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Verification of Numerical Weather Prediction Model Results for Energy Applications in Latvia

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A resolution to increase the production and consumption of renewable energy has been made by EU governments. Most of the renewable energy in Latvia is produced by Hydroelectric Power Plants (HPP), followed by bio-gas, wind power and bio-mass energy production. Wind and HPP power production is sensitive to meteorological conditions. Currently the basis of weather forecasting is Numerical Weather Prediction (NWP) models. There are numerous methodologies concerning the evaluation of quality of NWP results (Wilks 2011) and their application can be conditional on the forecast end user.

The goal of this study is to evaluate the performance of Weather Research and Forecast model (Skamarock 2008) implementation over the territory of Latvia, focusing on forecasting of wind speed and quantitative precipitation forecasts. The target spatial resolution is 3 km. Observational data from Latvian Environment, Geology and Meteorology Centre are used.

A number of standard verification metrics are calculated. The sensitivity to the model output interpretation (output spatial interpolation versus nearest gridpoint) is investigated.

For the precipitation verification the dichotomous verification metrics are used. Sensitivity to different precipitation accumulation intervals is examined.

Skamarock, William C. and Klemp, Joseph B. A time-split nonhydrostatic atmospheric model for weather research and
forecasting applications. Journal of Computational Physics. 227, 2008, pp. 3465–3485.

Wilks, Daniel S. Statistical Methods in the Atmospheric Sciences. Third Edition. Academic Press, 2011.