

JOINT WMO TECHNICAL PROGRESS REPORT ON THE GLOBAL DATA PROCESSING AND FORECASTING SYSTEM AND NUMERICAL WEATHER PREDICTION RESEARCH ACTIVITIES FOR “[2007]”

ARMENIAN STATE HYDROMETEOROLOGICAL AND MONITORING SERVICE REPUBLIC OF ARMENIA

1. Summary of highlights

Armenia till now has not his own MWP model, and weather forecast is based on some Global and Regional prognostic centers (ECMWF, MRF_EUROPA, WEATHER CENTRALE, MOSCOW) analyze and prognostic charts, which are available freely over the Internet.

The received charts have not been additionally processed. Using data from local meteorological stations and radio sounding data, regional rules and some regional manual calculation methods are applied to produce the forecast. The SYNOP encoding software has been developed.

2. Equipment in use

1. MESSIR-COMM workstation (SCO Unix operational system)
2 PCs COMPAQ (Pentium 200 MHz)
Printer Laser Jet 6MP
Receiver RETIM-2000
2. Technavia SKYCEIVER VIEW system (Windows 98 operational system)
PC Intel Pentium 75 MHz
Printer Laser Jet 5L
Parabolic antenna (WEFAX reception)
VHF/APT active antenna
Receiver
3. MITRA (Windows 98 operational system)
PC (Pentium 4 3.2GHZ)
Printer Epson ST-1160
Monitor 17
DVB-Tuner
Antenna
4. Internet Gateway
PC (Intel Xeon 2.4GHz)
UPS 500VA
Printer (network) Laser Jet 6L
DSL modem
5. File Server
PC (Intel Core 2 Duo E6600)
UPS 1200VA
6. DigiCora II Sounding system
PC based on Metgraph sounding graphics program
Autotracking UHF antenna
GPS local antenna

3. Data and Products from GTS in use

- SYNOP
- TEMP
- METAR
- TAF
- GRIB

4.1 System run schedule and forecast ranges

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

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*)

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*)

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

There are no specialized numerical predictions.

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

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]"

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

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 and Long-range Forecasting

6.2.1 Planned Research Activities in NWP

It is planned to introduce High Resolution Model (HRM) developed at DWD for operational use in the short range weather prediction.

6.2.2 Planned Research Activities in Nowcasting

6.2.3 Planned Research Activities in Long-range Forecasting

It is planned to continue research activities of the empiric-statistical model development for prediction of precipitation and further improvement of temperature prediction skill.

It is planned to develop Long Range Forecasting system in the service. With this purpose Global dynamic models predictions will be collected from other global producing centers (GPCs) and Multi-model Ensemble Prediction and Regional Downscaling using Regional Climate Models (RCMs) will be carried out for the Caucasus region. A horizontal resolution of 20 km for the Regional model will be sufficient to represent the topography and land surface characteristics of the region. Observational data analysis (NCEP, ECMWF Reanalysis, and other data) will be examined to understand the mechanism of climate variability in the region and to identify sources of predictability. Findings of this research will go a long way in improving the long range forecasting techniques for the region.

7. References

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