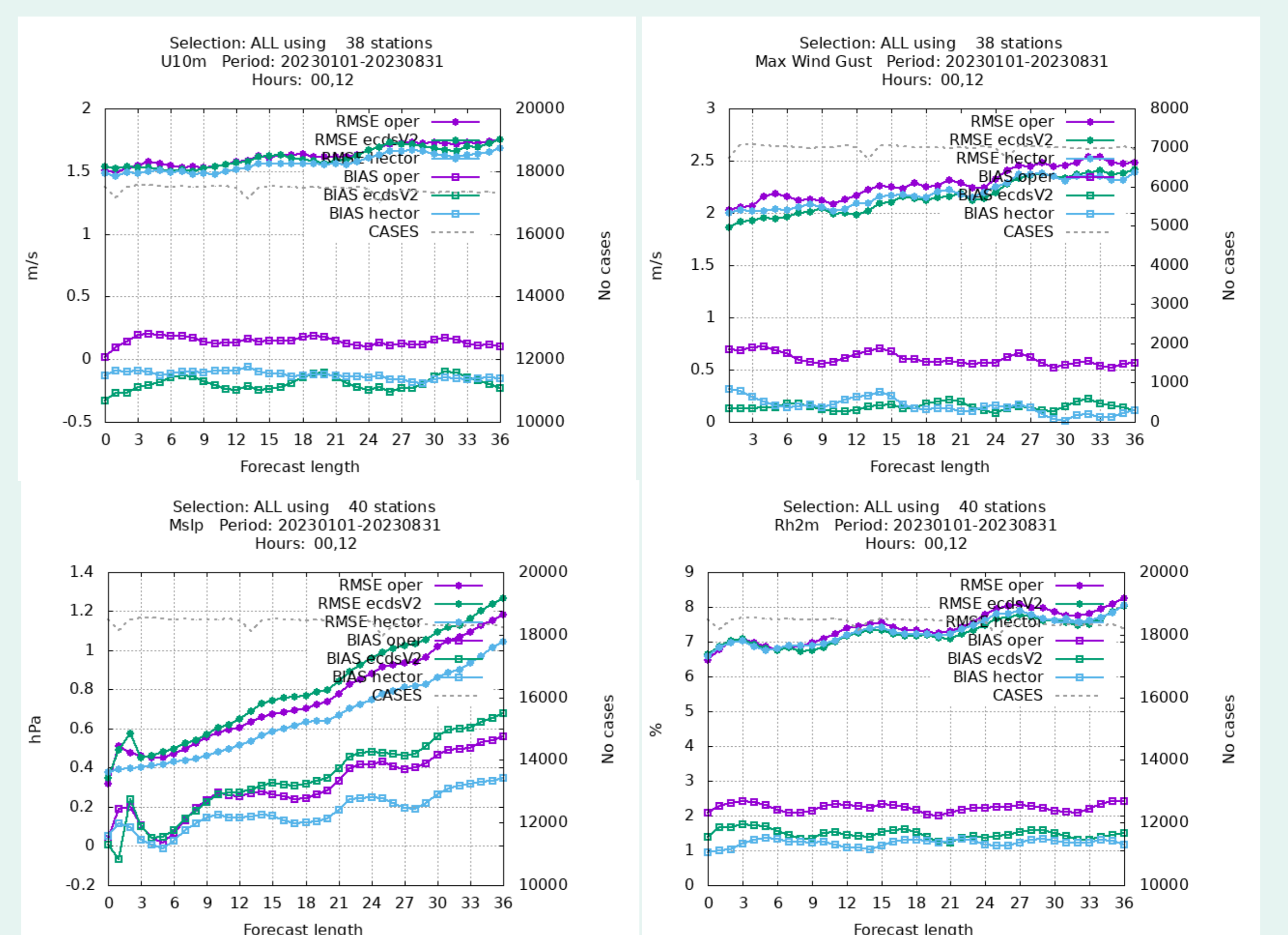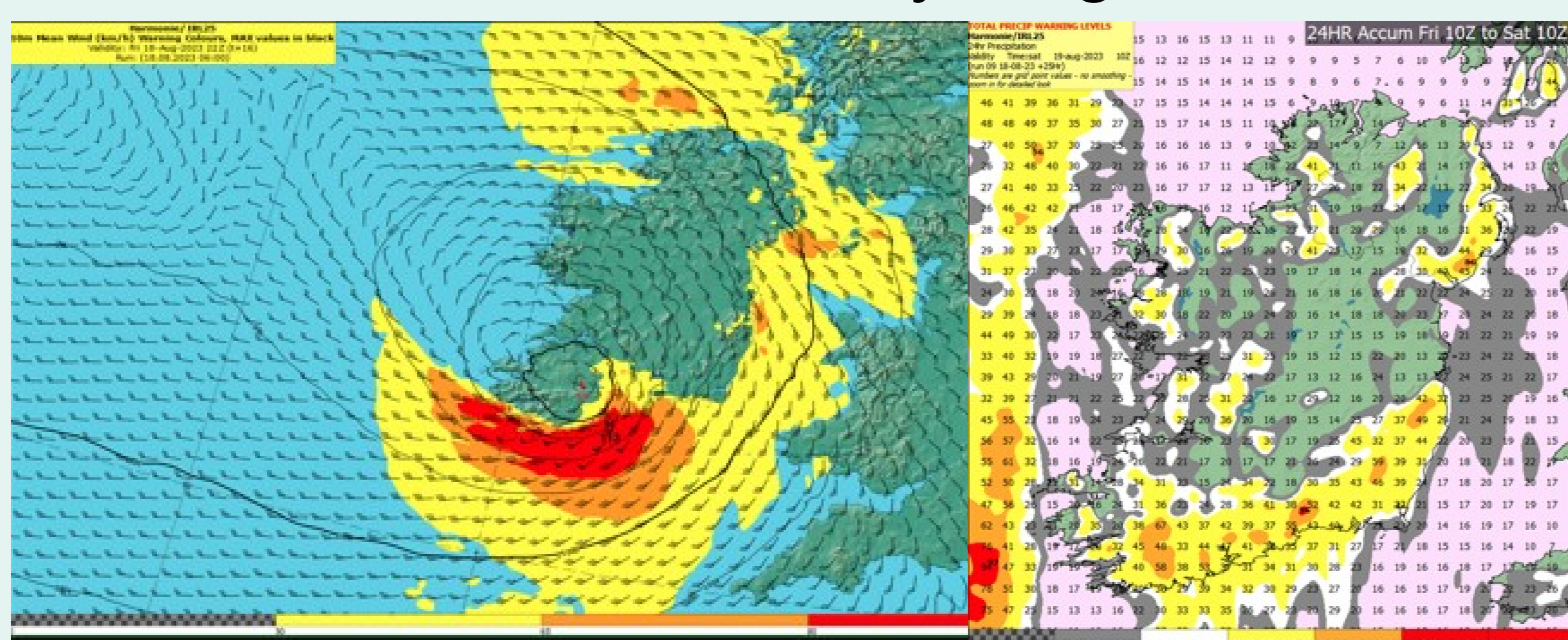
Early results are promising. Positive feedback from end-users

Verification results comparing IREPS (purple), UWC-W ECDS (green) and HECTOR (blue) for U10 (top-left), G10 (top-right), PMSL (bottom-left) and RH2 (bottom-right)