hydrometeorological innovative solutions

HiWat

Hydrometeorological Information System for water management

HiWat is a powerful decision support system for authorities and companies involved in water management and flood mitigation. It provides high quality and high resolution information about the meteorological and hydrological conditions at the region of interest in order to optimally monitor rainfall evolution and water levels. HiWat facilitates water management, offering in one single system a full solution embracing data management and data quality control, data processing, product and alert generation, and visualization of data and products.

Modular architecture

HiWat is a highly modular system, easily adaptable to the needs of specific end-users and existing operating systems, sensors, and databases. Main modules are the Data Manager, the Product Generator, and a state of the art visualization application. The **HiWat** system manager controls, centralizes, and optimizes all tasks related to system activity. **HiWat** is designed to easily integrate data from different observing systems to fully exploit the combined information content and thus generate high quality products based on the best available information.

HiWat Product Generator

HiWat produces a number of hydro-meteorological products based on observations and hydrological modeling. Quantitative precipitation estimation and quantitative precipitation forecasts are derived from radar observations in combination with rain gauge networks. These precipitation products are used as input for the generation of high resolution hydrological products. HiWat product generation is based on technology from leading research institutes: the Center of Applied Research in Hydrometeorology (CRAHI-UPC) from the Polytechnical University of Barcelona and McGill University*.

Quantitative precipitation estimation and forecasting

Precipitation intensity and accumulated precipitation, for customizable basins and time spans, are provided with high spatial and temporal resolution for the region of interest. Leading edge radar technology is used to correct for non-meteorological echoes, to determine the optimum relationship to translate reflectivity into precipitation at the ground, and to calibrate the radar derived rain rate with rain gauge data. Short term forecasts of precipitation intensity and accumulated precipitation are generated using extrapolation techniques extending the lead time for decision making up to two hours in the future.

Hydrometeorological products

Water discharges in the basin of interest are simulated and forecast on the basis of the quantitative precipitation products. Alerts are designated to specific regions of the river system on basis of observed and predicted precipitation intensity, precipitation duration, and the probability of the occurrence of such an event for the given basin. These alerts can be issued either on a pixel basis only based on radar observations or as an aggregated warning for the river system as a whole taking into account the topography of the basin.

HiWat provides the possibility of implementing a distributed hydrological model to simulate water flow taking into account the geomorphological properties and the topography of the basin. Mean and peak discharges are forecast with higher reliability and larger lead times in comparison to the radar based products providing the basis for optimized decision making.

HiWat alert generator

HiWat automatically generates alerts when predefined warning levels are reached in selected regions. All alerts can be adapted to the user's needs and warning levels are customizable. Alerts are visualized on the **HiWat** display and more detailed information is provided via text messages.

Visualization

The **HiWat** visualization system has been designed to reduce the complexity of the information and to allow for quick and easy overviews of current and future weather situations for optimized decision making. Customization and navigation are facilitated by well-designed, intuitive, visually pleasing and friendly graphical user interfaces.

HiWat
FEATURES

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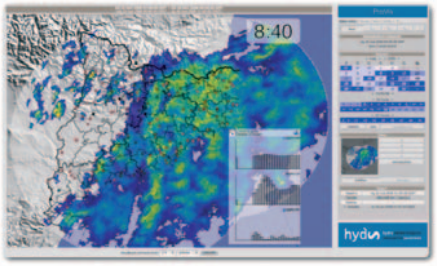

HiWat key features

Multi instrument support (integration of different sensors, e.g. lightning, LLWS, rain gauges, ...)

HYDS data management solutions

Modular architecture

Series of hydrometeorological products

Visualization of products and observations with customizable, graphical user interfaces

Automatic alert generator

Google Earth integration

Platform independence

Hydrometeorological Products

Bright band contamination detection

Optimum Surface precipitation map

Advanced radar-raingauge combination

Separation of convective and stratiform precipitation

VPR determination and correction (Vertical Profile of Reflectivity)

Double Z-R

Average precipitation intensity over customizable basins and time spans

Automatic alerts for predefined basins and customizable thresholds

Precipitation accumulation maps for different time periods

Precipitation accumulations for predefined river catchments

Pixel based rainfall intensity warnings

Aggregated rainfall intensity warnings

Hydrological products

Discharge alert based on pixel basis

Aggregated discharge alert

Forecasting products

Precipitation tracking and extrapolation

Short term forecasts of accumulated precipitation

Hydrological Modeling

Adaption and integration of distributed hydrological model at basin

Calibration of hydrological model

Forecast of discharges and peak discharges

Automatic alerts for predefined basins and customizable thresholds

*HYDS has exclusive technology license agreements with McGill University and CRAHI-UPC

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