WORLD WEATHER WATCH TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA-PROCESSING SYSTEM FOR THE YEAR 2001

KENYA

National Meteorological Centre

This report summarizes the global data processing system activities carried out at the National Meteorological Centre of Kenya.

1. The major events during 2001 are:
   - Installation and Operation of three limited area models;
     a. Regional Atmospheric Modelling System (RAMS) from Colorado state University (CSU).
     b. The High Resolution Model (HRM) from DWD Germany.
     c. The MM5 from Colorado, USA.
   - Operation of Messir.
   - Operation of Primary Data User Station (PDUS) station
   - Installation and Operation of High Resolution Picture Transmission (HRPT) NOAA Satellite acquisition station.

2. COMPUTING FACILITIES

   - IBM Computer – Using Linux (Red hat Linux),
     IBM Server, Netfinity 3500 M10, Pentium III Processor (550MHz), RAM of 256MB and 18GB hard disk.
   - Meteorological Data Distribution (MDD)- Using Messir Vision (application Software).
   - Numerical Weather Prediction (NWP)- Using Messir Vision.
   - PDUS- Meteosat Operation Manager (MOM)
   - PDUS- Autosat Block5
   - HRPT- Noaa acquisition station (Operating system- Dos)
     - Quorum
   - Automatic Message Switching System (AMSS)- Operating System – UNIX
     -Oracle data management system
     -Routing Software

3. Data and Products from GTS in use

   3.1 Data in use

   - SYNOP + SYNOP/SHIP: 300
   - TEMP+ TEMP/SHIP: 100
   - AIREP
   - SATEM
   - SATOB

3.2 Products in Use

- GRIB Meteo-France: 620
- GRIB KWBC: 620
- GRIB EGRR: 520
- GRIB ECMWF: 70

4. Data input System

   - Fully automated system

5. Quality control system.

   National Surface Observations are manually controlled at two levels – at the observing sites, and at the data-collecting centre, and at the time of archiving we have automated control system for erroneous values.

6. Monitoring of the observing system.

   Nairobi - Kenya was nominated by the Commission for Basic Systems (CBS) for the monitoring of the quality of land surface stations for Regional Association I (RA I-Africa). We produce monthly lists of observing stations that persistently report erroneous observations. We also compile six monthly-consolidated lists of suspect stations (stations reporting erroneous data). The purpose of this is to investigate possible sources of errors on the data quality and do the necessary corrections.

7. Forecasting system

National meteorological centre- Kenya doesn't have operational NWP model running currently, however we are in the process of installing RAMS on an IBM Computer. We use output products of several foreign Models (e.g. Medium Range Forecasts (MRF) from National Climate and Environmental Prediction (NCEP)/USA-Washington) via Internet, and forecast products of ECMWF, ARPEGE via MESSIR.

7.2 The output products of Arpege, MRF and ECMWF/Bracknell are used for short range and medium range forecasts.

7.2.3 Numerical Weather Prediction products

- The numerical Weather Prediction products which are used at the National Meteorological centre of Kenya are:

a. Bracknell/ECMWF (00 – 72h)
   - MSLP

- Accumulated precipitation
- Wafs
- KWBC (00 – 72h)

b. Arpege: (00 – 72h)
   - H + RH 700 hPa
   - H + T 850 hPa
   - MSLP + thickness 1000/700 hPa
   - Accumulated precipitation (12 – 24 – 36 – 48h)
   - Wind + T 850 hPa

c. MRF/NCEP
   - MSLP
   - Geop 500 hPa
   - Accumulated Precipitation

7.2.4 Operational techniques for application of NWP products.

The NWP products of Arpege (Meteo-France) are used in the computation of some derived fields as:

- Divergence fields.
- Vertical Velocity at 850 and 700 hPa
- Relative Vorticity.

8.0 Verification of prognostic products

National Meteorological Centre- Kenya doesn't produce standard scores.

9.0 Plans for the future.

Plans are at an advanced stage of setting up an operational NWP section within the Operation Division. The forecasting system will be based on three limited area models, Regional Atmospheric Modelling System (RAMS) from Colorado State University, the High Resolution Model (HRM) from DWD Germany and MM5 from Colorado, USA, which will be launched twice a day (0000 and 1200 GMT), providing 72 hours forecasts. The initial and boundary conditions will be downloaded via the Internet from NCEP/Washington. RAMS is a highly versatile numerical code developed by scientists at Colorado State University (CSU), for simulating and forecasting meteorological phenomena, and depicting the results. Kenya Meteorological Department intends to;

a. Build Capacity for Numerical Weather Prediction experts who will be responsible for the daily running of the models, Research and Development and model fine-tuning.
b. Acquire and improve on the computing facilities for the enhancement of Research and Development vis-à-vis NWP modelling.
c. Make NWP models at our disposal operational in the next few years.
d. Enhance Collaboration with Institute of higher learning, Centres of excellence with a view of improving the flow of information.
e. Improve network infrastructure in a bid to speed up downloading of model initialisation data.

The goal of the National Meteorological Centre is to provide accurate meteorological forecasts for the various sectors of Kenyan economy with special emphasis in Aviation industry, Hydro-power energy and Agriculture.

References

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