

# JOINT WMO TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA PROCESSING AND FORECASTING SYSTEM AND NUMERICAL WEATHER PREDICTION RESEARCH ACTIVITIES FOR 2013

## LATVIAN ENVIRONMENT, GEOLOGY AND METEOROLOGY CENTRE

### 1. Summary of highlights

The installation of the new forecaster workstation "SmartMet" (Finnish Meteorological Institute) has been finished on 2013.

### 2. Equipment in use

Workstation "METVIEW" - for data processing and visualization of some ECMWF model results.  
Workstation "DIANA" is not in use anymore.

**TRANSMET** - Messages Switch System for GTS. 2 servers HP ML 370 G4, processor XEON 3.2GHz and supervision PC.

**IMS** - Integrate Meteorological System for national observations. 2 servers Acer Altos G520, processor XEON 2.8 GHz.

**Weather Radar System** - Rainbow 5.0 Product Generation Server. 2 servers HP XW 8200, processor XEON 3.4GHz.

**DWDSAT**- Satellite Receiving System for DWD data and products. Processor Pentium 4 2.6GHz.

**RETIM 2000** - Satellite Receiving System for the raw data and aviation products with the WEDIS workstation for visualization. Processor Pentium D 2.8GHz.

**MEOS MSG - XRUS** - Satellite Receiving System for MSG data and products. 2 servers HP P4, processor 3.2GHz.

**Alice-SC™** - station for reception and processing of the imagery transmitted from NOAA satellites in HRPT. Processor P4 3.2GHz.

**SmartMet** - Software tool for visualizing and editing meteorological data. Works on IBM Blade servers in Virtual machine environment (VMWare ) on RedHat 6 OS.

### 3. Data and Products from GTS in use

- SYNOP-500 (please modify according to your situation)
- .....
- .....

#### The daily statistic of raw information:

<b>SYNOP:</b>	00/06/12/18	UTC	2200
	03/09/15/21	UTC	1100

#### OPMET:

<b>TEMP:</b>	00/12	UTC	75
	06/18	UTC	30

#### The daily statistic of products:

<b>GRIB (EGRR):</b>	00	UTC	750
	12	UTC	500

## 4. Forecasting system

### 4.1 System run schedule and forecast ranges

LEGMC doesn't run the local models, only model results received from the other centres are used:

1) DWD GME model products (from up to 168h twice per day and up to 48h once per day) and LME model products (up to 72h ahead twice per day) in accordance to the Product-Catalogue DWDSAT.

2) Finnish HIRLAM model products (up to 54 h ahead four times per day).

3) ECMWF model products (up to 360 h ahead twice per day, twice per week monthly forecasts, once per month - 6 up to months) – deterministic and ensemble forecasts, also probabilities.

### 4.2 Medium range forecasting system (4-10 days)

#### 4.2.1 Data assimilation, objective analysis and initialization

##### 4.2.1.1 In operation

[information on Data assimilation, objective analysis and initialization]

##### 4.2.1.2 Research performed in this field

[Summary of research and development efforts in the area]

#### 4.2.2 Model

##### 4.2.2.1 In operation

[Model in operational use, (resolution, number of levels, time range, hydrostatic?, physics used)]

##### 4.2.2.2 Research performed in this field

[Summary of research and development efforts in the area]

#### 4.2.3 Operationally available Numerical Weather Prediction Products

[brief description of variables which are outputs from the model integration]

#### 4.2.4 Operational techniques for application of NWP products (*MOS, PPM, KF, Expert Systems, etc..*)

##### 4.2.4.1 In operation

[brief description of automated (formalized) procedures in use for interpretation of NWP output]

##### 4.2.4.2 Research performed in this field

[Summary of research and development efforts in the area]

#### 4.2.5 Ensemble Prediction System (EPS)

##### 4.2.5.1 In operation

[Number of runs, initial state perturbation method, perturbation of physics?] (*Describe also: time range, number of members and number of models used: their resolution, number of levels, main physics used, perturbation of physics, post-processing: calculation of indices, clustering*)

##### 4.2.5.2 Research performed in this field

[Summary of research and development efforts in the area]

##### 4.2.5.3 Operationally available EPS Products

[brief description of variables which are outputs from the EPS]

### **4.3 Short-range forecasting system (0-72 hrs)**

#### **4.3.1 Data assimilation, objective analysis and initialization**

##### 4.3.1.1 In operation

[information on Data assimilation (if any), objective analysis and initialization,] (*Indicate boundary conditions used*)

##### 4.3.1.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.3.2 Model**

##### 4.3.2.1 In operation

[Model in operational use, (domain, resolution, number levels, range, hydrostatic?, physics used)]

##### 4.3.2.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.3.3 Operationally available NWP products**

[brief description of variables which are outputs from the model integration]

#### **4.3.4 Operational techniques for application of NWP products**

##### 4.3.4.1 In operation

[brief description of automated (formalized) procedures in use for interpretation of NWP output] (*MOS, PPM, KF, Expert Systems, etc..*)

##### 4.3.4.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.3.5 Ensemble Prediction System**

##### 4.3.5.1 In operation

[Number of runs, initial state perturbation method, perturbation of physics?] (*Describe also: time range, number of members and number of models used: their domain, resolution, number of levels, main physics used, for post-processing: calculation of indices, clustering*)

##### 4.3.5.2 Research performed in this field

[Summary of research and development efforts in the area]

##### 4.3.5.3 Operationally available EPS Products

[brief description of variables which are outputs from the EPS]

### **4.4 Nowcasting and Very Short-range Forecasting Systems (0-6 hrs)**

#### **4.4.1 Nowcasting system**

##### 4.4.1.1 In operation

[information on processes in operational use, as appropriate related to 4.4]

##### 4.4.1.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.4.2 Models for Very Short-range Forecasting Systems**

##### 4.4.2.1 In operation

[information on models in operational use, as appropriate related to 4.4]

##### 4.4.2.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.5 Specialized numerical predictions**

Specialized forecasts (sea waves, sea temperature, sea ice (for the Central Baltic and Gulf of Riga), UV and forest fire index forecasts) are based mainly on the ECMWF and HIRLAM model results.

##### **4.5.1 Assimilation of specific data, analysis and initialization (where applicable)**

###### 4.5.1.1 In operation

[information on the major data processing steps, where applicable]

###### 4.5.1.2 Research performed in this field

[Summary of research and development efforts in the area]

##### **4.5.2 Specific Models (as appropriate related to 4.5)**

###### 4.5.2.1 In operation

[information on models in operational use, as appropriate related to 4.5]

###### 4.5.2.2 Research performed in this field

[Summary of research and development efforts in the area]

##### **4.5.3 Specific products operationally available**

[brief description of variables which are outputs from the model integration]

##### **4.5.4 Operational techniques for application of specialized numerical prediction products (*MOS, PPM, KF, Expert Systems, etc.*) (as appropriate related to 4.5)**

###### 4.5.4.1 In operation

"[brief description of automated (formalized) procedures in use for interpretation of specialized NP output]"

###### 4.5.4.2 Research performed in this field

[Summary of research and development efforts in the area]

##### **4.5.5 Probabilistic predictions (where applicable)**

###### 4.5.5.1 In operation

"[Number of runs, initial state perturbation method etc.]" (*Describe also: time range, number of members and number of models used: their resolution, main physics used etc.*)

###### 4.5.5.2 Research performed in this field

[Summary of research and development efforts in the area]

###### 4.5.5.3 Operationally available probabilistic prediction products

"[brief description of variables which are outputs from probabilistic prediction techniques]"

#### **4.6 Extended range forecasts (ERF) (10 days to 30 days)**

##### **4.6.1 Models**

###### 4.6.1.1 In operation

[information on Models and Ensemble System in operational use, as appropriate related to 4.6]

###### 4.6.1.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.6.2** Operationally available NWP model and EPS ERF **products**

[brief description of variables which are outputs from the model integration]

#### **4.7 Long range forecasts (LRF) (30 days up to two years)**

##### 4.7.1 In operation

[Describe: Models, Coupled? (1 tier, 2 tiers), Ensemble Systems, Methodology and Products]

##### 4.7.2 Research performed in this field

[Summary of research and development efforts in the area]

#### **4.7.2** Operationally available EPS LRF products

[brief description of variables which are outputs from the model integration]

### **5. Verification of prognostic products**

5.1 [annual verification summary to be inserted here]

##### 5.2 Research performed in this field

[Summary of research and development efforts in the area]

### **6. Plans for the future (next 4 years)**

#### **6.1 Development of the GDPFS**

**6.1.1** Forecaster's workstation "SmartMet" (Finnish Meteorological Institute) has been implemented during the 2013. The new system provide simultaneous visualization of all kind of observations (ground, satellite, radar, etc) and model data. As the fundamental improvement in comparison to the previous systems will be the possibility to do field editing of the individual parameters using the macro language.

6.1.2 [major changes in the Operational DPFS which are envisaged within the next 4 years]

#### **6.2 Planned research Activities in NWP, Nowcasting, Long-range Forecasting and Specialized Numerical Predictions**

"[Summary of planned research and development efforts in NWP, Nowcasting, LRF and Specialized Numerical Predictions for the next 4 years]"

##### 6.2.1 Planned Research Activities in NWP

##### 6.2.2 Planned Research Activities in Nowcasting

##### 6.2.3 Planned Research Activities in Long-range Forecasting

##### 6.2.4 Planned Research Activities in Specialized Numerical Predictions

### **7. References**

[information on where more detailed descriptions of different components of the DPFS can be found]  
(Indicate related Internet Web sites also)