

WORLD WEATHER WATCH TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA-PROCESSING SYSTEM FOR THE YEAR 2003

ALGERIA

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This report summarize the global data processing system activities carried out at the National Meteorological Forecasting Center of Algiers.

1. Summary of highlights

The major events during 2003 are:

- ◆ Use in operational of the RANET system by our regional Centers, with the collaboration of ACMAD.
- ◆ Publication of the study on November 2001 extreme event, in the European Geophysical Society revue N°4 called Mediterranean Storms (4th plinius Conference)
- ◆ The ETA model was extended up to 4° South, in order to cover the Golf of Guinea, after the ask of ACMAD.
- ◆ The Algerian Met Office integrated the Consortium of ALADIN on the 31st October 2003, after the 8th assembly of the ALADIN partners.
- ◆ Participation to the SAPREM VI training on NWP, which touched place at Casablanca (Maroc) from 14 April to 02 May 2003, the training was organised by Meteo-Maroc and ACMAD.
- ◆ The outputs of the ETA model are encoded in Grib Format
- ◆ Quality control of the ETA/model.

2. Computing facilities

Computers used for GTS:

- ◆ Two (02) Messir-com working in hot stand-by mode
- ◆ Two (02) Data General MV 7800 XP

The functions of MESIR-COM are as follows:

- Satellite reception (RETIM 2000, SADIS and MSG)
- TCP/IP exchanges

- ◆ Three (03) Pentium 4 used for NWP (ETA model)
- ◆ PDUS station : 01

- ♦ RETIM station : 01
- ♦ SADIS station : 01
- ♦ Six (06) Messir-Aeronautical (Aeronautical assistance)
- ♦ Ten (10) Messir-Vision, used by the forecasters (Visualisation of the models outputs)

3. Data and products from GTS in use

3.1 Data in use

- ♦ Synop + Synop/Ship: 4000
- ♦ TEMP + TEMP/Ship + Pilot: 600
- ♦ Airep: 200

3.2 Products in use

- ♦ GRIB Meteo-France: 1800
- ♦ GRIB KWBC: 2400
- ♦ GRIB EGRR: 2200 (Aeronautical assistance)
- ♦ GRIB ECMWF : 256
- ♦ Aeronautical charts from Bracknell 500 (T4 code) (via SADIS)
- ♦ T4 on RETIM2K

4. Data input system

- ♦ Fully automated system

5. Quality control system

- ♦ Automated quality control of incoming data based on horizontal consistency check for synop messages (comparaison with climatological data) and hydrostatic vertically control for TEMP messages by the WADE.
When some data are not accepted by the system, the operator correct them and inject them again in the system.

6. Monitoring of the observing system

- ♦ Surface observations and upper data are monitored on the national level.

7. Forecast system

- ♦ The ETA limited area model (ETA/Algeria) is operationally launched twice a day (networks of 0000GMT and 1200GMT) providing 72 hours forecasts.

7.1 Schedule of the forecast system

- ♦ The forecasting system at the national meteorological centre is based on the limited area model ETA/Algeria, which is launched twice a day (networks 0000 and 1200 GMT), providing 72 hours forecasts. The initial and the boundary conditions are downloaded via Internet from NCEP/Washington.

We also use the outputs of the following models:

- Arpège (Toulouse)
- Bracknell
- Washington
- CEPMMT.

The outputs of ETA model together with the ones of Arpège, are used for short range forecasting (00-72 Hours), the outputs of the CEPMMT are used for medium range forecasting (96–144 hours).

The ensemble forecasts (120-240 hours) of CEPMMT are used since March 2000.

7.2 Medium range forecasting system (4-10 days)

The ensemble forecasts (120-240 hours) of CEPMMT are used since March 2000.

7.2.1 Data assimilation, objective analysis and initialisation

- ◆ Not available

7.2 .2 Forecast model

- ◆ There is no medium range-forecasting model, which is integrated at Algiers.

7.2.3 Numerical weather prediction products

The Numerical Weather Prediction products witch are used at the National Meteorological Forecasting Center of Algiers are:

- ◆ ETA/Algérie (00-72h)
 - Z + T 500 Hpa
 - Z + T 850 Hpa
 - RH 700 Hpa
 - RH 850 Hpa
 - Thickness 1000/700 Hpa
 - MSLP + Vent
 - Dust Concentration
 - Accumulated precipitations (06,12, 18, 24, 30,36, 42,48, 60, 72)
 - Wave height (WAM model) etc ...

All of this products and others, are available in the the following web site:
www.meteo.dz (rubrique: eta-onm)

- ◆ Arpège : (00-72 h)
 - Z + T 500 Hpa
 - Z + RH 700 Hpa
 - Z + T 850 Hpa
 - MSLP + Thickness 1000/700 Hpa
 - Accumulated precipitations (12-24-36-48h)

- ◆ CEPMMT: (24-144h)
MSLP
Geopotential 500 Hpa
Wind +T 850 Hpa
- ◆ Bracknell (00-72h)
Wafs
- ◆ KWBC (00-72h)
Wafs

7.2.4 Operational techniques for application of the NWP products

The NWP products of ETA/Algeria are used in the computation of some derived fields as :

- ◆ LAPOT instability index, which is based on the equivalent potential temperature and combines the potential and latent instabilities.
- ◆ Divergence fields
- ◆ Vertical velocity at 850 and 700 Hpa
- ◆ Q Vector
- ◆ Relative vorticity
- ◆ Isentropic potential vorticity 315 and 330 K
- ◆ Symmetric instability
- ◆ K index

7.3 Short-range forecasting system (00 – 72h)

7.3.1 Data assimilation, objective analysis and initialisation

The operational limited area model ETA/Algeria which is integrated at the NMC of Algiers uses the initial and lateral boundary conditions of the NCEP global model. However, data assimilation process based on OI (optimal Interpolation) method is still under development.

7.3.2 Model

The limited area model ETA based on eta (η) coordinate, was adapted to the Algerian region.

- ◆ Basic equations: Primitive equations
- ◆ Independent variables: Latitude, Longitude, η , and Time
- ◆ Dependent variables: Temperature, horizontal wind components, specific humidity.
- ◆ Diagnostic variables: Precipitation, vertical velocity, and turbulent exchange coefficient
- ◆ Integration domain: 12° N to 54°N ; 25° W to 25° E
- ◆ Vertical coordinate: ETA (η), with 24 levels
- ◆ Grid : Arakawa E grid
- ◆ Resolution: 55 km
- ◆ Advection scheme: Semi –Lagrangien advection scheme

- ◆ Boundary data: Lateral boundary conditions from the NMC global model, based on the networks of 0000 and 1200 GMT and updated every 6 hours up to 48 h, and every 12 hours from 48 to 72h.
- ◆ Time integration: Split explicit, Euler backward advection adjustment, time step 3 minutes.
- ◆ Orography: Silhouet mountains
- ◆ Physical parameterisation:
 - Large scale condensation
 - Modified Arakawa-Schubert convection scheme
 - Betts-Miller deep and shallow convection scheme
 - Mellor-Yamada level 2.5 turbulence closure models for planetary layer, level 2 for surface layer.
 - GFDL radiation scheme
 - Ground surface processes and surface hydrology
 - Large scale and convective precipitation

7.3.3 Numerical weather prediction products

The products (outputs of the ETA/Algeria model) which are available operationally are :

	Model	Model high resolution
Resolution	0.5 °	0.25°
Integration Domain	25 W - 25 E 12 N - 54 N	05 W - 11 E 27 N - 42 N
Time Forecasts	72 H	48 h
NWP	Z+T 1000, 850, 700, 500 Hpa	
	RH 850, RH 700 Hpa	
	Vertical velocity 850, 700 Hpa	
	Vorticity 500 Hpa	
	Pmer, T2m, DC (Dust Concentration), CL (Cloud Cover).	Pmer, T2m, DC (Dust Concentration), CL (Cloud Cover).
		LI (latent instability) 1000/850 LI 850/700 hPa LI 700/500 hPa Potential Vorticity 315 K Potential Vorticity 330 K Divq Surface Divq 850 hPa Tetae surface Tetae 850 hPa Spe Humidity Surface
	Accumulated Precipitation (12h)	Accumulated Precipitation (06)
Outputs	Every 06 h	Every 03 h

7.3.4 Utilisation of the NWP products at the National Meteorological Center of Algiers:

- Computation of derived fields, with the outputs of the following models:
 - ETA/Algérie and Arpège.
 - Synoptic interpretation on both screen (workstation and PC-Software) and Charts.

7.4 Specialized forecasts

The WAM model developed by the Max Plank Institute for meteorology, Hamburg, Germany, is running operationally on a workstation. It uses the 12h forecast (10 m winds) of the ETA model as initial conditions. Vagmed (Toulouse) is also used for the forecasts of the wave heights over the Mediterranean Sea.

7.4.1 Assimilation, objective analysis and initialisation

Not available

7.4.2 Models

Two models are available at the National Meteorological Center of Algiers: ETA/Algeria and WAM model (cycle 4). The first one is used for synoptic and meso-scale forecasts and also for research and development. The second one is used for the forecast of wave heights over the Mediterranean Sea.

7.4.3 Numerical weather products

Same as in 7.3.3

8. Verification of prognostic products

The following parameters: u, v, h and t are automatically verified for all the validities from 06 to 72 hours concerning the ETA model which is under use at the National Meteorological Forecasting Center of Algiers.

9. Plans for the year 2004

- Further increase of model resolution
- The integration of the Algerian Met Office to the ALADIN Consortium needs the enhancement of our computing capacities, by the acquisition of a computer, and we plan to buy one during the year 2004.
- The development of the data assimilation chain will continue.
- Participation to the Trainings about ALADIN model.