Flood Risk DSS
Hydroview: River basin module

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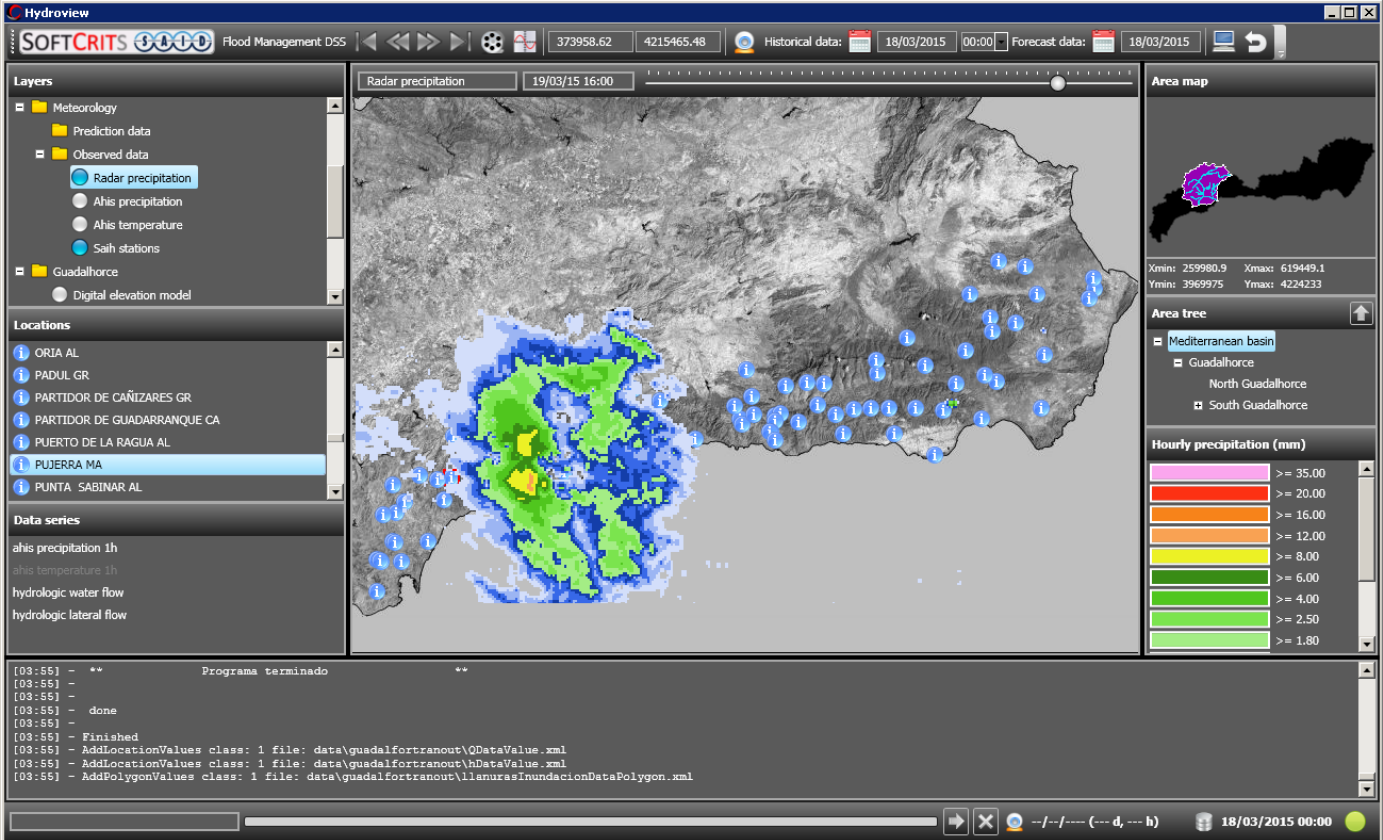University of Málaga
19th October, Málaga

Hydroview - overview

- GIS-based decision support system (DSS) for integrated simulation of river basins in flood episodes.

- Simulates different models of the basin:

  - WiMMed → physically-based distributed hydrological model.

  - Guadalfortran → 1-D hydrodynamic model.

- Simulations consume **historical** and **forecast** data series (e.g. climate data) to anticipate the river basin response.

- Dam releases are integrated in the simulation downstream.

Graphical User Interface (GUI)

- Include open-source GIS components (MapWinGIS)

Simulation - workflow

- Complex tasks underlying a simulation simplified to users:
  - Access to external servers to collect input data.
  - Data conversion to formats required by simulation models.
  - Coordinated execution of different models.
  - Adaptation of results for their visualization.
  - Storage of variables in database.
 - Refreshing GUI elements.
  - ...

Simulation – Climate input data

- Simulations based on **climate forecasts**:
  - HIRLAM input data provide 72-hour predictions (precipitation, temperature, pressure and cloudiness)
- Simulations based on **observed values**:
  - Hidrosur provides hydro-meteorological data (+100 control stations in the Mediterranean basin)
- Simulations based on both types of input information:
  - N hours of **observed data** followed by M hours of **predictions**
- HIRLAM and Hidrosur data catalogs supplied by CMAyOT

Simulation – Dam data

- Dams outflow can be configured for simulation:
  - Outflow = 0
  - Outflow = inflow
  - Outflow = data series (typed or loaded from file)
- Simulations produces dams inflow → exported to file.
- Current basin model considers Guadalhorce and Guadalteba as one single reservoir (flood scenario), and Conde del Guadalhorce
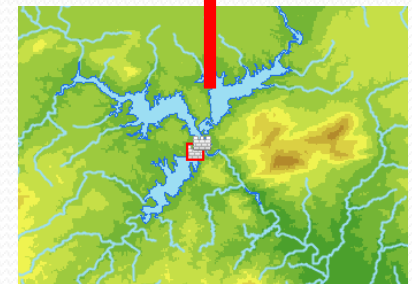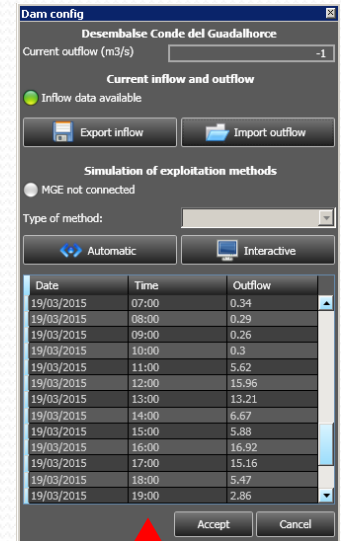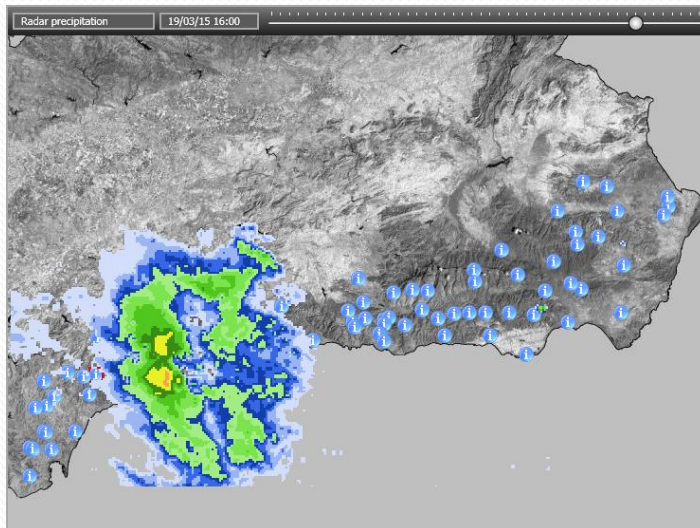
Simulation – Results visualization (I)

- Graphical representation (charts):
  - Input or simulated time data series.
  - Any combination of **points/locations** and **supplied variables.**
  - Can be exported to CSV files.
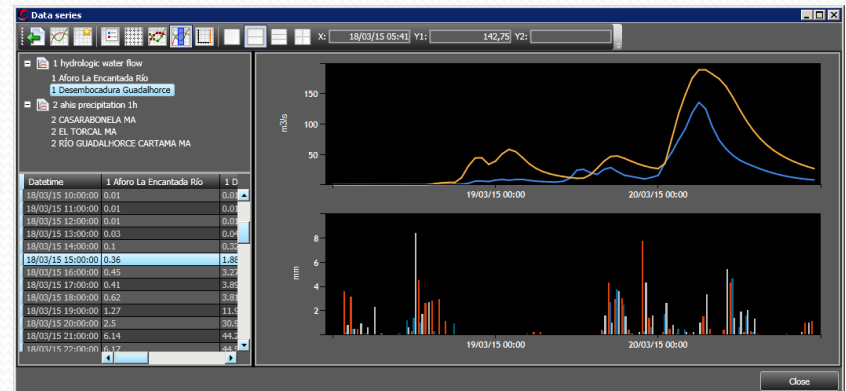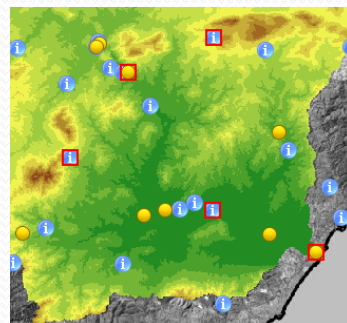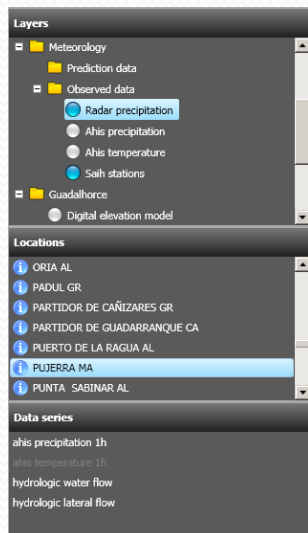
# Simulation – Results visualization (I)

- **Animations** of time-based 2D layers, such as precipitation or simulated flood plain.

Customization

- Hydroview modular architecture enables its extension and adaptation to different river basins with moderate efforts.
- Simulation models and data consumers managed as external components that use XML to interact with the core libraries.
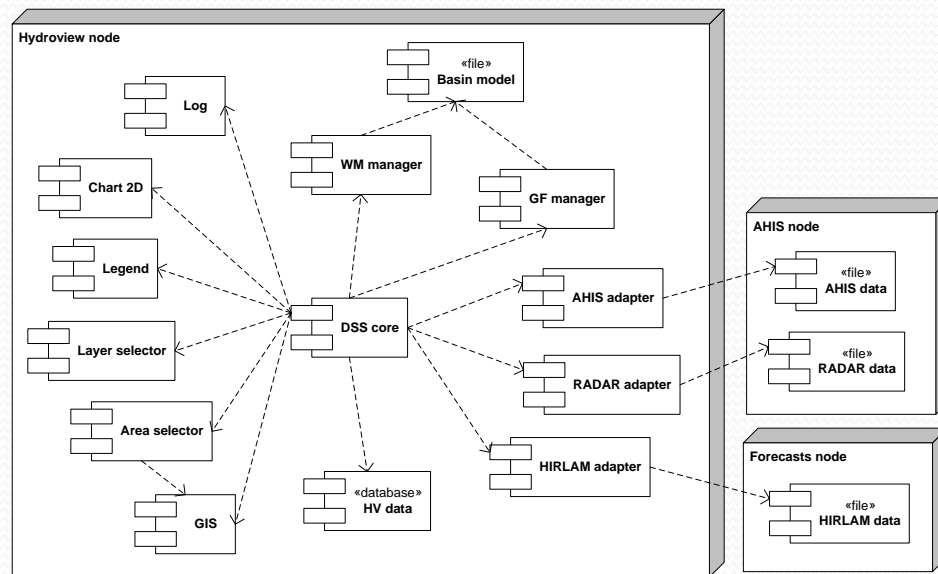
Thank you for your attention

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Live Demo

- Initial date: 19/03/2015 00:00
- End date = 22/03/2015 00:00
- Simulation with observed data
- 1st simulation : dams outflow = dams inflow (-1)
  - Export dam inflow to file.
  - Charts to show the flow downstream and dam parameters
  - Flood area animation