



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

Isabelle Charpentier, Hossam Elouati, Hugo Kelhetter, Daniil Kudriashov,
Hélène Blanchoud, Mathieu Bonnefond, Sylvie Dousset, Véronique Gouy, C.
Piscart, Marie-Noëlle Pons, et al.

► To cite this version:

Isabelle Charpentier, Hossam Elouati, Hugo Kelhetter, Daniil Kudriashov, Hélène Blanchoud, et al..
Joint exploration of agriculture-water quality links through the hybrid serious game Exp'Eau. 1st
OZCAR-TERENO international meeting: Advancing Critical Zone Science, Oct 2021, Strasbourg,
France. hal-03319283

HAL Id: hal-03319283

<https://hal.science/hal-03319283>

Submitted on 30 Sep 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



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

Isabelle Charpentier, Hossam Elouati, Hugo Kelhetter, Daniil Kudriashov, H  l  ne Blanchoud, Mathieu Bonnefond, Sylvie Dousset, V  ronique Gouy, Christophe Piscart, Marie-No  lle Pons, Olivier Ragueneau, S  bastien Salvador-Blanes, Olivier Barreteau



LTSEr-FR R  seau 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 on-going research project Exp'Eau (LTSEr-FR R  seau 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

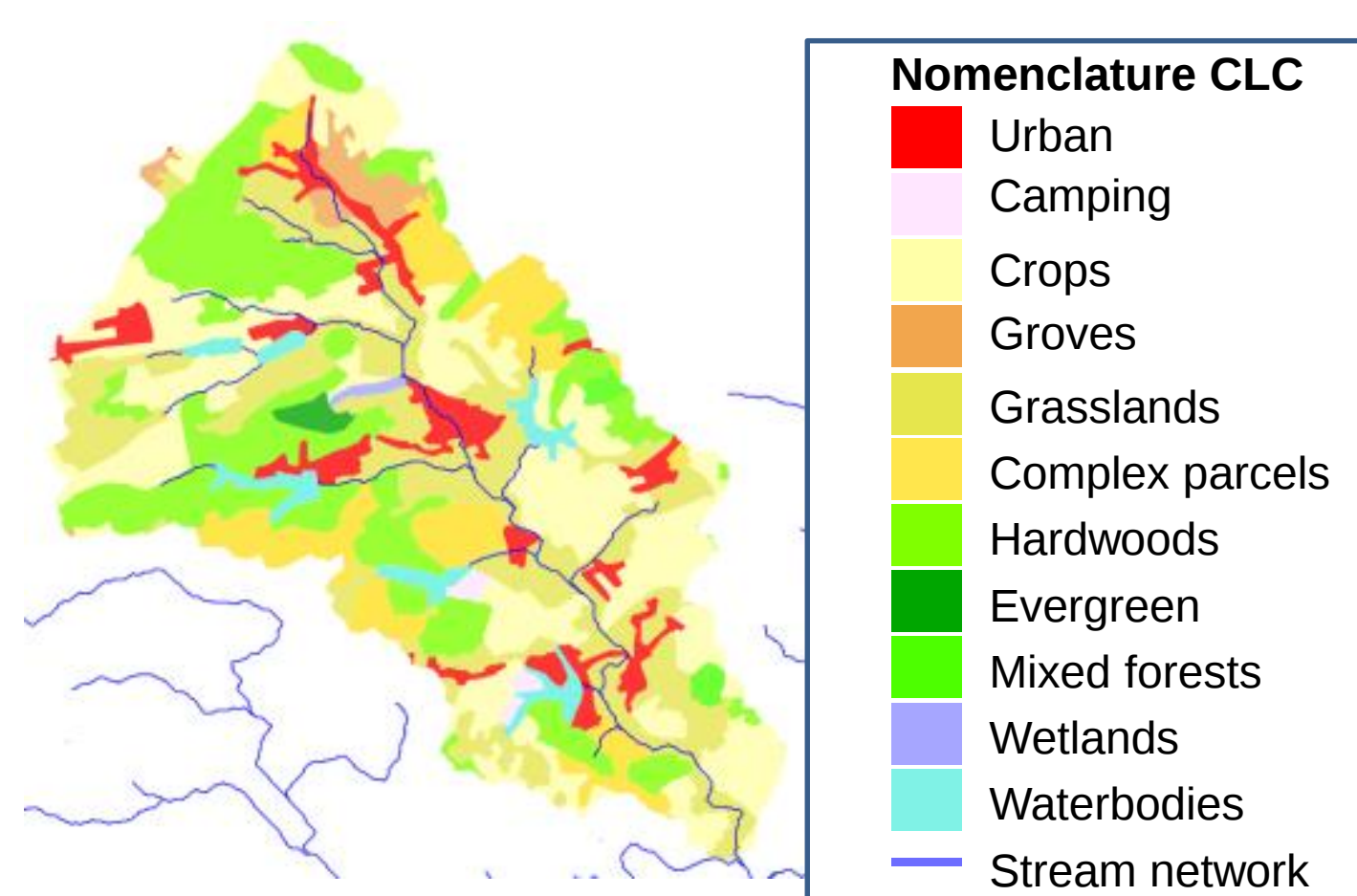
- Field crops
- Polyculture
- Land/sea interface
- Vineyards

Simplified modeling

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

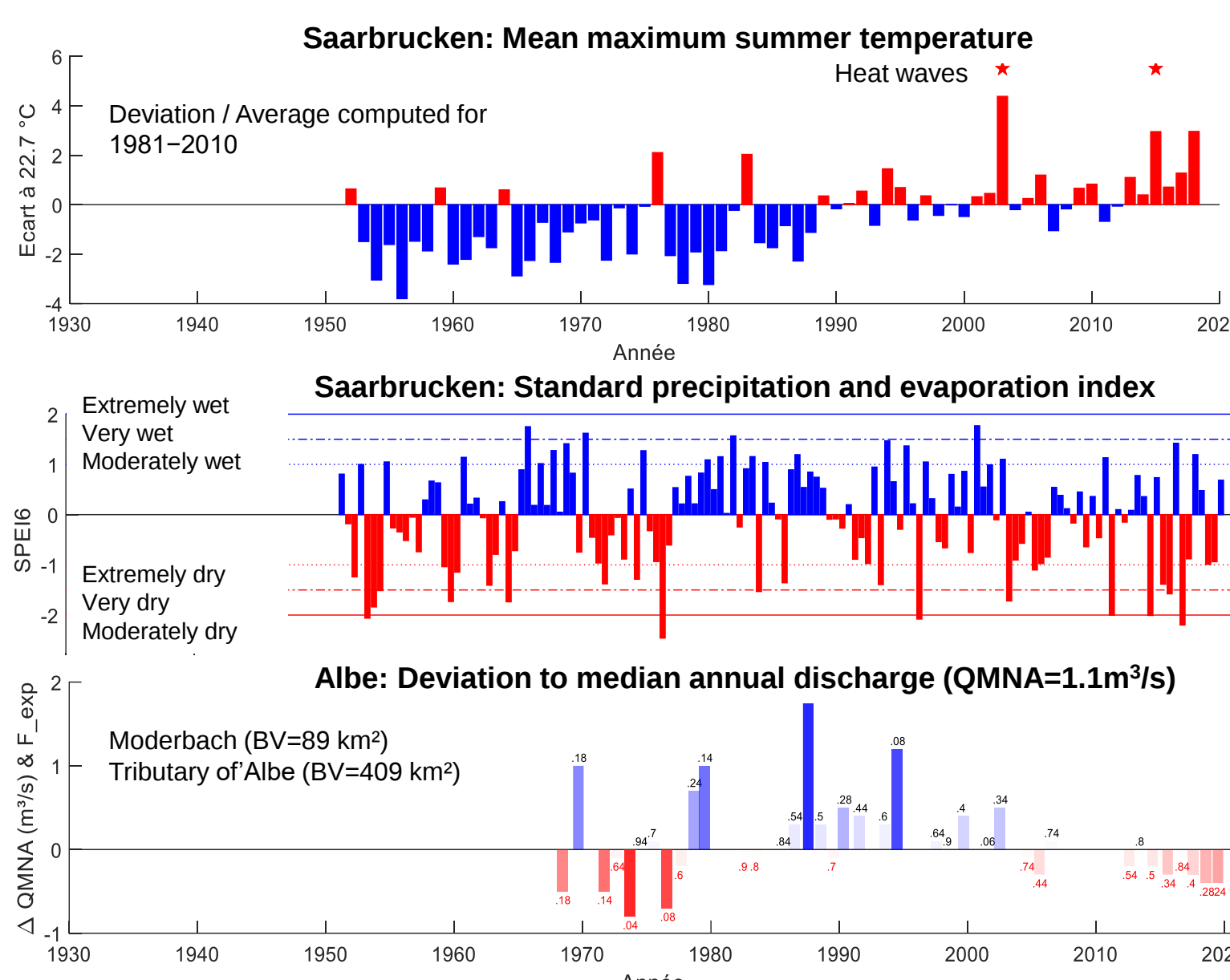
Maps

(Corine Land Cover 1990, IGN: BDALTI)



Climate timeseries for scenarios

(ECAD, Hydro)



Social model

Expert design of practices

Methods

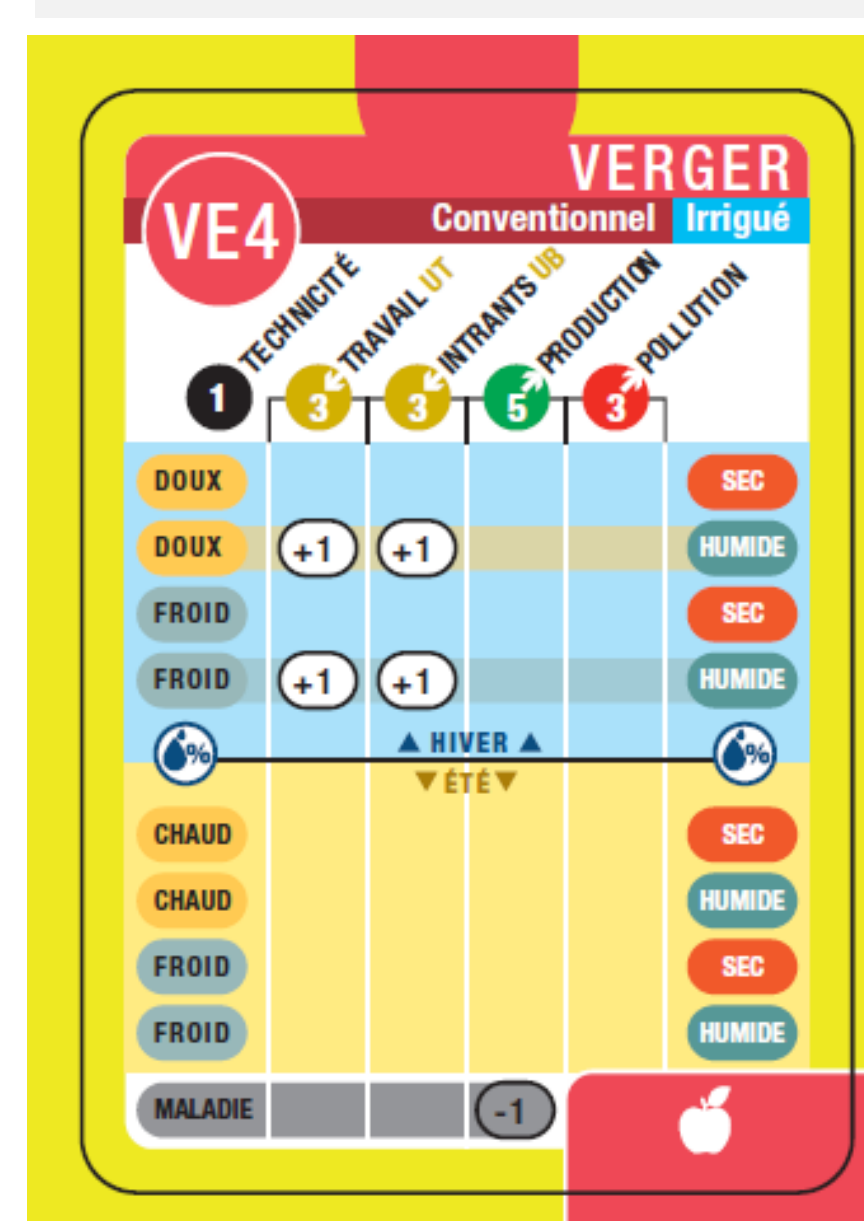
- Modeling workshop
- Databases
- Surveys
- Interviews

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

Bio-eco model

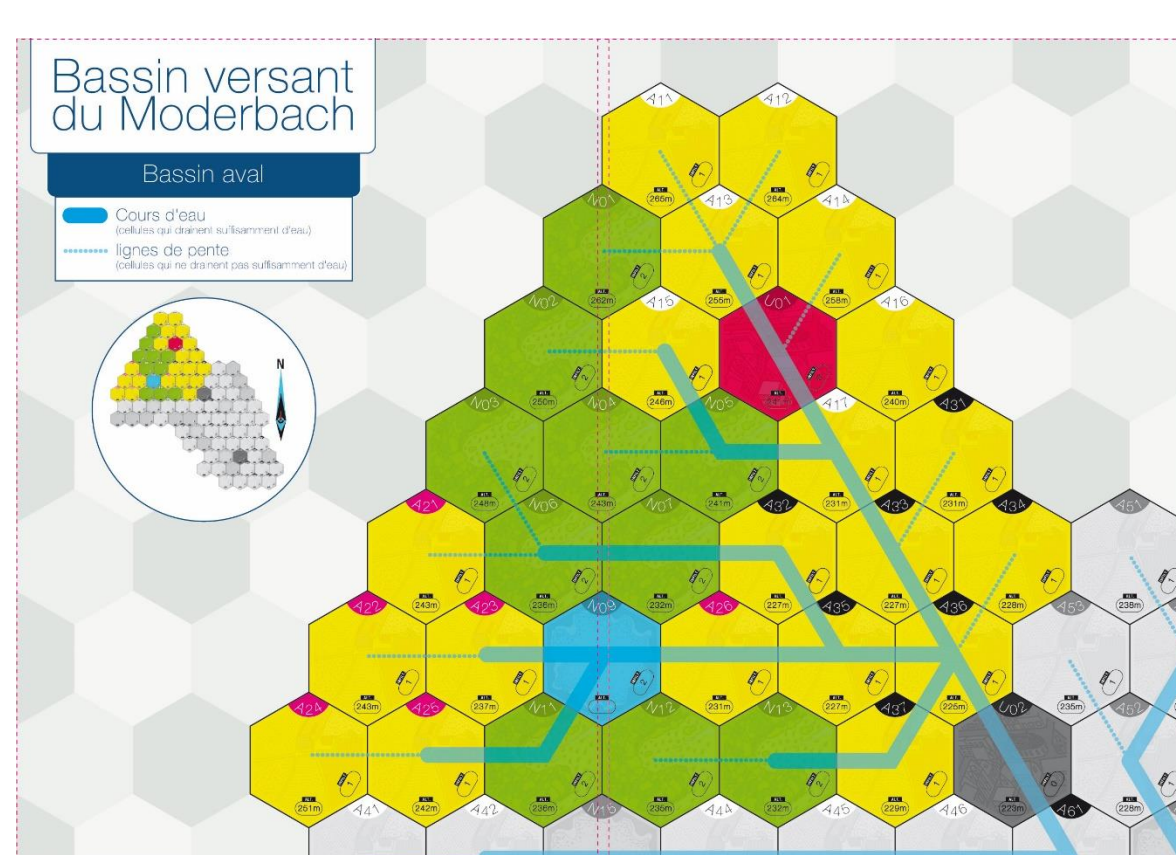
Server

Clients

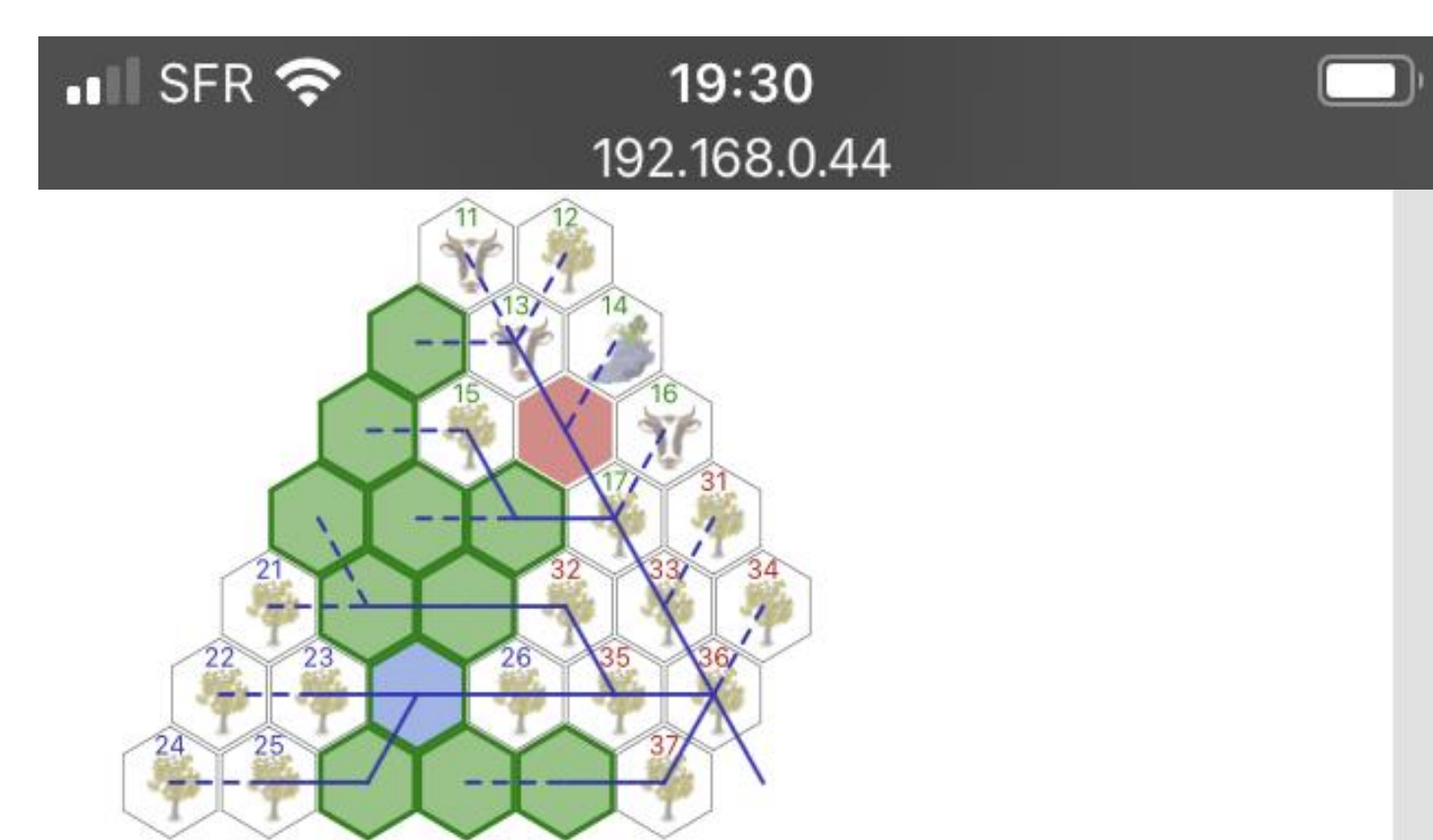


Game elements

3 sub basin boards

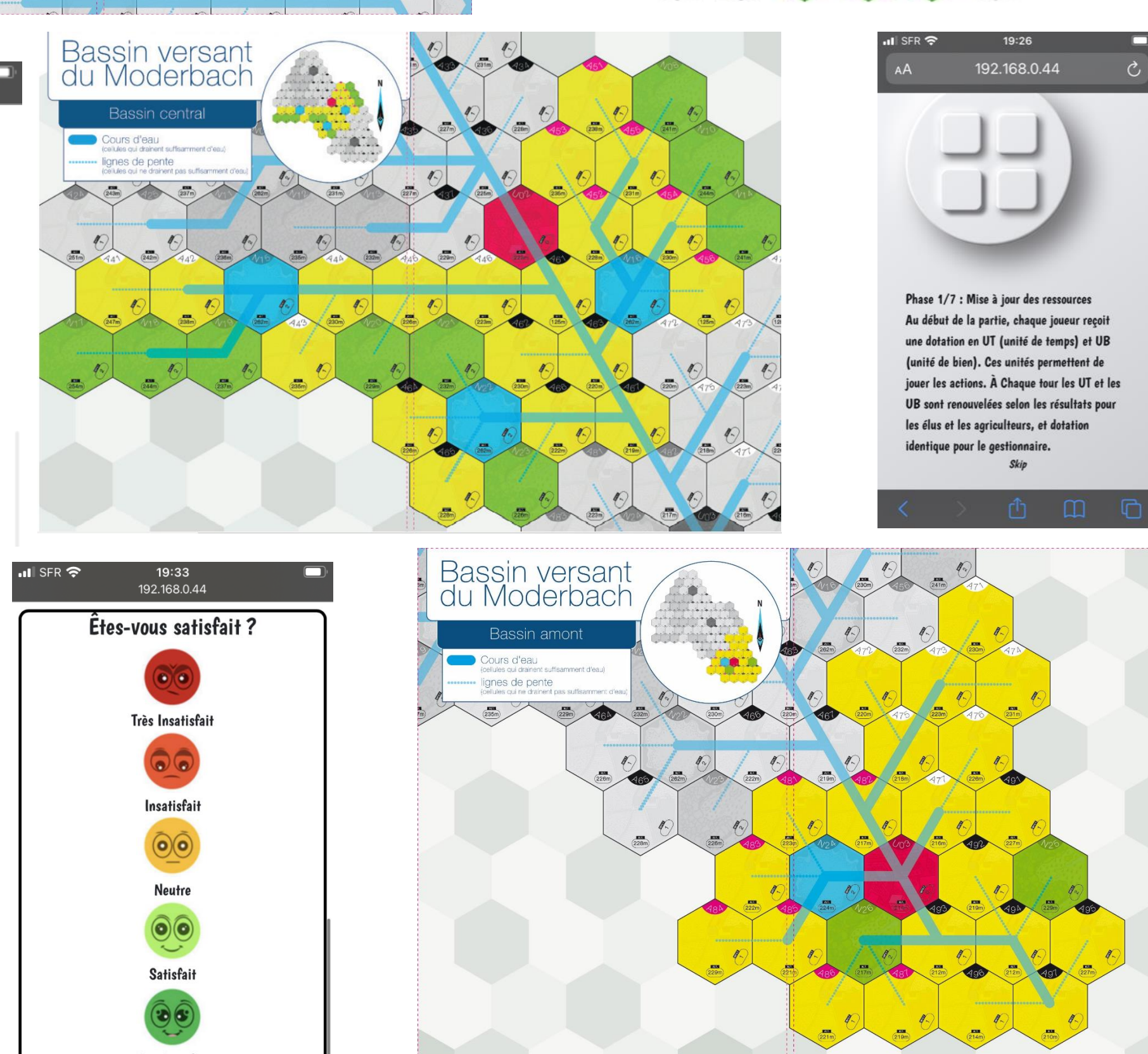


Virtual board / API



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

