The National Environmental Agency of Georgia

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SRNWP and Local Area Models' Simulations in Georgia

37th EWGLAM and 22nd SRNWP Meeting in Belgrade, 5th – 8th October 2015

Main types of synoptic processes and concerning weather conditions on the South Caucasus territory are following:

western type
eastern type
anticyclonic situation
frontal activities from the South



The capture of eastern and southern processes is the most difficult issue for NWP models, when main difficulties raised during the prediction of spatial-temporal distribution of precipitation fields.



Data and models

Observation (only surface) Satellite images; Global models: GFS, ARPEGE, ECMWF, GME LAMs:

- Environmental Modeling System Non-hydrostatic Mesoscale Model (EMS NMM) - initialized directly from the National Centers for Environmental Prediction Global Forecast System (GFS) with resolution 12 km and 31 vertical levels (operational);
- High Resolution Model (HRM) initialized from GME with resolution 14 km and 40 vertical levels (operational);
- Was replaced with COSMO from 2014;
- WRF ARW initialized from GFS with resolution 15 km (research) and 27 vertical levels;
- WRF NMM initialized from GFS with resolution 15 km, 5 km and 1.3 km
- No: Data assimilation
- No: Objective verification





Accumulated Total precipitation (shaded-mm) & MSLP (hPa) on 2015-10-01 15



domains

□ <u>d01</u>

ydef 67 linear35.286000 0.23735.286 - 50.928xdef 99 linear27.016000 0.2427.016 - 50.536

□ d02

ydef 75 linear38.900000 0.07938.900 - 44.746xdef 107 linear39.472000 0.0839.472 - 47.952

d03
 ydef 135 linear 40.419000 0.026 40.419 - 43.903
 xdef 191 linear 40.997000 0.027 40.997 - 46.127

WRF ARW vs. Observation

Total Precip (color,mm) 18204N0V2009

Total Precip (color,mm) 18204N0V2009



ARW_outer domain: 12-h precipitation based 00Z 04/11/2009 T+24 VT 18z04nov-06z05nov2009







ARW_inner domain: 12-h precipitation based 00Z 03/11/2009 T+48 VT 18z04nov-06z05nov2009



ARW_inner domain: 12-h precipitation based 00Z 04/11/2009 T+24 VT 18z04nov-06z05nov2009



Observation: 12-h precipitation 18z04nov-06z05nov2009

Meteorological Tasks- Applications in meteorology

- In the frame of SEE-GRID project two meteorological applications were developed:
- Regional scale multi-model, multianalysis Ensemble Forecasting System – (REFS)
- BOLAM, MM5, NMM, Eta models (multi-model system)
- The main aim was developing a post-processing procedure, based on capabilities of the Grid infrastructure, collection and analyses the outputs from all models for forecasts over the area of central and eastern Mediterranean.

Weather Research Forecast-Advanced Research Weather (WRF-ARW)

Forecasting over the territory of Georgia: air temperature, quantitative precipitations, surface maximum wind speed, etc.

Investigation peculiarities of interaction of airflow with complex orography of Caucasus **using WRF-ARW model**



