EMS Annual Meeting Abstracts
Vol. 15, EMS2018-614, 2018

Wind Surface European Database (WiSED): Compilation, Quality Control and previous analyses.

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The reliability of inferences resulting from the analysis of meteorological records leans on the quality of the observational data. The errors in the data can be roughly classified into three groups: random, systematic and rough errors. Random errors are unavoidable and inherent to the very nature of the measurements. Systematic errors are produced by instrumental scale shifts and drifts or any other potentially persistent factor that perturbs the measurements. Rough errors are associated with sensor malfunction or errors arising during data processing, transmission, reception or storage. It is important to minimize observational datasets errors, and thus, it is essential to develop procedures that allow to identify such, thereby improving data quality.

This work involves the compilation and quality control of a dataset of wind variables over the broad European domain as well as the impact of eliminating unreliable measurements from the dataset. The Wind Surface European Database (WiSED) spans the period 1900-2017 and it has been compiled from six different sources, either from national meteorological services: DWD (Deutscher Wetterdienst, German Meteorological Institute?) , KNMI (Koninklijk Nederland's Meteorologisch Instituut, Royal Netherlands Meteorological Institute) and SMHI (Sveriges Meteorologiska och Hydrologiska Institut, Swedish Meteorological and Hydrological Institute); or other international institutions: ECA&D (The European Climate Assessment Dataset), GTS (Global Telecommunication System) and NCAR (National Center for Atmospheric Research.

Once the initial dataset was compiled, quality assurance techniques are applied to detect and correct for random measurement errors, outliers as well as systematic changes (inhomogeneities) in sampling procedures.

The improved quality of the data and the high temporal and spatial resolution, as well as its spatial coverage, will represent a strength over previous products. The creation of such database would allow reliable to analyze both wind speed and direction variability over Europe from intra-daily to multidecadal timescales. Within potential relevant applications it is worth to mention: the identification of wind trends and subregions in Europe with homogeneous wind behaviour (regionalization), downscaling exercises, analyses of wind extremes, wind power assessment, etc. Moreover, the more accurate understanding of the wind variability based on quality data, the more realistic the evaluation of mesoscale simulations.

This work summarises the compilation, preliminary analyses of the surface wind speed and direction field from the original observations and the application of the initial steps of the quality assurance.