



WRF sensitivity experiments for the mesoscale NEWA wind atlas production run

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The New European Wind Atlas (NEWA) project aims to develop a new reference method for wind resource assessment and wind turbine site suitability based on a mesoscale to microscale model-chain. This new approach will produce a more reliable wind characterisation than current models, leading to a significant reduction of uncertainties on wind energy production and wind conditions that affect the design of wind turbines.

As part of the NEWA model chain, the configuration of the mesoscale model simulations, which forms the base of the new European Wind Atlas, is currently being decided. The Weather Research and Forecast (WRF) model is used. Many different model setups have been tested and compared to a baseline configuration and also evaluated against observations to obtain the most accurate settings in the context of a wind atlas. Among some of the parameters tested were: model version (3.6 and later versions), model domain size and position, number of vertical levels, atmospheric and sea surface temperature input (including ERA-5), land use maps and surface parameters (e.g. CORINE) and boundary layer parameterisations. We discuss the choices made and provide arguments and evaluation against observations (when possible) for each. We divide the various setup options according to their influence on the wind climate: the ones that do not influence the simulation, the ones with substantial impact and the ones made for other reasons.

We also present the preliminary results from a multi-domain simulation that covers all Europe using the final setup options.