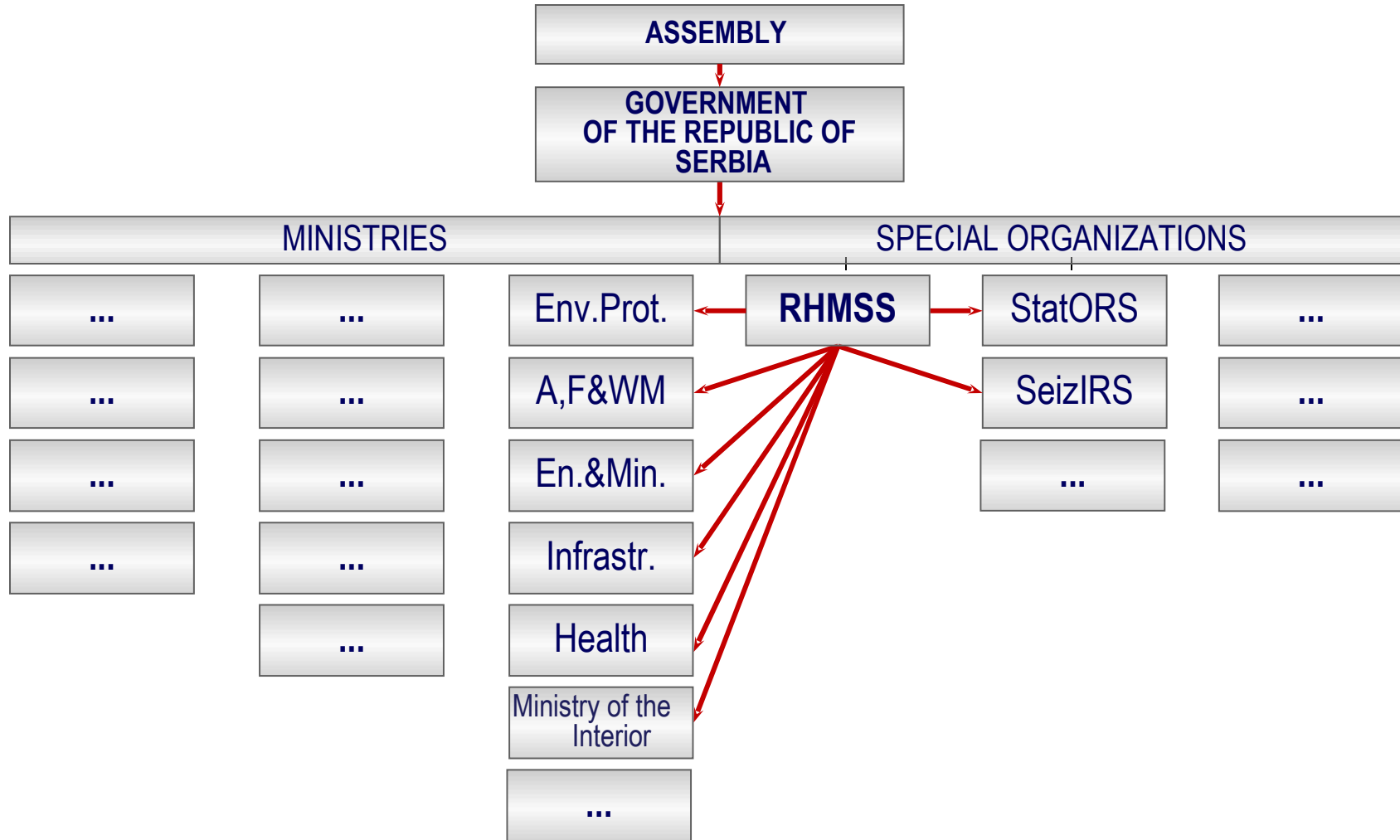# Republic Hydrometeorological Service of Serbia

ICEED 9th Session
Ljubljana 10th – 11th December 2009
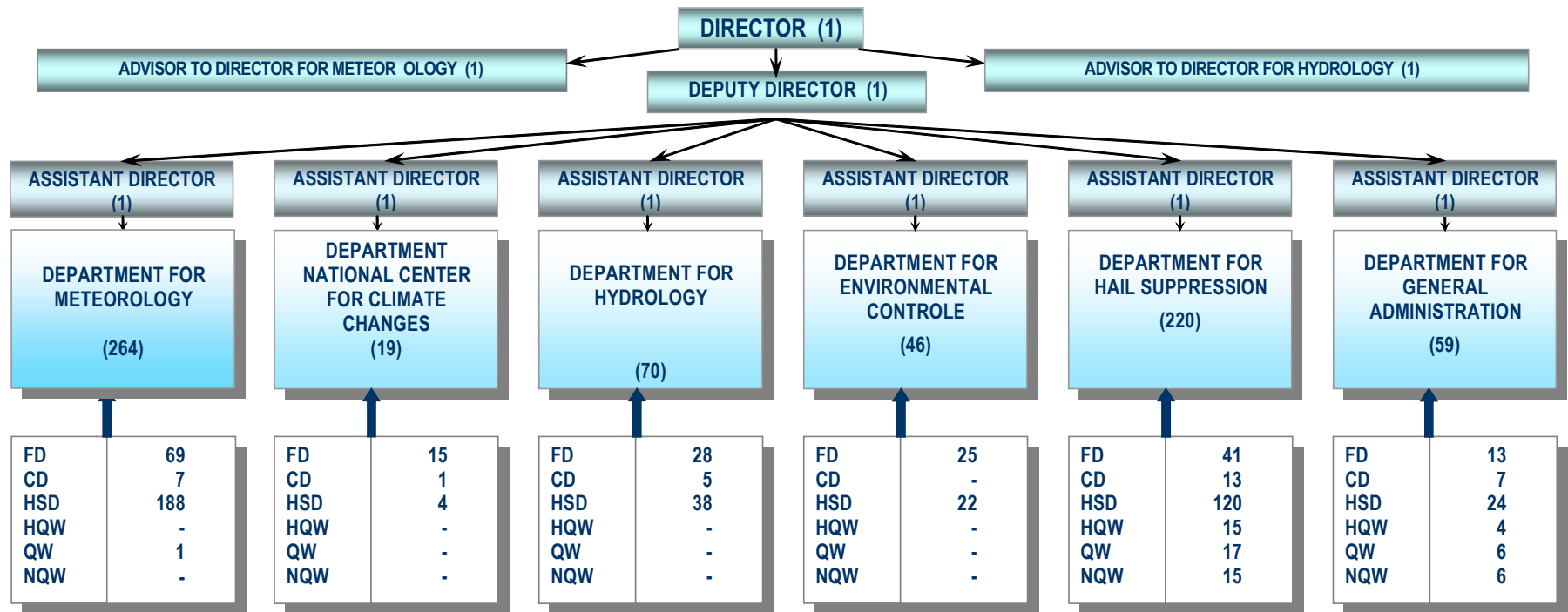
Position of the RHMS of Serbia in the Serbian Government Administration

ASSEMBLY

GOVERNMENT OF THE REPUBLIC OF SERBIA

MINISTRIES | SPECIAL ORGANIZATIONS

... ... Env.Prot. ← RHMSS → StatORS ...
... ... A,F&WM ← SeizIRS ...
... ... En.&Min. ... ...
... ... Infrastr.
... Health
Ministry of the Interior
...

Organizational and Qualification Structure of the RHMS of Serbia

DIRECTOR (1)

ADVISOR TO DIRECTOR FOR METEOR OLOGY (1)

DEPUTY DIRECTOR (1)

ADVISOR TO DIRECTOR FOR HYDROLOGY (1)

ASSISTANT DIRECTOR (1)	ASSISTANT DIRECTOR (1)	ASSISTANT DIRECTOR (1)	ASSISTANT DIRECTOR (1)	ASSISTANT DIRECTOR (1)	ASSISTANT DIRECTOR (1)
DEPARTMENT FOR METEOROLOGY (264)	DEPARTMENT NATIONAL CENTER FOR CLIMATE CHANGES (19)	DEPARTMENT FOR HYDROLOGY (70)	DEPARTMENT FOR ENVIRONMENTAL CONTROLE (46)	DEPARTMENT FOR HAIL SUPPRESSION (220)	DEPARTMENT FOR GENERAL ADMINISTRATION (59)

	Meteorology		Climate Changes		Hydrology		Environmental		Hail Suppression		General Admin
FD	69	FD	15	FD	28	FD	25	FD	41	FD	13
CD	7	CD	1	CD	5	CD	-	CD	13	CD	7
HSD	188	HSD	4	HSD	38	HSD	22	HSD	120	HSD	24
HQW	-	HQW	-	HQW	-	HQW	-	HQW	15	HQW	4
QW	1	QW	-	QW	-	QW	-	QW	17	QW	6
NQW	-	NQW	-	NQW	-	NQW	-	NQW	15	NQW	6

## 688 posts

Department for Meteorology

- Project of installment of 28 Automatic meteorological stations (AMS) completed

- Improvement of acquisition system of AMS network

- 4 Soil Moisture Measurement AT Delta-T   (Profile probe type PR2)

- Climatological data basis connected with system of acquisition allowing data management

- Installment of SADIS 2G

- Ongoing works of modernization and automatization of MRL 5 (dual band 3-10 cm)

Automatic meteorological stations:

- 28 MicroStep AMS 111

- 4 Soil Moisture Measurement AT Delta-T
  (Profile probe type PR2)
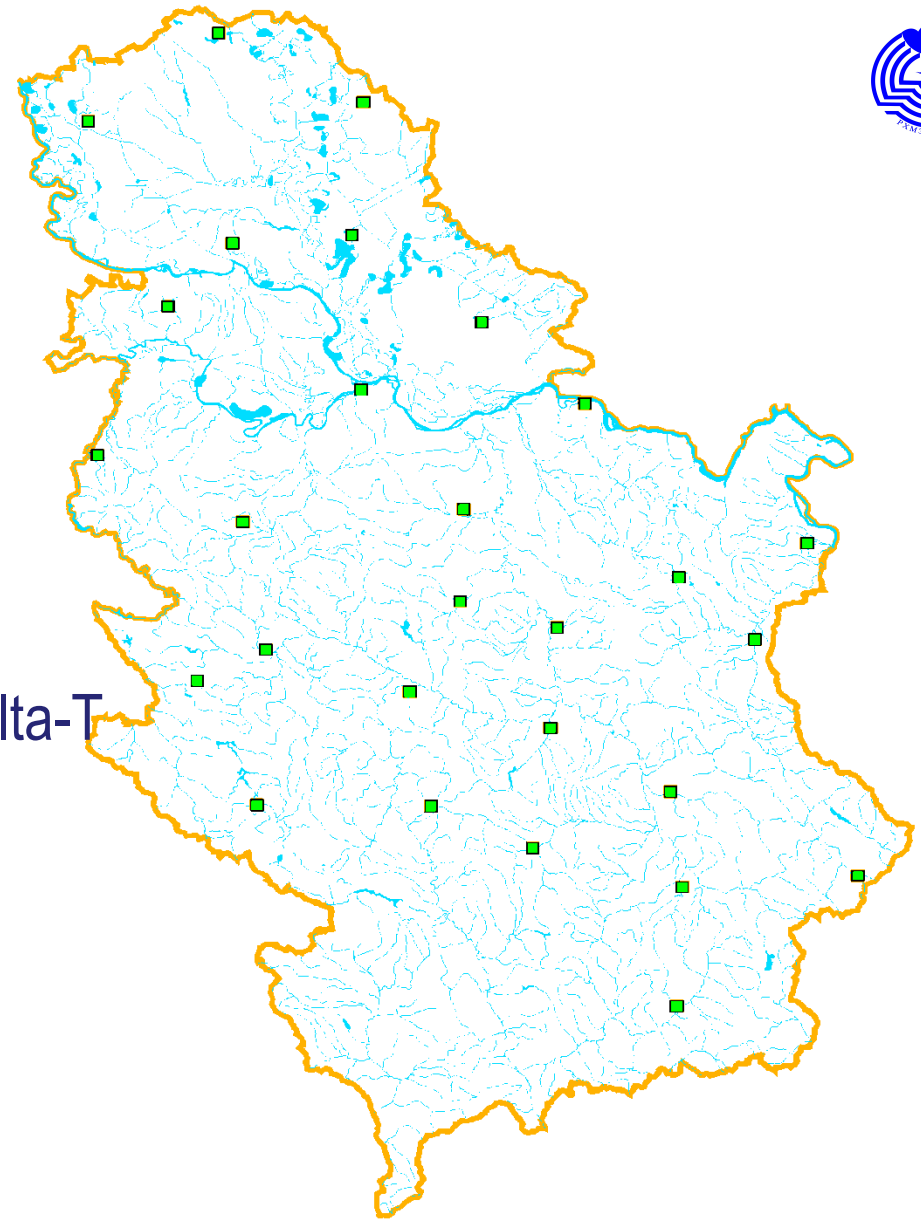
Numerical forecast

- Eta 26 km 32 vertical levels up to 100 hPa (+120 hrs) DWD boundary conditions

- NMM-WRF 10 km 38 vertical levels up to 50 hPa (+72 hrs)

  NMM-WRF 4 km 45 vertical levels up to 50 hPa

  ECMWF boundary conditions

- NMM is planned to run on DWD boundary conditions

- NMM-B is planned to be implemented in RHMSS in 2010

Numerical forecast

WRF−NMM 3.1.1   Ukupne 3h padavine (mm) & prizemni pritisak (hPa)

Start:01.12.2009.   00UTC   Valid:01.12.2009.   12UTC

Numerical forecast

WRF—NMM 3.1.1   Vetar na 10m (m/s)

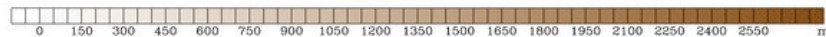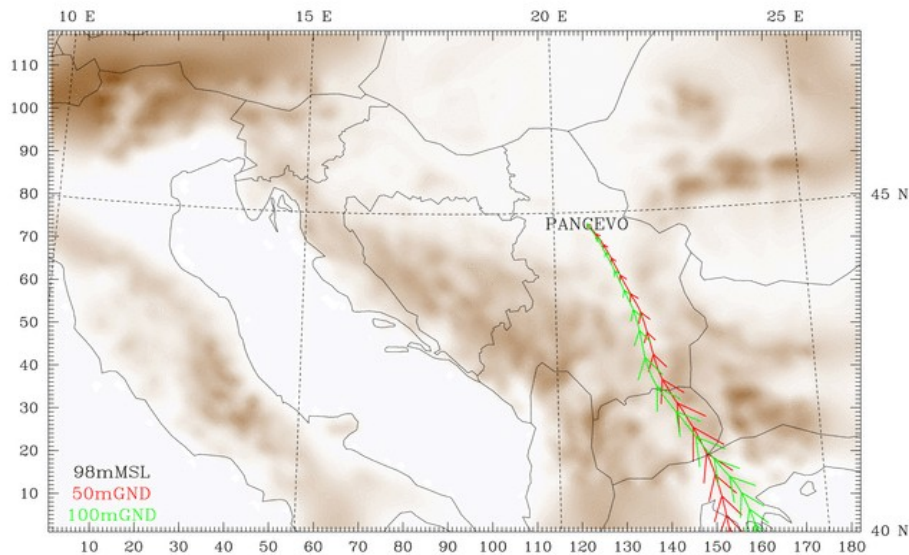Start:01.12.2009.   00UTC

Valid:01.12.2009.   12UTC

Numerical forecast
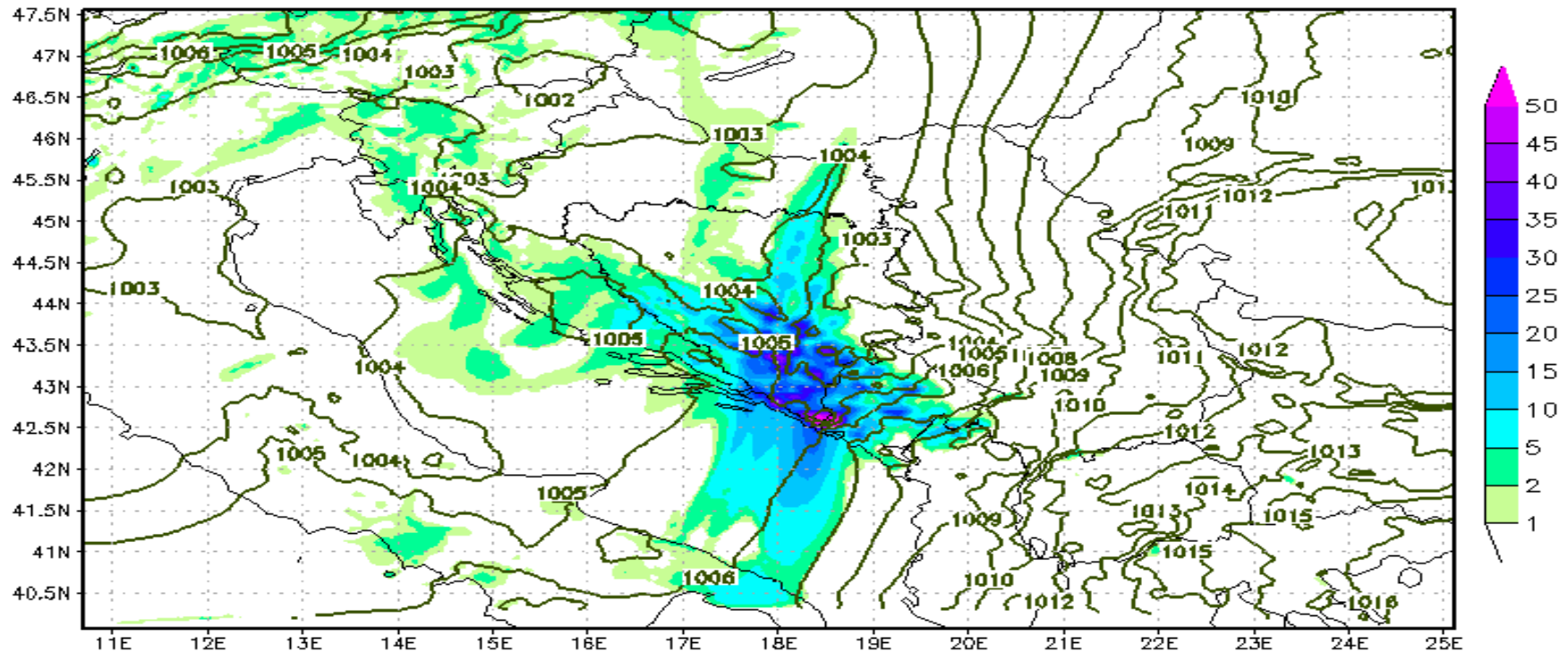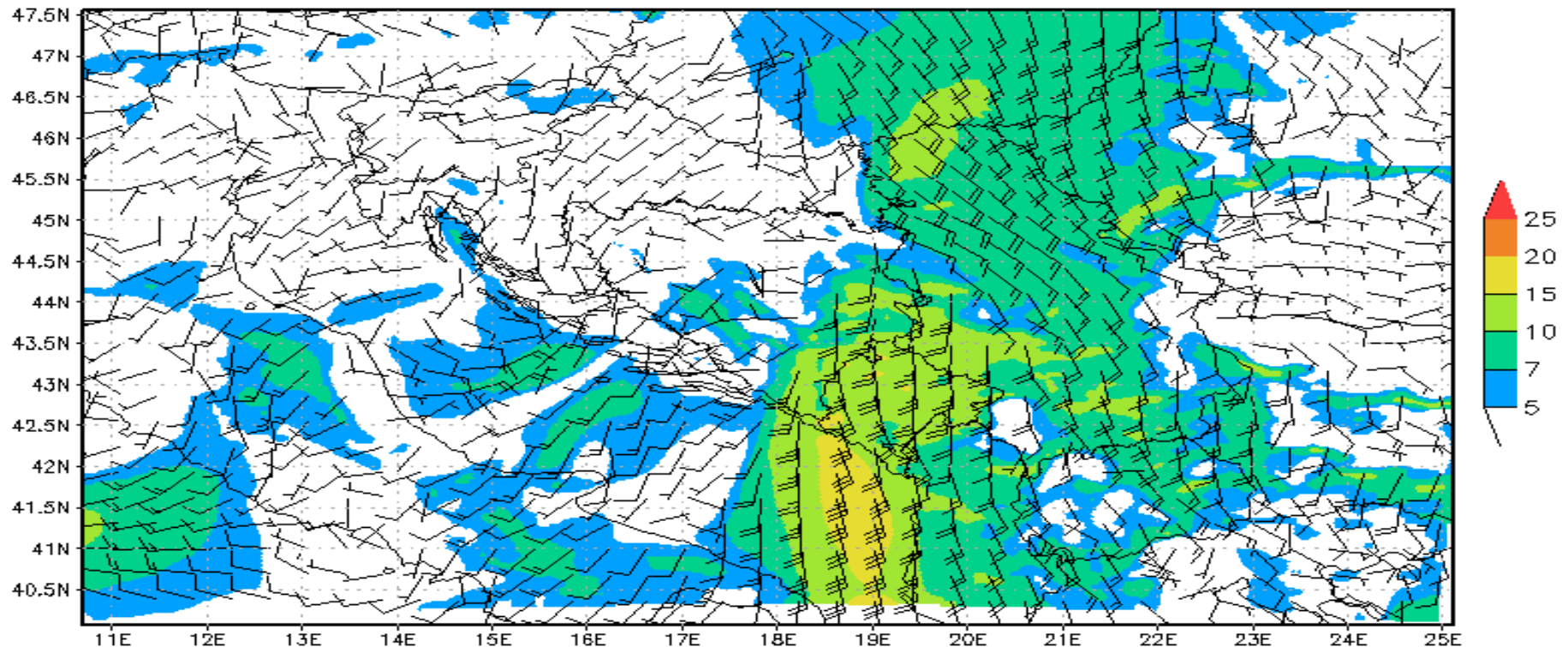
ICEED 9th Session
Ljubljana 10th – 11th December 2009

Numerical forecast

Dataset: wrfnmm   RIP: Backward trajectories   Init: 00 UTC Tue 01 Dec 09
Terrain height AMSL
Trajectories from hour   0.000 to 24.000
Trajectories from hour   0.000 to 24.000

98mMSL
50mGND
100mGND

0   150   300   450   600   750   900   1050 1200 1350 1500 1650 1800 1950 2100 2250 2400 2550   m

Model Info: V3.0   BMJ   MYJ PBL Ferrier   NMM Noah 7.1 km, 37 levels,   24 sec
LW: GFDL SW: GFDL

WRF-NMM 3.0   Beograd (44.77N 20.42E h=158m)
Start:01.12.2009 00 UTC   Valid:01.12.2009 12 UTC
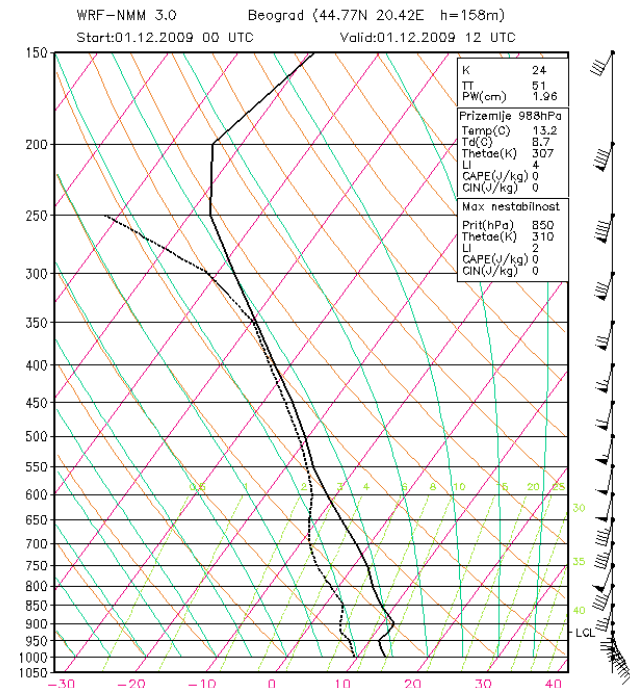
Computer facilities

- **P HXC 3000 bl Cluster**

- DDR Infiniband based
- 16 nodes (8 BL2x220c servers)
- 2 DL380 G5 head nodes
- Intel Quad-core Xeon E5450 processors
- 3.0 GHz (total of 128 compute cores)
- 6 GB of DDR2 memory
- Linux based OS RHEL 4
- LSF is integrated with SLURM
- Intel Compiler Suite 11.0.081
- HP MPI 2.02.05.

- **HP x3600**

- Single stand-alone HP rx3600
- Two Intel dual-core Itanium2 processors
- 1.6 GHz and 8 GB of DDR memory
- SLES 10 Linux OS
- Intel 9.1 compilers suite
- HP MPI version 2.02.05.

Department National Center for Climate Changes

- Resolution adopted by the WMO RA VI on Establishment of the RA VI RCC-Networok (among others SEEVCCC hosted by RHMSS participating in all three nodes)

- Link Established with the USA National Weather Service, Nation Centers for Environmental Prediction (NCEP, Washington) on collaboration in implementation and further development of the NMM-B unified multiscale model,

- Quasi-operational run of the monthly and seasonal prediction cycle based on ECMWF GPC seasonal prediction system (more info from Mr. Pejanovic),

Department for Hydrology

- Installment of Oracle 11g data base.

- Installment of Hydrological Operational system Whiskey (package for acquisition, processing, post processing report, on Oracle data base.

- Installment of hydrological forecasting model for small and medium catchments HBV
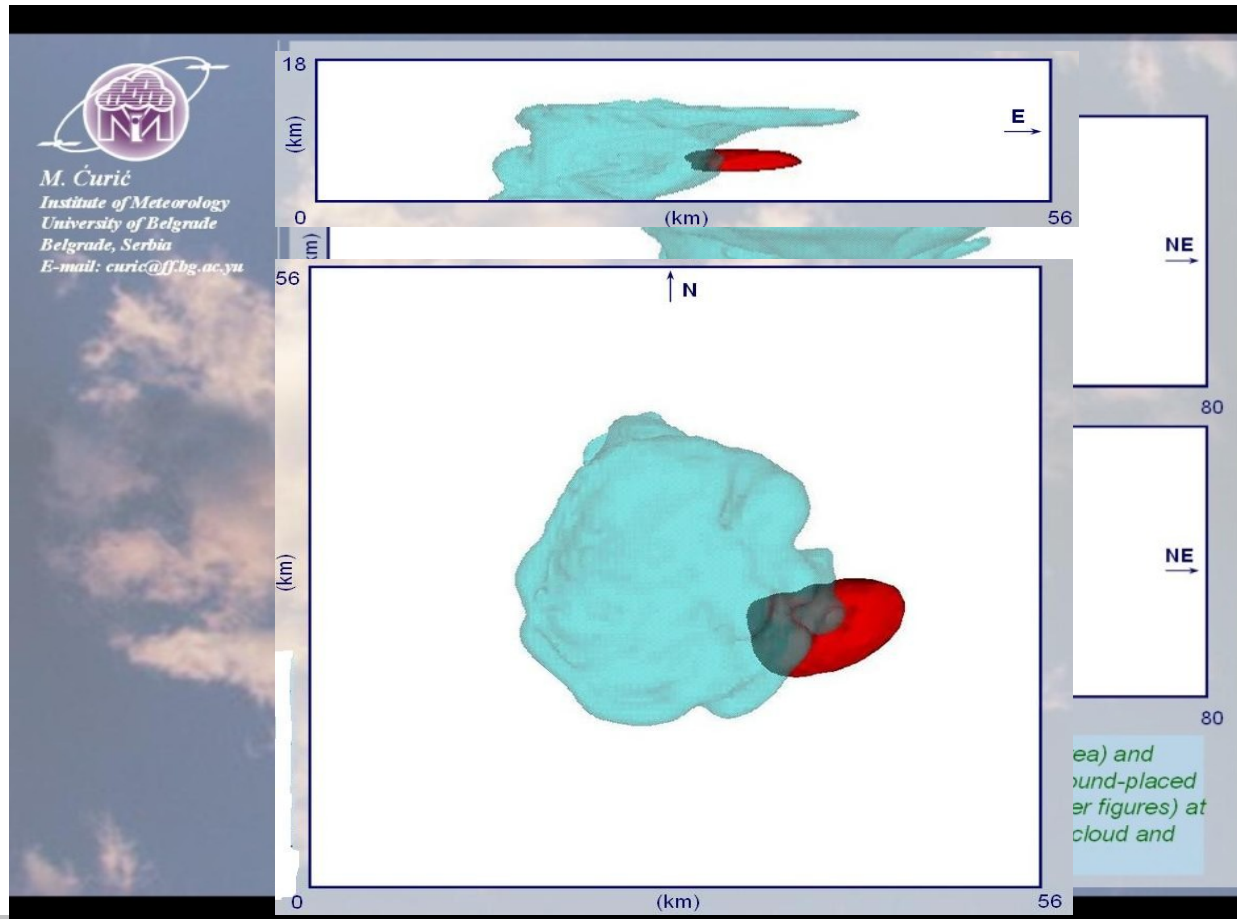
Department for Environmental Control

- **New** equipment for laboratory for water quality (cationic chromatograph)

- Pilot River Basin Management Plan for the Kolubara River Basin completed

Department for Hail Suppression

A 5-year project "Application of a mesoscale cloud seeding model for weather modification"

Participants:

• Institute of Meteorology, Faculty of Physics

• Republic Hydrometeorological Service of Serbia

Current meteorological/Climate related projects

- SINTA - SImulations of Climate ChaNge in the MediTerranean Area
  (SINTA-1 completed, SINTA-2 under negotiation, to start in 2009)
  Financed by the Italian Ministry for Environment and Territory,

- Disaster Prevention & Risk Management – strengthening of RHMS Weather Monitoring and Forecast System in the South Eastern Region of Serbia (under negotiation), to be financed by the Italian Ministry of Foreign Affairs,

- DMCSEE - Drought Management Centre for South East Europe. RHMS of Serbia, together with the Department of Water Management of Faculty of Agriculture, University of Novi Sad (UNSFA) as other copartner from the Republic of Serbia, participates in DMCSEE Project. This is the three year duration (2009-2011) project within the SEE Transnational Cooperation Programme,

- WMO Project: "Regional Cooperation in South Eastern Europe for meteorological, hydrological and climate data management and exchange to support Disaster Risk Reduction". This project emerged from the South East Europe Disaster Risk Mitigation and Adaptation Programme (SEEDRMAP), initiated in 2007 by the World Bank, the WMO and the United Nations Strategy for Disaster Risk Reduction (UNISDR),

- Initial National Communication on Climate Change – UNFCCC, financed by GEF/UNDP.

Current Hydrological Projects

- **Hydrological Flood Forecasting for Small and Medium Sized Catchments in Serbia – Pilot Phase** implemented in partnership with the Norwegian Directorate for Water Resources and Energy, completed in December 2008 – Second Phase, started in January 2009 to be completed by December 2010, both financed by the Norwegian Government through its Ministry of Foreign Affairs,

- **Danube River Enterprise Pollution Reduction (DREPR)** – financed under the WB – GEF Investment Fund.

Current Environmental Protection Projects

- **Danube River Enterprise Pollution Reduction (DREPR)** – started in 2005, expected to be completed by the end of 2010, financed from the World Bank – GEF Investment Fund,

- **Pilot River Basin Management Plan for the Kolubara River Basin** – in collaboration with the Swedish Environmental Protection Agency, started in October 2007, completed in last September, financed by the Swedish Environmental Protection Agency (86%) and Serbian Ministry for Agriculture, Forestry and Water Management - Water Directorate.

Current Hail Suppression Projects

- **Application of the cloud-resolving meso scale model on Cloud Seeding in Weather Modification** – 5-year project in collaboration with the Institute for Meteorology of the Faculty of Physics – University of Belgrade,

- **Hail Suppression Information System (HASIS) 3DI** – in collaboration with the Faculty of Electronics – University of Niš, financed by the Serbian Ministry of Science,

- **Stimulation of Precipitation** – in collaboration with the Faculty of Physics – University of Belgrade.

Cooperation with other national and international institutions

Singing of the Agreement of cooperation between the Republic of Serbia and EUMETNET, Exeter Great Britain, May-2009

- Serbia became a member of Meteoalarm
- Serbia became cooperating state of Eumetsat (Nov 2009)
- One of 21 initial founders of the Economic Interest Group of Eumetnet
- Activities regarded SEEVCC FAP
- Signed MOU s with several countries in SEE region
- Strengthening the cooperation with regional institutions in DRR project
- Participating in WMO-EC project SEEDRR
- Ministries conference „Climate changes and environment", Belgrade, November 2009
- ...

Meteoalarm

http://meteoalarm.eu

www.meteoalarm.rs

Medium term plan

- To upgrade and expand automatic station network

- To upgrade and expand automated rain gauge network

- To consider establishing the second upper air observing station

- To finish digitalization of observed data

- To unify data base in single web oriented data base

- To install MARS/ECMWF archive

- To purchase the software for visualization of NWP products

Medium term plan

- To set up super computing center in Serbia jointly with R&D Institute of Physics

- To establish ISO 9001 QMS

- To obtain ISO/EN 17025 certificate for laboratory for calibration of instruments

- To invest in modernization of radar network

- To invest in early warning and alerts infrastructure

- To establish assimilation cycle for data preprocessing

- To invest in HR development (training of personnel in use of remote sensing systems…)

Thank You!

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