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Theme 6 [SPACE]



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Uncertainties in Ensembles of Regional Re-Analyses

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The EU Brief was published in the "Parliament" Magazine, Issue 429, 7 March 2016. It can be found in the Parliament on the Dods web site:

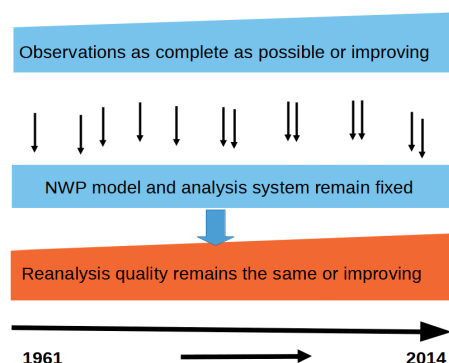
<https://www.theparliamentmagazine.eu/articles/magazines/issue-429-07-march-2016> page 43.



The UERRA Project contributes to the detailed understanding of the European state of the Climate

UERRA is a FP7 pre-operational Copernicus Climate Change Service (C3S) Project: Uncertainties in Ensembles of Regional ReAnalyses.

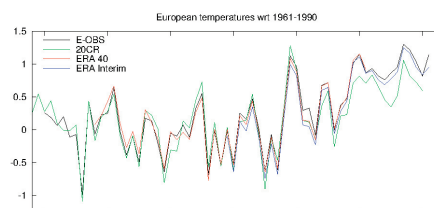
UERRA aims to Reanalyse the recent atmospheric climate over Europe. We have developed our **Reanalysis** systems for high resolution – about 11 km between each analysis data grid point – and with Ensemble systems. The Regional Reanalyses will provide a unique tool for all sorts of climate analysis for the recent climate and climate trends..



The different models and data assimilation systems and ensembles are illustrated below.

UERRA develops methods and software to **estimate the accuracy and uncertainty** in the Regional Reanalyses. Many different observations are used to evaluate the quality and the differences in the Ensembles also give uncertainty information.

Different Reanalyses and data sets can be compared as shown below.



Temperature records from 1950 to 2010 (every 10 years marked) from different reanalyses and E-OBS gridded observational data set with respect to the climate norm (source KNMI) are shown above.

The observational data is the back bone of all Reanalyses, so UERRA has a **Data Rescue** (and Development) activity and some 8M data have been digitised from several countries in and around Europe and on a sub-daily scale.

Data services including **visualisation services** have been built and adapted to a common UERRA archive. A common set of meteorological parameters from the Met Office, SMHI, University of Bonn and Météo-France from the new UERRA reanalyses are being archived from 2016.

Users of Regional Reanalyses need the higher spatial resolution than available

Background:

Reanalysis: Gridded spatial meteorological data sets from the recent past up to today based on combining observations with fixed Numerical Weather Prediction (NWP) model and Data Assimilation system.

Data Assimilation: Using observations to update the modelled state of the atmosphere using a first guess, usually a short range forecast.

Data Rescue: Scanning manual observation records and digitising them including quality control

Ensembles: Different realisations, data sets of the state of the atmosphere valid for the same time which are possible within the estimated uncertainties of the knowledge of the state of the atmosphere.

hitherto. Long time periods of 30-50 years and hourly resolution and parameters at several levels in the bottom few 100 meters of the atmosphere are required, particularly for renewable energy. High resolution data sets are used to drive other application models like snow, hydrology or road conditions and for downscaling for detailed studies. Regional Climate prediction Models need to be verified against multi-decadal high resolution Reanalyses.

The different Reanalysis streams together with Ensembles and subsequent data services are prepared to be able to continue and evolve in an **operational Copernicus service** and the results stored and disseminated in the Copernicus Data Store.

