CONSORTIUM FOR SMALL SCALE MODELING

COSMO

COSMO-LEPS: updates

I. Cerenzia, A. Montani

Arpae Emilia-Romagna Servizio IdroMeteoClima, Bologna, Italy
ECMWF, Reading, UK

arpae
agenzia prevenzione ambiente energia emilia-romagna

CGM 09/2019

Operational suite: status

The operational suite runs at ECMWF HPC as time critical application managed by Arpae-SIMC (Ines and help by Andrea)

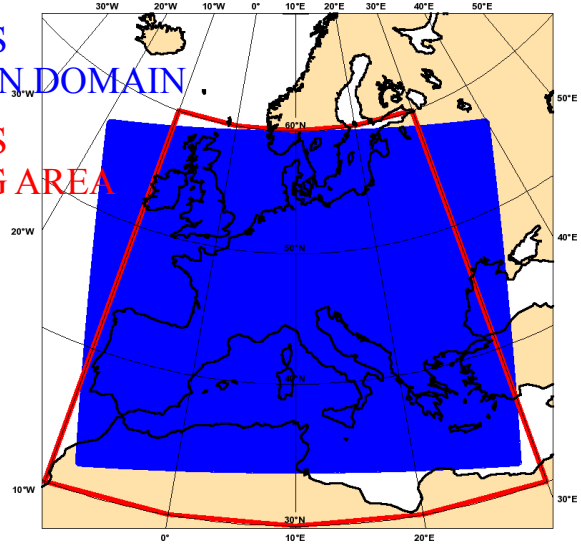
The computer time is provided by the COSMO partners which are ECMWF member states (CH, D, GR, I)

Configuration:

- ensemble size: 20 members
- IC/BCs from ECMWF ENS members (only 00 and 12UTC ENS runs are considered) using cluster analysis and soil IC from ICON-EU
- horizontal / vertical resolution: 7 km / 40 ML
- forecast range: +132h
- starting times: 00 and 12UTC
- COSMO model version: 5.03 in single-precision
- convection scheme: Tiedtke
- perturbations in turbulence scheme and in physical parameterisations (PP), but no SPPT
- ecflow suite

COSMO-LEPS INTEGRATION DOMAIN

COSMO-LEPS CLUSTERING AREA



Performed updates in 2019

No scientific updates to the COSMO-LEPS suite in 2018-2019

Maintenance

- Work flow migration from XCDP to ECFLOW (November 2018)
- Transition to new MARS dissemination (January 2019)
- INT2LM version updated to 2.05 (February 2019)
- Transition to new version ENS ECMWF (June 2019)
- Runtime issues
- User requests

Upgrade ENS ECMWF (June 2019)

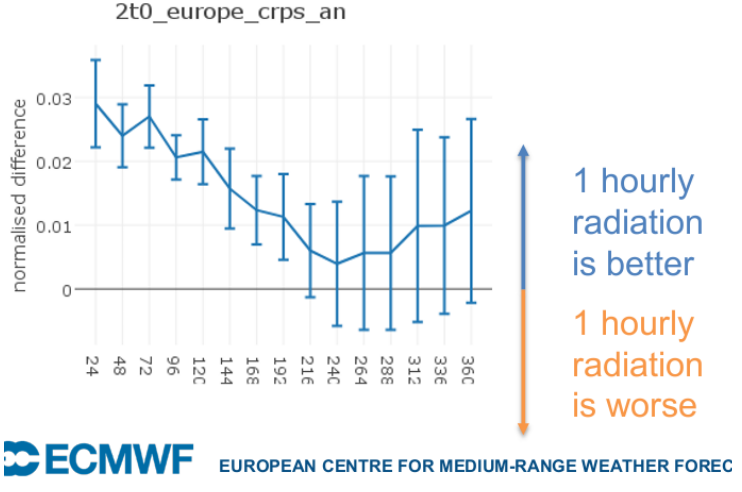
https://www.ecmwf.int/en/forecasts/documentation/evolution-ifs/cycles/summary-cycle-46r1

Improved ENS ensemble initialization:

- as removes need to use +/- symmetry to get from 25 EDA perturbations to 50 ensemble members
- New continuous data assimilation (decouples observation cut off time from the start of the assimilation)
- More efficient and more coupled soil moisture analysis
- New microwave channels assimilated and improved geostationary radiances

Physics ENS

- 1-hour radiation update frequency
- 2D CAMS aerosol climatology has been replaced by a new 3D climatology (limited impact)
- Improvement in the snow scheme by correctly computing the rain amount that can refreeze

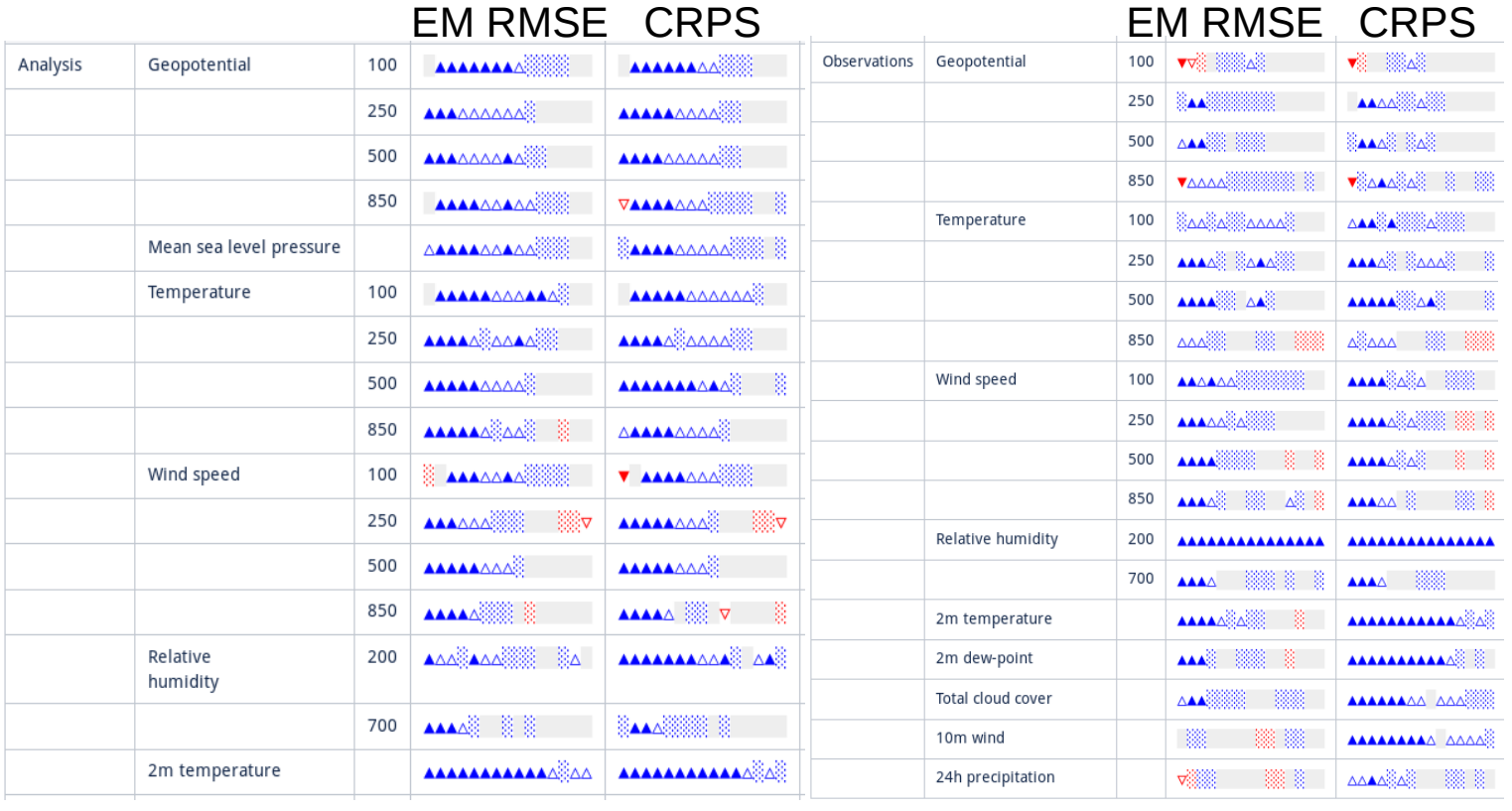


ECMWF EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FOREC

Upgrade ENS ECMWF (June 2019)

https://www.ecmwf.int/en/forecasts/documentation/evolution-ifs/cycles/summary-cycle-46r1

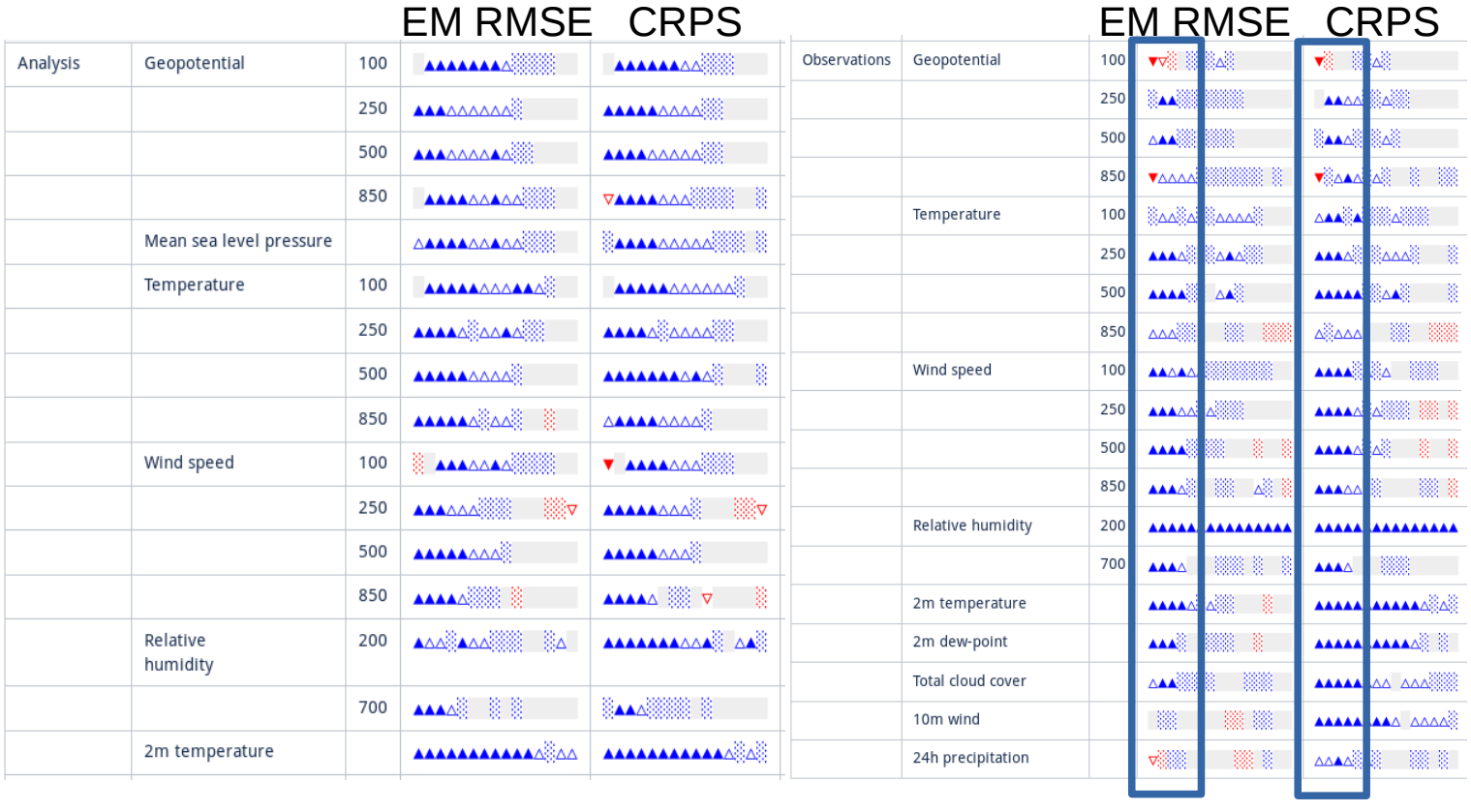
For Europe



Upgrade ENS ECMWF (June 2019)

https://www.ecmwf.int/en/forecasts/documentation/evolution-ifs/cycles/summary-cycle-46r1

For Europe



Issues and User requests

Run time issues

- Connection to the user server for the upload of results (broken or overloaded)
- Connection with new DWD server for downloading ICON-soil: COSMO-LEPS fed with IFS-soil between 2019/06/04-25
- Other rarer cases (missing BC/IC, workflow errors)

User requests

- Migration to product in Grib2 (DWD)
- New fornitures (UNINA?)

Updates foreseen in 2019-2020

Maintenance

- Upgrade of several modules (Magics, Metview, python, grib_api, libsim, fieldextra) due to ECWMF system session (18 September 2019)
- Complete migration from grib_api to eccodes (libsim, fieldextra) (within 2019)
- Work flow migration from XCDP to ECFLOW of esuite (within 2019)
- Upgrade of COSMO version from 5.03 SP to 5.06 SP (as soon as it will be available)

Upgrade

- Extension of COSMO-LEPS domain towards East to include Israel (increment of ~45% cost and time, challenging implementation)
- Lagged ensemble (ENS 06UTC,12UTC for LEPS starting at 12UTC; ENS 18UTC,00UTC for LEPS starting at 00UTC) (= SBU, simple implementation)
- SPPT (in COSMOv5.06 SP) (small increment of cost and time, simple implementation)
- Starting experimentation for migration to ICON-LAM

CONSORTIUM FOR SMALL SCALE MODELING

COSMO

arpae

agenzia prevenzione ambiente energia emilia-romagna

Thank you for your attention!