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Surface water - Groundwater Feature Relation Discussion

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Surface water - Groundwater Feature Relation Discussion

The 124th OGC Member Meeting

Sylvain Grellet,
Florent Millet BRGM
05 October 2022



M P A
S I N G A P O R E

Meeting sponsor



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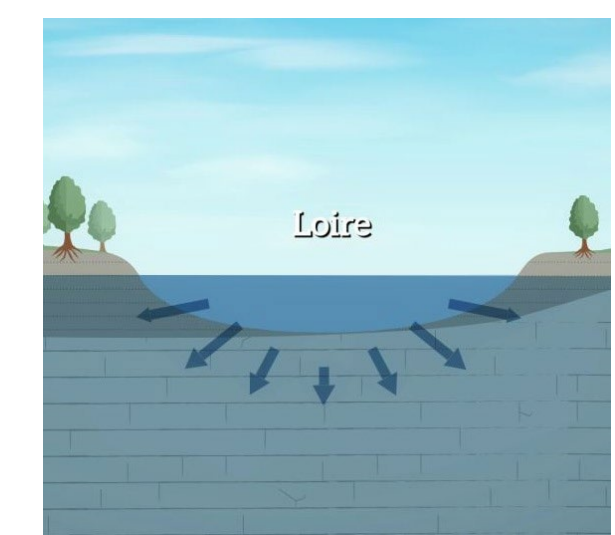
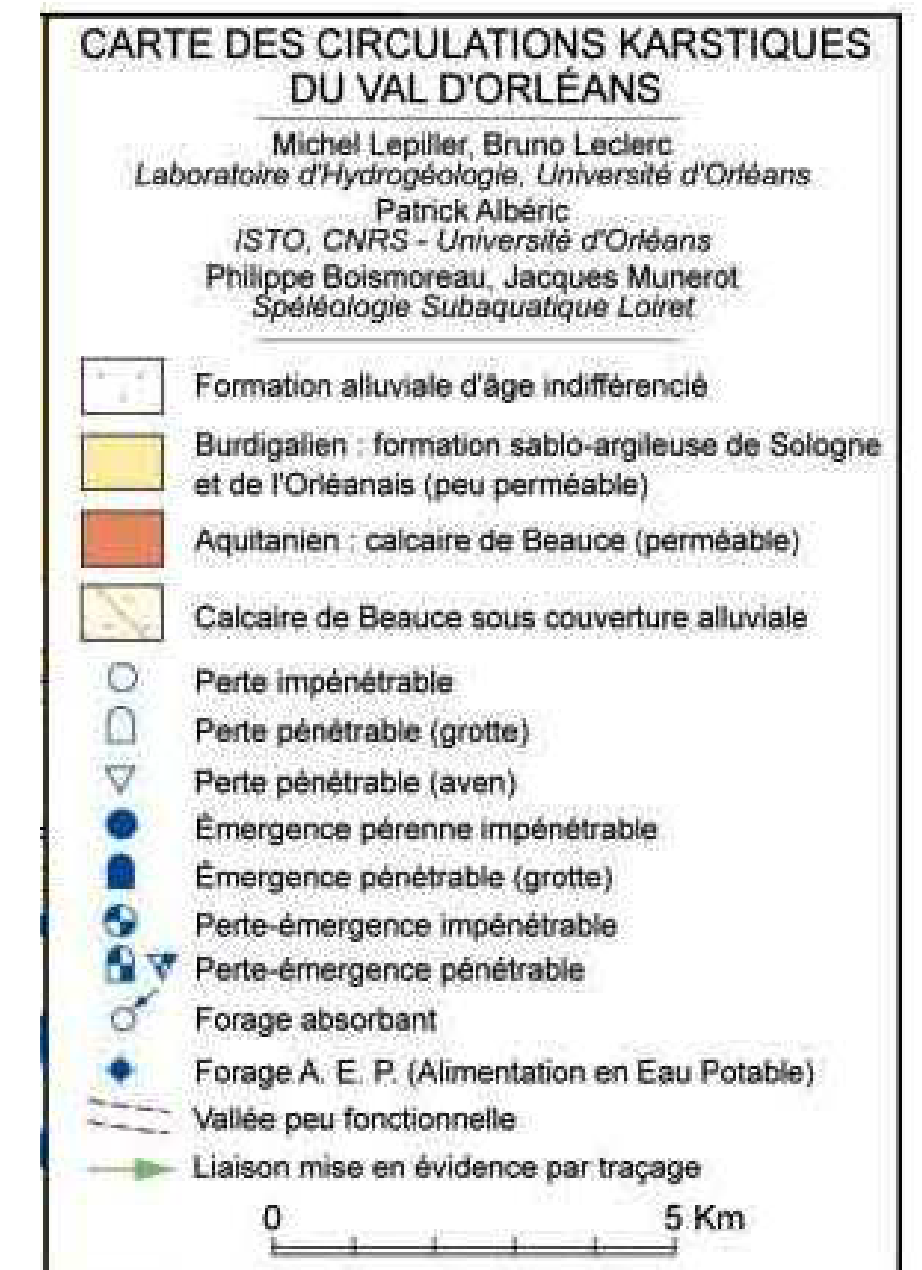
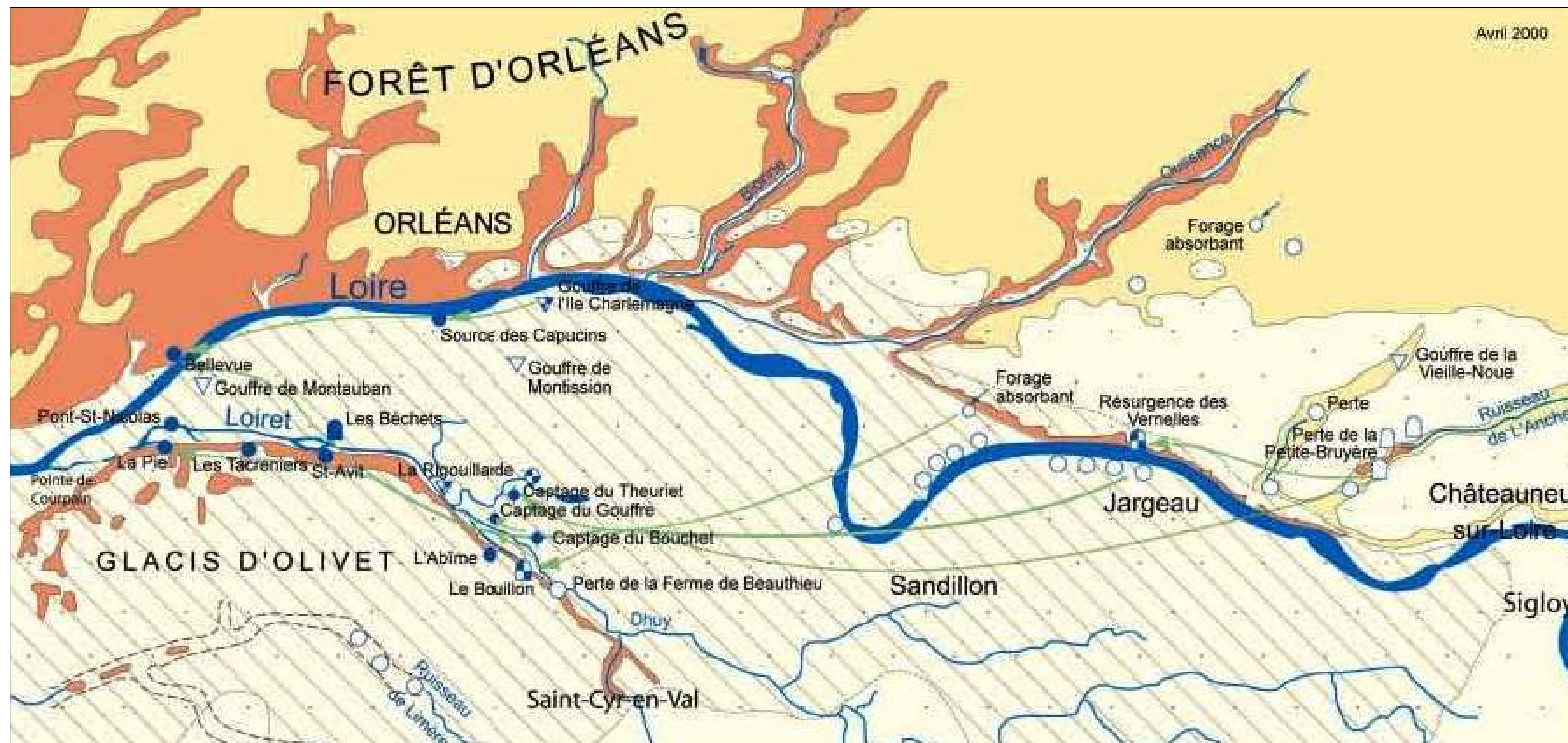


Context

- Having a better knowledge of surface-ground water relations
- Through many local studies on the field
- Involving a wide diversity of technics
- Leading to interpretation and identification of Flow Interface Features between both water compartment
- So far, no interoperable approach agreed on to share this

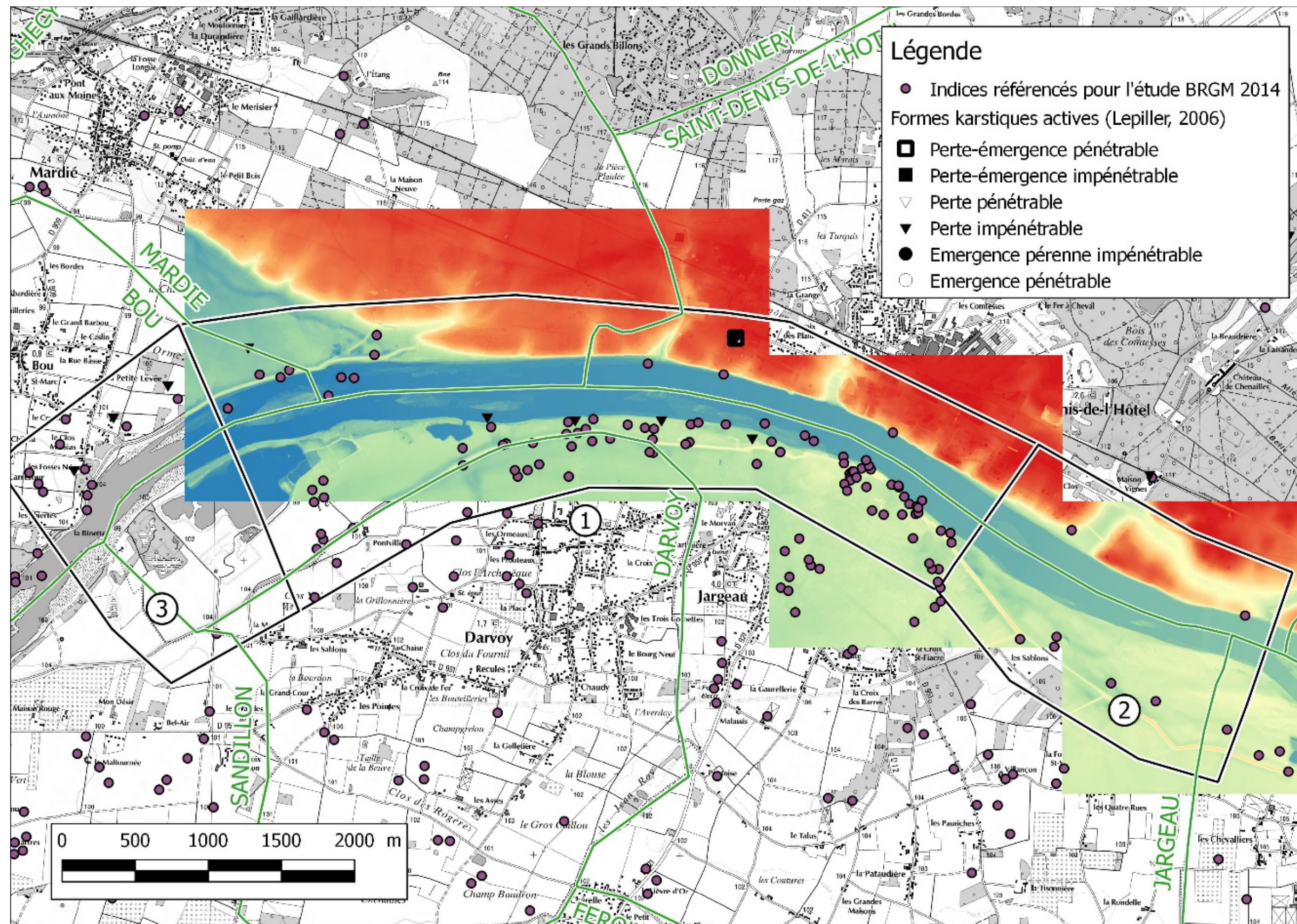
An example

- The CENARI-O project : understanding river <-> aquifer relations on the Loire river near Orléans



An example – observation methods

- Remote sensing – identify exchange areas



LIDAR

Fine grain Topography data

Here : Loire riverbed near Jargeau => identify « hollow » zone -> water loss ?

An example – observation methods

- Remote sensing – identify exchange areas



Catarob drone

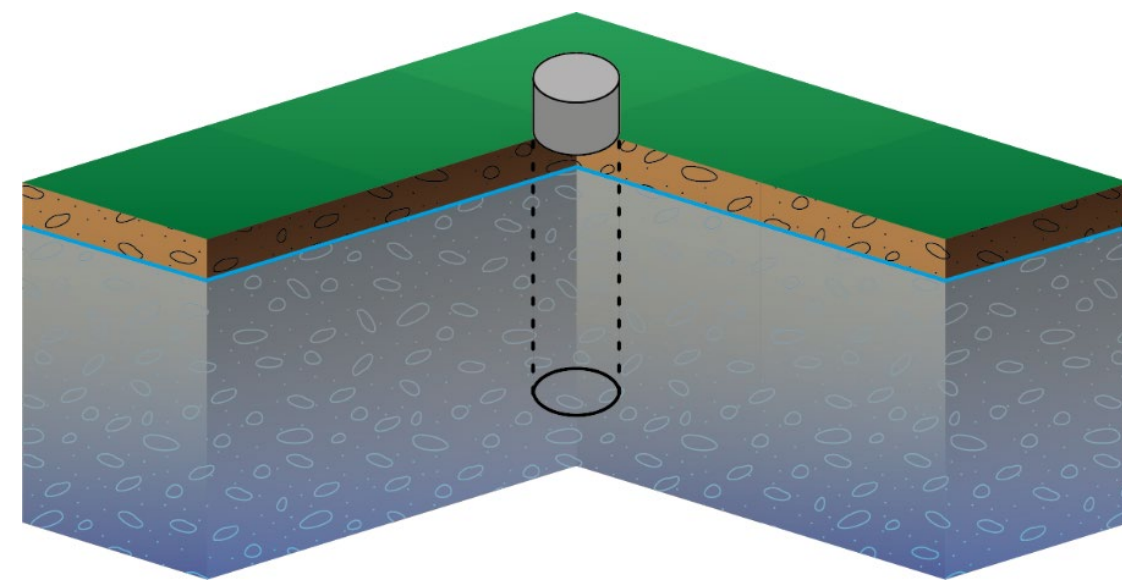
Topo-bathymetry of the Loiret (a
@fr 'résurgence' ?
@en 'upwelling' of the Loire river)

Identify water exchange areas

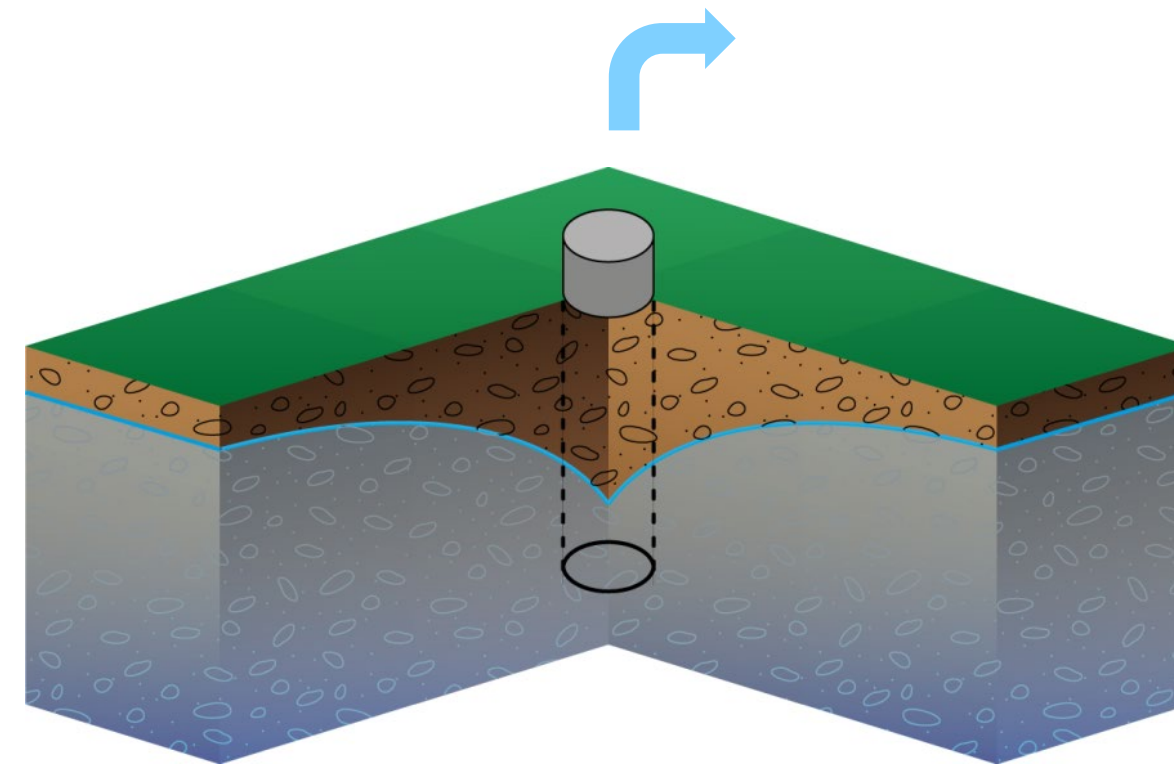
Coupling conductivity and
temperature data

An example – observation methods

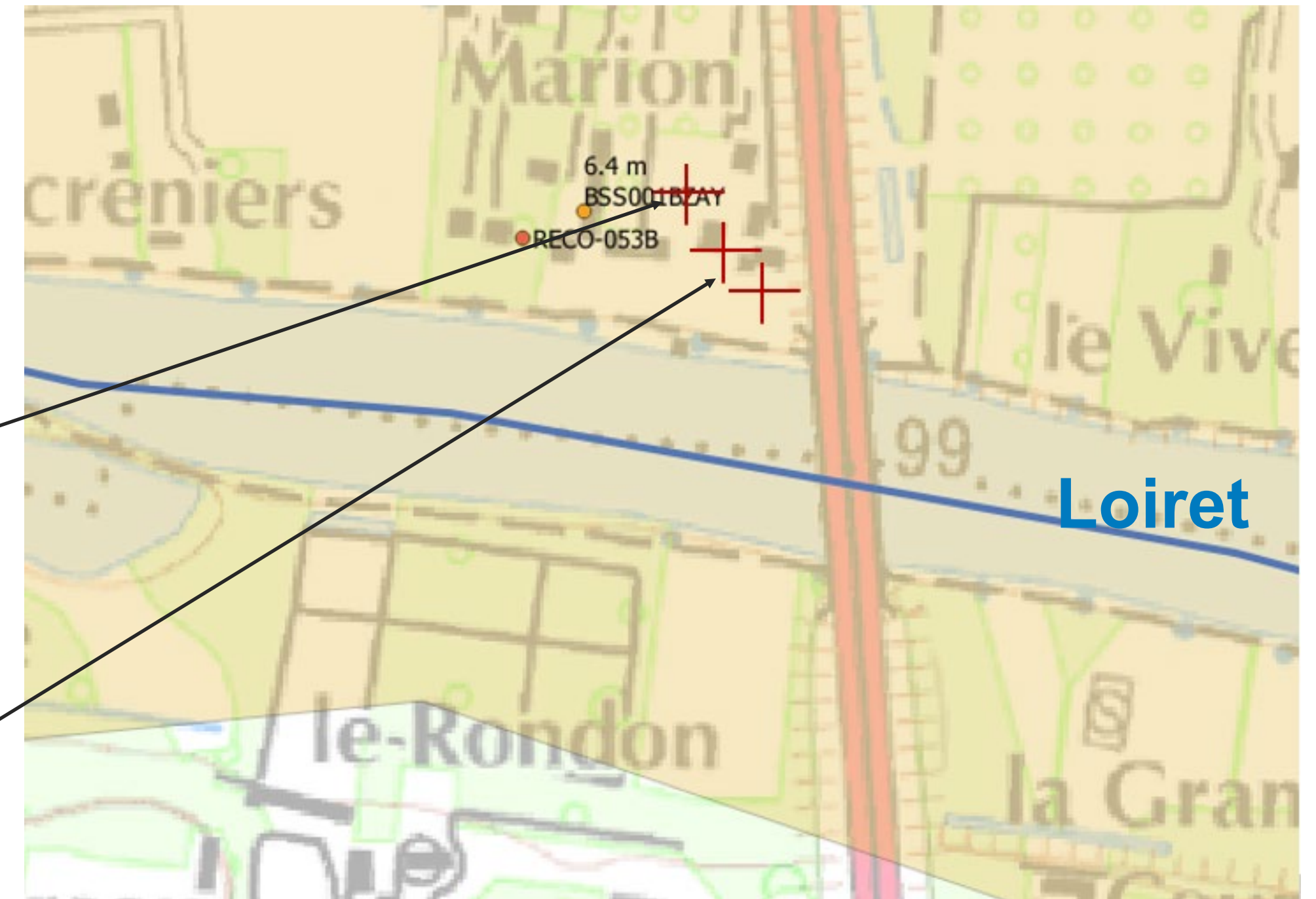
- Pump test and tracing



Puits Liger (observation well)



Puits De Koninck
(injection well)



An example – observation methods

- Pump test and tracing

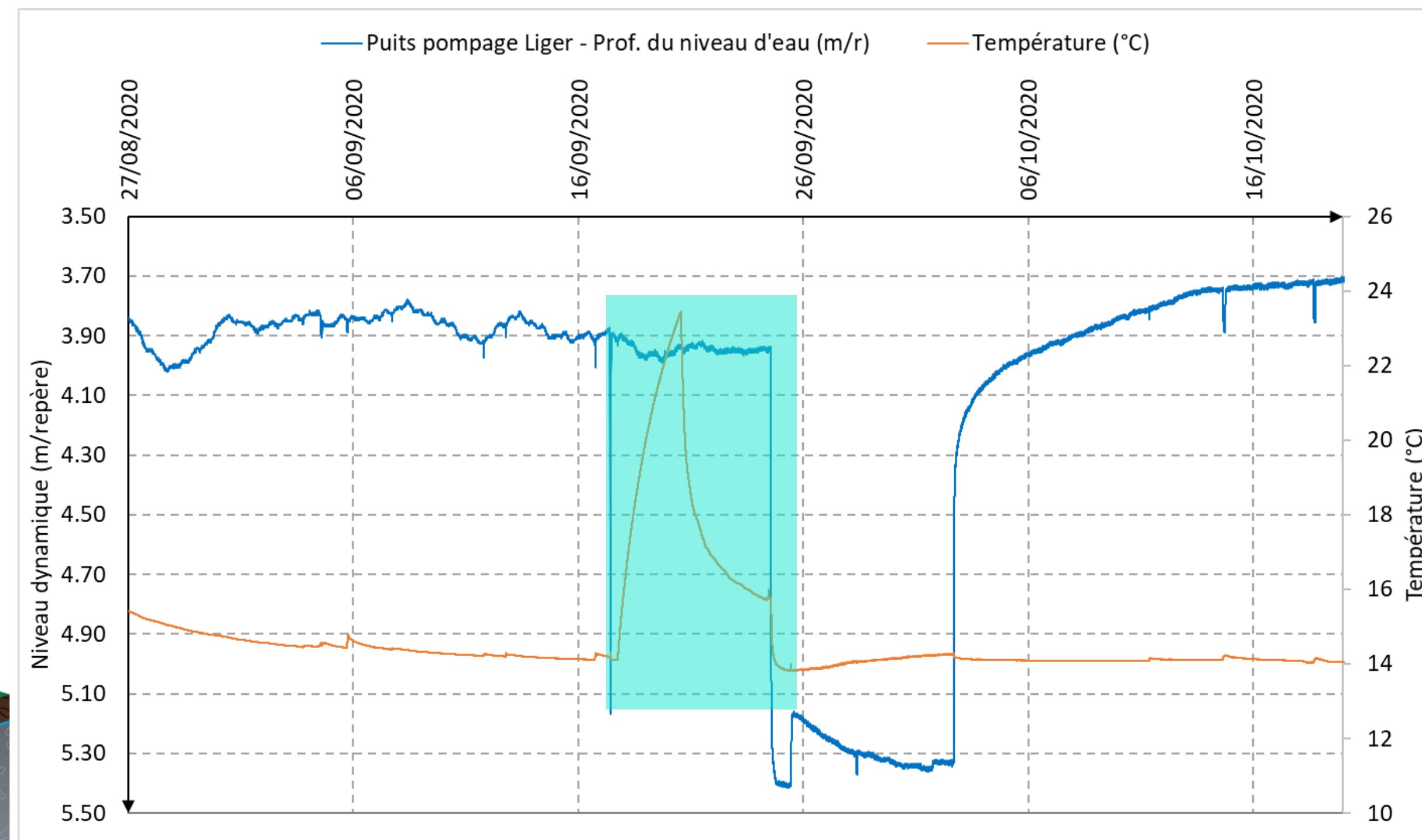
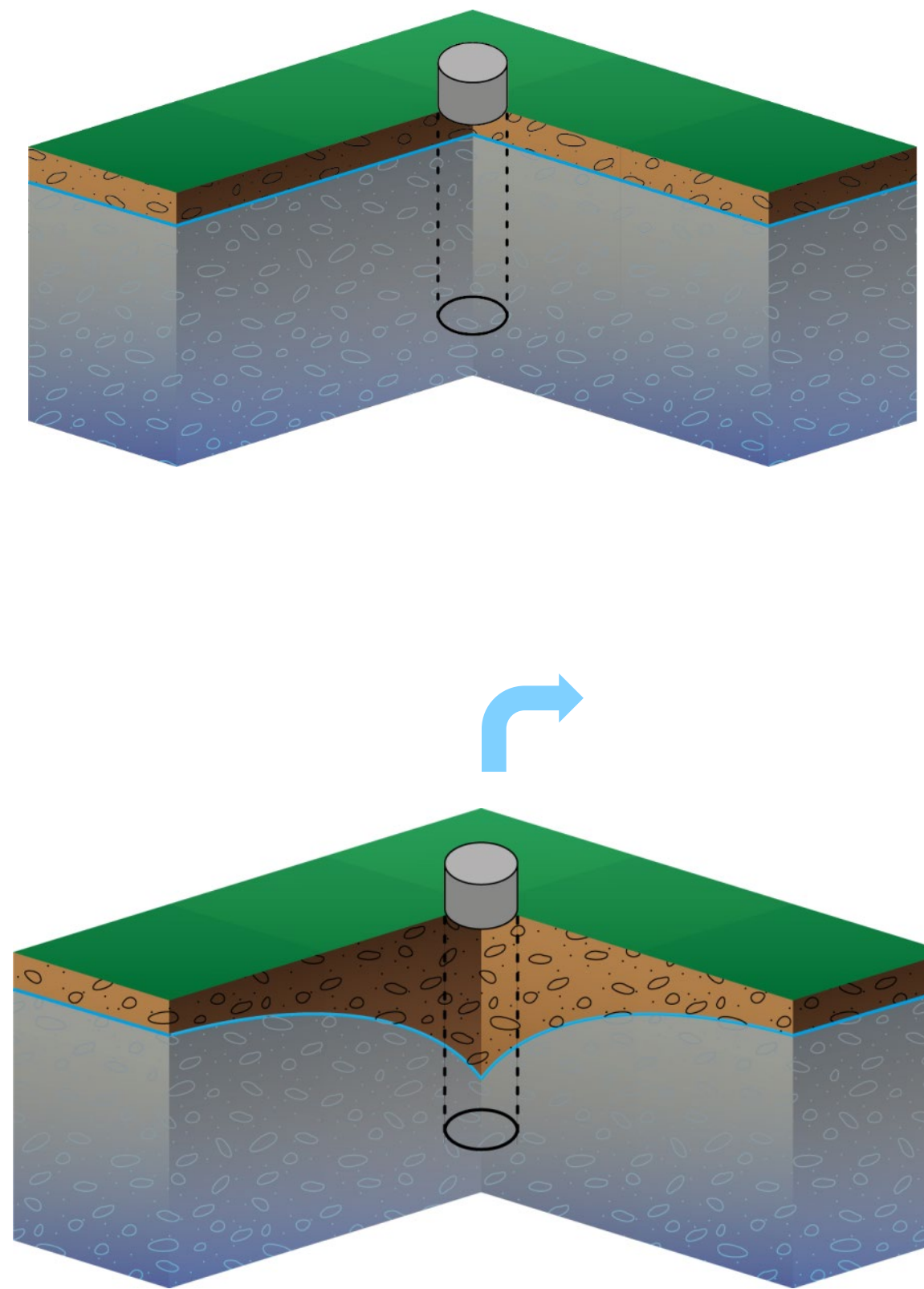


Illustration 10 : Evolution de la profondeur du niveau d'eau et de la température au puits de pompage (Puits Liger) du 27/08 au 20/10/20

Water temperature rising in the well

Linked to « water pool » on surface emptying (max air temp 14/09/2020 = 34.5°C)

An example – observation methods

- Pressure – temperature sensor



Conductivity / T°C prob: work with speleologist to define their location



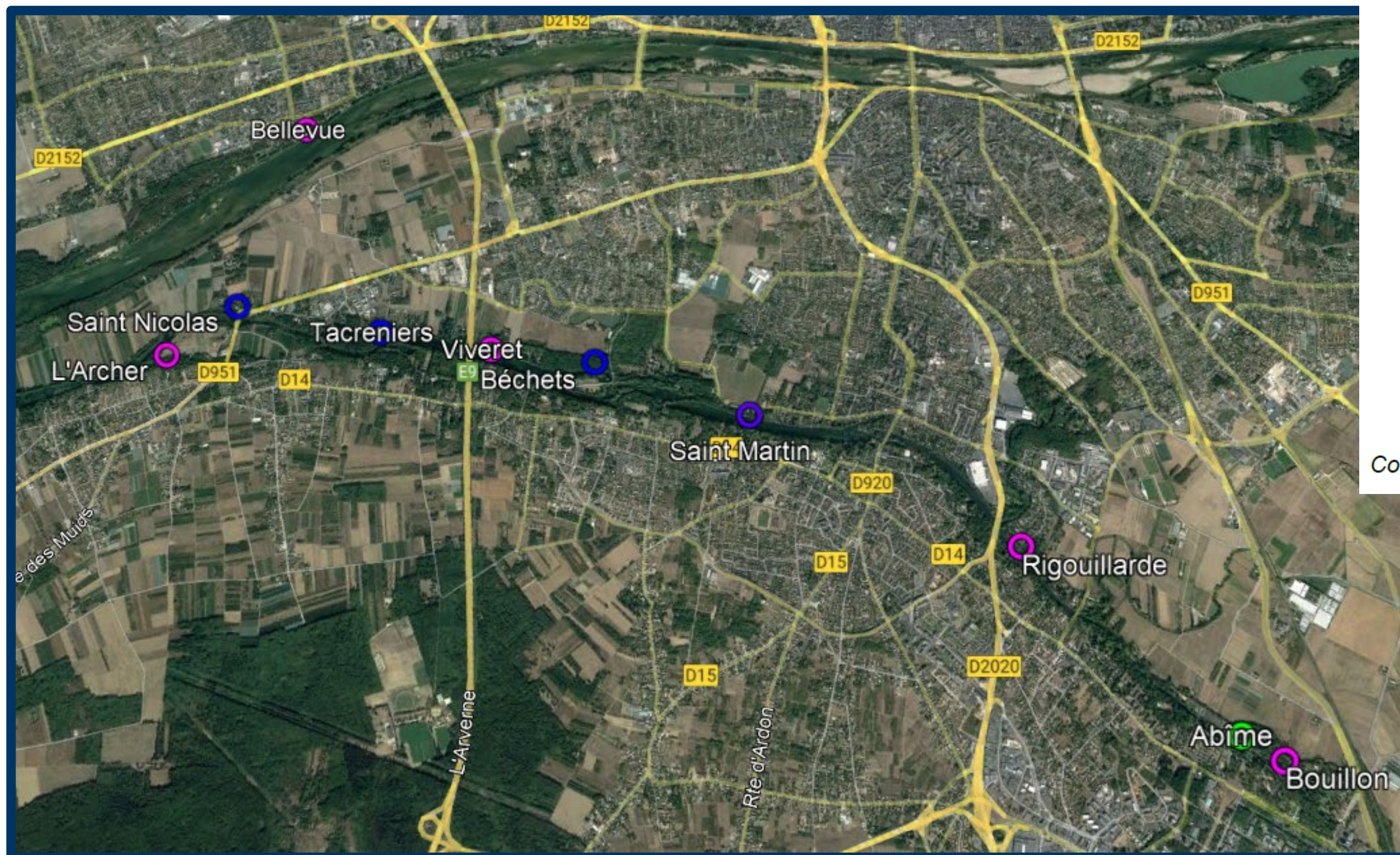
Légende

-  Patrimoine architectural
-  Gare à bateau
-  Moulin
-  Faune
-  Zone humide et/ou roselière
-  Navigation de loisir : canoë, kayak, aviron...
-  Promenade

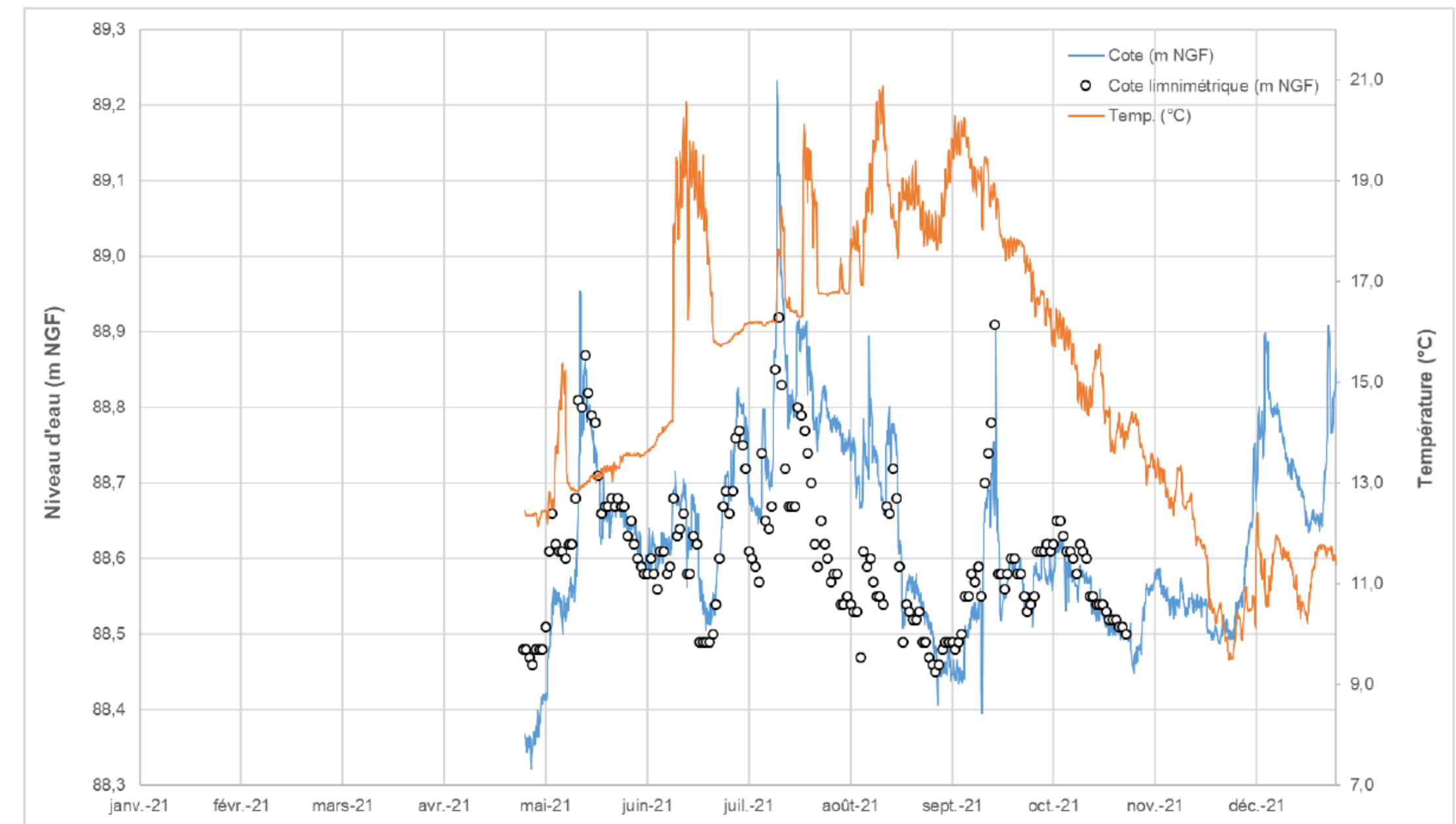


An example – observation methods

- Pressure – temperature sensor



Source des Tacreniers - 2021

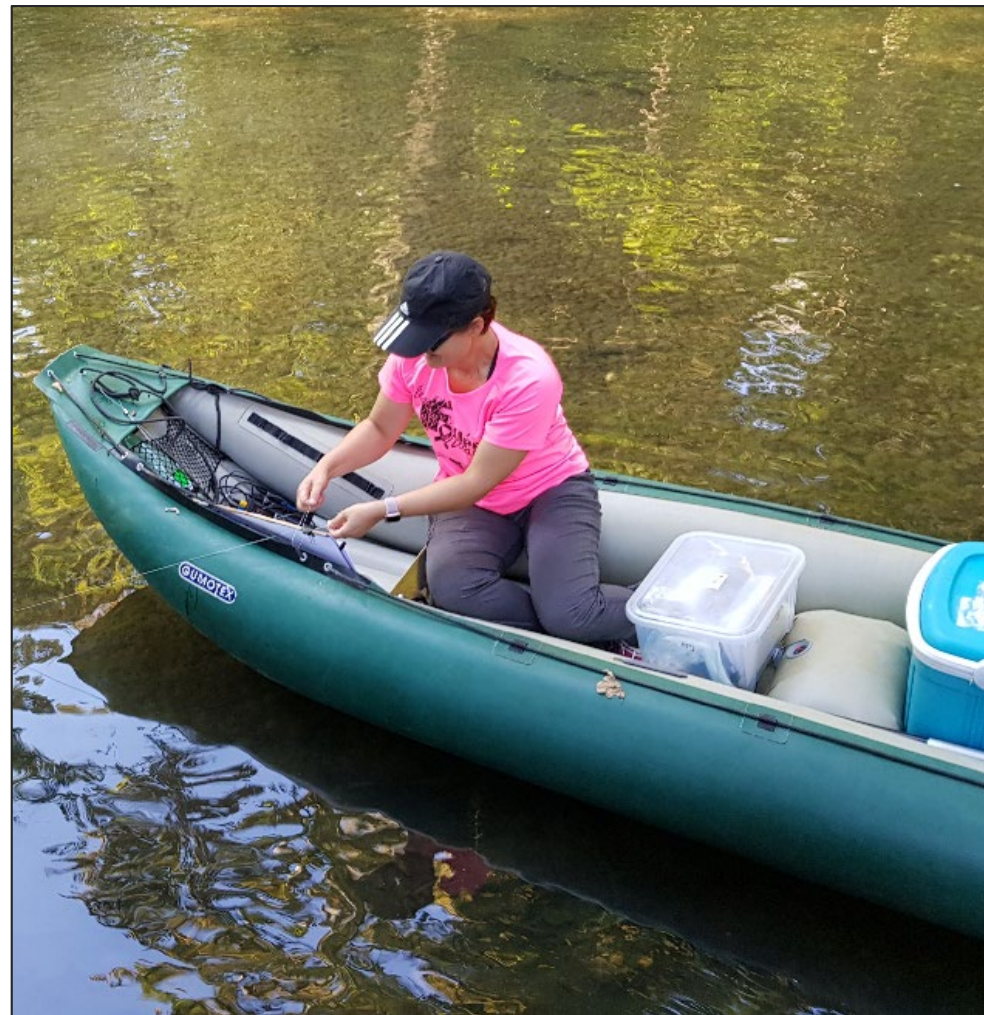


Capteur Sensus positionné à ~1 m du conduit karstique, au fond du lit du Loiret

Cotes limnimétriques mesurées par l'ASRL

An example – observation methods

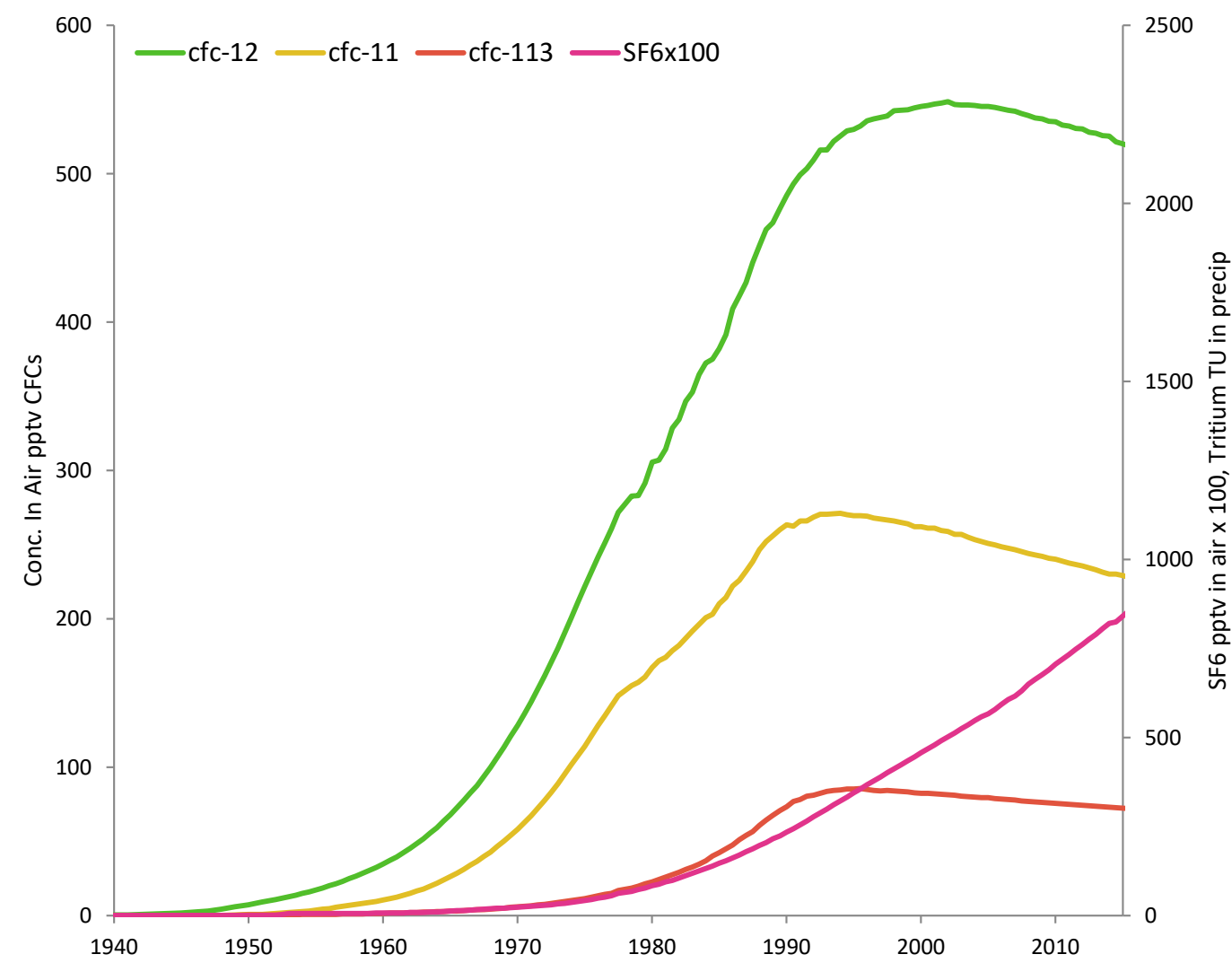
- Chemical campaigns



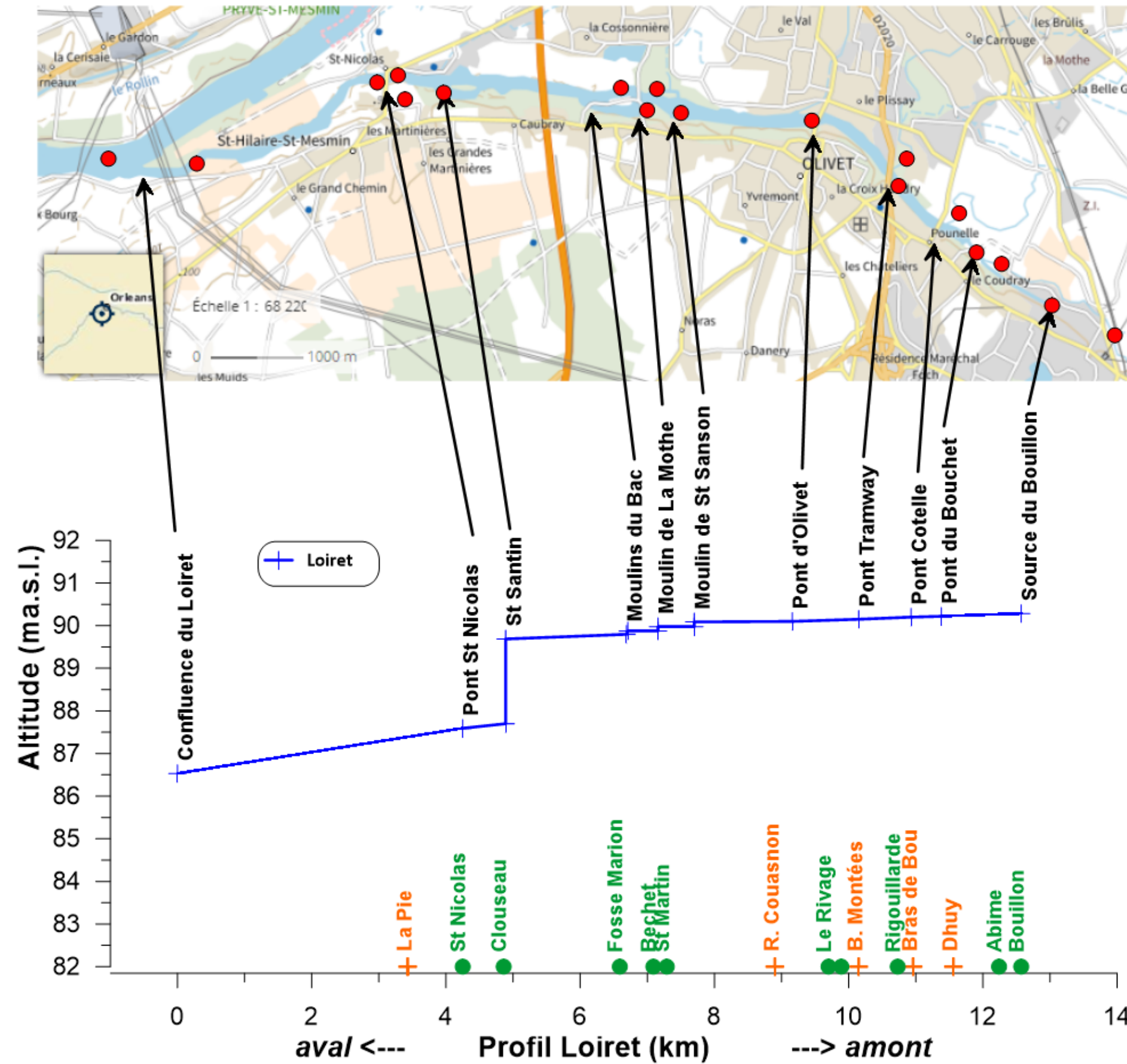
- *in situ* physicochemical parameters
 - water dating (@fr 'datation')
 - radon
 - organic / inorganic carbon
 - isotopes
 - piezometry
- surface/ground water flow difference

An example – observation methods

- Chemical campaigns



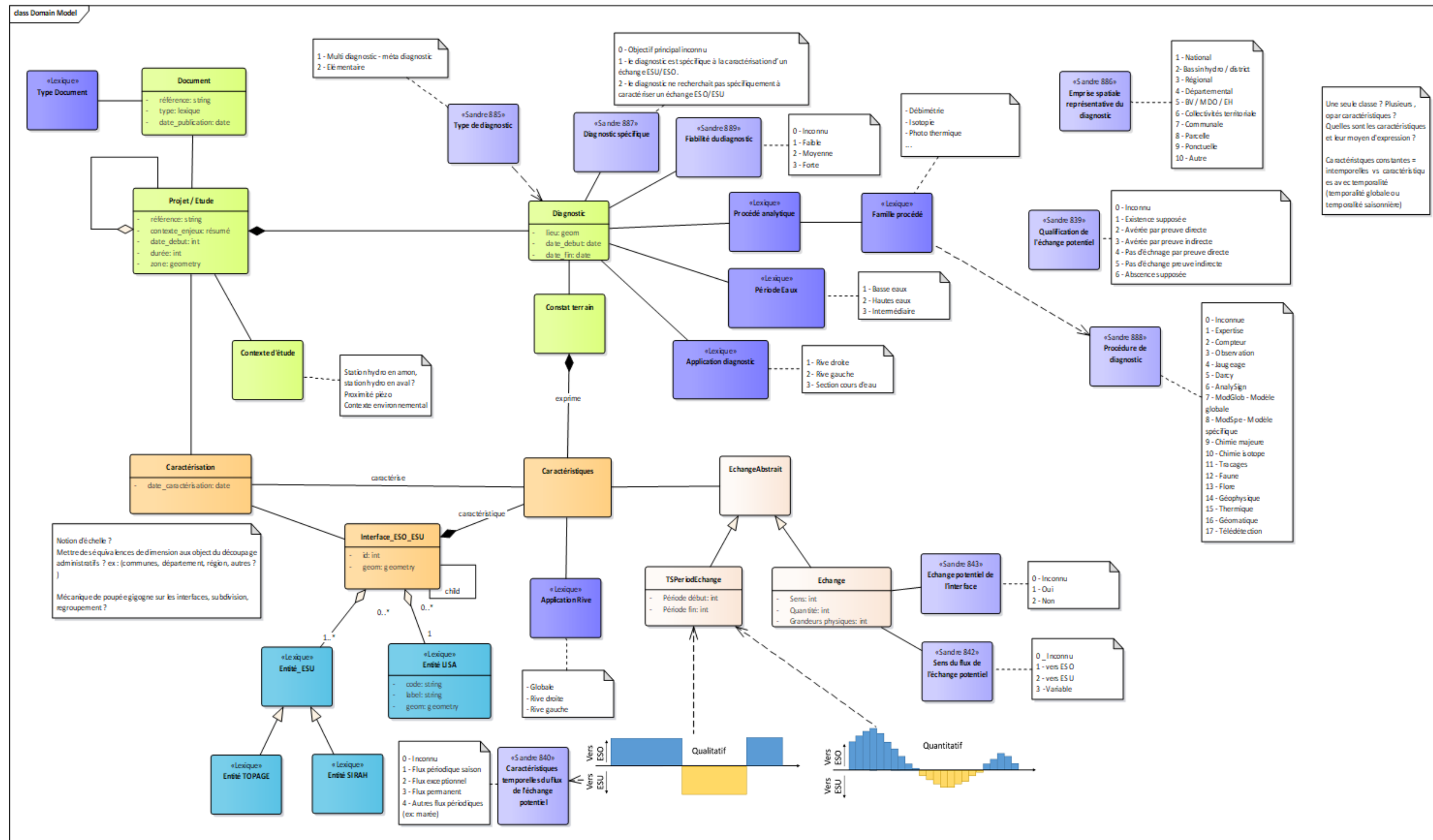
Water dating (@fr 'datation') with water from the pump test (observation well)



Isotopic analysis

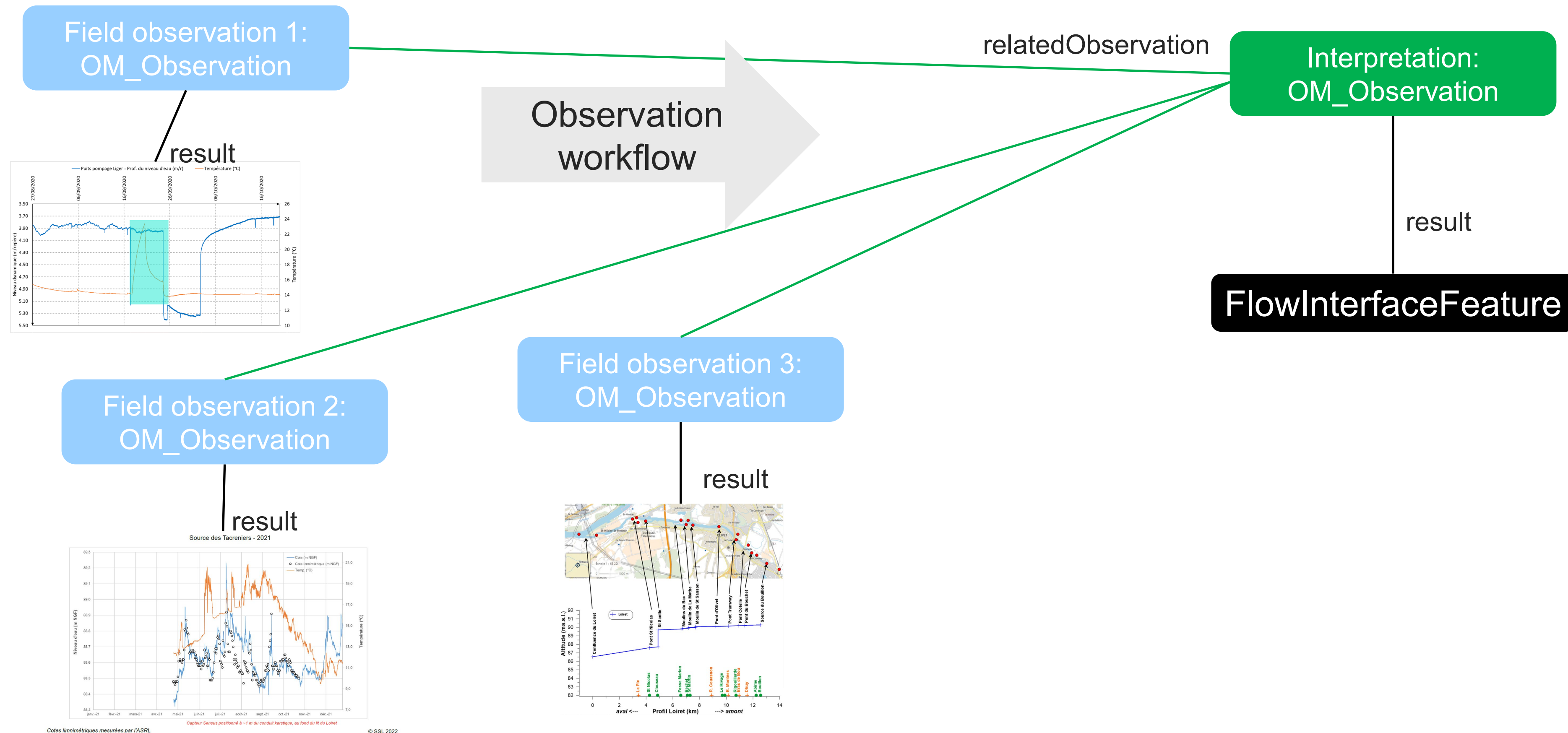
Structuring data

- Draft Data Model from domain colleagues -> to be ported to an interoperable way



Structuring data

- Underlying logic
 - An observation workflow based on O&M

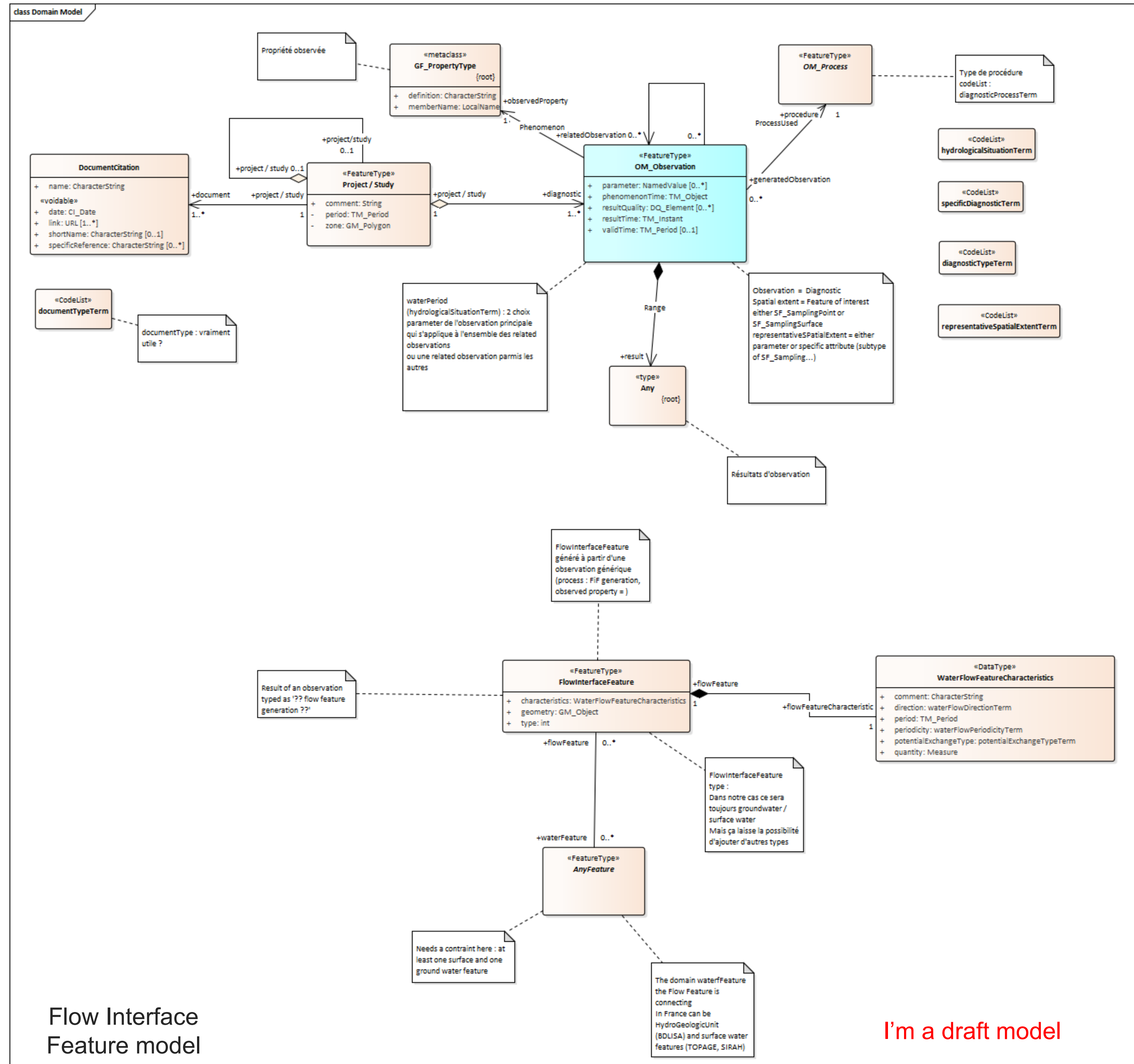
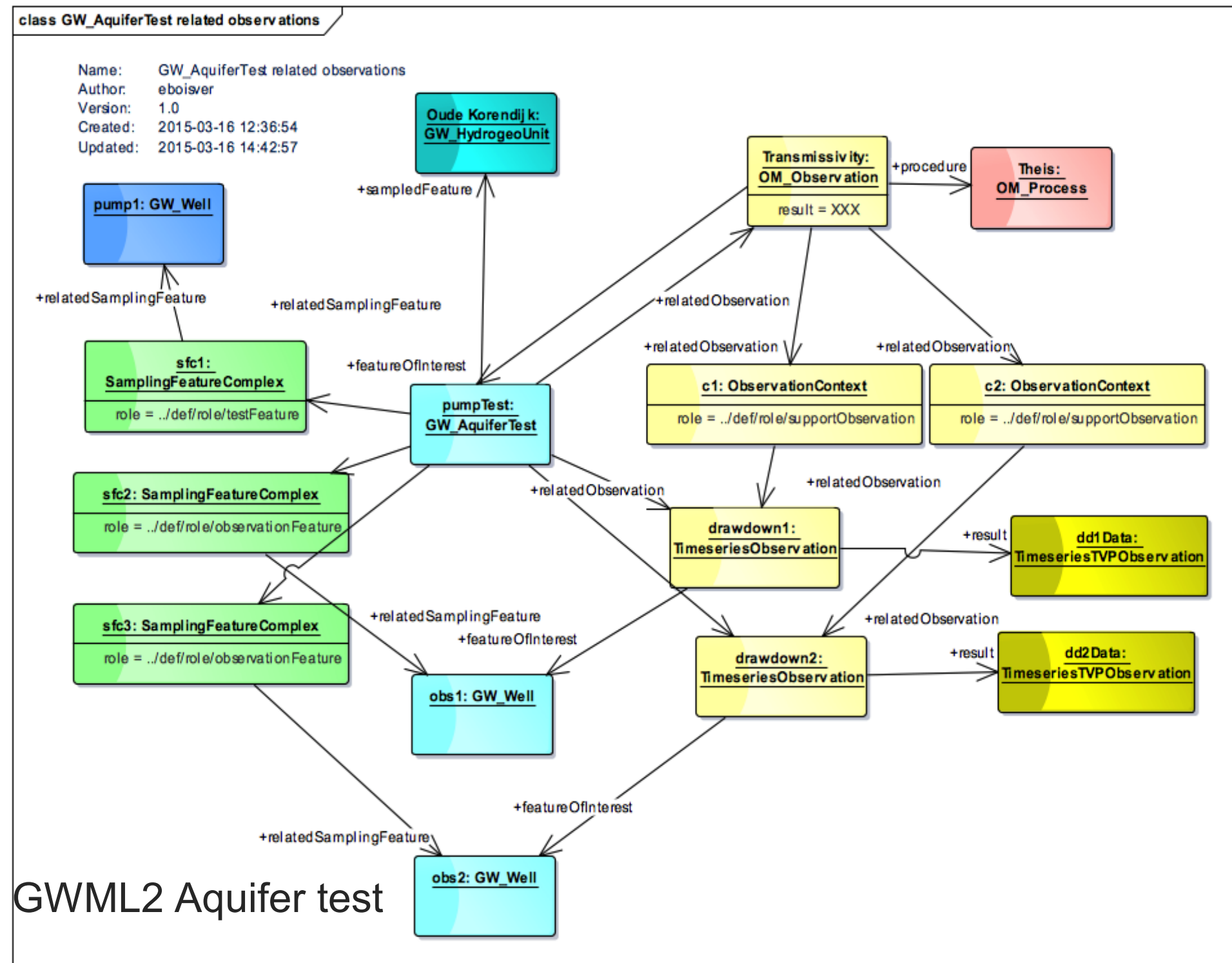


Structuring data

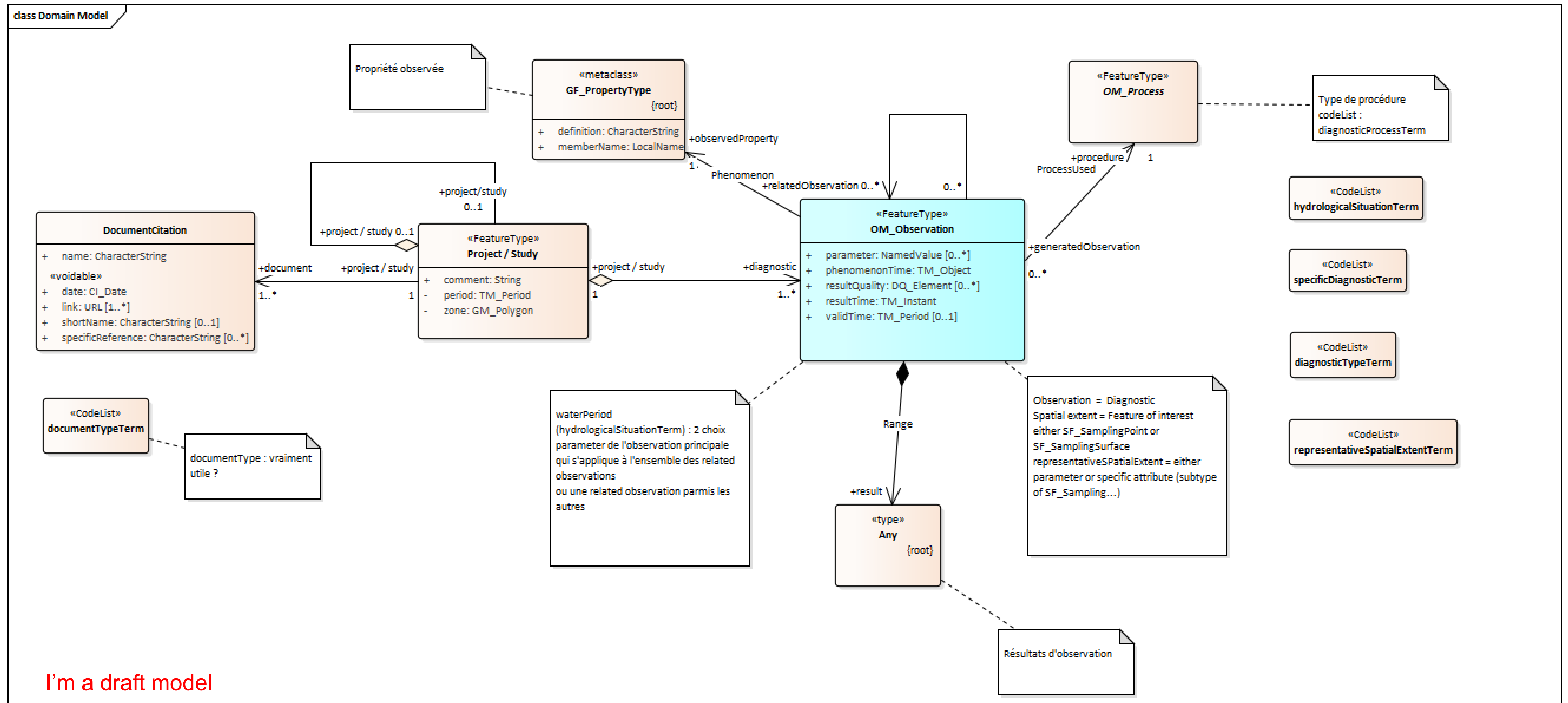
- Enriching this with pre-existing patterns

Ex : GroundWaterML2

GW_AquiferTest (O&M profile)

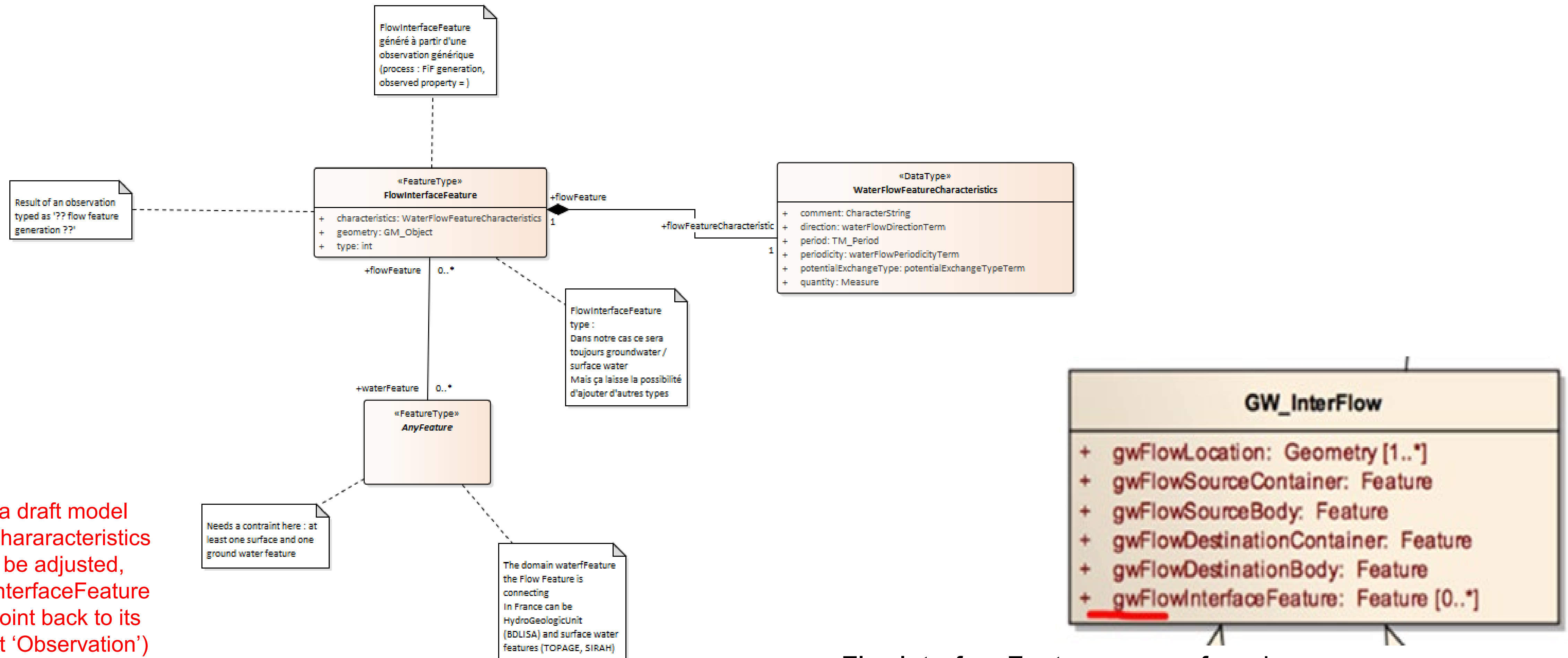


Structuring data



I'm a draft model

Structuring data



I'm a draft model
(ex : characteristics will be adjusted, FlowInterfaceFeature will point back to its parent 'Observation')

FlowInterfaceFeature comes from here
(GWML2 Flow package)

Next steps

- Finalizing model
- Logical Model -> Physical model + data-from CENARI-O project > APIs
- Discussion with HY_Features & GWML2 group how this fits in the current puzzle

Thank you and thanks to



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Thank You

Community

- 500+ International Members
- 110+ Member Meetings
- 60+ Alliance and Liaison partners
- 50+ Standards Working Groups
- 45+ Domain Working Groups
- 25+ Years of Not for Profit Work
- 10+ Regional and Country Forums

Innovation

- 120+ Innovation Initiatives
- 380+ Technical reports
- Quarterly Tech Trends monitoring

Standards

- 65+ Adopted Standards
- 300+ products with 1000+ certified implementations
- 1,700,000+ Operational Data Sets
- Using OGC Standards

