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Joint exploration of agriculture-water quality links through the hybrid serious game Exp'Eau

Isabelle Charpentier, Hossam Elouati, Hugo Kelhetter, Daniil Kudriashov, H el ene Blanchoud, Mathieu Bonnefond, Sylvie Dousset, V eronique Gouy, Christophe Piscart, Marie-No elle Pons, Olivier Ragueneau, S ebastien Salvador-Blanes, Olivier Barreteau

LTSER-FR R eseau des Zones Atelier

Context

Agriculture practices are increasingly disconnected from their local non-agricultural socio-environmental context. As a consequence, agriculture is considered today as having major impacts on water quality in river basins and coastal areas. Tensions emerge between agricultural sector and some civic organizations. Transition from this situation to a better integration of agricultural practices in their environment is sought by many stakeholders and policy makers. Efforts for increasing water quality while maintaining a sustainable agriculture may be expensive. With the ongoing research project Exp'Eau (LTSER-FR R eseau des Zones Ateliers), our purpose is (1) to raise awareness on the opportunities to handle agricultural sources of water pollution collectively, and (2) to compare them in various watersheds.

Biogeophysical model

Actual case studies

LTSER-FR sites

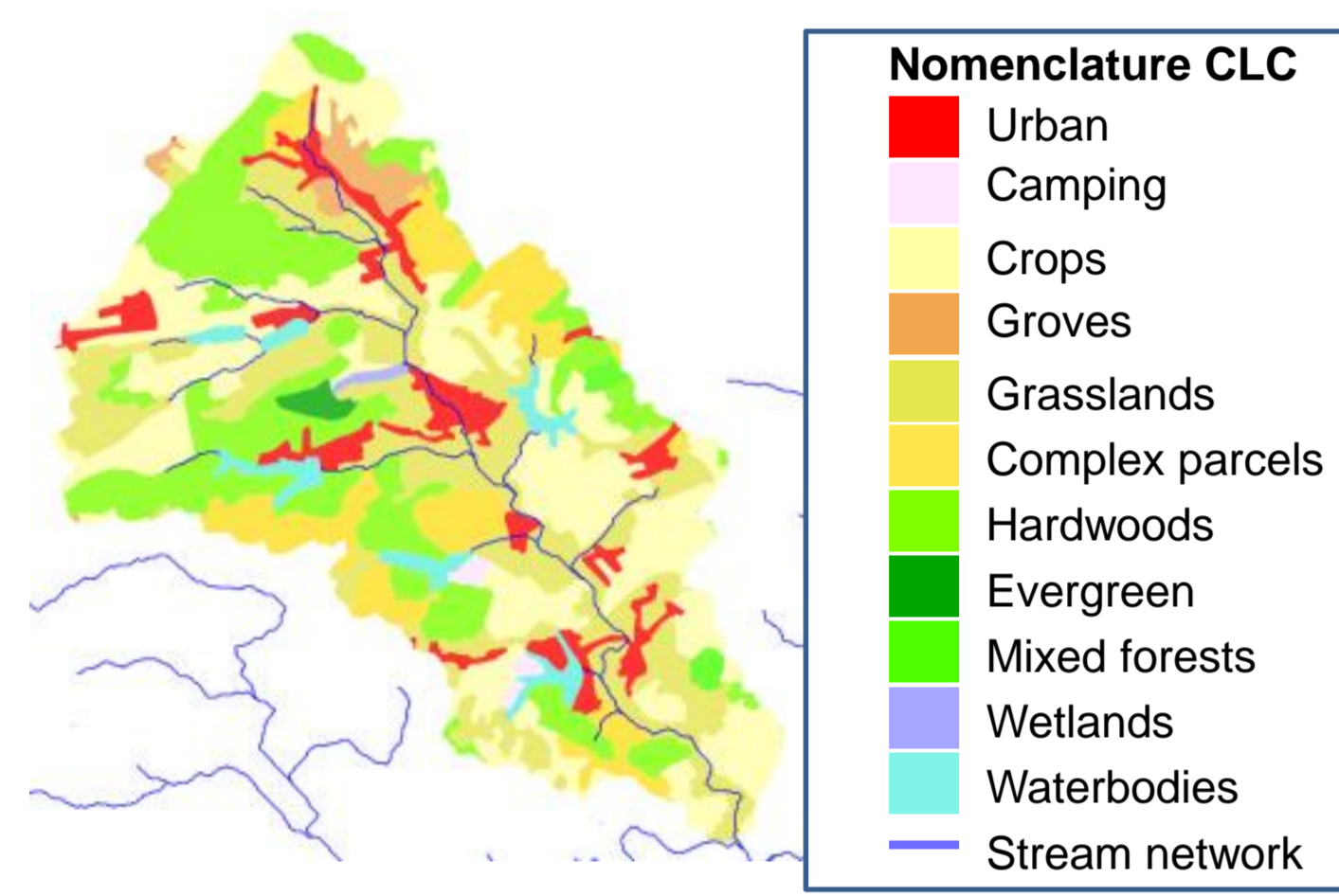
- Field crops
- Polyculture
- Land/sea interface
- Vineyards

Simplified modeling

- Catchment level
- Land cover
- Elevation
- Soil
- Seasonal climate
- Pests

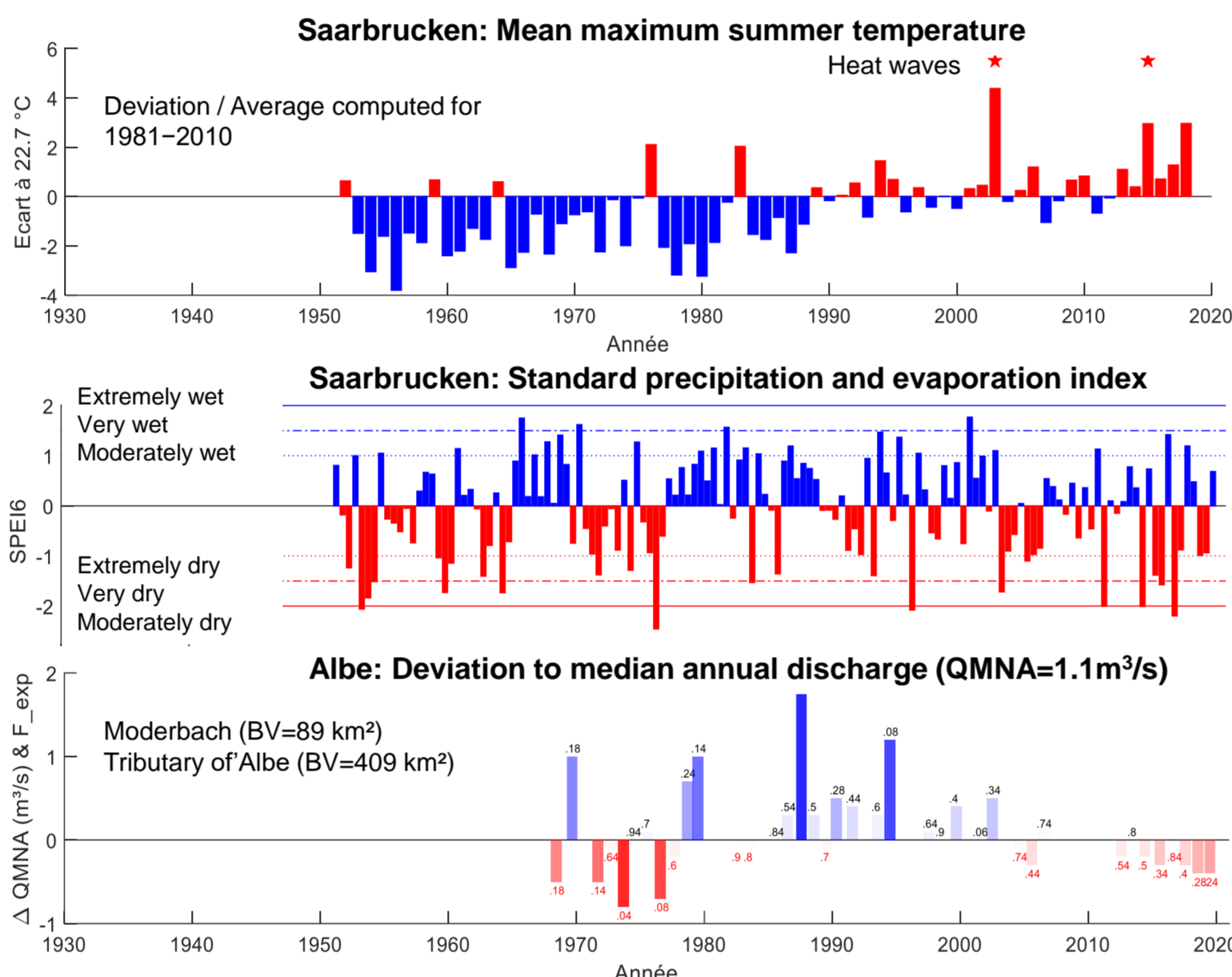
Maps

(Corine Land Cover 1990, IGN: BDALTI)



Climate timeseries for scenarios

(ECAD, Hydro)



Social model

Expert design of practices

Methods

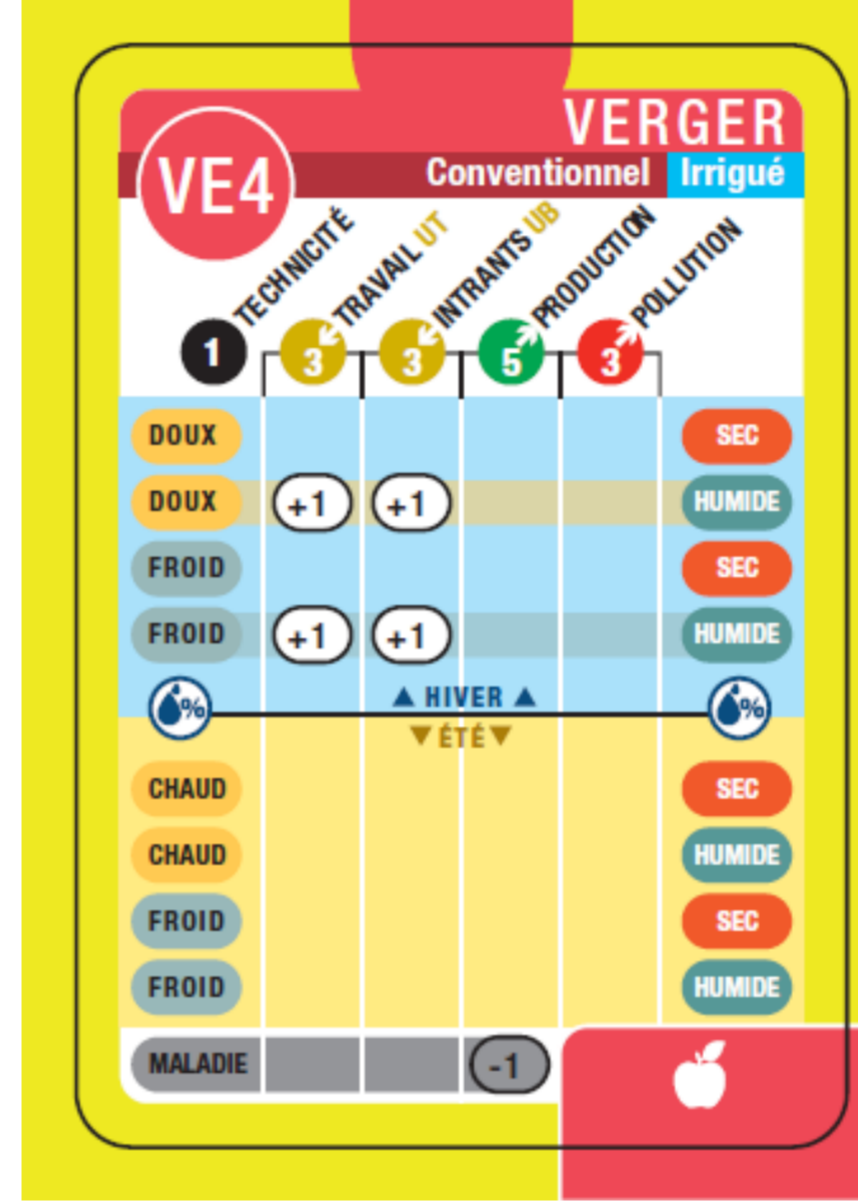
- Modeling workshop
- Databases
- Surveys
- Interviews

Simplified model

- Actors
 - Farmers (x9)
 - Local elected people (x3)
 - Catchment manager (x1)
- Practices
- Awareness
- Impacts

Actors' practice cards

Farmers



Local politician

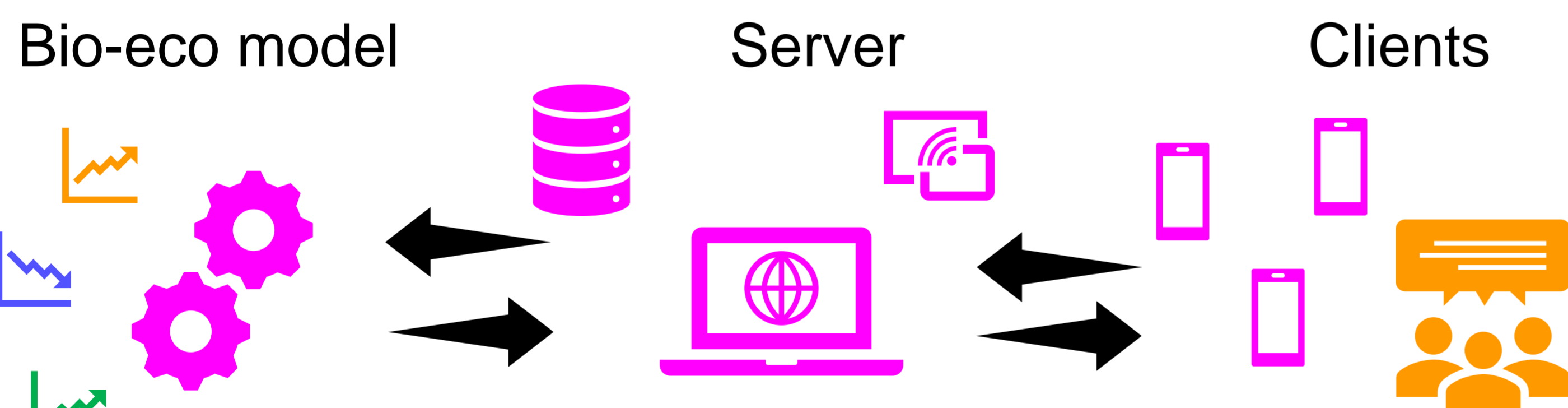


Catchment manager



Serious game media (API + Board game)

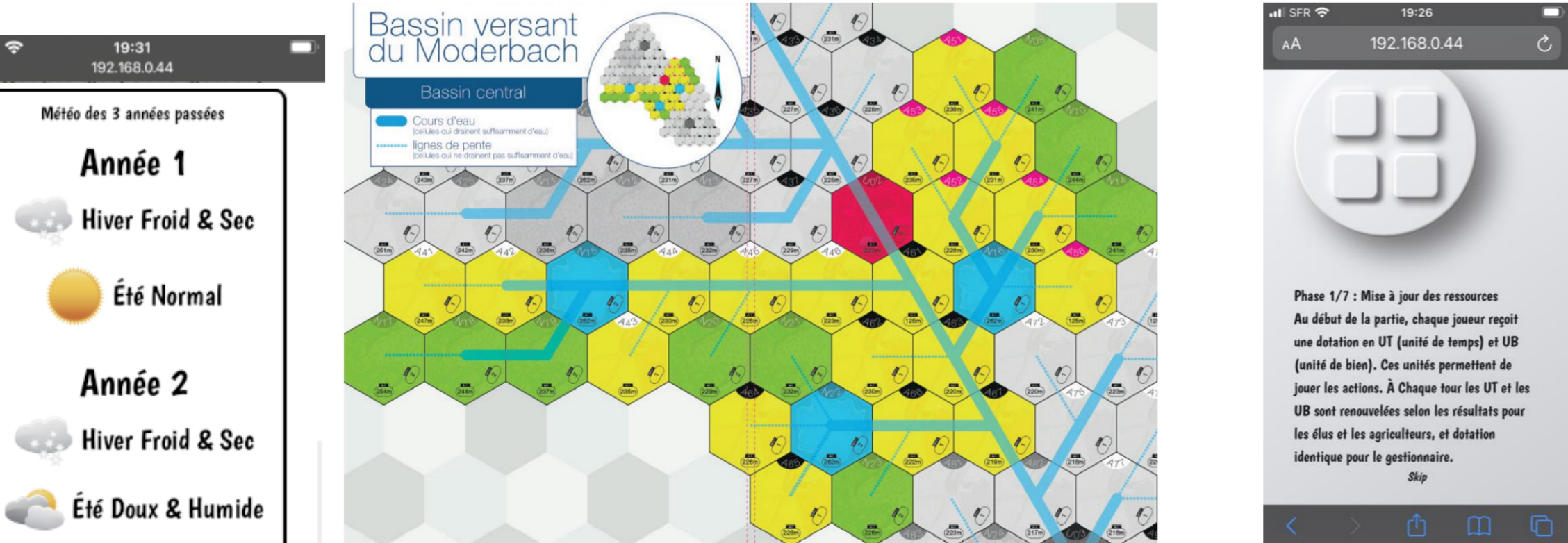
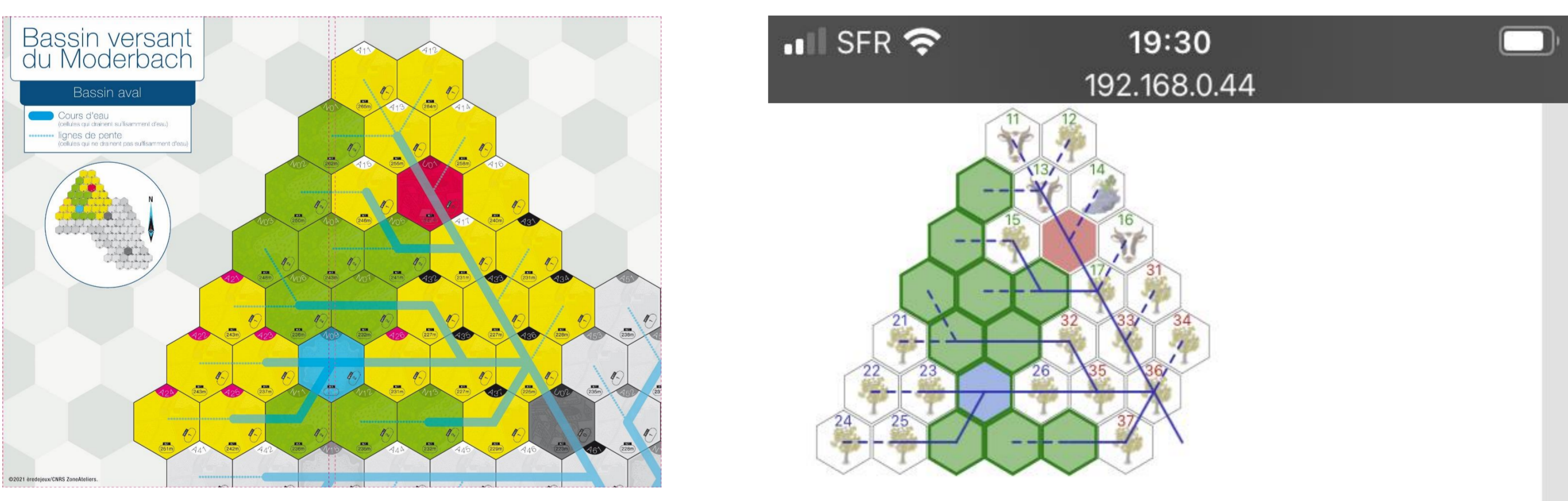
Application Programming Interface



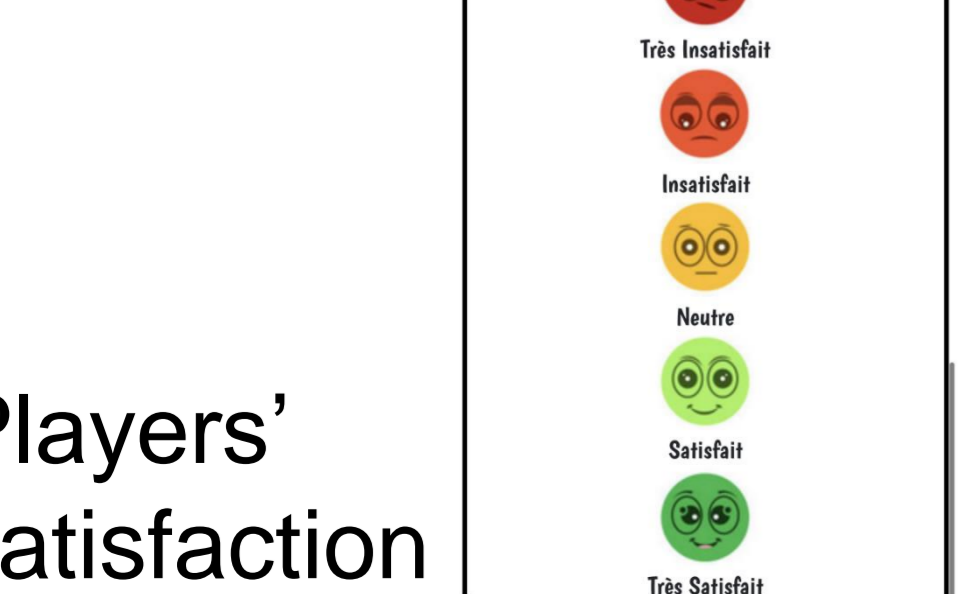
Game elements

3 sub basin boards

Virtual board / API



Climate scenario



Players' satisfaction

Serious game objectives

Raising multi-level discussions

- At local level (1 of the 3 boards)
 - Sharing actors' constraints, understanding lock-in situations
 - Setting higher value market
 - Support for training
 - ...
- At basin level (the 3 boards)
 - Location of collective equipment and subsidies
 - Commitment for improving practices
 - ...

Gaming experiments

Workshop in Tours, 2021



On going development towards test and use with groups of students