JOINT WMO TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA PROCESSING AND FORECASTING SYSTEM AND NUMERICAL WEATHER PREDICTION RESEARCH ACTIVITIES FOR 2016

Libya/National Meteorological Centre (NMC)

1.   Summary of highlights

We used to receive data from Meteo-France via (RETIM AFRICA) and (RETIM EUROPE), but since the beginning of 2015 we have started receiving it by (RETIM EUROPE-FTP) as the EUMETCast-Europe DVB-S service was ended and replaced by a EUMETCast-Europe DVB-S2 service.

2.   Equipment in use

- Forecasting system (Synergie System).
- MSG System.
- SADIS.
- MeteoFactory.
- Transmet System (sending & receiving local and global data).
- Retim Africa & Retim Europe (for receiving data).
- Weather Radar type METEOR 500C.
- Weather Radar type METEOR 50DX.
- CDMS (climate data processing).

3.   Data and Products from GTS in use

• SYNOP, METAR, TEMP, SIG WEATHER, SPECI, WARNG & TAF. Since 2015 we have started using the GTS FTP circles to exchange data.

4.   Forecasting system

We use Synergie System from Meteo-France for forecasting. The data is received in hashing format and divided into many parts, then assembled in special servers to be ready for viewing in Synergie System.

4.1   System run schedule and forecast ranges

- Two runs per day via Retim Africa and Retim Europe.
- For models, we use ARP-AFRO/1.5 & ECMWF 2.5.
- Forecasting ranges up to 7 days.

4.2   Medium range forecasting system (4-10 days)

4.2.1   Data assimilation, objective analysis and initialization N.A.

4.2.1.1 In operation

- ARP.NMC/1.5 (resolution = 166.5Km, number of levels = 16 levels, run schedule = twice a day, forecast ranges = 96 hours (4 days), non hydrostatic, physics used = unknown).

- ARP-AFRO/1.5 (resolution = 166.5Km, number of levels = 16 levels, run schedule = twice a day, forecast ranges = 96 hours (4 days), non hydrostatic, physics used = unknown).

- ECMWF/2.5 (resolution = 3,052.5Km, number of levels = 5 levels, run schedule = twice a day, forecast ranges = 168 hours (7 days), non hydrostatic, physics used = unknown).

4.2.1.2 Research performed in this field N.A.

4.2.2   Model

4.2.2.1 In operation

Atmospheric Models:

- ALA.NMC/0.1 (resolution = 11.1Km, number of levels = 14 levels, run schedule = twice a day, forecast ranges = 48 hours (2 days), hydrostatic = non hydrostatic model, physics used = unknown).

- ARP.NMC/1.5 (resolution = 166.5Km, number of levels = 16 levels, run schedule = twice a day, forecast ranges = 96 hours (4 days), hydrostatic = non hydrostatic model, physics used = unknown).

- ARP-AFRO/1.5 (resolution = 166.5Km, number of levels = 16 levels, run schedule = twice a day, forecast ranges = 96 hours (4 days), hydrostatic = non hydrostatic model, physics used = unknown).

- ECMWF/2.5 (resolution = 3,052.5Km, number of levels = 5 levels, run schedule = twice a day, forecast ranges = 168 hours (7 days), non hydrostatic, physics used = unknown).

Waves Models:

- ALADIN/0.05 (resolution = 5.55Km, run schedule = twice a day, forecast ranges = 48 hours (2 days), hydrostatic = non hydrostatic model, physics used = unknown).

- ALADIN/0.1 (resolution = 11.1Km, run schedule = twice a day, forecast ranges = 48 hours (2 days), hydrostatic = non hydrostatic model, physics used = unknown).

- ARPEAG/0.25 (resolution = 27.75Km, run schedule = twice a day, forecast ranges = 48 hours (2 days), hydrostatic = non hydrostatic model, physics used = unknown).

- ARPEAG/1.0 (resolution = 111Km, run schedule = twice a day, forecast ranges = 72 hours (3 days), hydrostatic = non hydrostatic model, physics used = unknown).

4.2.2.2 Research performed in this field

We made a study on the efficiency of MM5 model by comparing the model output (air temperature, precipitation and wind speed and direction elements) with the actual (SYNOP) over Libya during the period from October 2008 to February 2009.

4.2.3 Operationally available Numerical Weather Prediction Products

Most of weather elements are available outputs from models integration (such as MSL pressure, air temperature, dew-point temperature, pressure tendency, clouds, precipitation, etc).

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

4.2.4.1 In operation

4.2.4.2 Research performed in this field

4.2.5 Ensemble Prediction System (EPS) N.A.

4.2.5.1 In operation

4.2.5.2 Research performed in this field

4.2.5.3 Operationally available EPS Products

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

4.3.1 Data assimilation, objective analysis and initialization

Synop & Temp.

4.3.1.1 In operation

- ALA.NMC/0.1 (resolution = 11.1Km, number of levels = 14 levels, run schedule = twice a day, forecast ranges = 48 hours (2 days), non hydrostatic, physics used = unknown).

- ALADIN/0.05 (resolution = 5.55Km, run schedule = twice a day, forecast ranges = 48 hours (2 days), non hydrostatic, physics used = unknown).

- ALADIN/0.1 (resolution = 11.1Km, run schedule = twice a day, forecast ranges = 48 hours (2 days), non hydrostatic, physics used = unknown).

- ARPEAG/0.25 (resolution = 27.75Km, run schedule = twice a day, forecast ranges = 48 hours (2 days), non hydrostatic, physics used = unknown).

- ARPEAG/1.0 (resolution = 111Km, run schedule = twice a day, forecast ranges = 72 hours (3 days), non hydrostatic, physics used = unknown).

4.3.1.2 Research performed in this field **N.A.**

4.3.2   Model

4.3.2.1 In operation

- ALA.NMC/0.1.
- ALADIN/0.05.
- ALADIN/0.1.
- ARPEAG/0.25.
- ARPEAG/1.0.

4.3.2.2 Research performed in this field **N.A.**

4.3.3   Operationally available NWP products

Most of weather elements are available outputs from models integration (such as MSL pressure, air temperature, dew-point temperature, pressure tendency, clouds, precipitation, etc).

4.3.4   Operational techniques for application of NWP products

4.3.4.1 In operation

- Forecasting system (Synergie System).
- Transmet System (sending & receiving local and global data).
- Retim Africa & Retim Europe (for receiving data).

4.3.4.2 Research performed in this field **N.A.**

4.3.5   Ensemble Prediction System **N.A.**

4.3.5.1 In operation

4.3.5.2 Research performed in this field

4.3.5.3 Operationally available EPS Products

4.4   Nowcasting and Very Short-range Forecasting Systems (0-12 hrs) **N.A.**

4.4.1   Nowcasting system

4.4.1.1   In operation

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

(Note: please also complete the CBS/PWS questionnaire on Nowcasting Systems and Services, 2014)

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 **N.A.**

[Specialized NP on sea waves, storm surge, sea ice, marine pollution transport and weathering, tropical cyclones, air pollution transport and dispersion, solar ultraviolet (UV) radiation, air quality forecasting, smoke, sand and dust, etc.]

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)* N.A.

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)* N.A.

4.7.1 In operation

4.7.2 Research performed in this field

Yes, in initiating LRF.

4.7.2 Operationally available EPS LRF products

5. Verification of prognostic products N.A.

5.1 "[annual verification summary to be inserted here]"

5.2 Research performed in this field

6.   Plans for the future *(next 4 years)* In spite of the exceptional situation our country is experiencing, we hope to :

- Upgrade our forecasting system.
- Run models at the NMC instead of running them from France.
- Initiate NWP and LRF.

6.1   Development of the GDPFS

6.1.1 "[major changes in the Operational DPFS which are expected in the next year]"

No major changes expected.

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

No major changes expected.

6.2   Planned research Activities in NWP, Nowcasting, Long-range Forecasting and Specialized Numerical Predictions N.A.

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)

http://www.mfi.fr/en/