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Wind Surface European Database (WiSED): Compilation and Quality Control

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Analyses and simulation of surface wind over the broad European domain is a challenging task both in terms of data availability and modelling understanding and computational requirements. The New European Wind Atlas (NEWA) project targets this objective on both dimensions. Within the frame of NEWA, an extensive database of surface wind observations over the whole European domain is being developed, which will allow for analysing wind speed and direction variability over Europe from intra-daily to multi-decadal timescales. The improved quality of WiSED (Wind Surface European Database) and its high temporal and spatial resolution, as well as its spatial coverage, represent an enhancement over previous products.
Relevant applications of this future database are, for instance, the estimation of potential wind trends, identification of subregions in Europe with homogeneous wind behaviour (regionalization), downscaling exercises, analyses of wind extremes, wind power assessment, etc. Moreover, a better understanding of the wind variability and the availability of data over the broader European domain will facilitate the validation of mesoscale simulations.

WiSED originally feeds from several sources, either from national meteorological services or from international institutions. Time resolution ranges from hourly to daily and the time span covers the period of 1900-2016.

The creation of a database of such magnitude entails several challenges regarding the compilation stage. Generating a common format of records, collecting metadata or identifying and ensuring the elimination of overlaps and duplication between databases are examples of such initial issues. The main sources of difficulties encountered for the identification of overlaps are related to the use of different resolutions in the reported position of the station, possible changes of position, different identifiers or the reuse of this identifiers.

The quality of the data varies widely depending on the source. Thus, a common QC is applied once completed the data compilation. This QC procedure is structured into two phases. The first phase deals with problems related with data recording and management. The second phase is related to instrumental/measurement errors.

This work summarises the compilation, preliminary analyses of the surface wind speed and direction field from the original observations and the application of the first steps of a Quality Control (QC), presenting results of each phase.