Data Assimilation Activities at OMSZ

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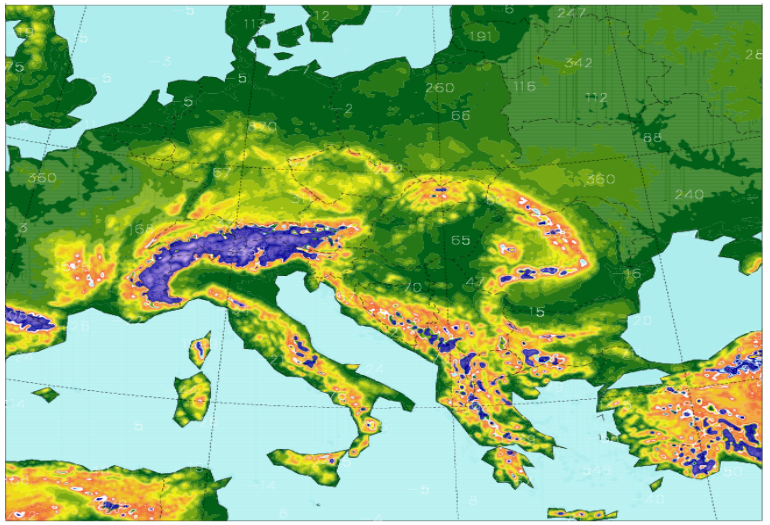
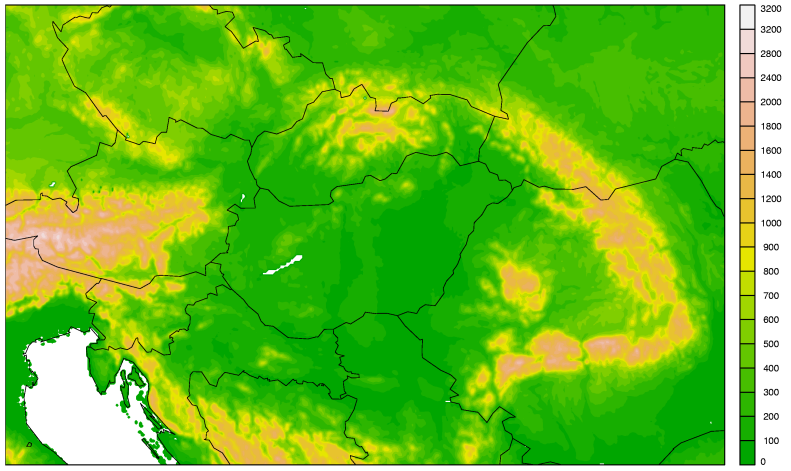
Outline

- Operational NWP and DA systems at OMSZ
- OPLACE developments
- Introducing AROME DA operational
- AROME DA experiments (AMV, RADAR, SigmaB tests)
- ALARO DA experiments
- ALARO EnDA
- Future plans

Operational NWP systems at OMSZ



- ALARO
  - 8km mesh size, 49 levels
  - DFI initialization
  - 4 runs/day up to 60 hours
  - LBC from IFS 3 hourly freq.
  - Operational 3DVAR+CANARI DA



- AROME
  - 2.5km mesh size, 60 levels
  - No initialization
  - 4 runs/days up to 48 hours
  - 1 hourly coupling from IFS
  - Operational 3DVAR RUC 3h

Operational DA systems at OMSZ

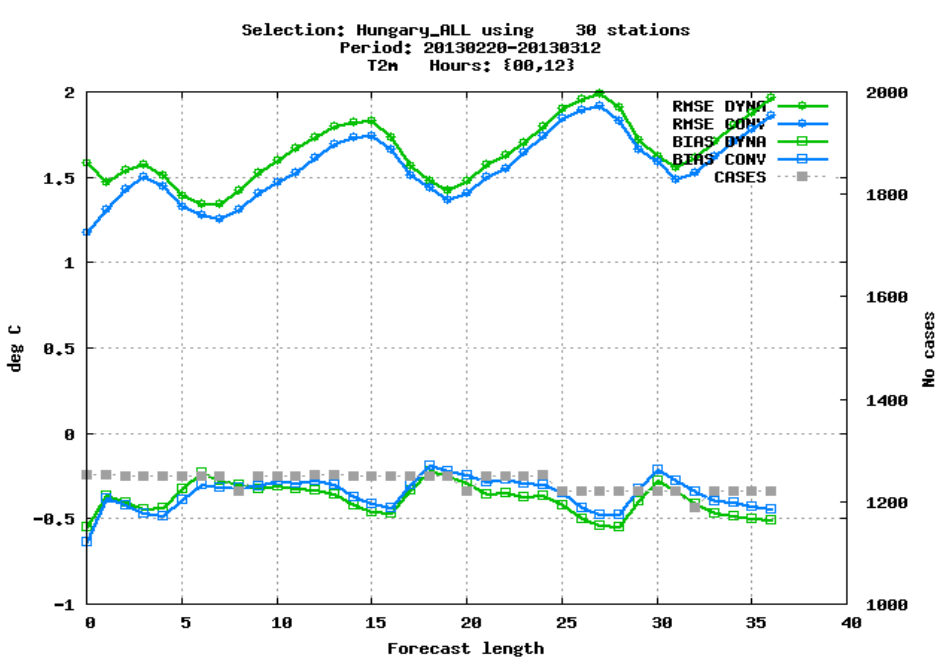
- ALARO DA 3DVAR+OI(CANARI)
  - B matrix from downscaled AEARP EDA
  - 6h cycling with DFI before first guess production
  - 3 hourly IFS coupling time-consistent approach
  - Observations: SYNOP,SHIP,TEMP,AMDAR,ATOVS,AMV,SEVIRI
- AROME DA only 3DVAR
  - B matrix from Downscaled ALADIN EDA
  - 3h cycling without initialization
  - 1 hourly IFS coupling space-consistent approach
  - Observations: SYNOP,TEMP,AMDAR
  - Surface from downscaled ALADIN OI(00,06,12,18UTC) and AROME first guess(03,09,15,21UTC)

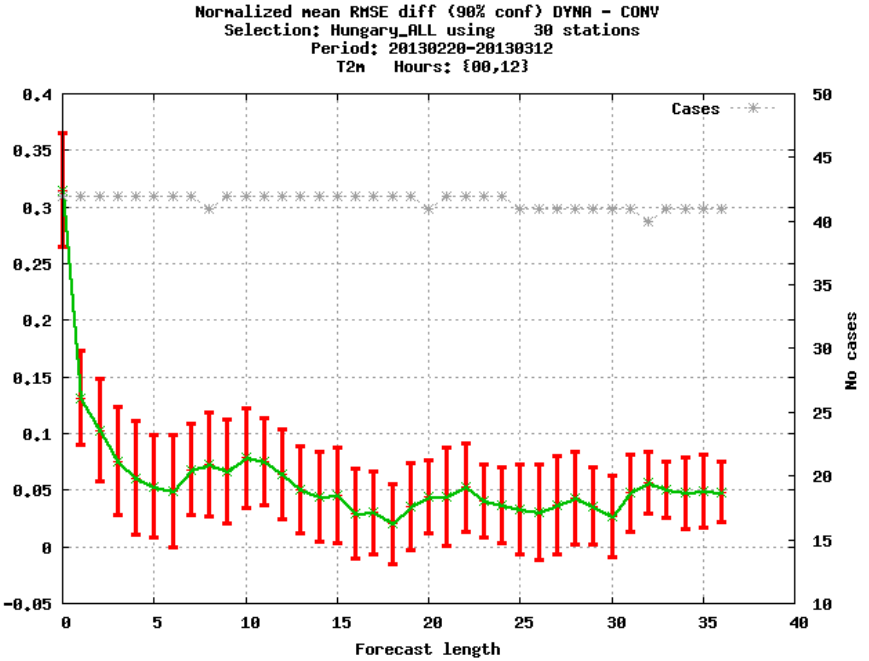
OPLACE developments

- Implementation of IASI from METOP-B.
- Dissemination of LANDSAF albedo, snow and ASCAT soil moisture in OMSZ. Final implementation is scheduled at the end of this year into OPLACE.
- Satellite ID Meteosat-10 SEVIRI has been changed in SEVIRI GRIB files
- BUFR based SYNOP observations were tested through OPLACE. With merging traditional and BUFR SYNOP the amount of automatic SYNOP reports can be achieved.

Introducing AROME DA operational

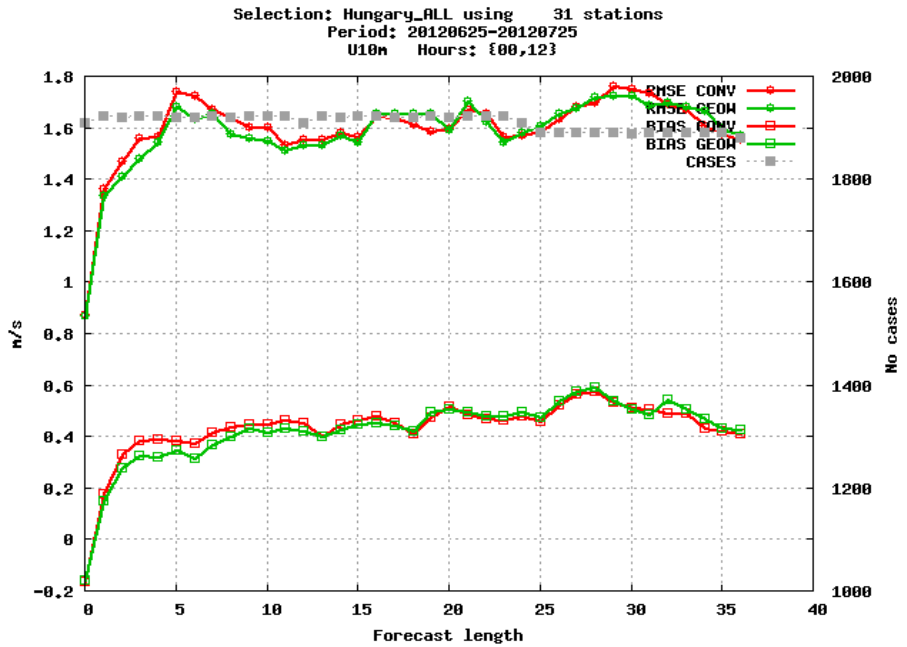
- In March 2013 Arome DA with conventional observations was introduced.
- The 3DVAR local analysis could improve AROME forecast compare to the dynamical adaptation.
- The OI_main surface assimilation was not introduced, because degradation was observed for longer forecast ranges. Surface fields are downscaled from ALADIN OI analysis and AROME first guess.

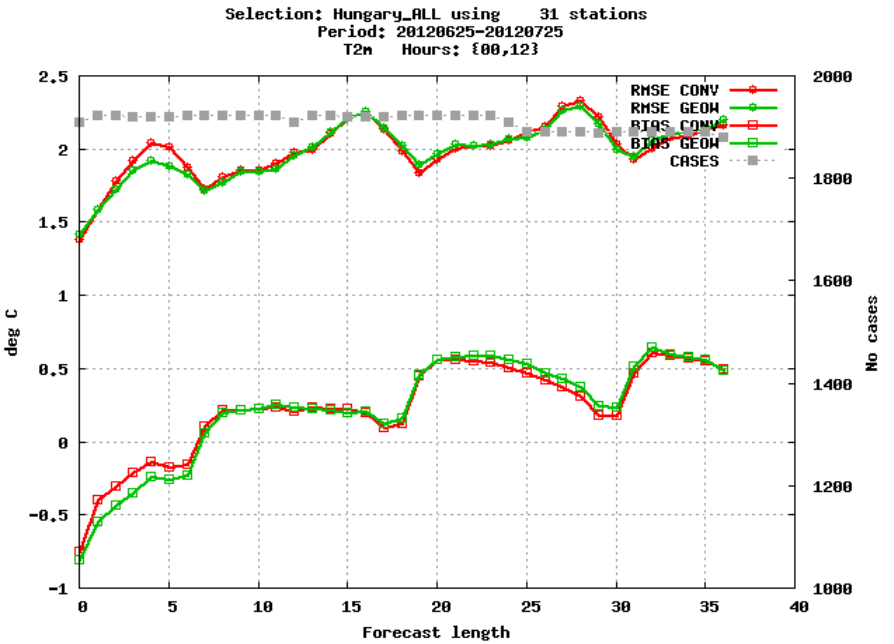




AROME experimental AMV in DA system

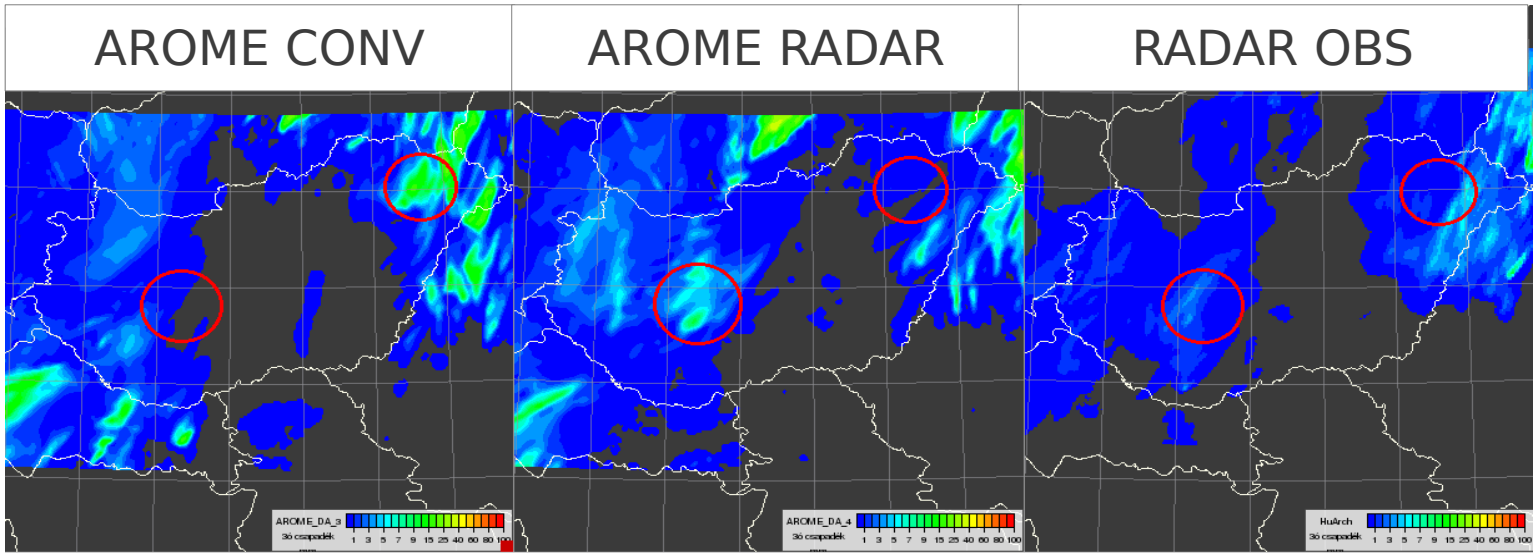
- Meteosat-9 GEOWIND AMV observations were tested in AROME 3DVAR.
- Summer period: 25th June – 25th July 2012





AROME experimental RADAR in DA system

- 3 Hungarian RADAR stations and two periods in 2012 were investigated with AROME 3DVAR.
- More details in separate presentation about AROME RADAR studies



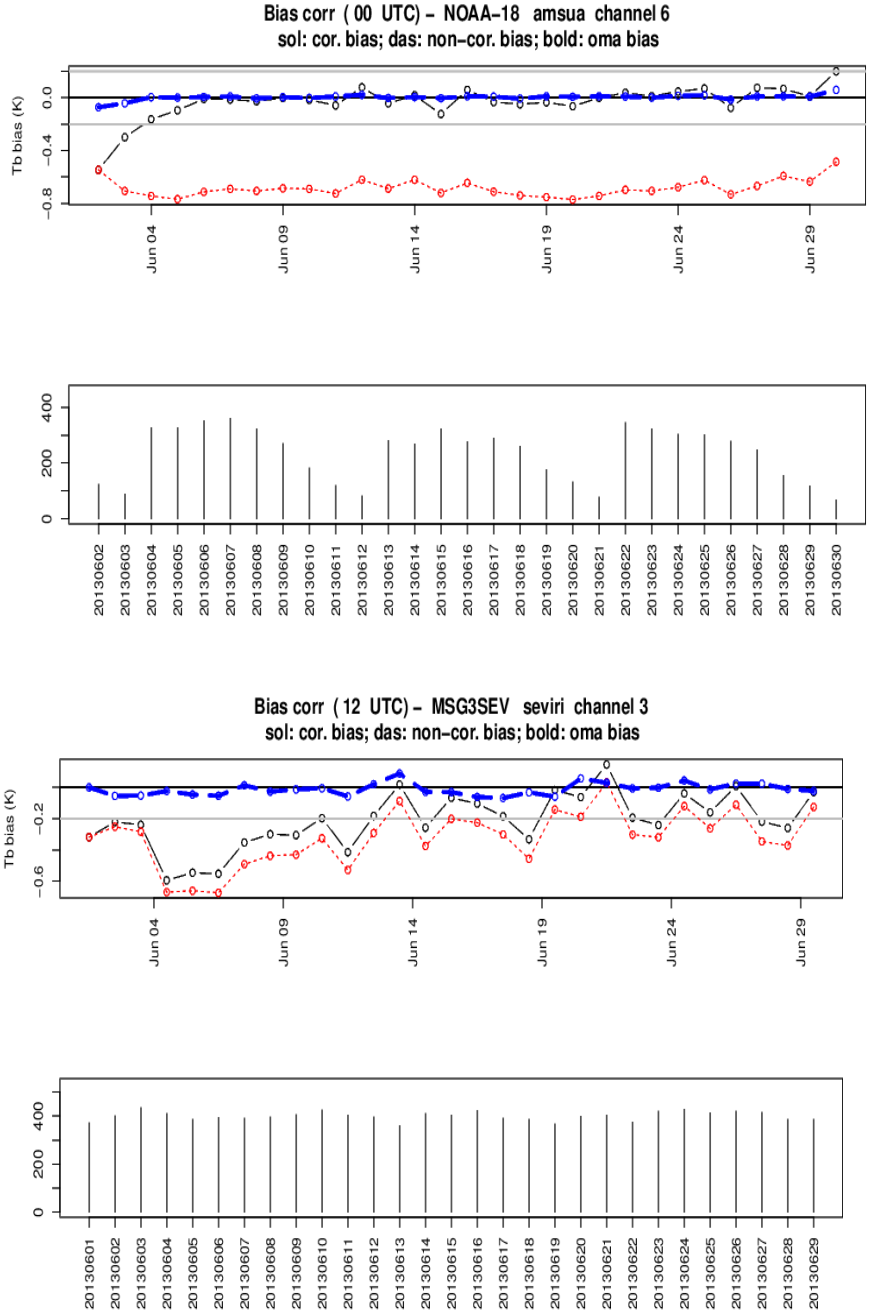
AROME experimental SigmaB Maps in DA system

- The method to use spatially varying background error variances (Strajnar 2008) was tested with AROME 3DVAR.
- During technical validation of the method a bug was found concerning humidity increments which is missing due to assimilation of wind observations.
- More slides in Background error statistics section

ALARO DA experiments

New set of VARBC was implemented with the operational changes of Meteosat-10 SEVIRI radiances.

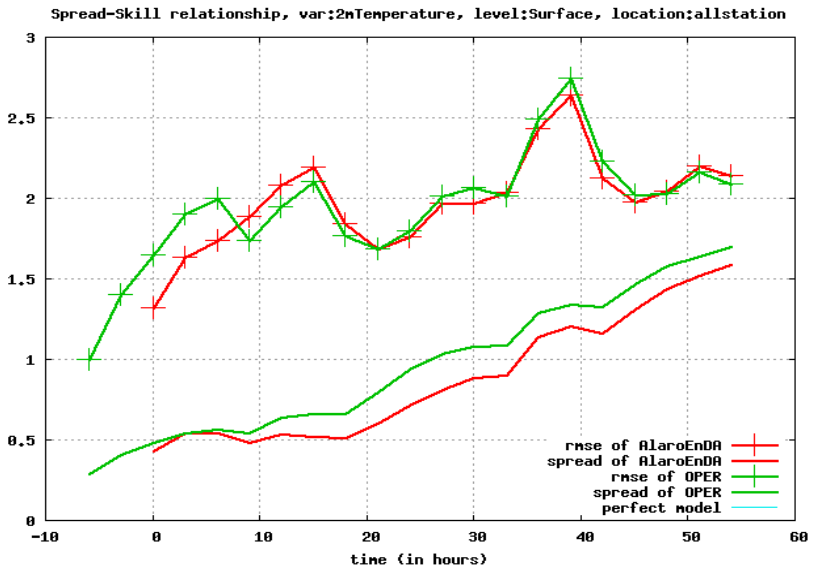
It means a coldstart VARBC computation for all used radiance observations (ATOVS and SEVIRI channels).

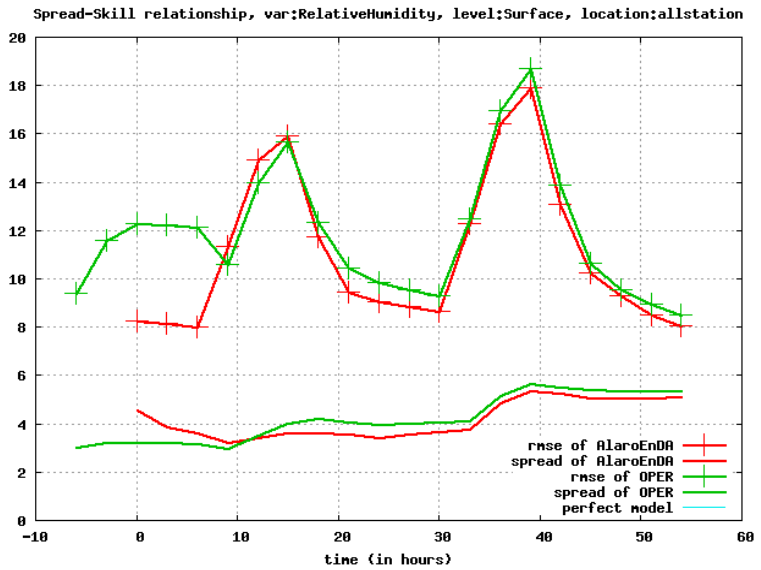


ALARO EnDA

For limited-area ensemble prediction purposes an ALARO Ensemble DA was built in order to implement local perturbations and reorganize the daily forecast runs.

ALARO OI+3DVAR assimilation schemes were used with perturbed observations at screen level and upper air.
Perturbation algorithm is based on Monte-Carlo method and perturbations are scaled with observation errors.





Plans

AROME DA:

- RADAR data assimilation is going on.
- Steps to implement radiance observations
- GPS assimilation
- Surface Assimilation with OI_main recently and EKF in the future
- Better representation of B matrix (AROME EDA)

ALARO DA:

- IASI implementation
- B matrix from ALADIN EDA

Questions?

Thank you for your attention!
Thanks to those who contributed!

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