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Operational Water Resources Forecasting System for The Netherlands

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During periods of low flows of the Rhine and Meuse Rivers and/or agricultural drought the National Coordinating Committee for Water Distribution of the Netherlands has to decide how the available surface water is used and allocated between different functions like safety (e.g. peat-levee stability), reduction of salt water intrusion, drinking water and agriculture.

Since 2009, a real time forecasting system is operational and provides daily nationwide forecasts on the total fresh surface water supply, groundwater levels and saturation of the root zone at 250x250 meters using a surface water model coupled with a MODFLOW-MetaSWAP model of the saturated–unsaturated zone and with a lead-time of 10-30 days.

In 2011, new forecasts products like a spatial groundwater anomaly plots for the weekly drought bulletin were introduced. Besides this product, a no rain scenario with a leadtime of 30 days and schematic status displays were also introduced. These products turned out to provide usefull information to support decision making and inform the public during the low period and unusal dry start of 2011 in the Netherlands and Rhine and Meuse basin.

The changing patterns in groundwater anomaly give good insight into the hydrological behaviour of the Netherlands. The no-rain scenario provided usefull information to decide on maintaining increased target levels of Lake IJssel and Lake Marker (e.g. the main fresh water supply basins in the Netherlands). Displays of water quality infomation (chloride concentrations) helped to gain insight on the extend of salt water intrusion in the South-Western part of the Netherlands. The schematic status displays provide the water managers a quick and easy to understand overview of the hydrological status cumulating all the underlying detailed information.