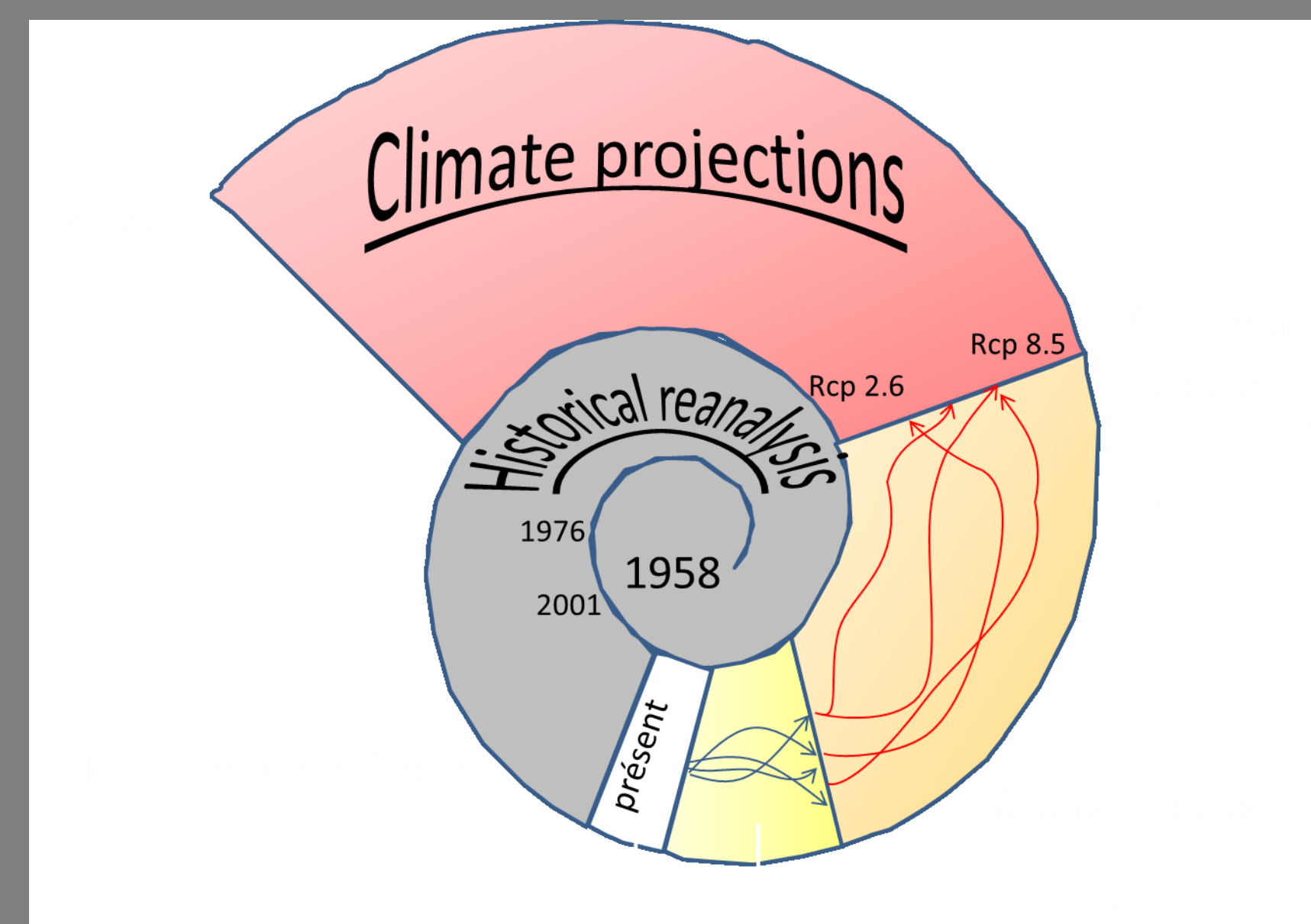




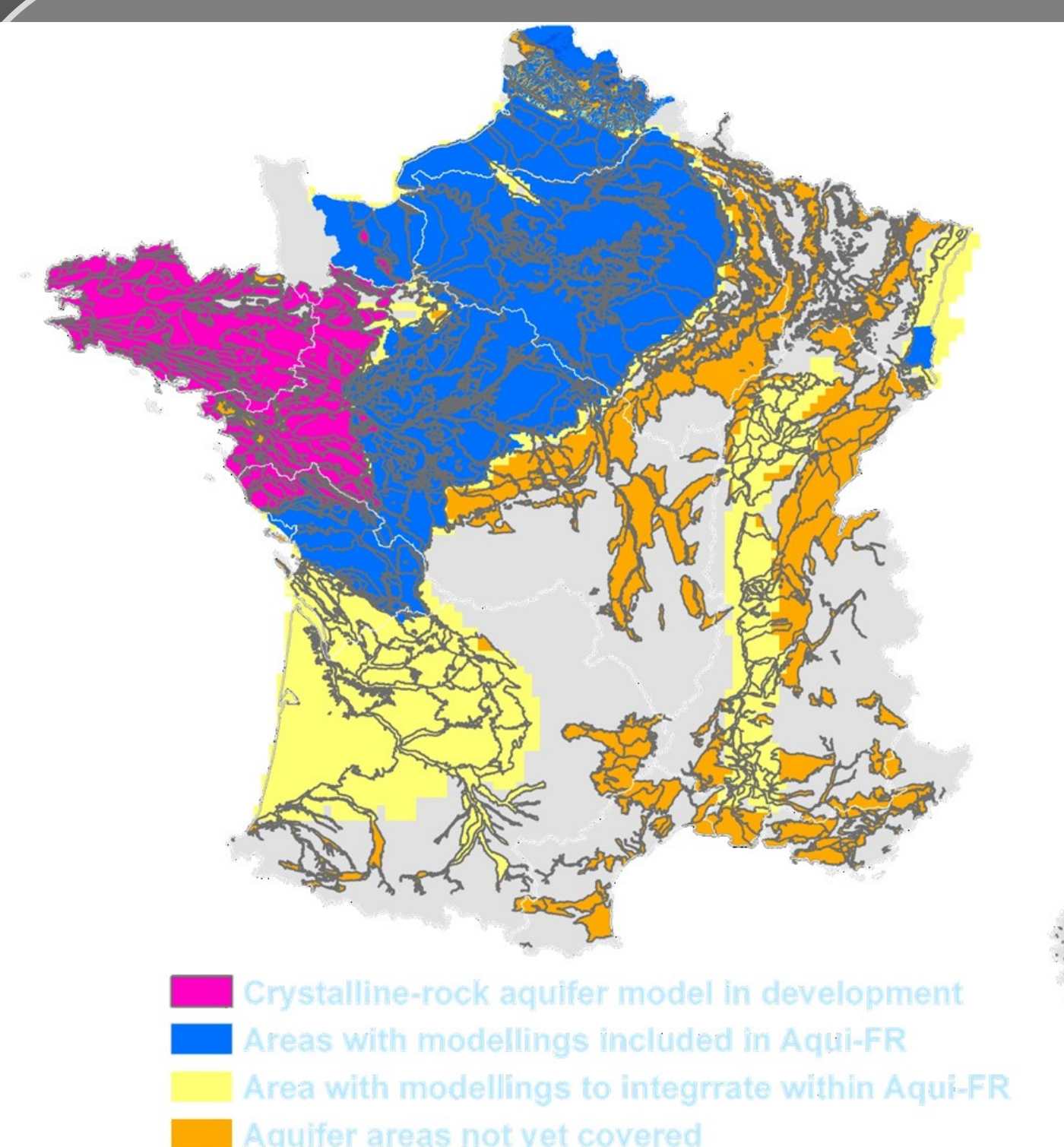
Aqui-FR : a national multi-model hydrogeologic system

aiming at taking benefits of existing groundwater modeling applications used by stakeholders to develop new products in order to provide useful information for water resources management.

Florence Habets¹, Philippe Ackerer², Nadia Amraoui³, François Besson⁴, Yvan Caballero³, Jean-Raynald de Dreuzy⁵, Pierre Etchevers⁴, Patrick Le Moigne⁴, Thierry Morel⁶, Fabienne Regimbeau⁴, Marie Rousseau³, Pauline Rousseau-Gueutin⁵, Nicolas Roux⁴, Dominique Thiéry³, Jean-Pierre Vergnes³, Pascal Viennot⁷, Bénédicte Augéard⁸

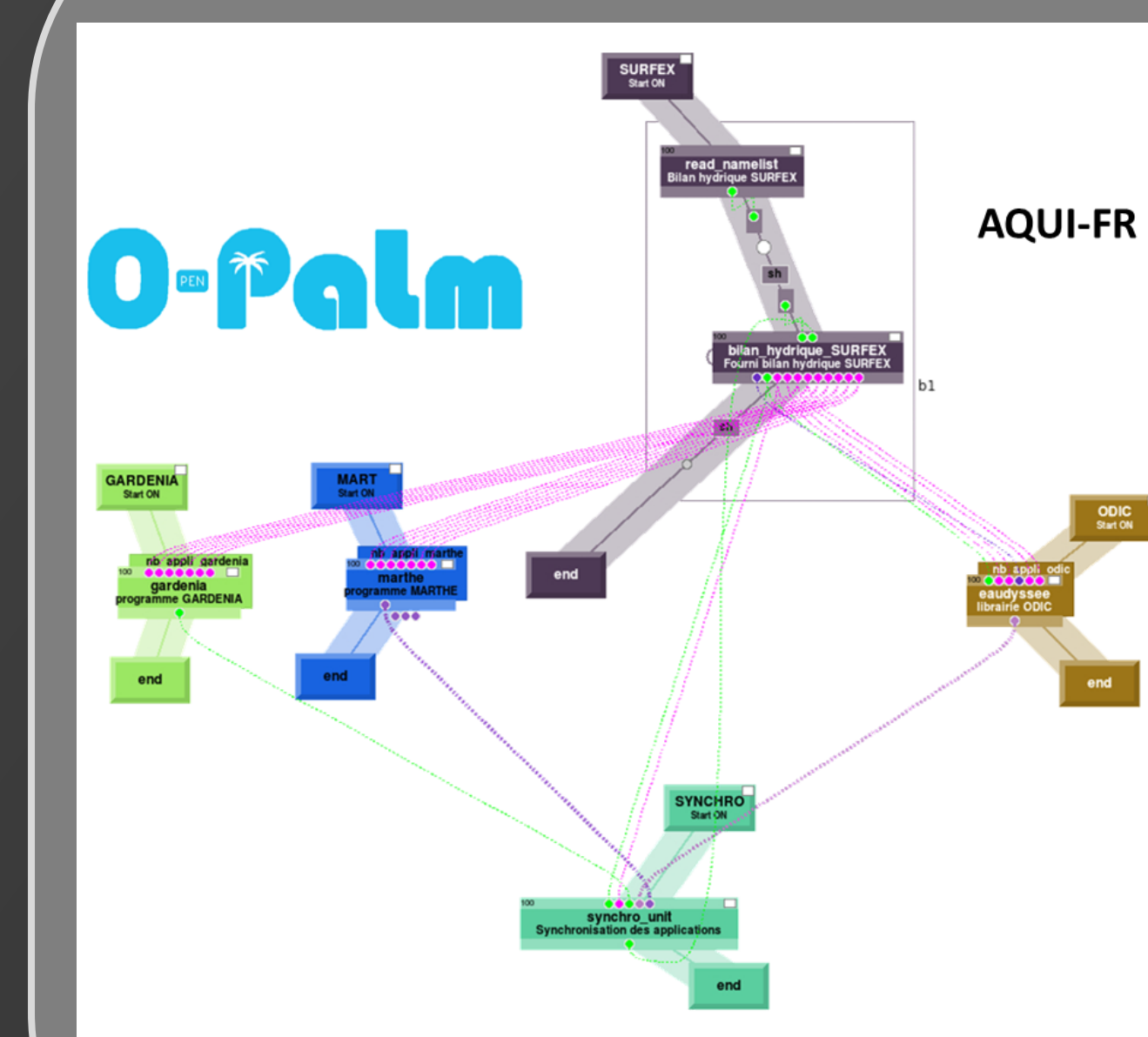


Aqui-FR aims at providing forecasts of the groundwater resources at medium range to seasonal scale. Initial states of the forecast will be partly based on a real time monitoring. Long term historical analysis is used to compare forecasts to past events. The Aqui-FR project will also be used to project climate change impact on the hydrology.



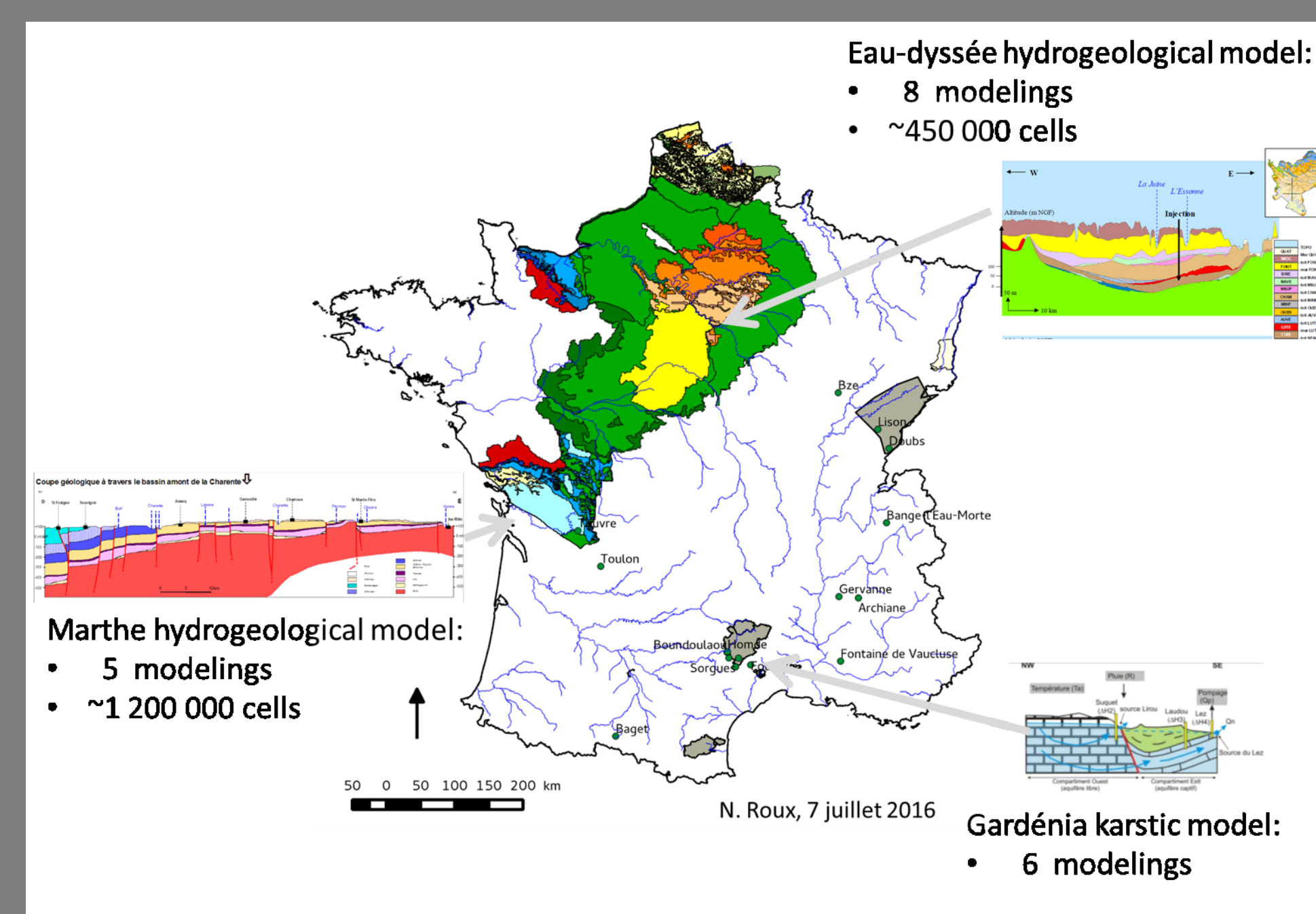
expected to the sedimentary of France as well and hard rock

presents the extension (in pink) as well present extension

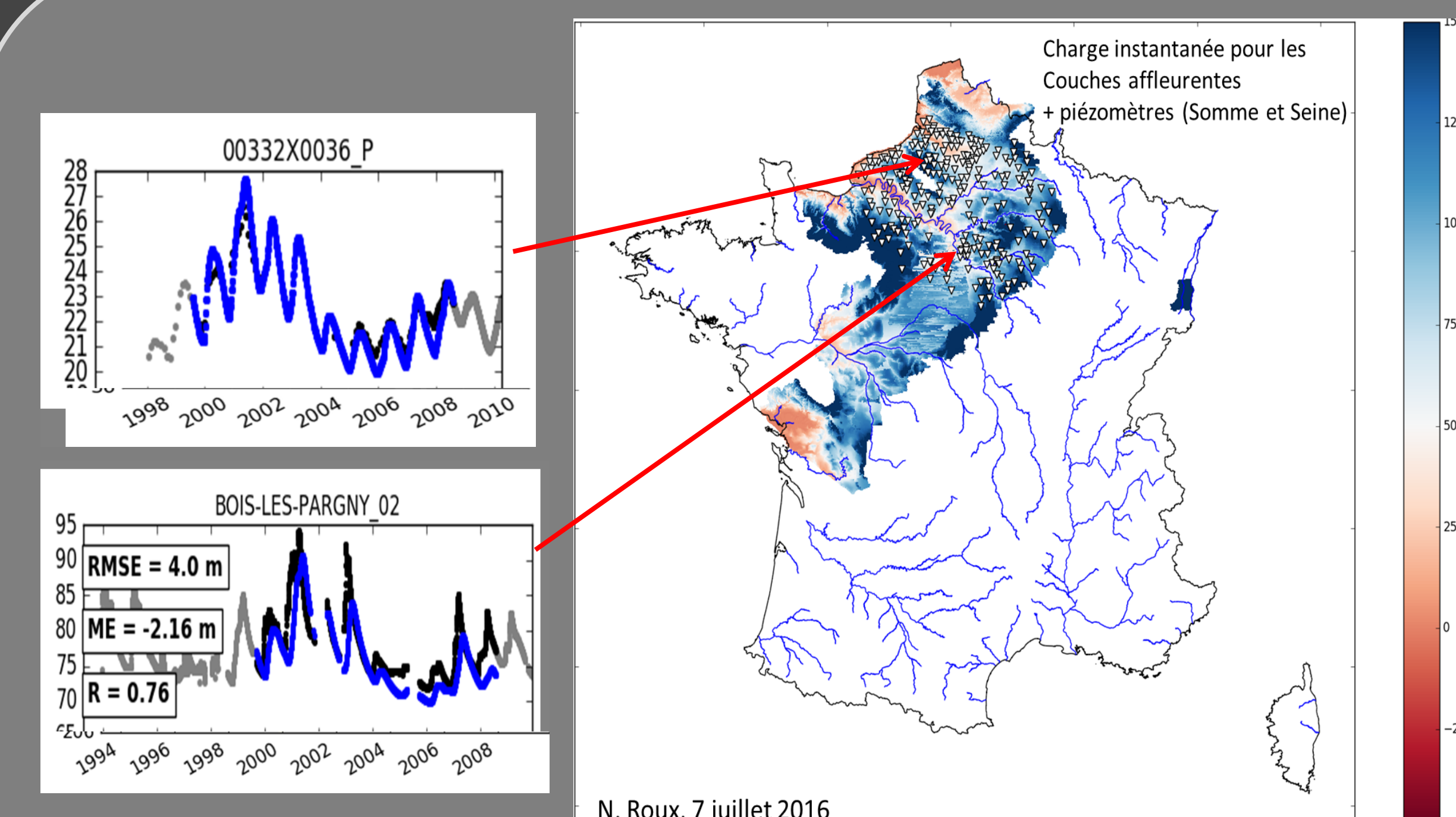


Up to now 3 hydrogeological models (Marthe, Eau-dyssée & Gardénia) covering 8 multilayers sedimentary aquifers and 6 karstic aquifers in France are included in Aqui-FR.

These applications are assembled within the coupling system O-Palm facilitating the parallel computation. They are also coupled to the land surface model Surfex used in the French numerical weather model that provides the recharge.



So far, 19 hydrological modellings encompassing 57 aquifer layers and more than 1.5 billions cells are included in Aqui-FR. The spatial resolution varies from 125m up to 1km. The temporal resolution is daily. Groundwater abstractions are explicitly taken into account, however, there are only well-known over the last decade.



The Aqui-FR system is now being assessed. Comparison with observed piezometric heads (see figure) and river-flows are done.

Groundwater indicators will also be tested, for instance, average on groundwater bodies, evolution compared to *climatic normal value*, estimation of the river-aquifer exchange, etc...

Conclusion:

The Aqui-FR system is now running on the super-computer of the french weather forecast. It is presently being assessed , although new modellings will be include to cover a larger extent. Next step will be to test the additional value of such details groundwater modelling in a forecast mode. Two lead times are targeted: ensemble 10-day forecasts and seasonal forecasts. The skills of such forecasts will be assessed on the past (hindcast) and then on real time. To improve the initial state of the groundwater forecast, special focus is made on data assimilation. The results of Aqui-FR will be provided freely to water resource public managers, and a close collaboration with stakeholders is necessary to build appropriate products.

More informations:

- www.metis.upmc.fr/~aqui-fr/index_eng.html
- Nicolas Roux, IAH, Session 8.1, 5pm, Pasteur Auditorium
- Habets et al., 2015 Aqui-FR, *un système multi-modèle hydrogéologique à l'échelle nationale*. Géologues

Contact: florence.habets@upmc.fr