

**WWW TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA-
PROCESSING AND FORECASTING SYSTEM (GDPFS),
AND THE ANNUAL NUMERICAL WEATHER PREDICTION (NWP)
PROGRESS REPORT FOR THE YEAR 2005**

EGYPT

The Egyptian Meteorological Authority (EMA)

1. Summary of highlights

Research and development in the area of NWP focuses on high-resolution analysis and now casting, meso-scale weather prediction and more recently wave modeling. The operational models used are WS-ETA, MM5, Egypt ETA and WAM. The first model is used as a principal forecasting model for the atmospheric prediction, the second and the third models are for research and the last one as a test version to be used in education and research purposes.

During the year 2005, a new system of telecommunication of two servers, one live & one back-up, has replaced the old one, The new system is running on windows 2003 server and is based on the MESSIR automatic message switching system (MESSIR-COMM, MESSIR-VISION and MESSIR-AERO)

2. Equipment in use at the center

a. For Computations and data base :

- i. The IBM Mainframe with central processor unit with:
 - o Power 80 MIPS
 - o Processor based on z-architecture , 64bit
 - o Dynamic I/O reconfigurations management for peripherals
 - o IBM operating system(VSE/ESA and OS/390)
 - o Communicate with the already existing computers in the center of the existing databases of the various units of EMA (According to site survey)
- ii. Storage unit:
 - o 3 ESCON channels and one FICON channel.
 - o The capacity at least 400 GB useable, raid-protected, with the scalability can be extended to one TB.
 - o Support parallel access volume.
 - o Support multiple allegiances

b. For Telecommunication System (AMSS):-

- i. Two servers, one live & one back-up, model IBM X series 345.
- ii. 3 Supervisory, model IBM Think Center.

c. For The Numerical Weather Prediction

- i. One Compaq server with 4 processors with RISC architecture
 - o 4GBSDRAM
 - o 510GB total internal storage capacity
- ii. One Compaq server with 2 processors with RISC architecture
 - o 2GBSDRAM
 - o 120GB total internal storage capacity.
- iii. Two IBM compatible PCs
 - o 2.8GHZ
 - o 100GB total internal storage capacity
- iv. Two IBM compatible PCs
 - o 1.8GHZ
 - o 40GB total internal storage capacity

3. Data and Products from GTS

WMO observation data	SYNOP, TEMP, METAR, AIREP....reports.
WMO processed data	NWP Products & Regional Meteorological Centers and T4 code charts
Meteorological image data	Satellite images data.

4. Data input system

- a. Fully automated system for incoming bulletins and reports from the remote sites.
- b. Some human intervention available to correct bulletin. reports and to put our local observation

5. Quality Control System

- a. Quality control of incoming data: the format of all coded reports are checked and if necessary corrected if possible.
- b. All received messages are checked for internal consistency before storing and exchange.
- c. Space consistency check.
- d. Time series consistency check.

6. Monitoring of the observing system

- a. Surface and upper-air observations are monitored on the national level.
- b. From MESSIR COM we involves the collection of data for annual global for all type and send it to another client PC to make some operations to obtain the results reports to be carried out once a year in October {(1-5) and (1-15)} and send the monitoring results to the WMO FTP server via Internet.
- c. From MESSIR COM we involves the collection of raw data for all type and send it to another client PC to make A PRE-ANALYSIS by using DP4 software

and send the monitoring results to the WMO FTP server via Internet periodically four times per year (February-April - July - October).

7. Forecasting System

- a. Several models are used operationally for the sake of :
 - Short range forecast
 - Medium range Forecast
 - Research Studies
- b. System run schedule and forecast ranges

System	Base Time	Approximate start time (UTC)	Forecast Availability (UTC)	Forecast Range from base date (hrs)	For the sake of
WS-ETA	0000	0600	0900	120	Short Range forecast and R&D
	1200	1800	2100		
Egypt -ETA	0000	600	1100	240	Medium Range Forecast and R&D
	1200	1800	2300		
MM5	0000	0900	1300	120	Medium Range Forecast and R&D
	1200	2100	0100		
WAM	0000	0900	0920	120	Specialized Numerical Prediction and R&D.
	1200	2100	2120		
Reg-CM	Under test				
CAMX					
ISC3T					
CALPUFF					

- c. Model Variables:-
 - i. The operational prediction model in use is the regional ETA Model with terrain representation basic equations & primitive equations.
 - o *Independent:* Longitude, Latitude, ETA, time
 - o *Prognostic variables:* Temperature, wind components, Specific humidity, turbulent kinetic Energy, soil moisture, snow depth, Surface potential temperature.
 - o *Diagnostic variable:* Precipitation, vertical velocity, turbulent exchange coefficients.
 - o *Topographic data set:* Mean orography, land sea mask.
 - o *Assimilation cycle:* 0000, 0006, 0012, 1800UTC,
 - ii. A new non-hydrostatic forecasting system of, at least, 36 levels Sigma Coordinates Forecast for 48 h.
 - o Basic equations: primitive equations system.
 - o Dependent variables: T, U, V, Q, P.
 - o Integration domain 25E to 37E 22N to 35 N
 - o Horizontal resolution. 33km
 - o Vertical resolution; 36 levels.

- iii. Meso-scale Model (MM5)- Non-hydrostatic
 - o Additional equations for prognostic 3D vertical velocity and perturbation pressure.
 - o No equations for prognostic surface pressure diagnostic pressure and diagnostic omega integrations.
 - o 24 categories for vegetation and physical properties.
 - o Projections (dx=dy) (Paler-Lambert and Macerator).
 - o Data Required to run:
 - Topography and land use
 - Cribbed Analyses (Regional), Wind, Heights, Temp.
 - Snow cover, SST, and RH for 18 levels with top at 100hPa.
 - o Nesting (one and two ways).
 - o Vertical interpolation from pressure levels to sigma coordinate system.
 - o Resolution three nested 63,21,7 km.

8. Numerical Weather Prediction Products:

- The geopotential height at the standard level and mean sea level pressure.
- Horizontal wind components (U.V).
- Temperature (T).
- Specific Humidity (q).
- Surface pressure (Ps).
- Soil temperature.
- Soil moisture content.
- Surface temperature.
- Connective precipitation.
- Layer cloud amount.
- Vertical velocity.
- Thunderstorm and sandstorm

9. Future Plan:

1. Using the dispersion models (CAMX, ISC3T and CALPUFF) at different resolution, to monitor the emission of dust factory and mongering the Rice burning control.
2. Upgrading the Hardware used to fulfill the requirement.