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Data Manager Activity

Progress Report

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Progress summary

The core of RC LACE Data Manager (DM) activity has been the maintenance and development of the common Observation Pre-processing system for LACE (OPLACE). To minimize data provision problems OPLACE system reliability and monitoring has been improved. Furthermore, time availability of observations was enhanced to support 1H RUC and/or nowcasting applications. Regarding non-LACE countries access to OPLACE, the last year's request from Turkey has not been finalized and a new request was received from Tunisia in May 2015. There are no technical problems to ensure the access to non-LACE countries. A clarification of EUMETSAT data policy for non-EUMETSAT countries and a decision from RC LACE Council are awaited.

The exchange of surface synoptic data within RC LACE is working well and the regular overview was prepared. A new data type was added in April 2015 - Mode-S Meteorological Routine Air Report (MRAR) aircraft temperature and wind observations were kindly provided by Slovenian colleagues. A proposal for further extension by Mode-S EHS data from KNMI was prepared and decision from RC LACE Council is awaited.

The DM followed up advances of the Continuous Observation Processing Environment (COPE) project and proposed areas of possible collaboration between ECMWF, Météo France, ALADIN, RC LACE and HIRLAM.

Scientific and technical main activities and achievements, major events

Action: OPLACE

Description and objectives: Meteorological observations are a key aspect of data assimilation and verification. The OPLACE was built with aim of providing available observations in an appropriate format for data assimilation to RC LACE Members. Regular maintenance is required in order to provide stable and reliable bases for the operational purposes and further extension by the new data is essential for a general progress in area of data assimilation.

Efforts: 3.5 person months

Status: Several issues in OPLACE data provision pointed deficiencies of the system. OPLACE reliability has been improved and a system monitoring was extended to help the trouble-shooting. Analysis showed that some problems were related to IT infrastructure, but we hope to find solutions with help of HMS IT department.

The OPLACE system maintenance this year comprised few bug-fixies for SYNOP, AMDAR and wind profiler data handling. Satellite data pre-processing software and data volumes were upgraded to ensure a reliable data acquisition.

The TAC to BUFR migration for sounding has been tackled. The OPLACE uses operationally only TEMP TAC messages, because there are still issues with availability and quality of TEMP BUFR data. There is only very small difference in a number of TEMP TAC (due to changes in TEMP network itself), so the operational use of TAC reports is not affected by TAC to BUFR migration yet. Inconsistencies of SYNOP metadata were pointed, but a clean solution is not yet identified.

No new observations were added, but a preparatory work has started to support further extension of radiance data assimilation of new satellite sensors such as Cross-track Infrared Sounder (CrIS) with three IR bands (9.13 - 15.40μm, 5.71 - 8.26μm, 3.92 - 4.64μm) and 1305 channels in initial operation mode, cross-track scanning Advanced Technology Microwave Sounder (ATMS) with 22 channels and Special Sensor Microwave – Imager/Sounder (SSMIS) with 24 channels both covering the 54 and 183 GHz bands, (WMO, 2015).

To improve availability of observation a time schedule of OPLACE was extended. A good compromise between number of available data and short cut-off time was found for an additional update at +15min. The new schedule was implemented in August 2015 to give assistance to 1H RUC and/or nowcasting applications.

The non-LACE countries showed an interest to access OPLACE. The request for OPLACE access from Turkey has not been finalized and a new request was received from Tunisia in May 2015. We are technically ready to open access to non-LACE countries. The LACE Members use all (essential and additional) surface synoptic data from OPLACE-national, so there are no data with data policy restrictions on OPLACE for EUMETSAT members. A clarification of EUMETSAT data policy for non-EUMETSAT countries is being investigated. Final decision, including clarification of conditions, is awaited from RC LACE Council.

Action: Data exchange

Description and objectives: The substantial number of local observations is available in LACE countries. The main objective is to ensure an exchange of data, which have a potential for data assimilation and verification.

Efforts: 1.25 person month

Status: The exchange of the surface synoptic data within RC LACE is working well and there are already Members, which use the data operationally. The data (mostly not available in GTS) are provided by the Members to OPLACE-national, only some Members (Croatia, Slovenia and Slovakia) provide also essential and additional data available in GTS. Coverage of the exchanged data is illustrated on Figure 1.

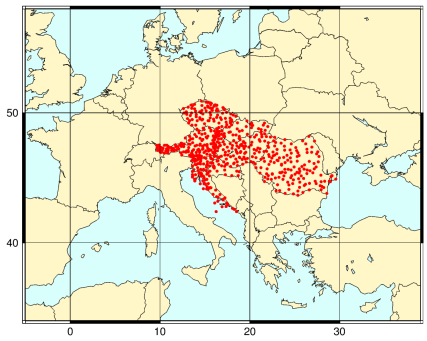


Fig 1: Geographical distribution of exchanged national synoptic data

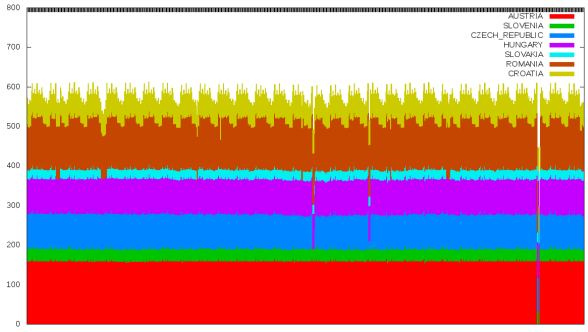


Fig 2: Hourly number of stations exchanged during August 2015

Only few drop-outs in the data provision were experienced in 2015, thus the system is stable and ready for use. Hourly availability statistics for August 2015 are shown on Fig 2. There were only minimal updates in the number of provided stations. Regular review of the exchanged data was prepared for August 2015 and detailed statistics are available.

Thanks to long term efforts of Benedikt Strajnar (*Strajnar 2012, Strajnar et al 2014*) the first high-resolution Mode-S Meteorological Routine Air Report (MRAR) aircraft temperature and wind observations from Slovenia are available on OPLACE-national. The Mode-S MRAR data have been provided since 25th April 2015 and their coverage is illustrated on Fig 3. All Members are kindly encouraged to investigate availability of Mode-S data in their countries.

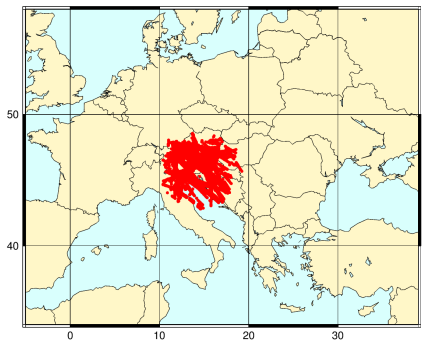


Fig 3: Geographical distribution of Mode-S MRAR data from Slovenia

Regarding a non-LACE data availability the KNMI was contacted to get an access to Mode-S EHS derived meteorological information available from their data hub http://mode-s.knmi.nl/data/. Mode-S EHS data are available for NMHS after signing a Non Disclosure Agreement (NDA). The RC LACE Steering Committee supported the extension of the data exchange by Mode-S EHS data from KNMI. An approval of RC LACE Council is awaited.

Action: ODB support

Description and objectives: The main objective is to provide observation database (ODB) related support and to help with configuration and usage of ODB and related applications at RC LACE members' site. The DM also acts as a contact point for the Continuous Observation Processing Environment (COPE) project initiated by ECMWF, which is expected to provide a new frame-work for a quasi-

continuous, more scalable and timely observation processing including conversion to ODB.

Efforts: 0.75 person months

Status: There has been very limited progress on COPE since the last video-conference meeting in autumn 2014. A delay is due to lack of dedicated project resources. Stage 2 of the COPE was formally closed in spring 2015. The main reason for finishing stage 2 and restarting stage 3 was the inclusion of COPE in ECMWF's Scalability Programme. The Programme management requires a significantly higher level of planning and coordination to ensure no negative cross influences between the different projects. All deliverables and objectives that could not be achieved in stage 2 have either been transferred into the stage 3 plans, have become obsolete, or will be addressed outside of the project. The final report is available on https://software.ecmwf.int/wiki/display/COPE. The next stage 3 of COPE (COPE 3) is addressing more advanced aspects such as the renationalisation of pre-obs functionalities requiring an evaluation of departures (e.g. smart thinning, FG check, advanced monitoring).

A collaboration with external partners (Meteo France, HIRLAM, ALADIN/LACE) is a key component of COPE. The DM proposes the WP3 “Pre-assimilation quality control” as main area of LACE possible contribution. A coordination of COPE-3 working packages started only in autumn, but no concrete contribution has been realized in 2015. Moreover, there still remains the issue that only limited resources were identified within RC LACE (10% of the DM working-time) and in such a situation it is hard to propose any real contribution.

Action: HARMONIE

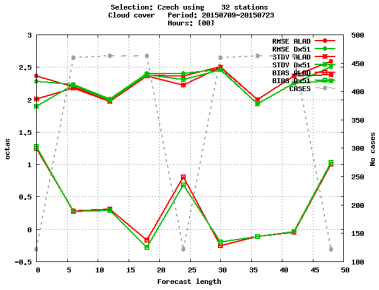
Description and objectives: Data assimilation suite is rather complex and demanding for an installation and its maintenance. The HARMONIE scripting system was suggested as a common platform for collaboration with HIRLAM partners and a framework to support RC LACE research. Recent efforts focus on rather standalone component - HARMONIE Verification package.

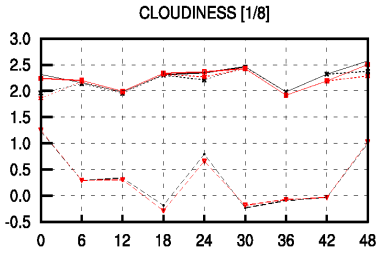
Efforts: 0.5 person months

Status: Main statistics of the HARMONIE Verification package and VERAL were inter-compared. Although there are differences between both packages (in quality control algorithms, extraction of model equivalents and statistics computations) it is possible to adjust the packages to provide qualitatively same verification results, see Figure 4 for an illustration.

HARMONIE Verification package offers a wide variety of the verification statistics, but a good understanding of its methodology it essential to avoid misinterpretation of the results.

In a view of the fact that the obsoul format is becoming obsolete and BUFR will be used in the future, the plan to develop an interface for OPLACE observation in obsoul format was abandoned.





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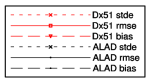

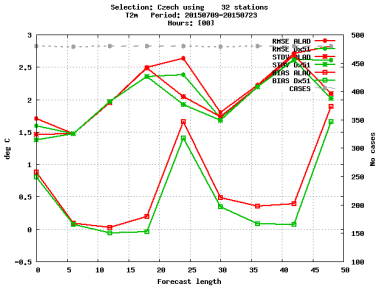

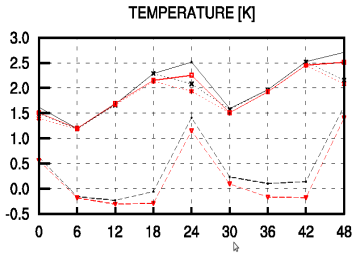

Fig 4: Evolution of scores with forecast range (left column HARMONIE Verification scores and the middle column VERAL scores of cloudiness and 2m temparature.

List of actions, deliverables including status

Subject: ODB support

Deliverables: proposal for cooperation on the COPE project

Status: DONE

Subject: OPLACE

Deliverables: OPLACE maintenance and development;

Status: ONGOING

Subject: Data exchange

Deliverables: data overview and proposal for an extension by MODE-S data;

Status: DONE

Subject: HARMONIE

Deliverables: cross-comparison with respect to the VERAL package

Status: DONE

Documents and publications

Activities of management, coordination and communication

1) 24th LACE Steering Committee meeting, Romania – attendance canceled due to illness.
2) Joint 25th ALADIN Workshop & HIRLAM All Staff Meeting 2015, 13-17 April 2015, Helsingor, Denmark – attendance cancelled due to illness.
3) 37th EWGLAM and 22nd SRNWP Meeting, 5-8 October 2015, Belgrade, Serbia.

Summary of resources/means

Subject	Resource		LACE	
	planned	realized	planned	realized
ODB support	**1 PM**	**0.75 PM**		
OPLACE	**3 PM**	**3.5 PM**	**0.5 PM**	**0.5 PM**
Data exchange	**1 PM**	**1.25 PM**		
HARMONIE	**1 PM**	**0.5 PM**		
Total:	**6 PM**	**6 PM**	**0.5 PM**	**0.5 PM**

Problems and opportunities

The non-LACE countries showed an interest to access OPLACE. The request from last year for OPLACE access from Turkey has not been finalized and a new request was received from Tunisia in May 2015. A decision, including clarification of conditions, is awaited from RC LACE Council.

The RC LACE Steering Committee and the Management Group are kindly invited to consider a contribution to the COPE project and keep in mind that corresponding human resources have to be allocated.