



## High-resolution regional reanalysis for Europe and Germany: Evaluation and Applications

Sabrina Wahl (1,2), Jan Keller (3), Christian Ohlwein (1,2), Andreas Hense (1), Petra Friederichs (1), and Susanne Crewell (4)

(1) University of Bonn, Meteorological Institute, Bonn, Germany (wahl@uni-bonn.de), (2) Hans-Ertel Centre for Weather Research - Climate Monitoring Branch, (3) Deutscher Wetterdienst, Offenbach, Germany, (4) University of Cologne, Meteorological Institute, Cologne, Germany

Global and regional reanalyses are an important tool for climate monitoring and can provide input for the development of adaption or mitigation strategies. Dynamical reanalysis systems use a numerical weather prediction model with a fixed data assimilation scheme. The resulting 4-dimensional fields represent our best estimate of the atmospheric state physically consistent in time and space as well as between the meteorological variables. Regional reanalyses allow high spatial and temporal resolutions for a limited area which is important for decision makers on the regional or local level.

The Hans-Ertel Centre for Weather Research - RA4 Climate monitoring and diagnostics - has developed a regional reanalysis system for Europe and Germany. The system is based on the operational COSMO-EU and COSMO-DE models and uses a nudging scheme for the assimilation of observational data. The European reanalysis covers the CORDEX EUR-11 domain with a horizontal resolution of 6km (COSMO-REA6). The reanalysis is available for the twenty year time-period 1995 to 2014. Furthermore, a reanalysis system on the convection allowing scale was setup for Germany and the neighboring countries with an increased grid-spacing of 2km (COSMO-REA2). Additional to the nudging of standard observations, COSMO-REA2 uses latent heat nudging for the assimilation of radar derived rain rates. Data from COSMO-REA2 is available for the eight year period 2007 to 2014.

This presentation focus on the evaluation of the COSMO-REA6 and COSMO-REA2 reanalyses and inter-comparison with other products, e.g. global reanalyses, downscaling or gridded data sets. We will discuss the use of independent data and new verification methods for high-resolution model output. Moreover, we will show the use of regional reanalyses for climate monitoring, climate services and impact models.