Integrated hydro-meteorological forecasts application in an operational environment

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The availability of quantitative precipitation forecast (QPF) for operational use in real-time mode made it possible to develop an integrated hydro-meteorological forecast system to provide stream flow prediction over the Nattai River Catchment for water resources management. This system is nested in a robust forecasting framework Mike FloodWatch that integrates data management, monitoring, forecast modelling tools and dissemination methodologies into a single, user friendly GIS environment (DHI). The forecasting system uses the Short Term Ensemble Prediction System (STEPS) to generate ensemble rainfall forecasts that are based on a blend of radar mosaic and NWP rainfall forecast for lead times out to 6 hours. This gridded rainfall product provides an ensemble of spatially distributed rainfall fields over the entire catchment area, replacing the scenario based catchment average rainfall forecast. This meteorological forecast is utilised to run the hydrological models including both the rainfall run-off models and the river routing models. The physically-based, fully distributed hydrological model, Mike SHE was chosen for the above described forecasting framework. The European Hydrological System (Mike SHE) is a flexible hydrological modelling framework, that permit changes in the model structure including both conceptual and physically based process descriptions. Mike SHE also permits the use of grid-based precipitation information from weather radar and numerical weather models as well as providing a direct integration to the forecasting shell Mike FloodWatch. The findings from the case study Case study presented in this paper describes the application of this integrated hydro-meteorological forecasting system in an operational environment.

Key words: hydro-meteorological forecast, STEPS, Mike FloodWatch, Mike SHE