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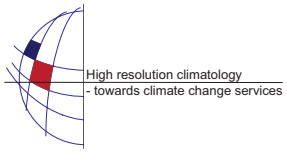

Evaluation of precipitation forecasts over the Alps using the D-PHASE multi-model ensemble

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In the scope of the WWRP Forecast and Demonstration Project D-PHASE a real-time end-to-end forecasting system for heavy precipitation and subsequent flood events in the Alpine region was set up. Based on probabilistic and deterministic atmospheric and hydrological models as well as on nowcasting tools, warnings were issued for specified river catchments. The forecast data of the participating numerical models, including high resolution convection resolving models and models with parameterized convection, are stored in a central data archive in the World Data Center for Climate in Hamburg. They provide a huge amount of data which is well suited to investigate the use of atmospheric/hydrological models for flood forecasting in mountainous regions.
Various methods are applied to get an objective verification of the model forecasts and their ability to correctly predict precipitation amounts and spatial patterns. The focus is hereby on a comparison of models with different horizontal mesh-sizes. The evaluation is done for the full D-PHASE observation period (DOP, June – November 2007) and for the whole D-PHASE domain covering basically the Alpine region. Amongst others, neighborhood verification techniques, where the forecast is evaluated on increasing spatial scales by defining an event based on the statistics of moving window domains, are applied with gridded VERA data serving as reference observation. The respective VERA analyses have been calculated by the University of Vienna based on the Joint D-PHASE/COPS (JDC) data consisting of more than 1000 GTS stations and more than 10000 non-GTS stations collected from national and regional weather services of Central Europe. A key feature of VERA is that no first guess is necessary to run the analysis - this makes the system Numerical Weather Prediction (NWP) model independent and therefore suitable for verification.
This way, the multi-model ensemble of NWP models contributing to D-PHASE is evaluated for the highly complex Alpine terrain of the D-PHASE domain and the ability of different model systems to correctly predict precipitation is assessed.