



How to characterize uncertainties in regional reanalyses

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When using climate data for various applications, users are confronted with the difficulty to deal with the uncertainties of the data. For both in-situ and remote sensing data the issues of representativity, homogeneity, and coverage have to be considered. Employing data assimilation with numerical weather prediction (NWP) models, a synthesis of observations can be obtained with a reanalysis.

The question of uncertainty of the reanalysis remains, particularly for the highly resolved regional reanalyses (RRAs) which are expected to provide more realistic representation of extreme events (e.g., of precipitation). The EU FP7 project UERRA (Uncertainties in Ensembles of Regional ReAnalyses) contributes to this scientific question by providing an estimate of the uncertainties of an ensemble of RRAs produced by a number of national meteorological services. Driven by the global reanalysis boundary conditions, they cover the European domain, and employ different numerical weather prediction models and data assimilation systems.

In the course of this project, we explore following methods on characterizing the uncertainties of the RRAs:

- a) validation against observations at point of observation
- b) validation against gridded fields (interpolated observations)
- c) validation against global reanalysis
- d) ensembles with probabilistic uncertainty characterization
- e) process oriented validation, including user application

We discuss the value of the methods for users of wind and solar energy, forestry and agricultural applications.