GRP and OTAMIN

Operational tools for real-time flood forecasting, with uncertainty quantification

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For more information

- about GRP
https://webgr.inrae.fr/en/software/grp/

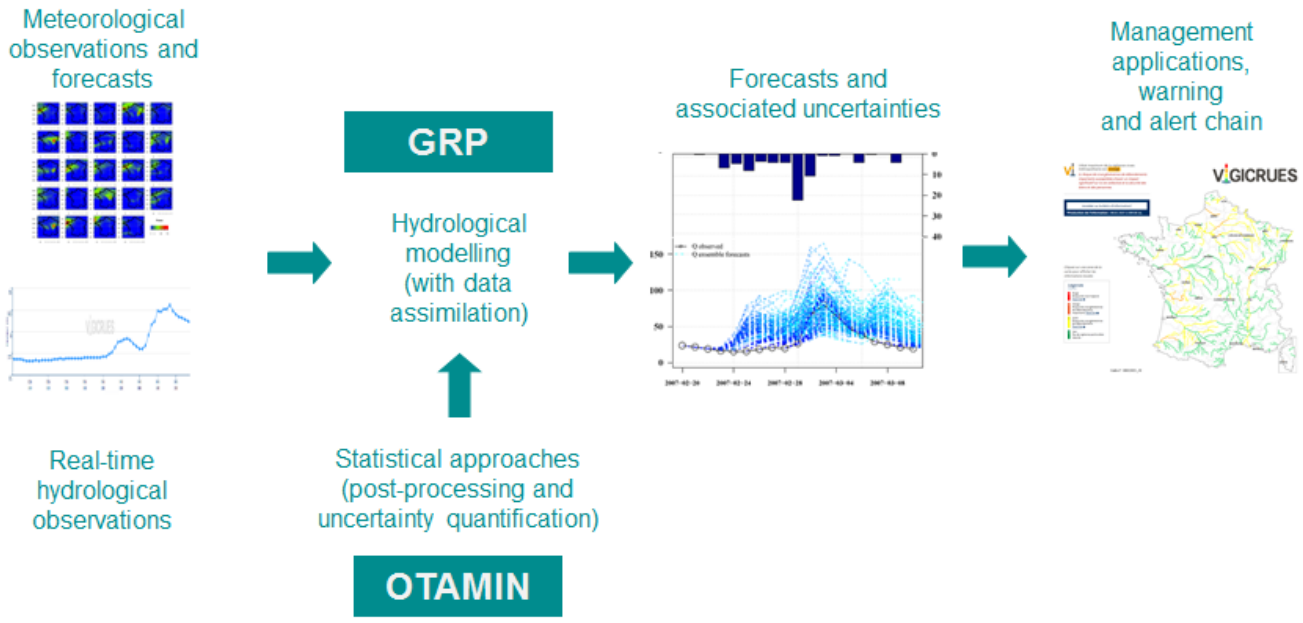
- about OTAMIN
https://webgr.inrae.fr/en/software/otamin/

The GRP software for real-time flood forecasting

- Flood forecasts at gauged stations
- Based on hydrological modelling
- Built-in assimilation procedure
- Codes in Fortran and R

The OTAMIN software to quantify uncertainty

- Empirical estimation of predictive uncertainty due to the hydrological model
- Calculation of confidence intervals associated with forecasts
- Codes in R



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https://www.jouy.inrae.fr/hycar
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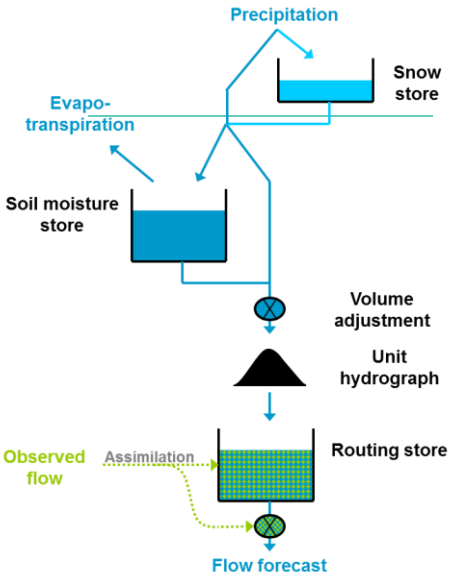


GRP hydrological model

The GRP hydrological model

⇒ Continuous conceptual model

⇒ Spatial resolution: Lumped or semi-distributed

⇒ Time resolution: From 5 min to 1 day

⇒ Inputs: Precipitation and temperature, streamflow for assimilation

⇒ Snow module (Cemaneige)

⇒ Widely used by operational flood forecasting services in France

The OTAMIN uncertainty quantification approach

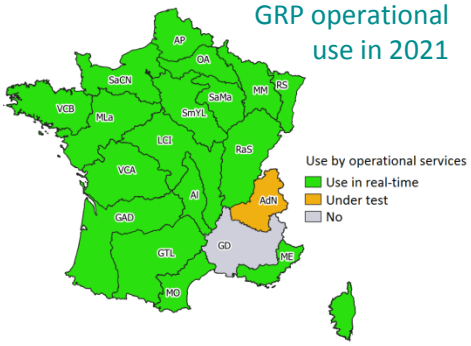
⇒ Analysis of model errors on historical series

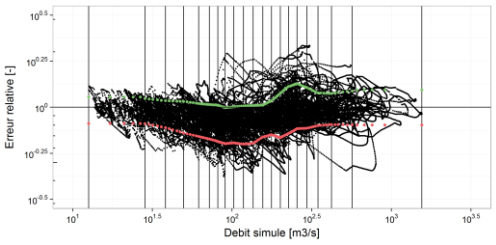
⇒ Statistical processing by flow range

⇒ Conditioning by hydrological situation (e.g. rising/falling limb)

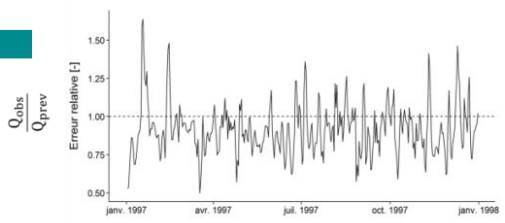
⇒ Derivation of confidence intervals on forecasted flows by lead time

GRP operational use in 2021





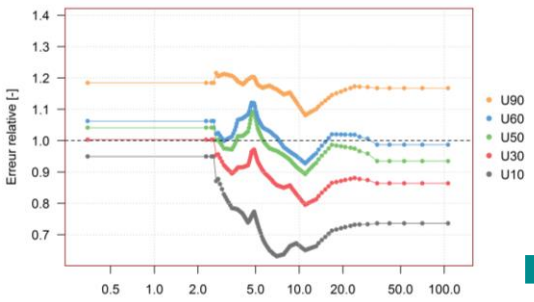
Relative errors as a function of forecasted flows



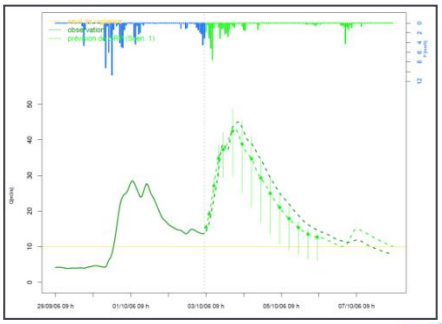
Relative flox errors over the historical period

OTAMIN flowchart

Error quantiles



Confidence intervals on streamflows forecasts



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