

*Regional Cooperation for
Limited Area Modeling in Central Europe*



ALARO in DEODE

Using results of many (Nika Kastelec), presented by Martina Tudor



Czech
Hydrometeorological
Institute



HungaroMet
Hungarian Meteorological Service

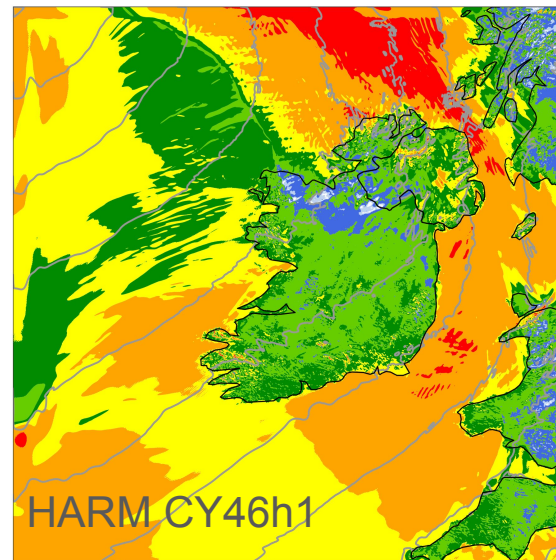
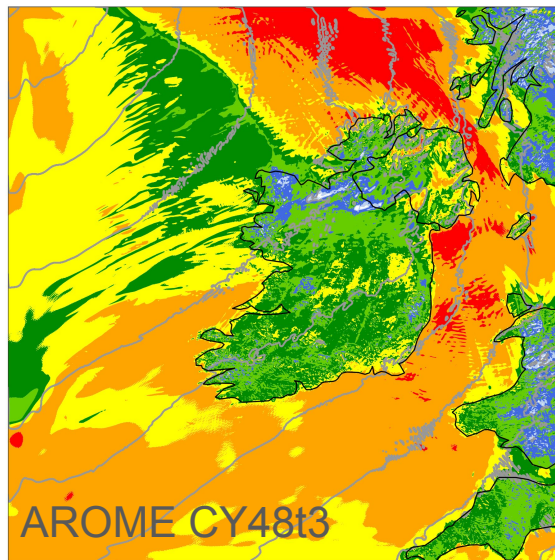
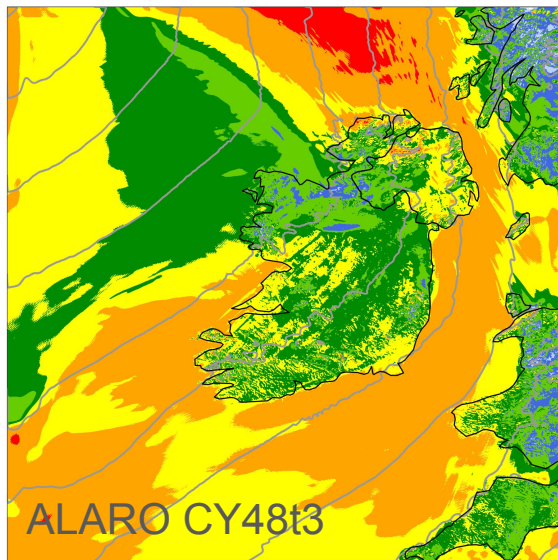
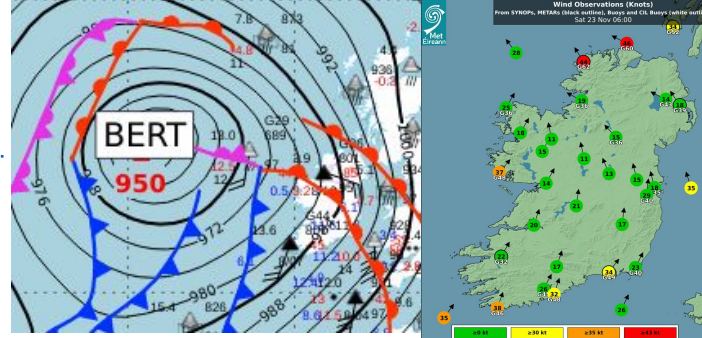


ARSO METEO
Slovenia

- *Different cycles and code used for different CSCs: CY46h1, CY48t3-alaro CY49T1 etc*
- *The goal is to use the same cycle/code for all three CSCs*
-
- *Configuration 903 is not working in CY49 any version (not used by ECMWF either) C903 with same compilation flags as we have in cy48t3 (intel2021, cmake) and some small fixes in code works now (update from Nika Kastelec)*
-
- *There was an abort for certain domains and cases for ALARO, but at least some aborts are related to having no sea points in the domain! (Prague, Zagreb, small domains, when extended to reach the sea, the integration worked for at least one)*

Ireland case study

Storm Bert: 2024112200+30
10 m wind forecast
© Colm Clancy

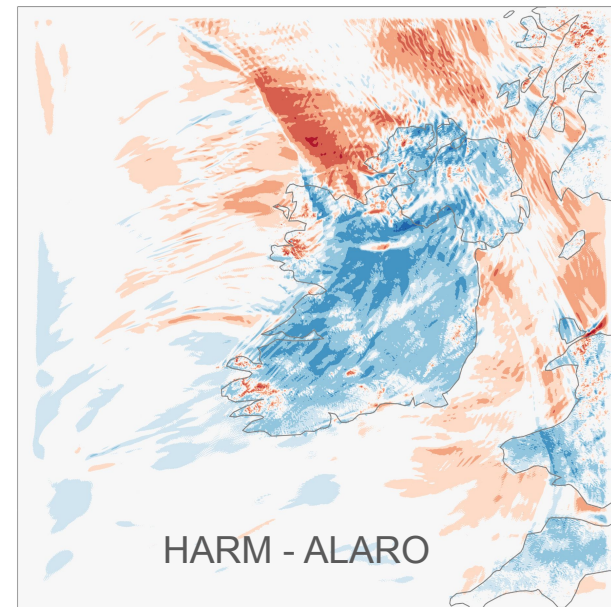
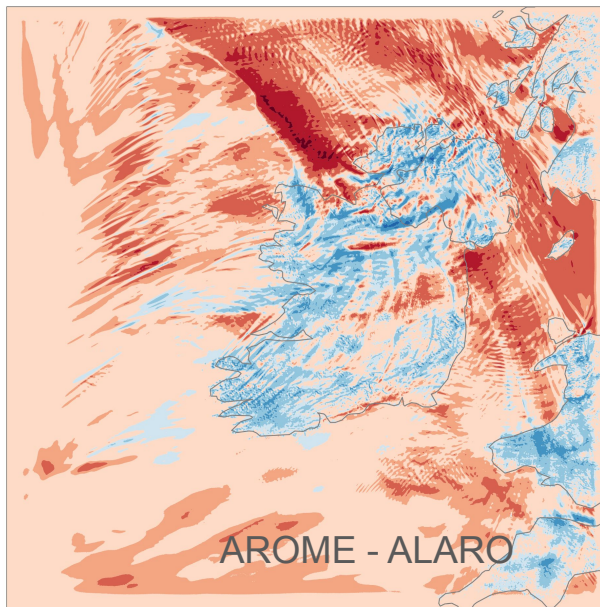
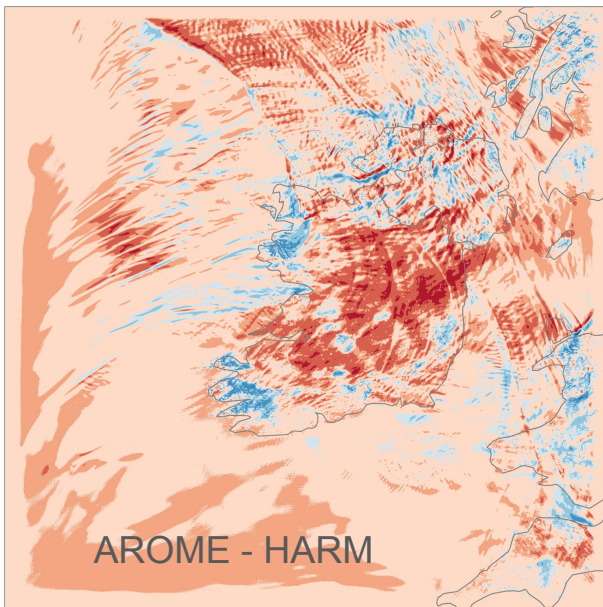
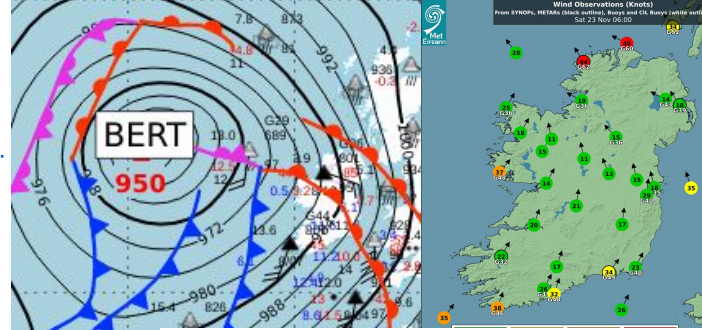


Ireland case study

Storm Bert: 2024112200+30

10 m wind forecast differences between CSCs

© Colm Clancy



Ireland case study

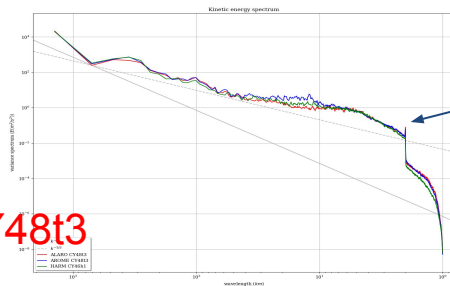
Storm Bert: 2024112200+30
10 m wind forecast
© Colm Clancy

2024112200+24

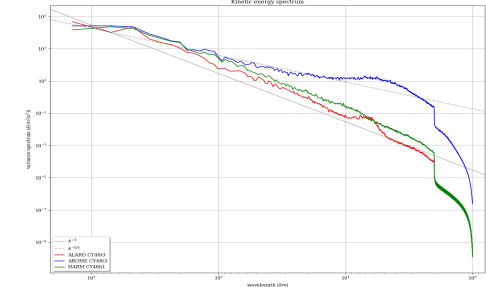
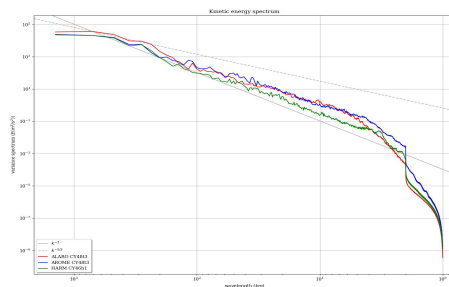
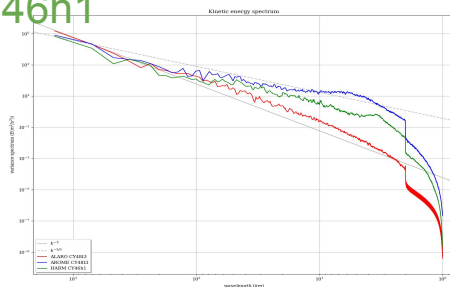
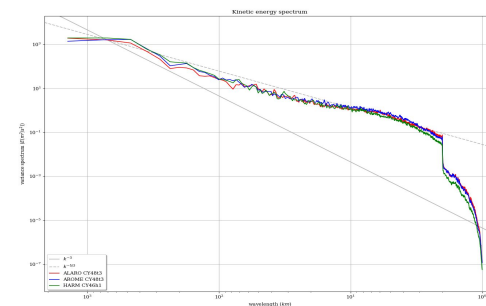
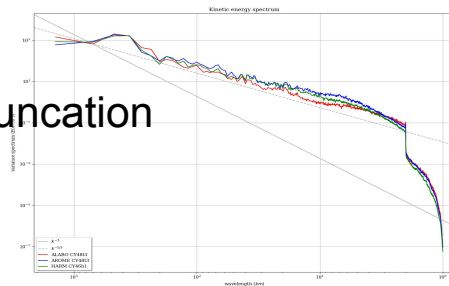
2024112300+06

2024112300+24

L80

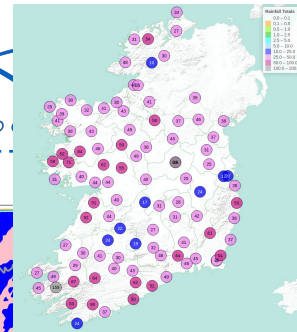


Truncation



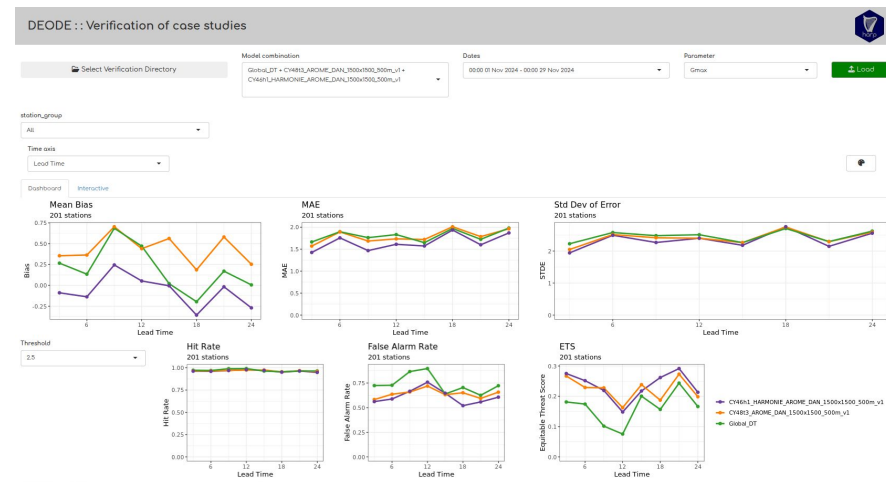
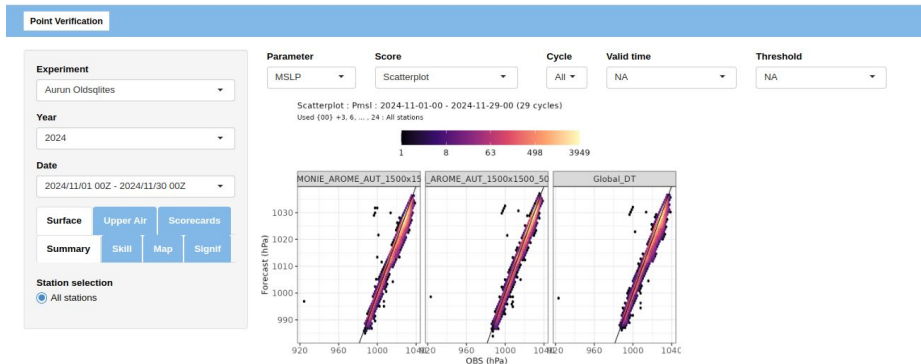
L20

Ireland case study



Model performance assessment

- Processing of observations OD-DT & Global DT data for spatial and point verification
- HARP:
 - Update to harp v0.2.2 & use of updated scripts from [oper-harp-verif](https://github.com/Deode/oper-harp-verif) repo
 - [Plugin for point verification of OD-DT runs](#)
 - [Plugin for aggregation of basic scores](#)
- Visualization apps:



<https://visualization.be-rmi-deode.f.ewcloud.host/visapp/>

<https://visualization.be-rmi-deode.f.ewcloud.host/harp/>

Status of dev-CY49T2h_deode

© Nika Kastelec

ALARO: dev-CY49T2h_deode git commit a6dda0f1e33d5ee1f3e5bbfc18287da7bddbc484

forecast works technically when compiled by gmkpack provided by Olda (intel 2023 +FLAGS) but prep crashes probably environment

forecast CRASHES with default cmake (intel 2021) on floating point exception

With correct flags alaro works with cmake intel 2021 without any problems

- Continue efforts to get CY49t2 running technically
 - ALARO (CHMI & Nika)

... check for news

Surface/SURFEX in DEODE configs

© Patrick Samuelson The conclusion from ta surface ACCORD WW in Brussels from 2024 is that we should aim for three patches with the following configurations:

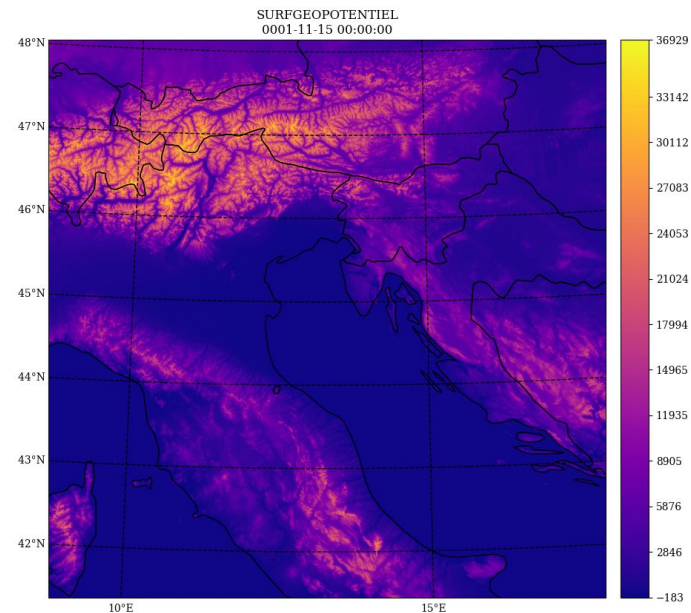
- Patch 1, bare soil, rocks and permanent snow
 - Configuration: Soil Organic Carbon (SOC) + Dry Soil Layer (DSL)
- Patch 2, forest
 - Configuration: MEB + SOC + Litter + newMLCH (Increased SOC percentage for the top two layers)
- Patch 3, low vegetation (grass and crops)
 - Configuration: MEB + SOC + DSL + newMLCH (Increased SOC percentage for the top two layers)

Please note that

- current cy49t2 code does not allow activation of MEB for non-forested patches. A PR to allow this exists for cy49t2h. Patrick tested this during the DEODE WW in Prague.
- the SOC option requires additional input files. [Global versions of these are now available via the SURFEX page here.](#)
- the DSL option requires new code. A PR for this exists for cy46h. It will be a PR for the cy49t2h repository (done?)
- the newMLCH option is under validation in experiments by the WW participants. Will be a PR when validated (done?)
- https://docs.google.com/presentation/d/1BdzWBbpSnvE9EYbDu2qvZTd_2ofj3l6vdMoNw9i51aM/edit#slide=id.g3283d3885e1_0_160 (Patrick's presentation explaining SURFEX options in CY46h1, CY48t3, CY49t2 and recommendations)

Bias of T2m and ALARO + SURFEX exp

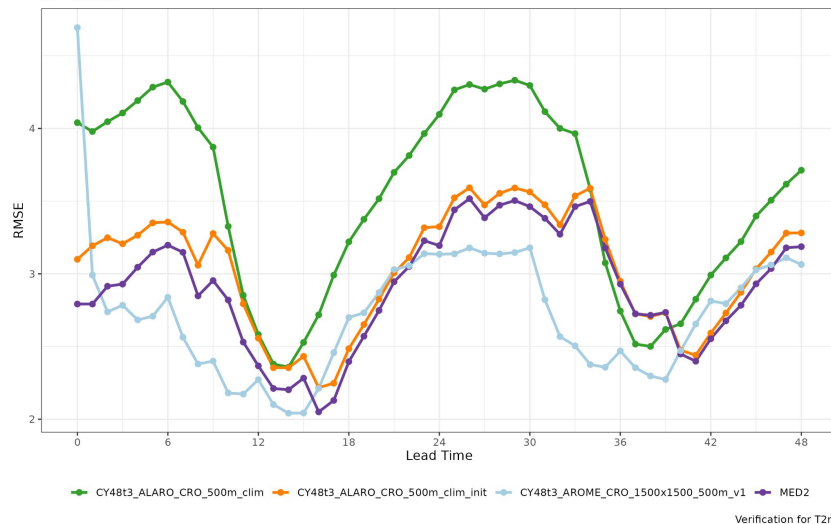
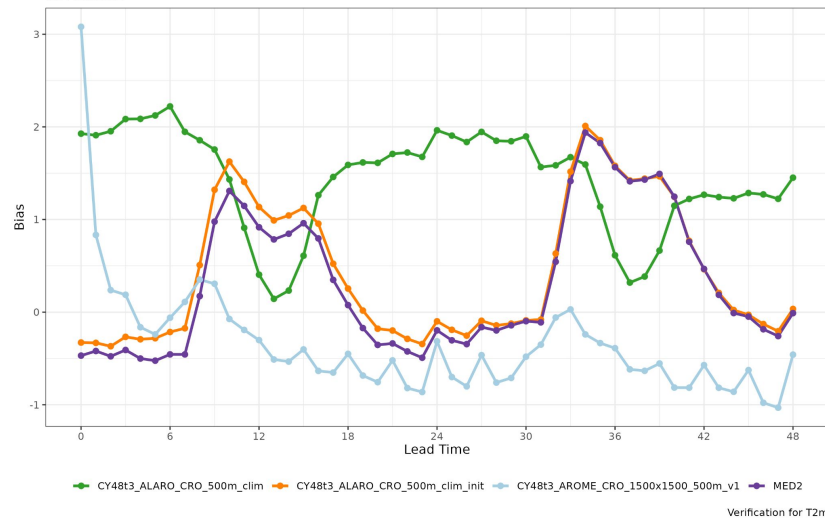
- No assimilation + coupling with global DT + no SURFEX -> Warm bias in T2m in the November's run
- All experiments was run on Mediteran-Alps domain, for first 3 days of the November 2024
- Resolution: 500m, time step: 15s, 1500x1500 gridpoint, forecast range: 48h
- In the summer operational runs we obtain cold bias.



DEODE runs

Bias :: 00:00 01 Nov 2024 - 00:00 03 Nov 2024
604 stations

RMSE :: 00:00 01 Nov 2024 - 00:00 03 Nov 2024
604 stations



ALARO deode operational cy48t3

ALARO deode operational cy48t3 + Arpage INIT file

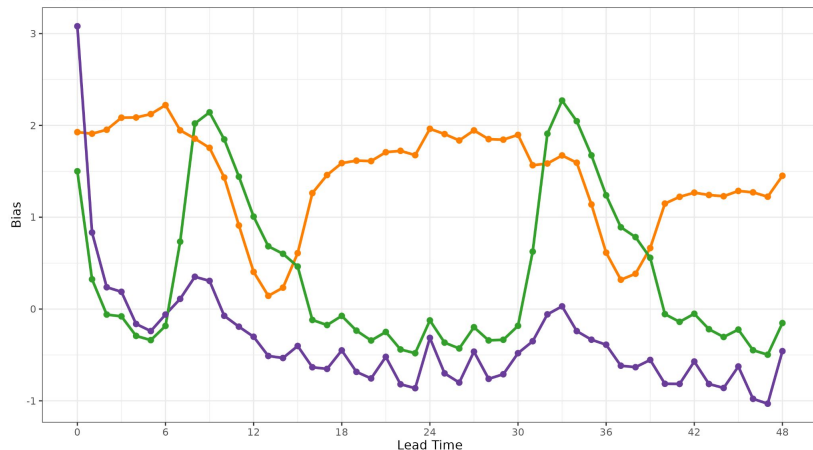
AROME deode operational cy48t3 (include surfex eccoclimap SG)

ALARO Czech operational like run

Experiments with ALARO + SURFEX

Bias :: 00:00 01 Nov 2024 - 00:00 03 Nov 2024

604 stations

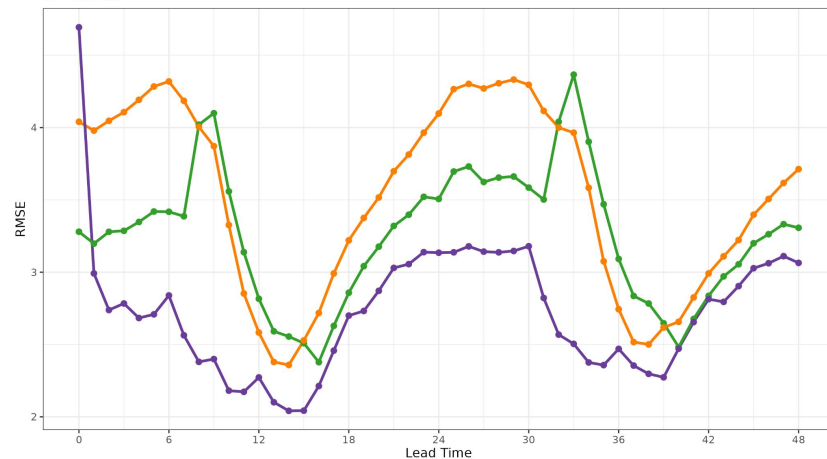


— CY48t3_ALARO_CRO_500m_clim — CY48t3_AROME_CRO_1500x1500_500m_v1 — G011

Verification for T2m

RMSE :: 00:00 01 Nov 2024 - 00:00 03 Nov 2024

604 stations



— CY48t3_ALARO_CRO_500m_clim — CY48t3_AROME_CRO_1500x1500_500m_v1 — G011

Verification for T2m

ALARO deode operational cy48t3

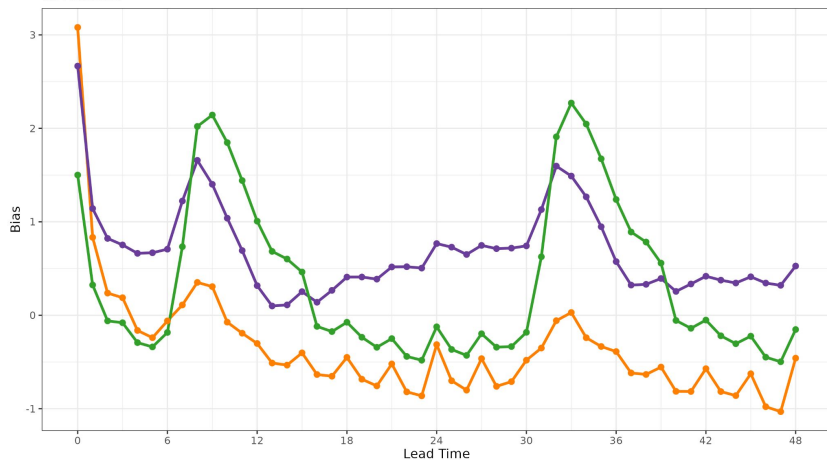
ALARO cy49t2bf_sfx + surfex eccoclimap II, with ISBA-DIF 14L, 3 patches, TEB with garden, and ISBA-ES 12L snow scheme, initialized by PREP from global DT (without ORORAD), done on the Belenos

AROME deode operational cy48t3 (include surfex eccoclimap SG)

Some more comparison

Bias :: 00:00 01 Nov 2024 - 00:00 03 Nov 2024

604 stations

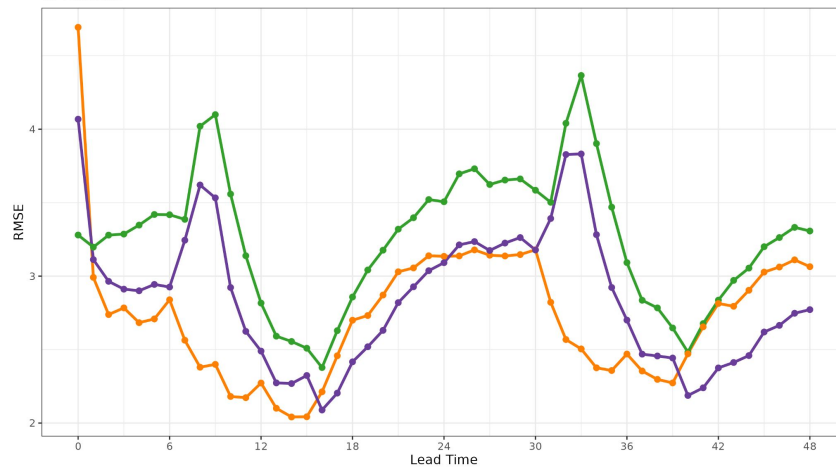


— CY48t3_AROME_CRO_1500x1500_500m_v1 — CY49t2_AROME_CRO_1500x1500_500m_eccoll — G011

Verification for T2m

RMSE :: 00:00 01 Nov 2024 - 00:00 03 Nov 2024

604 stations



— CY48t3_AROME_CRO_1500x1500_500m_v1 — CY49t2_AROME_CRO_1500x1500_500m_eccoll — G011

Verification for T2m

AROME deode operational cy48t3

ALARO cy49t2bf_sfx + surfex eccoclimap II, with ISBA-DIF 14L, 3 patches, TEB with garden, and ISBA-ES 12L snow scheme, initialized by PREP from global DT (without ORORAD) done on the Belenos

AROME deode cy49t2_bf (include surfex eccoclimap II, same PGD and PREP file as for ALARO, no ORORAD)

Addition (not DEODE related)

There are ACCORD user representative reports available here

https://opensource.umr-cnrm.fr/projects/accord/wiki/User_feedback

Only one is ALARO related

https://opensource.umr-cnrm.fr/projects/accord/wiki/DHMZ_Croatia_2024-11-25_Bad_cloud_coverage_and_precipitation

User representatives are forecasters!

Please encourage your forecasters to submit reports.

Thank you for your attention!