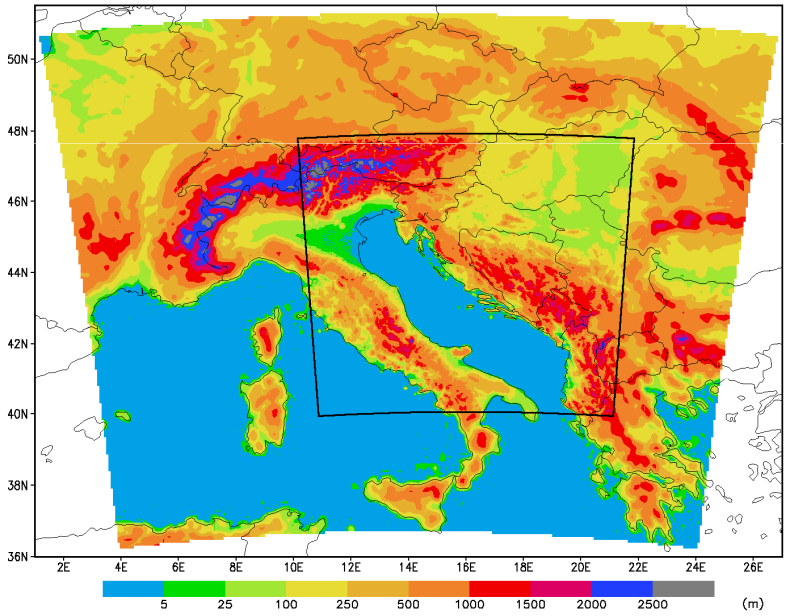
# NWP in Croatian Meteorological and Hydrological Service

## Current status of the operational suite

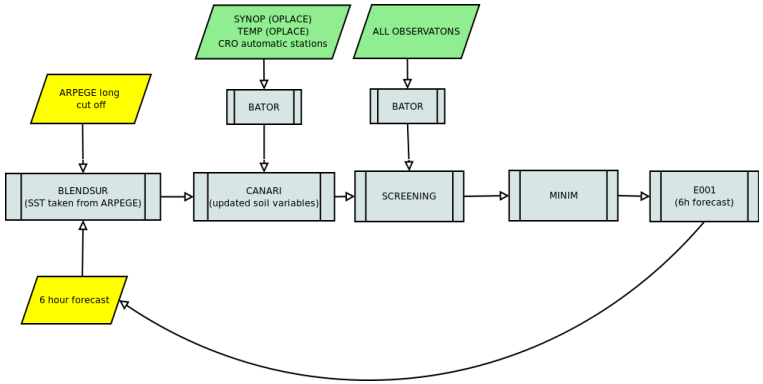
Operational suite is untouched from February 2008.
**8 km** horizontal resolution - main integration domain:
- 37 levels in the vertical, 229x205 (240x216) grid points,
- Corners: SW (36.18,3.90), NE (50.68,26.90),
- AL32T3 – ALARO0-3MT version with old radiation scheme Geleyn-Hollingworth,
- 72 hrs forecast range with 1 or 3 hrs time resolution depending on product type,
- Digital Filter Initialisation

**2 km** horizontal resolution - high resolution dynamical adaptation domain:
- 10 m mean wind and wind gust forecast,
- 15 levels in the vertical, 439x439 (450x450) grid points.

SGI Altix LSB-3700 BX2 Server with 48 Intel Itanium2 1.6GHz/6MB
96 GB standard system memory
2x146 GB/10Krpm SCSI disk drive, 1.6 Tb scratch disk




## Parallel suite

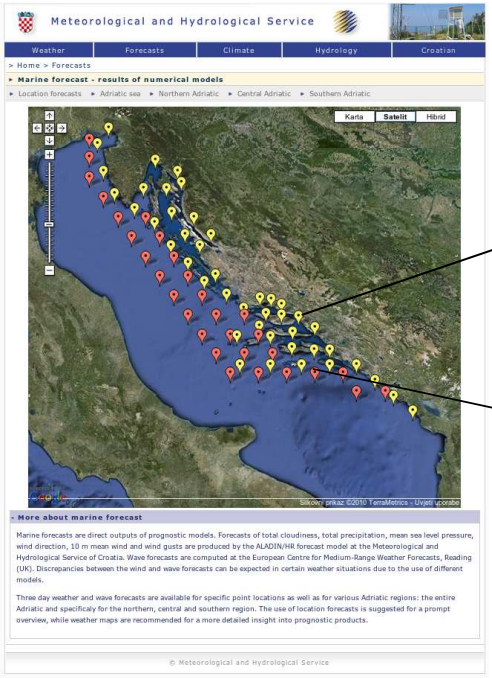



**Cycling:** 4 times per day
**Production:** twice per day at 00 and 12 UTC, 72 hours
**Data:** SYNOP, TEMP, SEVIRI (ch. 2 and 3), AIREP, GEOWIND (MSG 2), NOAA (AMSU-A, AMSU-B)
**Data source:** OPLACE
**B matrix:** NMC method, 100 days
**Verification:** bias and root mean square error
**LBC:** ARPEGE long cut off analysis and forecast

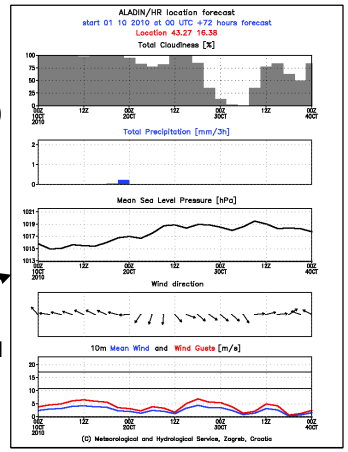
**Results of verification:** mostly positive impact

## Developement and application activities

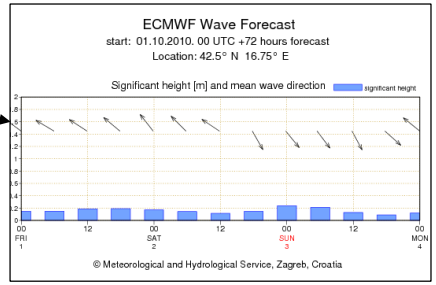
New products: Marine forecast ( http://prognoza.hr/nauticari_e.php?id=nauticari )




METEOGRAM




WAVES



## Tests of new versions

ALADIN 35T1 was ported and tested. Unfortunately verification scores for 6 month period (06.-11.2009.) ALARO+3MT with old radiation (Geleyn-Hollingworth) are not satisfied for changing the operational suite.

ALADIN 36T1 (including bug fixes up to 08) is ported and now new test will be done with ALARO+3MT most likely with new radiation scheme.

Tests with 3DVar+CANARI with version 35T1 are promising; there is still some small problem with T2m and RH2m forecast in July 2010. It is not clear if it is a problem with assimilation or more likely with soil parameterisation.

## Main computer, storage system and lines

**Computer**

- SGI Altix LSB-3700 BX2 Server with 48 Intel Itanium2 1.6GHz/6Mb,
- 96 Gb standard system memory,
- 2x146 GB/10Krpm SCSI disk drive,
- 1.6 Tb disk array,
- OS SUSE Linux Enterprise Server 9 for IPF with SGI Package,
- Intel Fortran compiler version 9.0.031 & C++ compiler version 9.1.053,
- Queuing system (PBS Pro).

**Storage system**

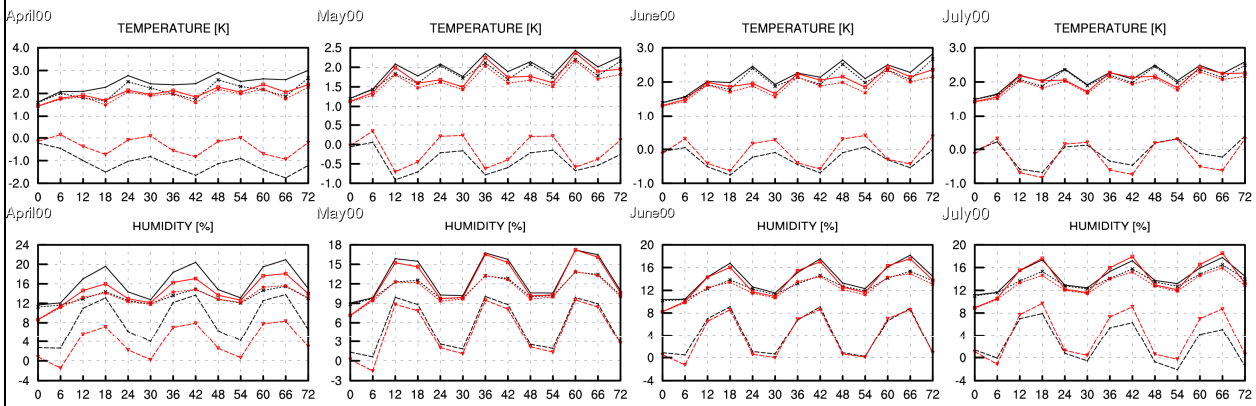
- 32Tb disk array - data available immediately for scp or ftp,
- 30TB online on tapes available in reasonable time (usually less than minute),
- and there is no limits for offline storage capacity.

**LBC files and lines**

- global model ARPEGE, coupling frequency 3 hrs,
- Internet and RMDCN through ecgate as backup from July 2006

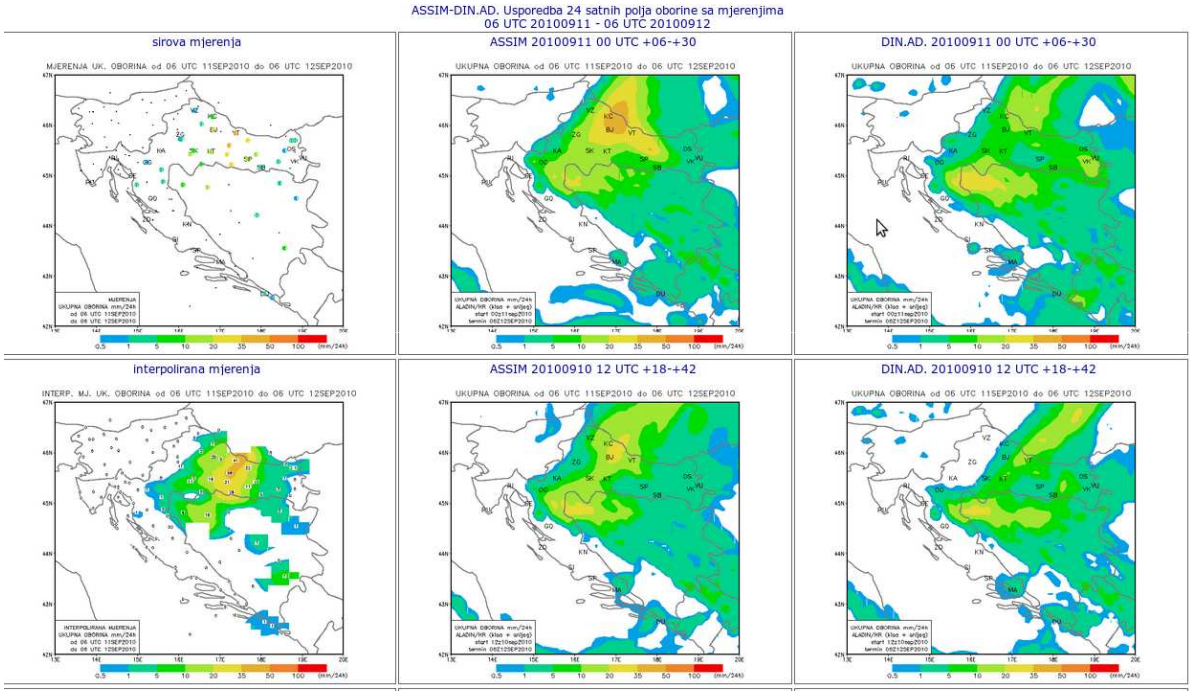
## Testing produciton from assimilation cycle

✓ Mostly positive impact on 2m parameters (decreased in summer months)




*Evolution of scores for 2m temperature and relative humidity for months April to July and for 00UTC run. Red is production from assimilation cycle, black operational production. Long dashed lines represent BIAS and full lines RMSE. On apscisa is lead time.*

✓ Better precipitation pattern with 3DVAR and CANARI




*24hour accumulated precipitation. First column: rain gauge measurements (points and interpolated values). Second column: production from assimilation cycle. Third column: operational forecast.*