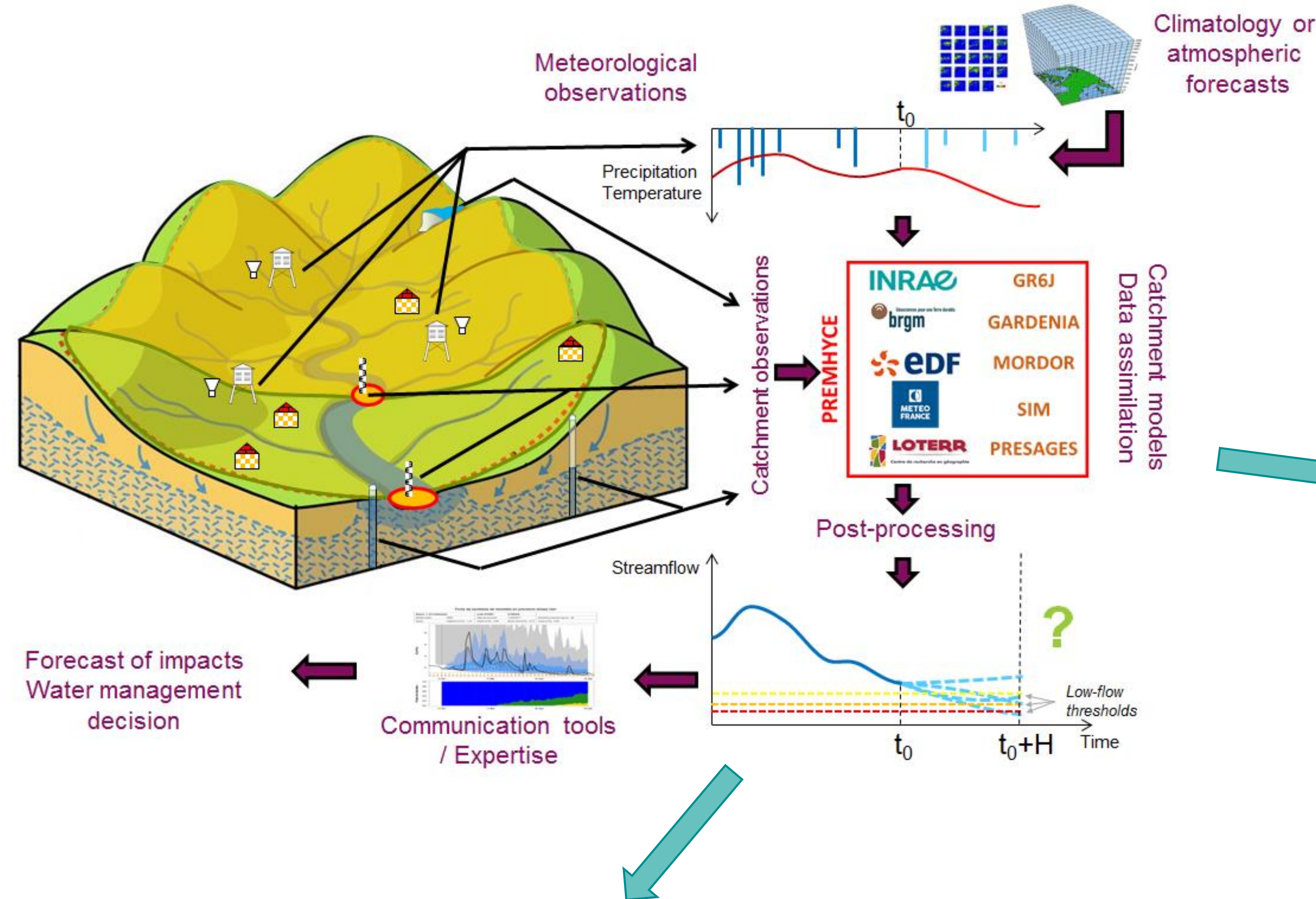# Integrated chain for the hydrometeorological forecasting of low flows and droughts in France – The CIPRHES project
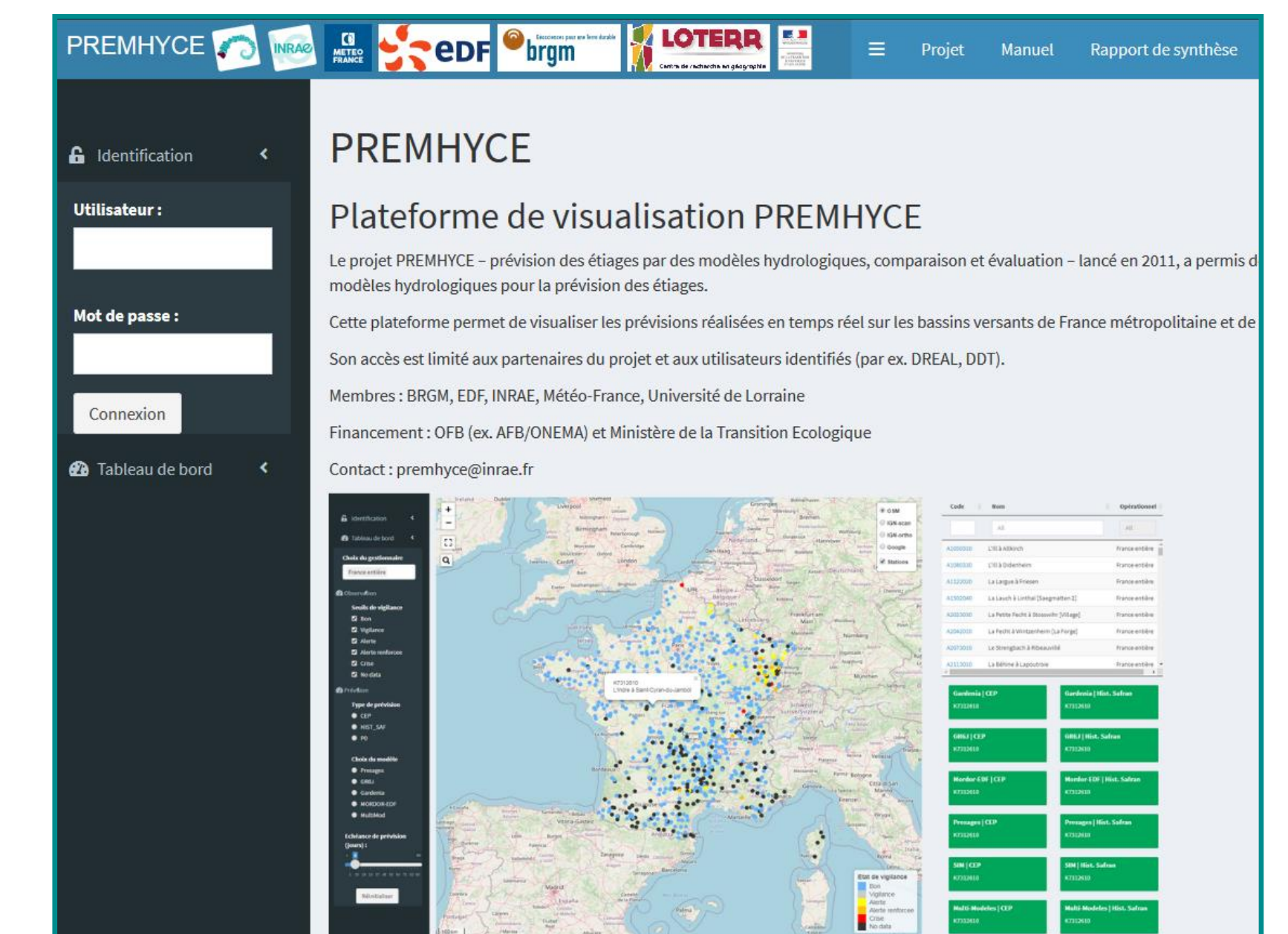
The CIPRHES key scientific and operational challenges

1. To produce efficient seamless atmospheric forecasts
2. To develop an integrated hydrometeorological modelling approach for low-flow forecasting
3. To develop approaches to identify and quantify the various sources of uncertainty affecting low-flow forecasts
4. To set up and apply advanced 'crash-testing' frameworks to better evaluate the performance and robustness of low-flow forecasts
5. To design a robust and user-tailored online hydrometeorological service for nation-wide forecasts based on the PREMHYCE platform

For more information

CIPRHES
https://www6.inrae.fr/ciprhes
charles.perrin@inrae.fr

PREMHYCE
https://sunshine.irstea.fr/app/premhyce
premhyce@inrae.fr

Meteorological observations — Precipitation Temperature — Climatology or atmospheric forecasts — t_0

Catchment observations — PREMHYCE — INRAE / brgm / eDF / MÉTÉO FRANCE / LOTERR — GR6J, GARDENIA, MORDOR, SIM, PRESAGES — Catchment models / Data assimilation

Post-processing

Streamflow — Low-flow thresholds — t_0 — t_0+H — Time

Communication tools / Expertise — Forecast of impacts / Water management decision
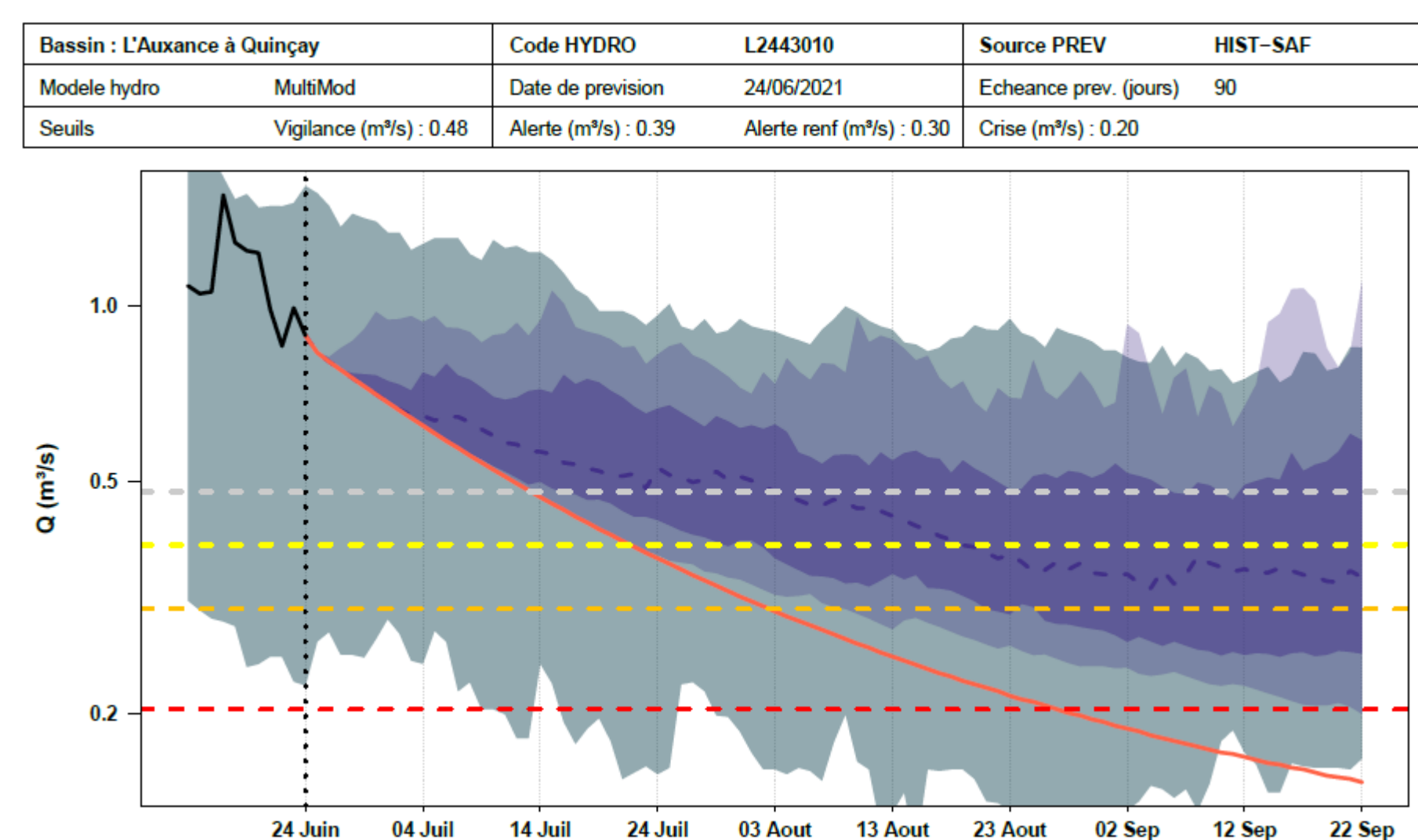
The PREMHYCE operational platform

⇒ Low-flow forecasting tool
⇒ Multi-model approach (5 hydrological models)
⇒ Use of historical data and CEP meteorological forecasts
⇒ Currently about 30 end-users

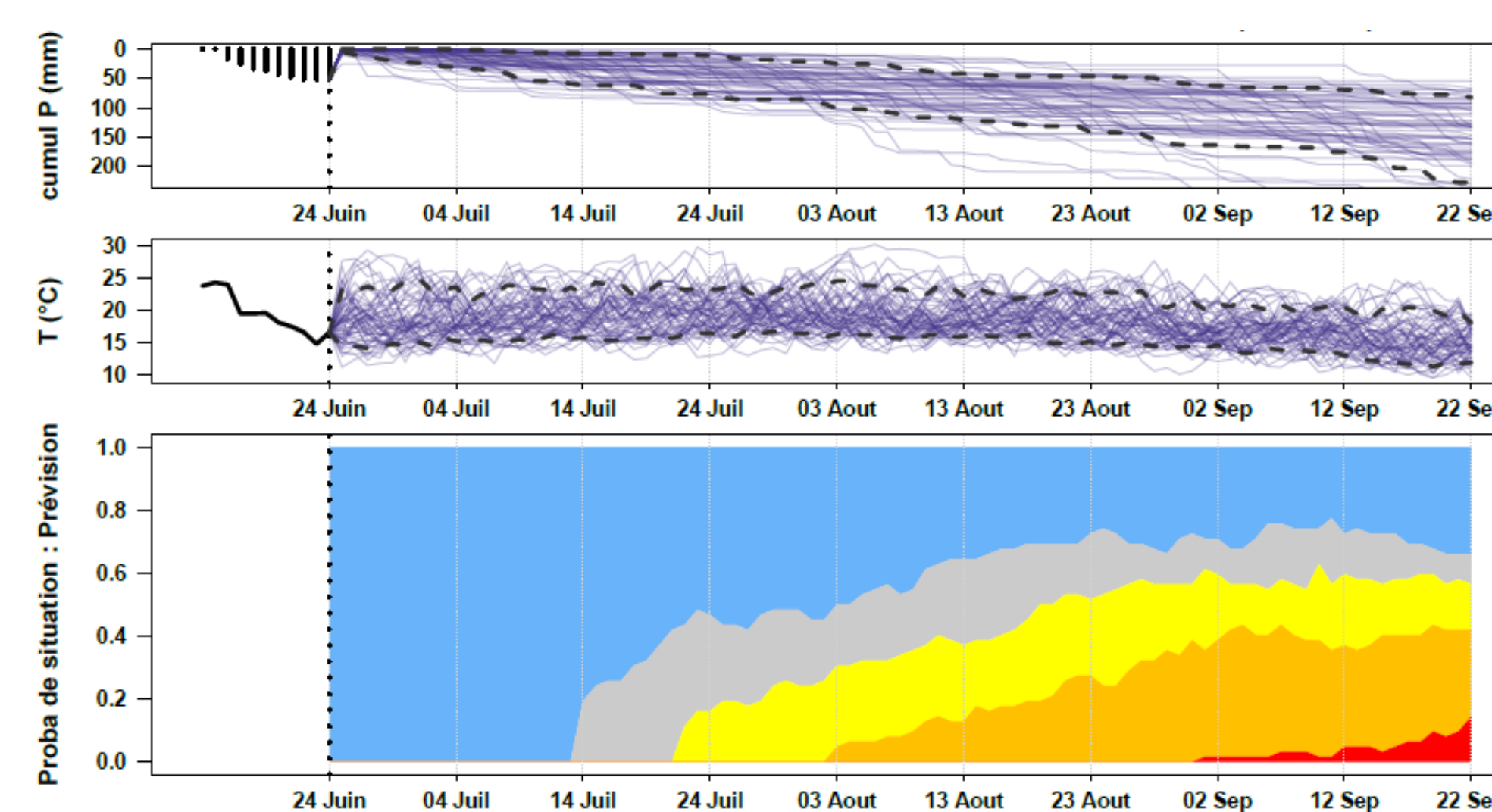## Multimodel PREMHYCE outputs

Bassin : L'Auxance à Quinçay		Code HYDRO	L2443010	Source PREV	HIST-SAF
Modèle hydro	MultiMod	Date de prevision	24/06/2021	Echeance prev. (jours)	90
Seuils	Vigilance (m³/s) : 0.48	Alerte (m³/s) : 0.39	Alerte renf (m³/s) : 0.30	Crise (m³/s) : 0.20	

Ensemble forecasts and comparison with historical flows

Probability to be under operational low-flow thresholds

CIPRHES ID

⇒ Four years (03/2021-02/2025)
⇒ Full budget: 1.8 M€
⇒ Funded by the French Agency for Research (ANR) (0.75 M€)
⇒ 263 person-months
⇒ 5 post-docs, 2 PhD, 5 trainees, 1 engineer hired for the project
⇒ 27 deliverables

Charles PERRIN [1], Vazken ANDRÉASSIAN [1], Pierre BERNARD [2], François BOURGIN [1], Alban DE LAVENNE [1], Olivier DELAIGUE [1], Claire DELUS [3], Gilles DROGUE [3], Hajar EL KHALFI [3], Pierre ETCHEVERS [4], Didier FRANÇOIS [3], Joël GAILHARD [2], Frédéric HENDRICKX [5], Jérôme LE COZ [6], Matthieu LE LAY [2], Sébastien LEBAUT [3], Luc MANCEAU [3], Céline MONTEIL [5], Simon MUNIER [7], Antoine PELLETIER [1], Maria-Helena RAMOS [1], Fabienne ROUSSET [4], Malak SADKI [7], Gaëlle TALLEC [1], Dominique THIERY [8], Guillaume THIREL [1], François TILMANT [1], Jean-Pierre VERGNES [8], Anne-Lise VÉRON [1], Christian VIEL [4], Jean-Marie WILLEMET [4]

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ANR — PROJET FINANCÉ PAR L'ANR — PROJECT FUNDED BY THE ANR

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