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). Several updates were implemented in OPLACE operational environment. The satellite data processing of ATOVS was improved and the system was extended by the new EUMETSAT prime spacecraft Meteosat-11 and new coastal wind observations over ocean from Metop-A/B. A major upgrade of the preprocessing of SEVIRI radiances is under evaluation. In order to improve the OPLACE system operations and to easy it's supervision an overall redesign of the OPLACE script system was started. The migration from Traditional Alphanumeric Codes to BUFR (TAC2BUFR) progressed very slowly in the first 8 months of 2018.

The exchange of surface synoptic data within RC LACE performs well and the extension by the national data from Poland was implemented in March 2018. The regular overview of exchanged data was prepared. The provision of the high resolution aircraft observation from Slovenia and Netherlands works well and further extensions are in preparations.

There was no coordination on COPE. An ODB related support and help with configuration and usage of data assimilation (DA) applications was provided to the Members. The DM also contributed to the ALADIN data assimilation starters kit (DAsKIT) coordination.

Scientific and technical main activities and achievements, major events

Action: OPLACE

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

Efforts: 2.0 person months

Status: Several updates were implemented in the OPLACE operational environment. The ATOVS data handling for Metop-A was corrected in February. In March the new EUMETSAT prime spacecraft Meteosat-11 became operational. To ensure a smooth transition from Meteosat-10 to Meteosat-11 a parallel data provision was enabled and necessary guidelines were provided on RC LACE Forum. New coastal wind observation over the oceans from Advanced SCATerometer (ASCAT) were implemented on 26 March 2018. The TEMP data processing was

updated to avoid BATOR crashes due to too many levels.

The OPLACE system was originally designed in 2008 and it comprised a limited number of observation processing tasks which run sequentially from the KSH script. Over the years more and more data (of various level of processing complexity) entered the system. The performance of the system (mainly sequential execution) starts to be an issue and also maintenance could be easier when a flexible scheduler is employed. During the maintenance stay a redesign of the OPLACE scripts was initiated to improve the system operations and to easy it's monitoring and supervision. The ecFlow job scheduler will be used in order to allow a parallel execution in a controlled state-of-the-art working environment.

The migration from Traditional Alphanumeric Codes to BUFR (TAC2BUFR) progressed very slowly. The pre-processing of BUFR SHIP and BUOY data was tested and their BATOR handling was evaluated in collaboration with Maria Monteiro (within a flat-rate stay at CHMI). Although the first prototype of BUFR (SYNOP&AMDAR) data processing is being tested in the OPLACE parallel suite, it requires further evaluation and developments. The BUFR data processing is rather time consuming and it is therefore desirable to implement it only after the OPLACE script redesign to avoid delays in the OPLACE data provision.

Furthermore, the preprocessing of SEVIRI data needs an upgrade. It has not been updated since 2006 and the old EMOS library is employed for the conversion to GRIB format. The SEVIRI preprocessing was based on Fortran programs obtained from CMS (Meteo-France / Centre de Meteorologie Spatiale, Lanion, France). The schema of the preprocessing is illustrated on Figure 1 and the main steps are as follows:

1) SEVIRI data local calibration to brightness temperatures and conversion to GRIB format;

2) NWC SAF products (cloud type, cloud top pressure) available in raster (HDF5 format) conversion at first to binary and then to GRIB;

3) necessary constant fields (lat, lon, azimuth and zenith angles) obtained from SAF NWC in binary format (.dta) are converted to GRIB.

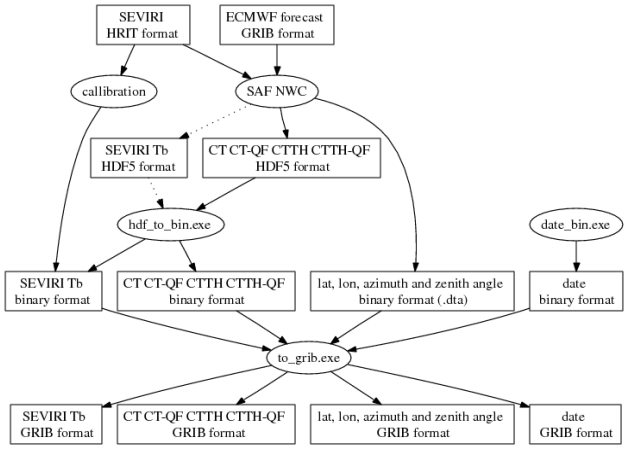

Fig 1: The scheme of the SEVIRI data pre-processing used in OPLACE.

Meteo France now uses the SEVIRI product in netCDF format and CMS kindly provided their new preprocessing (using python and java). The new version is being tested and apart of easier porting it should provide more flexibility for testing new versions of SAF NWC.

Action: Data exchange

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

Efforts: 0.50 person month

Status: The exchange of the surface synoptic data within RC LACE is working well and there are Members, which use the data already operationally. The data (mostly not available in GTS) are provided by the Members, only Slovakia provides also essential and additional data available in the GTS.

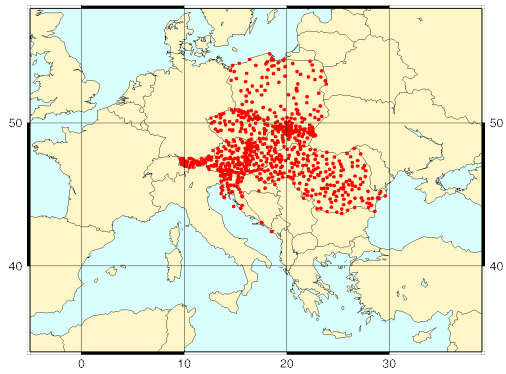

Fig 2: Geographical distribution of exchanged national synoptic data

Number of national stations		Update WRT 2017
Austria	169	-0/+0
Croatia	21	-0/+0
Czech Republic	60	-30/+0
Hungary	93	-2/+3
Romania	134	-0/+0
Slovakia	47	-0/+1
Slovenia	17	-0/+0
Poland	186	-0/+186
Total:	**727**	

Coverage of the exchanged data is illustrated on Figure 2. The exchange is stable and reliable for an operational use. There were mostly minor updates of the stations networks except for the Czech Republic where a temporary decrease is caused by technical issues of a local database. This issue was fixed 11 September 2018. The overall number of exchanged data increased significantly thanks to the extension by the national data from Poland. The regular review of the exchanged data was prepared for August 2018 and detailed statistics are available in a dedicated appendix.

The provision of the high resolution aircraft observations from modern air surveillance systems Mode-S MRAR (Meteorological Routine Air Report) from Slovenia and Mode-S EHS (Enhanced Surveillance) from KNMI has worked well in 2018.

An extension of Mode-S MRAR exchange by the data from the Czech Republic is ongoing. Furthermore, RC LACE initiated negotiations between the national air traffic control and KNMI about processing Mode-S EHS data from Slovenia and the Czech Republic to further extend the data coverage to south and east. It is still in an early stage and both technical means and data policy have to be elaborated.

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: 0.5 person months

Status: An ODB related support was provided upon request. The preparation of the sample ODB script for cy43t2 was not yet started, but it is planned for this autumn. There was no coordination on COPE in 2018.

Coordinated efforts are being organized by the ALADIN consortium to enhance progress in implementation of data assimilation, so-called data assimilation starters kit (DAsKIT), for ALADIN Members who do not run DA operationally, e.g. Algeria, Belgium, Bulgaria, Morocco, Poland, Portugal, Romania, Turkey and Tunisia. Almost all participating countries have activities on DA and a considerable manpower (~10 FTE) is being gathered to contribute to the DA activities within ALADIN. It is of interest of RC LACE to support the DasKIT participants to gain in the future the permanently missing manpower for research and development in area of data assimilation. The DM contributed to the coordination of the common RC LACE DA and DasKIT meeting which will be held in Bucharest in September 2018.

List of actions, deliverables including status

Subject: ODB support

Deliverables: ODB support; simple DA scripts for cy43t2

Status: ONGOING

Subject: OPLACE

Deliverables: OPLACE maintenance and development;

Status: ONGOING

Subject: Data exchange

Deliverables: the national exchange was extended by data from Poland and the regular overview of the exchanged data was prepared;

Status: ONGOING

Activities of management, coordination and communication

1) OPLACE maintenance stay, 15-25 January, Budapest, Hungary.

2) 30th LACE Steering Committee meeting, 15-16 March, Plitvice, Slovenia.

3) Joint 28th ALADIN Workshop & HIRLAM All Stuff Meeting 2018, 16-20 April, Toulouse, France.

Summary of resources

Subject	Resource		LACE	
	planned	realized	planned	realized
ODB support	**1 PM**	**0.5 PM**		
OPLACE	**4 PM**	**2.0 PM**	**1.0 PM**	**0.5 PM**
Data exchange	**1 PM**	**0.5 PM**		
Total:	**6 PM**	**3 PM**	**1.0 PM**	**0.5 PM**

Problems and opportunities

Maintenance and mainly development of the observation monitoring system to the new data types is pending due to lack of time. Also OPLACE developments, such as the redesign and TAC2BUFR migration, are progressing slowly. There starts to appear related issues, e.g. with availability of surface observations (the extreme temperatures, precipitation) for verification purposes.