**Operational ALADIN System in Croatian Meteorological and Hydrological Service**

The operational model version used is AL38T1 with ALARO0 physics for 8, 4 and 2 km resolution forecasts. Operational forecasts run for:

- 8 km horizontal resolution, on 37 levels in the vertical, 360 seconds timestep, 4 times per day, initialized using 3D variational assimilation and surface OI, 3 h cycling, run to 72 hours, using lagged LBCs from IFS (run starting from 00 UTC analysis is using LBCs from 18 UTC run of the previous day).
- 4 km horizontal resolution, on 73 levels in the vertical, timestep is 180 sec, hydrostatic, only from 00 UTC up to 72 hours, initialized using surface OI and 3D variational assimilation, 3h cycling, using lagged LBCs from IFS, uses SST from OSTIA.
- 2 km dynamical adaptation of wind field run on 15 levels, 8 km resolution forecast is interpolated to 2 km and the same file is ised as initial and forecast LBC, the model is run hydrostatically using only turbulent parametrisation for 30 minutes with 60 seconds time-step, hourly, 4 times per day up to 72 hours.
- 2 km non-hydrostatic run on 37 levels, initial conditions form 8 km resolution 6 hour forecast, 60 seconds timestep, using AL36T1 with available ALARO0 developments, run from 06 UTC up to 24 hours, SST from OSTIA and ROMS.

Hardware

- SGI UV 2000 (shared memory system); 38 Intel Xeon E5 6 core 2,9 GHz 15MB cache CPUs with total 228 cores (192 multi, 24 mono, 6 system, 6 interactive); 1TB RAM for multi nodes 2TB RAM for system and mono nodes.
- On 29 June 2016 the complete computer was disassembled and moved into the basement and assembled again. Two days later two nodes gave up. Consequently the computer stopped responding until the two nodes were identified and removed. The operations continued on lower number of nodes. The two nodes were replaced by the end of August.
- upgrade of archive computer (Quantum Scalar i500) performed in summer 2016 to 2 disks of 30 TB online archive, currently uses 80 LTO-6 tapes (100Tb), to be upgraded in 2017.

Research and development activities:

Data assimilation (Antonio Stanešić, Tomislav Kovačić):

- usage of logical switch LDIRCLSMOD=.T./.F. was tested
- tests showed that 2m temperature is different in case when it is diagnosed from model fields (LDIRCLSMOD=.T.) compared to case when it is read directly from FA file (LDIRCLSMOD=.F.) => different analysis increment
- LDIRCLSMOD was set to .T. in CANARI and SCREENING

- new MESCAN background error correlation function for T2m and RH2m dependent on difference in height and land-sea differences between two locations were tested
- test of new clim files (with all fields computed from high resolution database).

Physics (Martina Tudor, Stjepan Ivatek-Šahdan, Antonio Stanešić):

- Mario Hrastinski analyzed mixing lengths in TOUCANS.
- ALARO1 (backphased version to CY38T1) was implemented and tested.
- Alternative roughness length was computed from high-resolution database and tested on both ALARO0 and ALARO1. The resulting wind field forecast depends far more on the roughness length than on the physics package used.
- Research on the quality of SST and its impact on the model forecast revealed that SST received in the LBC files is substantially warmer than OSTIA and both are too warm for northern Adriatic, especially Kvarner Bay and Western Adriatic Current. As a result the SST in the initial file is modified by using SST from OSTIA and ROMS ocean model.

Dynamics (Stjepan Ivatek-Šahdan, Antonio Stanešić, Martina Tudor):

- tested NH version of operational forecast in 4km resolution and found no systematic improvement so the implementation of this option is postponed due to computational cost.
- Setup of 1km resolution dynamical adaptation of wind field: it is currently running in parallel suite to replace the third bullet in the operational set-up, stable but with questionable results, until the documentation from Petra arrived to the rescue.

Plans:

- run 4 km forecast 4 times a day,
- schedule it before the 8 km resolution run,
- see if the 8 km resolution run can be switched off (depends on users),
- use new climate fields in all configurations + SST from OSTIA+ROMS,
- test ALARO1 in all operational and parallel configurations,
- finalize set-up of 1km dynamical adaptation of wind,
- use CY40T1 once bf6 is available,
- research coupling of the ALADIN System to ROMS and WWM,
- dynamics set-up for meteotsunami forecast,
- have a copy of operational suite on cca.