

UWC-W Operational NWP Development status

Collaboration

- United Weather Centres is an operational NWP collaboration between 11 countries
- The cooperation between DMI, IMO, Met Éireann and KNMI is called UWC West.



Common Operations (planned)

- Continuous EPS on DINI domain
- Deterministic configuration for IG domain
 - Harmonie-Arome 43h2.2
 - 2.0 km grid-spacing
 - 90 vertical levels (L90)
 - Single/Double precision to be confirmed
- 1+5 continuous EPS with hourly updates
 - IFS-ENS LBCs, surface perturbations and

Infrastructure

All changes managed using CI/CD pipelines

- SPP five parameters
- 3D-Var using three-hour window
- **Observations assimilated:**
 - Conventional, Mode-S EHS (EMADDC), AMV, Scatterometer, AMSU-A, MHS, MWHS2, ATMS, IASI, Radar (OIFS)
- FullPOS, gl and gridPP for products





United

Weather

Centres

- HPE Cray systems have been installed at IMO for production (*aurora*) and research (*boreas*)

Teleport – secure environment	✓
GitLab – code management & integration	\checkmark
Ansible AWX – deployment to HPC	\checkmark
SAPP – observation pre-processing	\checkmark
ECPDS – data transmission	\checkmark
HPC – aurora compute resource	
NWP – Harmonie-Arome	Z
Obsmon – DA monitoring	\checkmark
Harp – forecast quality	\checkmark
System/application monitoring	Z

NWP Issues

- Known issues:
 - Frontal clouds optically too thick
 - Overestimation of Sc in open cell convection
 - Underestimation of Sc in strong inversion Shadowing effect on precipitation too strong

Early results

- "Early Common DINI Suite" running at **ECMWF since September 2021**
- 48 h forecast at 0000/0600/1200/1800
- Early work on low cloud and cloud thickness
- L90 benefits 10 m wind speed forecast
- Physiography corrections benefit 10 m winds
- Single precision degrades PMSL



10 m wind speed verification from Harmonie resolution tests (left) and comparing ECDS [L90] with IREPS [L65] and IFS-HRES (right). L90 forecasts show reduced bias compared to L65.

- Shallow showers missing $0^{\circ}C > T_{cltop} > -15^{\circ}C$
- Resolved issues:
 - Slow melting of thin snow cover
 - Overestimation of cloud cover
 - Disappearing snow when $T_s > 0^{\circ}C$
 - Too much drizzle
 - Verification of wind gusts



PMSL verification comparing ECDS and IFS-HRES for January 2023 (left) and February 2023 (right). PMSL bias degraded but varies from month to month

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