

# Flood Risk DSS

## Hydroview: River basin module

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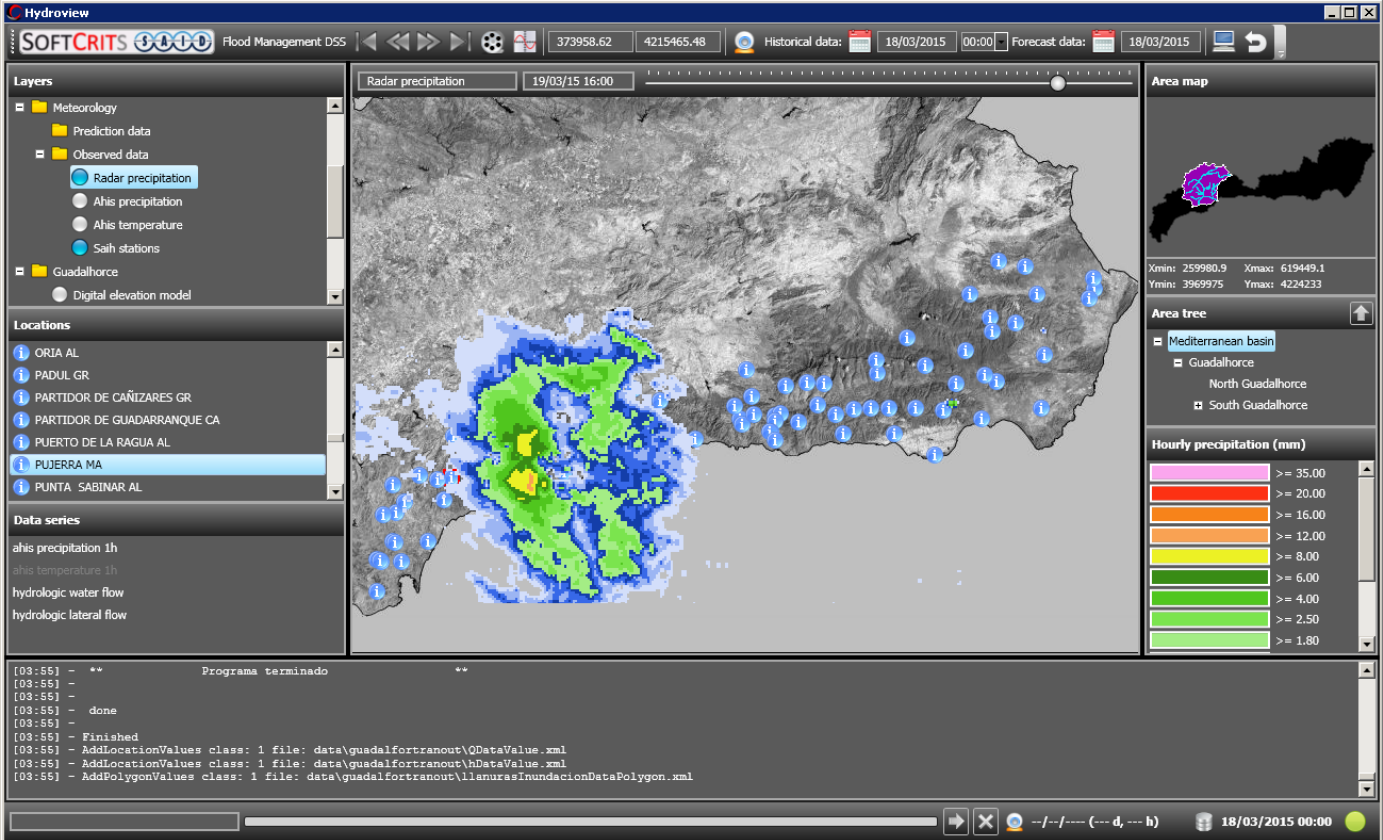
# Hydroview - overview

- 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)



The screenshot displays the Hydroview software interface. At the top, the title bar reads 'Hydroview' and the main menu bar includes 'SOFTCRITS SAID Flood Management DSS'. The interface is divided into several functional areas:

- Toolbar:** Located at the top, it contains navigation and data control icons, along with fields for coordinates (373958.62, 4215465.48) and dates (18/03/2015).
- Layers:** A panel on the left lists data sources such as 'Meteorology', 'Prediction data', 'Observed data', and 'Guadalhorce'. 'Radar precipitation' is currently selected.
- Locations:** A list of geographical points including ORIA AL, PADUL GR, PARTIDOR DE CAÑIZARES GR, PARTIDOR DE GUADARRANQUE CA, PUERTO DE LA RAGUA AL, PUJERRA MA, and PUNTA SABINAR AL.
- Data series:** A list of variables like 'ahis precipitation 1h', 'ahis temperature 1h', 'hydrologic water flow', and 'hydrologic lateral flow'.
- Map:** The central display shows a radar precipitation map over a topographic background. A legend on the right indicates precipitation intensity levels in mm, ranging from 1.80 to 35.00.
- Area map:** A small inset map in the top right shows the region's location within a larger context.
- Area tree:** A panel on the right shows a hierarchical view of the 'Mediterranean basin', including 'Guadalhorce' and its sub-areas.
- Log area:** A text window at the bottom left shows system messages, including 'Programa terminado' and file paths.
- Status bar:** The bottom right corner displays the current date and time: '18/03/2015 00:00'.



# 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.
  - ...

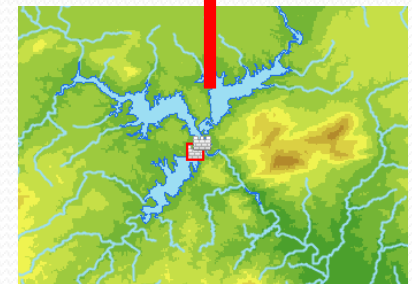
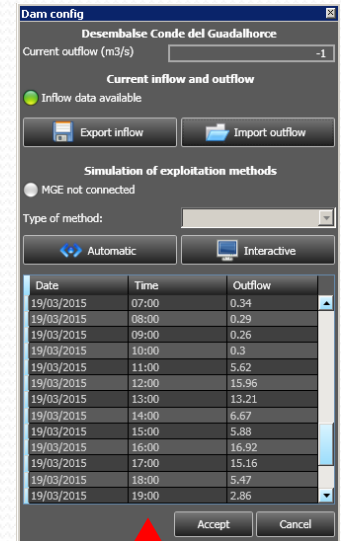


# Simulation – Climate input data

- 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

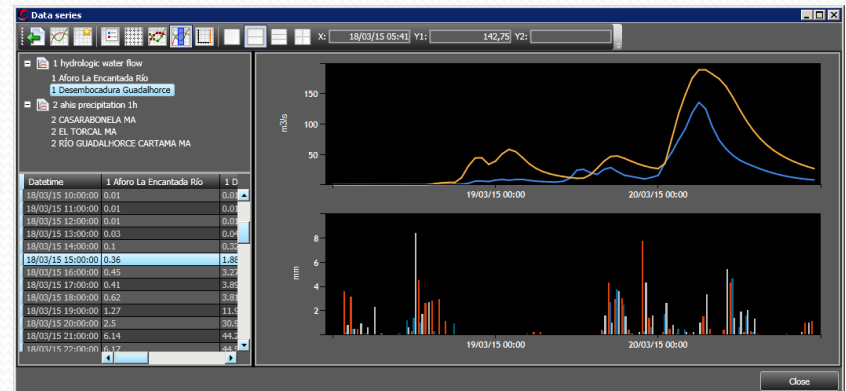
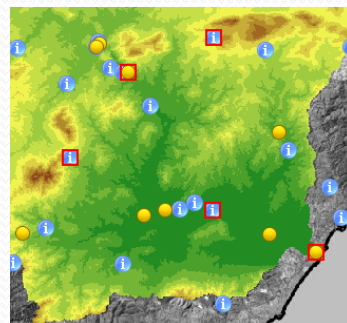
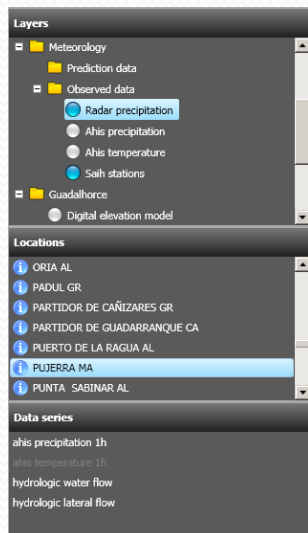
- Dams outflow can be configured for simulation:
  - Outflow = 0
  - Outflow = inflow
  - Outflow = data series (typed or loaded from file)
- Simulations produces dams inflow → exported to file.
- Current basin model considers Guadalhorce and Guadalteba as one single reservoir (flood scenario), and Conde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





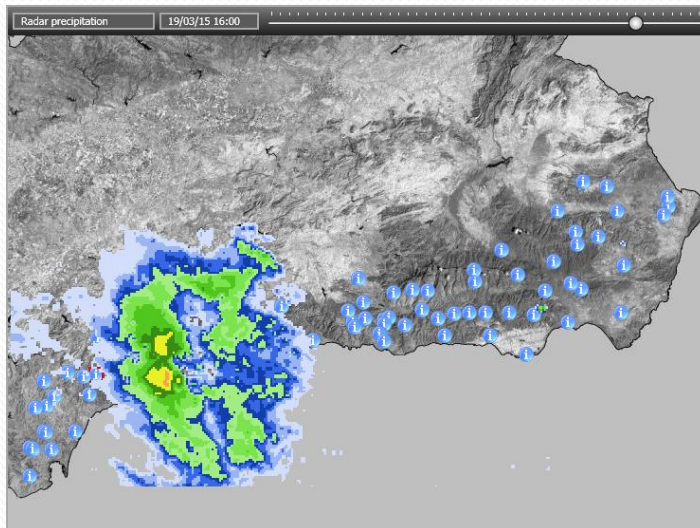
# Simulation – Results visualization (I)

- 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)

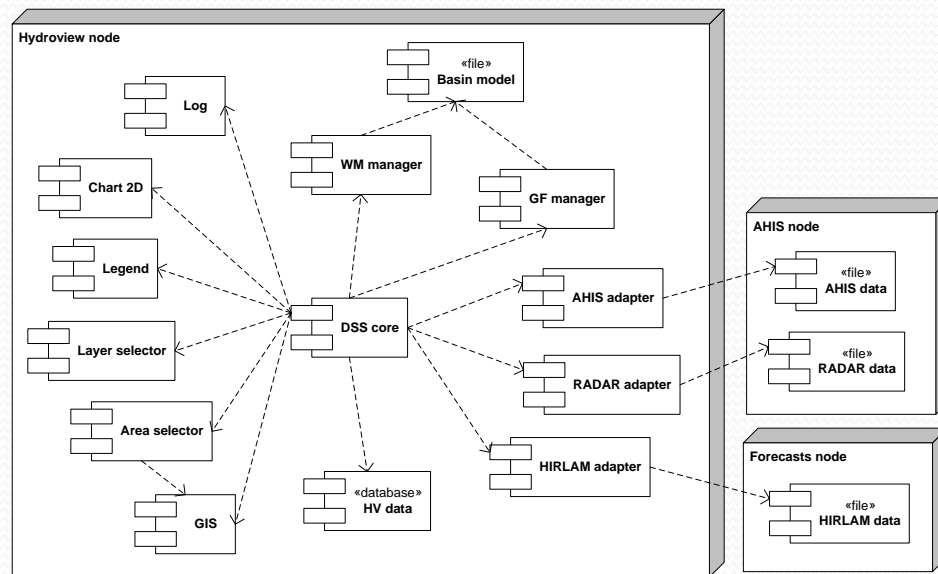
- **Animations** of time-based 2D layers, such as precipitation or simulated flood plain.





# 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

[www.said-project.eu](http://www.said-project.eu)



# Live Demo

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

