



European high resolution Regional Reanalyses in UERRA and the Copernicus Climate Change Service (C3S)

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Within the EU FP7 SPACE programme regional European Reanalyses systems were developed and produced for multi-decadal periods by 4 partners (SMHI, Met Office, Meteo-France and University of Bonn/DWD). SMHI coordinated the project and produced an 11 km grid resolution European Reanalysis from 1961. It has continued to near real time within the Copernicus programme (C3S) where SMHI is contracted to develop and produce a regional Reanalysis for Europe within the Copernicus climate change services (PRECISE). Météo-France and Met Norway are also working in the Project.

The UERRA system run by SMHI is with the ALADIN model in the HARMONIE environment developed within the HIRLAM modelling consortium. The horizontal grid is at 11 km and there are 65 model levels up to 10 hPa. Conventional observations from ECMWF MARS are used with complemented with extra surface observations from some countries. The global ERA-Interim (and ERA-40) reanalyses provide lateral boundaries and large scale forcing through an extra constraint in the 3D-VAR analysis. The reanalysis data are freely available through the MARS data services at ECMWF (in GRIB-2).

The 11 km resolution provides much more detail and realistic local features than is possible in the about 78 km global reanalysis. The UERRA partners have carried out an extensive evaluation of the quality and uncertainties of the SMHI reanalysis as well as of the Met Office and University of Bonn ones and the Météo-France surface parameter reanalysis. There both benefits and uncertainties which vary over region and with horizontal scales.

The PRECISE system for the C3S European Reanalysis is being developed and contains several enhancements. The resolution is roughly doubled, the cycling in time will be 3 hours instead of 6 and most importantly, there will be an ensemble assimilation coupled with the deterministic high resolution run.