Operational Meteo-Hydrological Predictions for the Northern-Alpine Ammer region during the MAP D-Phase

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Due to the extremely fast response of river runoff to precipitation events, early flood warning in Alpine catchments can only be achieved by precipitation forecasts. The early warning system currently developed at IMK-IFU consists of numerical high resolution weather forecasts, which drive a distributed hydrological model. While MM5 is used for an operational 72h prediction twice daily down to 3.75x3.75 km^2 resolution, WRF is used for forecasts down to 5x5 km^2. The distributed hydrological water balance model WaSiM is used for transforming the meteorological forecast into a river runoff prediction. Our investigations focus on the Alpine catchment of the river Ammer (610 km^2) in Upper Bavaria, extending from North of Garmisch-Partenkirchen to the Lake Ammersee. The river runoff forecast is initialized by the result of a parallel performed, station based hydrological simulation which is driven by on-line retrieved meteorological observations. The water storage in the unsaturated zone, snow, and river channels is updated daily and the interplay between snow melt, soil conditions and precipitation can be taken into account.

Results of the twice daily performed MM5 and comparisons to ground based observations are shown for the southern Bavarian alpine region (mainly convective precipitation events in the D-Phase period). These results are shown with respect to forecast length and initialization time (00/12 GMT).

Additionally, the strategy of combined hydro-meteorological modeling is discussed. Three-day WaSiM river runoff forecasts for the Ammer catchment, are shown for the MAP D-Phase period June-October 2007.