



ALADIN in Poland

Małgorzata Szczęch-Gajewska, Bogdan Bochenek, Marcin Kolonko, Marek Jerczyński, Jadwiga Wojciechowska
Institute of Meteorology and Water Management, Poland

OPERATIONAL

ALARO-1 (CY40T1) Operational Domain:

E040 domain: 4.0 km horizontal resolution, 789x789 grid points, 60 vertical model levels on a Lambert projection with 3h coupling frequency and 3h output, coupling zone with 16 points; Runs 4 times per day (00,06,12 and 18) with 66 hours forecast range; LBC from ARPEGE with 15.7km horizontal resolution;

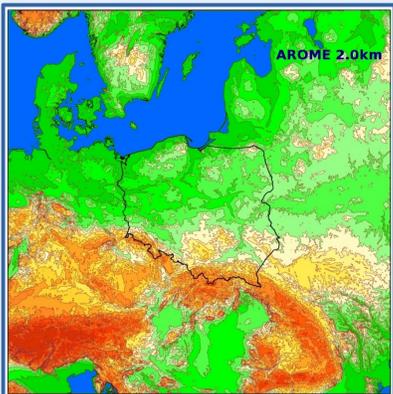
Operational machine characteristics

Cluster of HP BL460c_GEN8 servers connected with Infiniband network, OS Scientific Linux 6, Intel Xeon E5-2690 processors – with maximum 1552 cores (97 nodes with 16 cores each), each core RAM 128 GB, disc array – 64 TB.



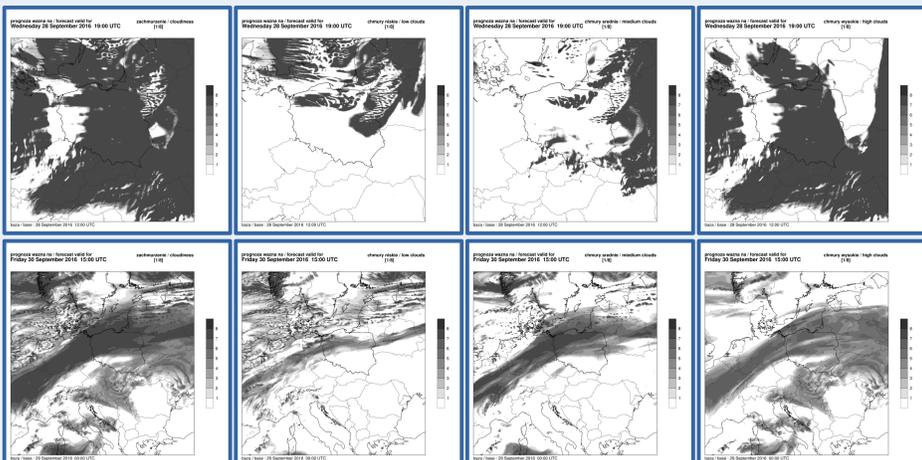
AROME Operational Domain:

P020 domain: 2.0km horizontal resolution, 799x799 grid points, 60 vertical model levels on a Lambert projection with 3h coupling frequency and 1 hour output 2 runs per day (00 and 12UTC) with 30 hours forecast range; LBC from ALARO-1; GRIB format, every 1h – for LEADS system;



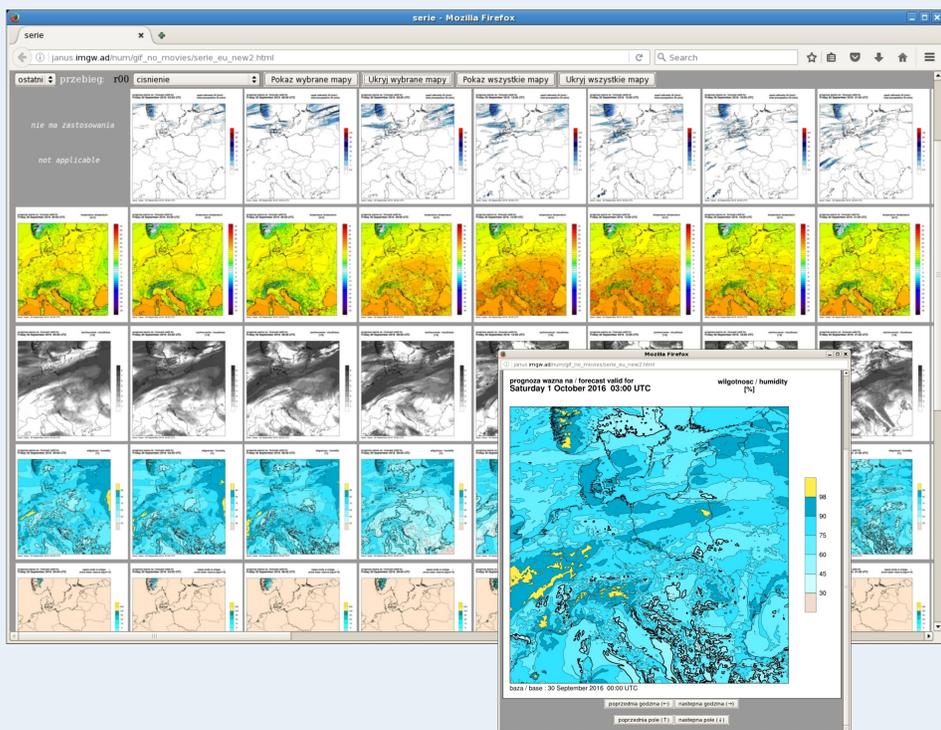
Cloud cover forecast

Below there are some examples of AROME and ALARO-1 CY40T1 cloudiness forecasts. We decided to not use smoothing on that fields, as we lose e.g. shallow convection features on maps especially for ALARO-1 ones.



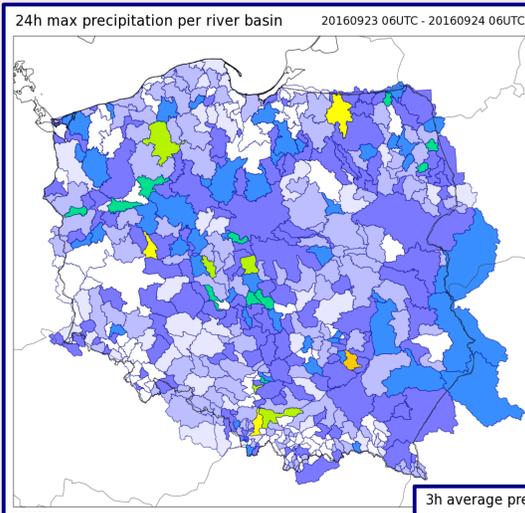
Web site news

As we try to follow ask from Synoptic Division side, the latest change in our web side (not yet operationally) is the new way of presentation and navigation (with arrow keys) of maps. Below is the example of that.

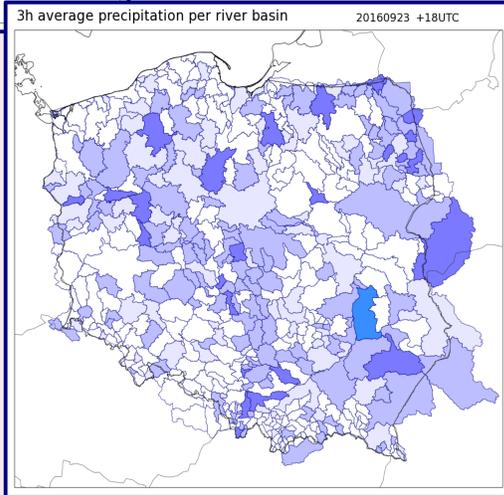
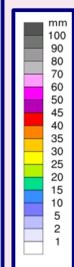


Precipitation forecast for river basins

Already for more than one year we prepare for Hydrological Forecast Department precipitation data per river basin. Currently in use are 489 river basins, presented on maps below. Data are prepared two times per day from both models – AROME and ALARO-1. There are files with maximum precipitation value in 24 hydrological hours (06-06UTC) and average precipitation for cumulations: 1, 3, 6, 12, 24 hours for AROME and 3, 6, 12, 24 hours for ALARO-1. We do not prepare maps for them, just send ascii data. Here on the top map are presented maximum values of 24 hours cumulated total precipitation per river basin from 23 Oct 2016. The other map presents average total precipitation cumulated in last 3 hours (15-18UTC) from 23 Oct 2016.



As one can see, some of the river basins are very small, especially for ALARO-1 4km happened that there are few river basins with no model grid point in it. Hydrologists asked to not interpolate the data for them, but to assign precipitation value from neighbouring river basin.

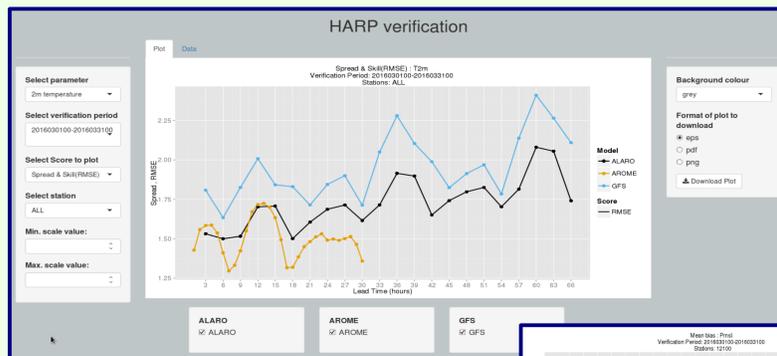


Additionally there are works on use of CROCUS model forecasts of snow cover by hydrologists, to estimate amount of water in separate river basins together with data from AROME and ALARO-1.

HARP Verification

HARP – Hirlam-Aladin R-Package is a common framework for verification. It already runs operationally for Aladin-Poland. As it works on-line one can choose parameters as: 2m temperature, msl pressure, 10m wind speed and direction, 12h precipitation accumulation, total cloud cover and 2m relative humidity. User can also determine a period for verification, kind of scores (Spread & Skill, Mean bias, Median bias or Mad) to plot. This point to point verification can be done as for single station as for all stations together, and is used for deterministic forecast. There are three meteorological models we can verify: ALARO, AROME and GFS. The observational data we use for this verification are synoptic stations data. The next step most probably will be adding automatic stations data for this verification.

Below are examples of the interactive verification menu and the results of verification for single station and all stations together, for last 30 days of forecast and all daily runs together.



Above is the Spread & Skill (RMSE) score for 2m temperature, with all stations in calculation.

On the right is the Mean Bias of MSL pressure for station Kolobrzeg for last 30 days.

