



Data Assimilation: experience & plans in Belgium

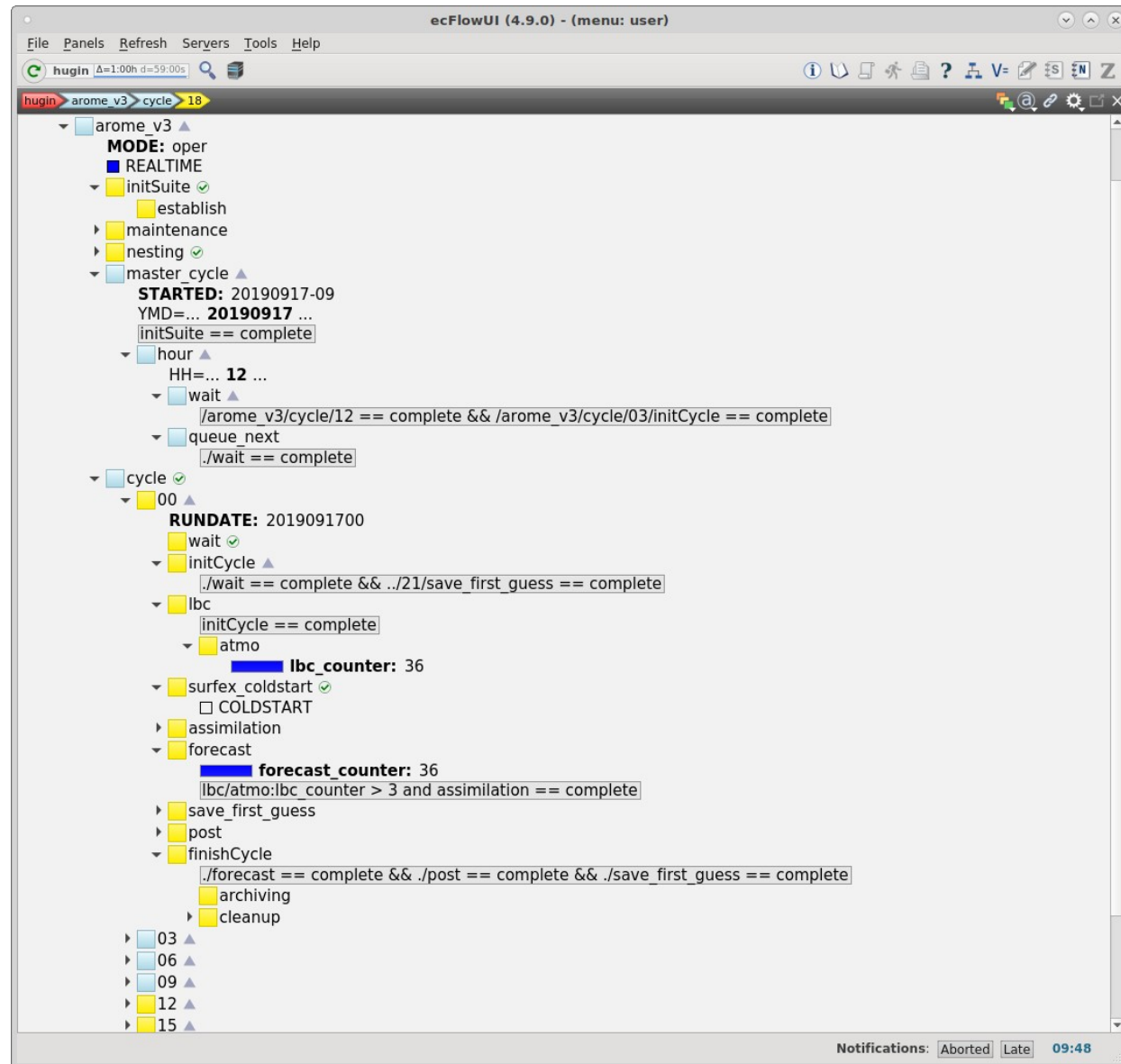
Alex Deckmyn
Prague, 18 September 2019

Current situation

- A surface DA cycle is running in experimental mode since June.
- AROME cy43t2, 1.3km
- 3h assimilation cycle (SYNOP observations only)
- OBS are treated with python scripts
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Experimental DA suite

- Experimenting with new ecFlow cycle set-up.
- 3-hourly surface DA
- Coupled to operational 4km alaro run.



Experimental DA suite

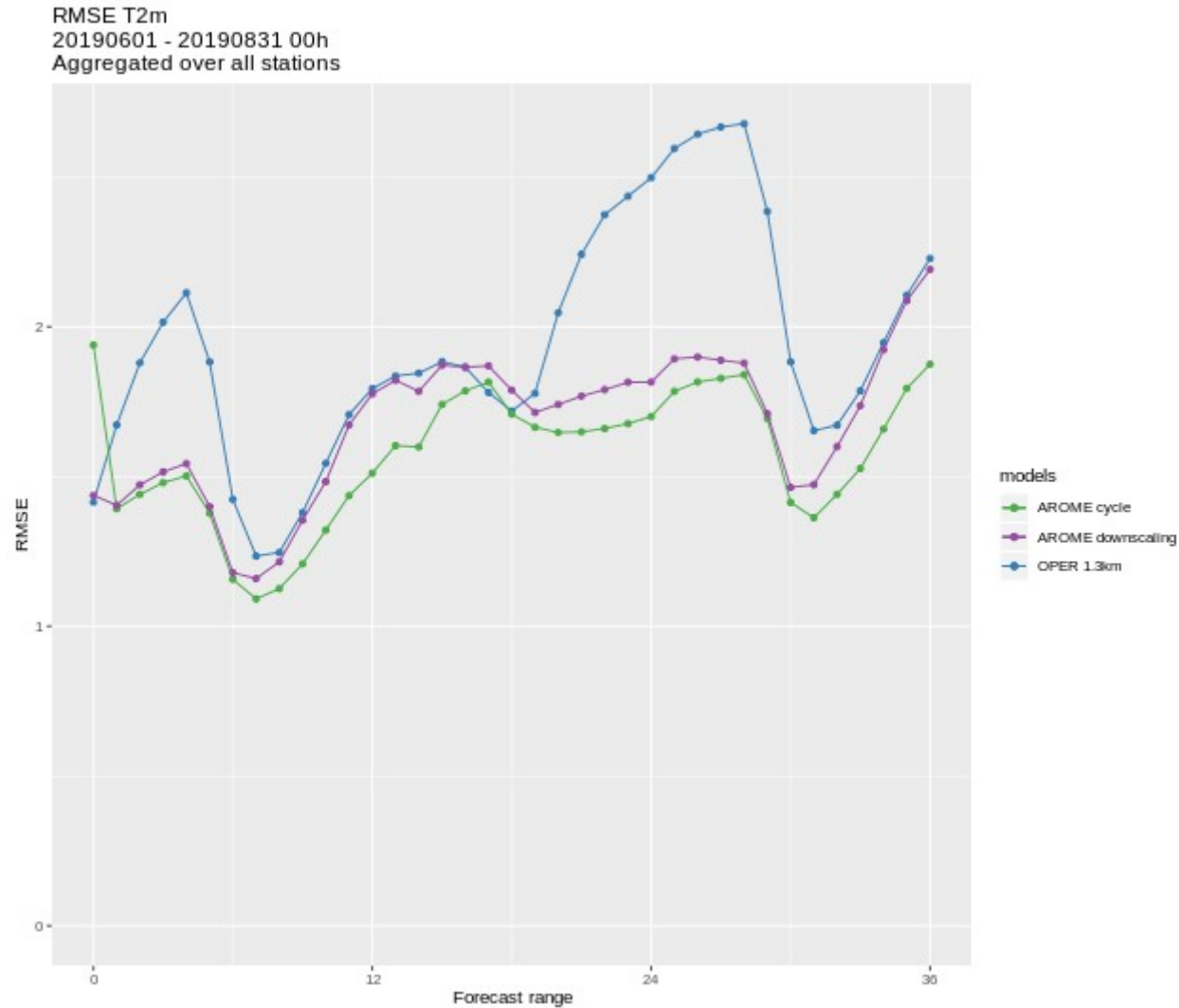
- Experimenting with new ecFlow cycle set-up.
- 3-hourly surface DA
- Coupled to operational 4km alaro run.

The screenshot displays the ecFlowUI (4.9.0) interface. The main window shows a tree view of a job cycle configuration for 'arome_v3'. The cycle is currently at step 06. The configuration includes the following components and their status:

- 00** (RUNDATE: 2019091800)
 - wait (checked)
 - initCycle (expanded)
 - ./wait == complete && ../21/save_first_guess == complete
 - lbc (expanded)
 - initCycle == complete
 - atmo (expanded)
 - lbc_counter: 36**
 - surfex_coldstart (checked)
 - COLDSTART
 - assimilation (expanded)
 - ./initCycle == complete
 - ./surfex_coldstart:COLDSTART == set
 - get_obs
 - bator (expanded)
 - surface (expanded)
 - bator == complete
 - addfields (expanded)
 - cpl_Ts (expanded)
 - addfields == complete
 - sst_update (expanded)
 - cpl_Ts == complete && ../lbc/atmo:lbc_counter > 0
 - canari (expanded)
 - sst_update == complete
 - upper_air (expanded)
 - forecast (expanded)
 - forecast_counter: 36**
 - lbc/atmo:lbc_counter > 3 and assimilation == complete
 - save_first_guess
 - post
 - finishCycle (expanded)
 - ./forecast == complete && ./post == complete && ./save_first_guess == complete
 - archiving
 - cleanup
 - 06** (highlighted)
 - 09
 - 12
 - 15
 - 18
 - 21
 - aloro_sfx_downscaling
 - ecflow-me

First results

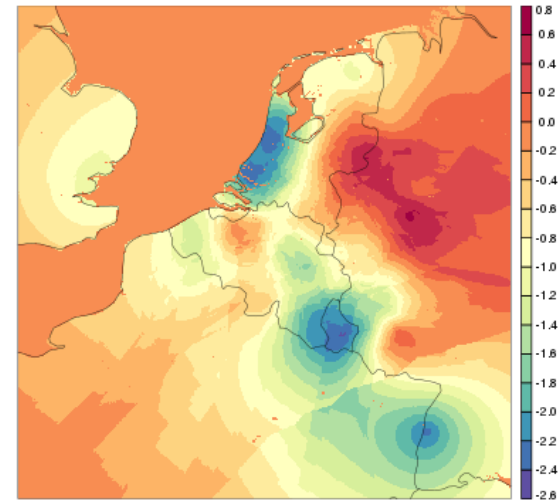
- Scores for past summer are quite good
- Clearly a problem with the 00h score. Presumably an effect of surface DA with basic “downscaling” for 3D fields.



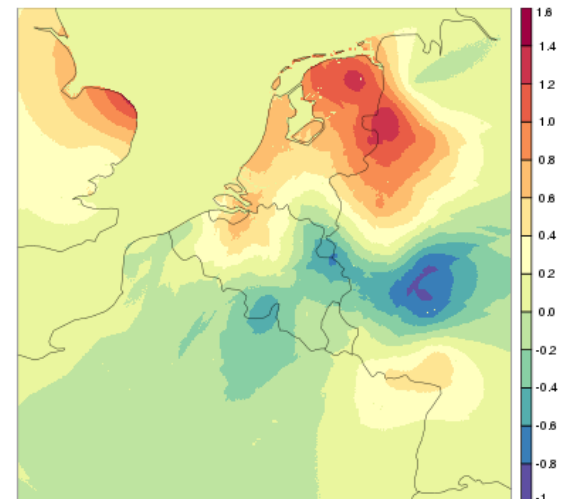
Some problems

- +00h : large bias in T2m (inconsistency surface vs atmosphere? Some bug in the data flow?)
- Some strange behaviour in the TG analysis increments.
- These strange gradients can also be seen in the obs-interpolation from CANARI.

X001TG1 (ana - fg)
2019051912



X001TG1 (ana - fg)
2019080512



Observation processing

- Currently, observations are processed with house-made python scripts (SYNOP-BUFR from GTS: basic filtering of messages and preparation of final BUFR file for DA)
- SAPP is installed but not yet configured properly for local use.
- OBSMON also not yet in use.

Future plans

- Switch from home-made python scripts to SAPP
- Add basic 3d-Var (AMDAR, RADAR, GPS...)
- Also start a DA cycle for the 4km Alaro run (SURFEX or ISBA?)
- OBSMon for monitoring: compiled but currently not yet in use.
- Move DA cycle to an “official” e-suite as a first step towards operational use (will require further work on the ecFlow scripts)