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Development, evaluation and applications of regional reanalyses for Europe and Germany based on DWD's NWP models: Status and outlook

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In recent years, Germany's national meteorological service (DWD) has started several activities aiming at the development, evaluation and application of regional reanalyses as a tool for climate monitoring. The most frequently used realization is the 6 km deterministic reanalysis for the European CORDEX-domain (COSMO-REA6; lateral boundary conditions from ERA-Interim, based on 'nudging' for data assimilation) which was developed in a cooperation of DWD's Hans-Ertel-Centre for Weather Research and DWD. COSMO-REA6 currently covers the period since 1995, is openly available (https://opendata.dwd.de/climate_environment/REA/) and used in several applications (mainly in studies related to renewable energy). The dataset has been evaluated against independent datasets (station-observations and satellite data) and other reanalyses (e.g. Niermann et al., 2019). In this presentation, we will present updated evaluation results, esp. against the latest global reanalysis of the Copernicus Climate Change Service (ERA5), but also against the higher reolution COSMO-REA2 (covering central Europe). One focus of the current evaluation activities are wind parameters and related extreme events. A new version of the COSMO-reanalysis is currently in preparation. It will be based on a more recent COSMO-version and ERA5-boundary conditions, but will still apply nudging for data assimilation. In parallel, also first experiments are performed to prepare the next generation of DWD's regional reanalysis based on DWD's new ICON-model system (ICOsahedral Nonhydrostatic model). The presentation will also provide an overview over the status of these developments, including first evaluation results.

Niermann et al. (2019): Evaluating renewable energy relevant parameters of COSMO-REA6 by comparing against station observations, satellites and other reanalyses, Meteorologische Zeitschrift, accepted.