# WRF data assimilation application for Caucasus region

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Accurate weather forecast is very valuable, but also a very challenging for Georgia. Currently, two LAMs are working in the NHMS of Georgia at the National Environmental Agency - WRF-ARW /NMM in the operational mode and COSMO is still in test mode. Physical parameters of the model (cumulus parameterization, microphysics scheme, boundary layer scheme, land- surface physics, and short and long wave radiation physics) have been optimally tuned for the territory of Georgia, taking into account very complex orography of region. Estimation of reliability of the prognostic parameters gave us encouraging results, however, forecast of some large-scale synoptic processes and local phenomena are still inaccurate. From the other hand there are huge stream of meteorological observations such as observation from network of surface stations, radar coverage, NWCSAF products and GPS derived vapor data, which may significantly improve model initial state and short-range performance skill by 3D/4D assimilation. We are testing Model sensitivity to different type observations by usage of Gridpoint Statistical Interpolation (GSI) system for further Diagnostics and Tuning, also for Evaluation of model output by comparing the analysis and early frames of a forecast and Verify forecasts a posteriori. This type of research is conducted for the first time in the South Caucasus region and important from several point of view: refinement/improvement of the short-range forecast; synthetic analysis of observation data at a region scale brings a significant contribution in the study of circulation processes of the mentioned territory and deep understanding of conditions of atmospheric processes and the mechanisms of their interaction; It also a preparation stage for ensemble-variational hybrid data assimilation system.