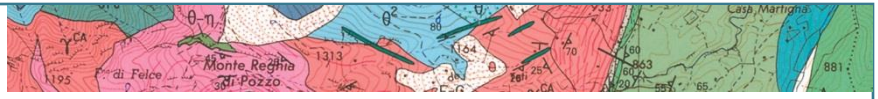

Implementing INSPIRE WFS and SOS for geoscience data: the technological cocktail to quench the user's thirst for data

Mickaël Beaufils, Sylvain Grellet & François Tertre

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INSPIRE Conference 2016 Workshop, Barcelona

Monday, September 26, 2016

BRGM on the rocks © cocktail

4. User interface

3. Identifier & resolver

2. SOS

1. WFS App Schema

WFS Application Schema

WFS App Schema > Stairway to … interoperability

User side

Advanced usage
(e.g. filtering)

Basic usage
(e.g. GetFeatureById)

Administrator side

Tool configuration for App Schema

Tool installation

Database modelling

Performance and scalability

Update and maintainability

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WFS App Schema > Tools used in BRGM

constellation
Spatial Data Infrastructures

GeoServer

deegree

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WFS App Schema > Current uses cases

			Implementations		
Data type	**Model**	**BRGM associated project**	constellation	deegree	GeoServer
Geologic units, faults and boreholes	INSPIRE Geology + GeoSciML v4	EPOS / EGDI			x
Water level piezometers	INSPIRE Environmental Monitoring Facility & Network	Pôle INSIDE			x
Shoreline	INSPIRE Sea Region	EnergicOD			x
Aquifer units	GroundWaterML v2	Pôle INSIDE	x		POC
Mineral resources	EarthResourceML	Minerals4EU		x	POC

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WFS App Schema > Subjective feedback

> No totally satisfying implementation

- Constellation
  - Difficult to configure and to update
- Deegree
  - Database structure must be close to diffusion schema
  - Filtering issues emphasized in 2015 (see Deegree Github)
- GeoServer
  - Still some bugs (e.g. ERML: IsMultipleIsTrue > data duplication)
  - Configuration of App Schema is tricky
  - Performances issues on complex features (all data are loaded by JAVA)

> Positive aspect

- GetFeatureById works
- Should we define stored queries and forbid other filter combinations?

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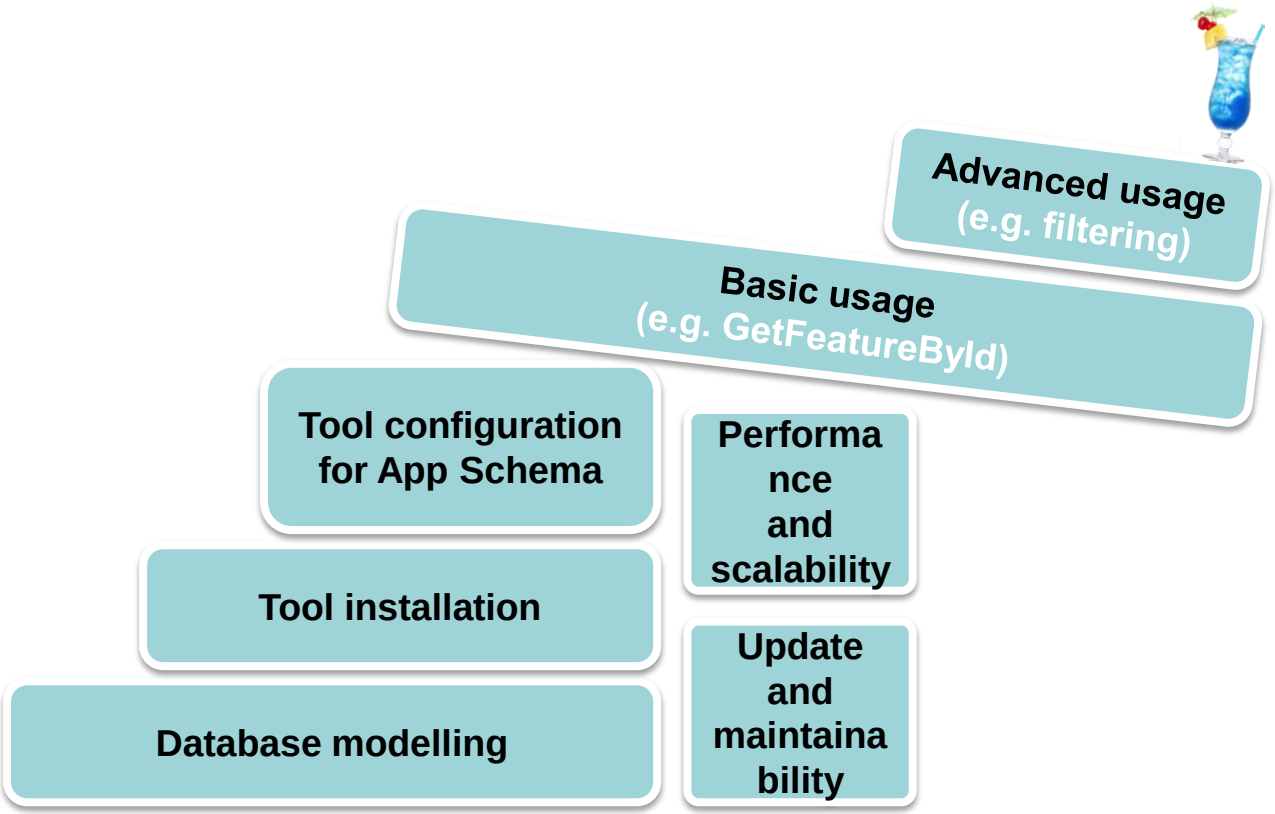
WFS App Schema > Main conclusion & perspectives



Can we team up to finance necessary evolution?

SOS

SOS > Feedback from SOS implementation

> Topics of discussion during the implementation

- Which SOS solution to deploy?
- How to map to preexisting (non O&M compliant) databases?
- How to design the rawobservation database?
- How to link features to observations (at service level)?

> Choices:

- 52 North solution
- Raw observation schema database very close to O&M schema
  - Use of materialized views to bridge to raw database
- One webapp is set up per use case

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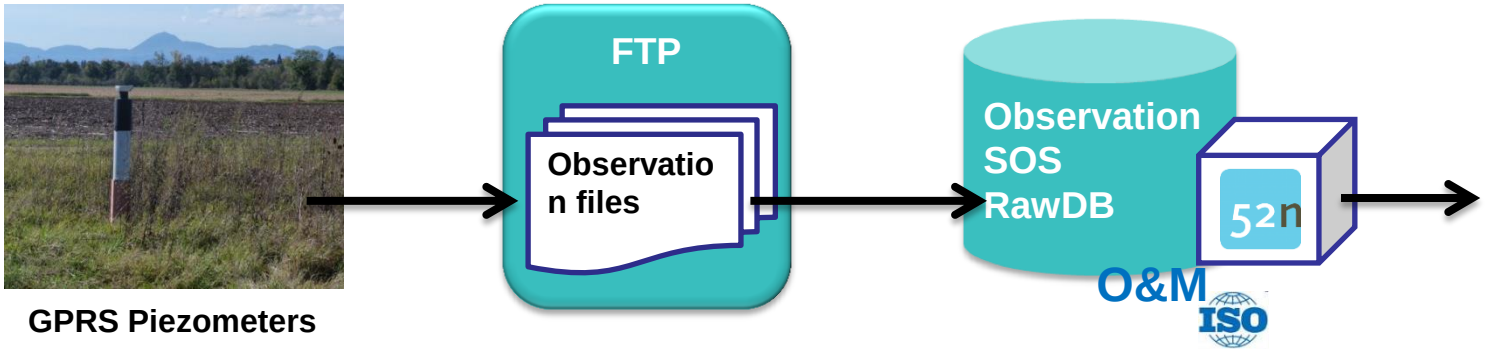
SOS > Current use cases

Data type	Profile	BRGM associated project	Status
Groundwater levels (raw observations)	INSPIRE PointTimeSeriesObs°	Pôle INSIDE	X
Groundwater levels (validated data)	INSPIRE PointTimeSeriesObs°	Pôle INSIDE	WIP
Groundwater quality (validated data)	Under discussion	Pôle INSIDE	Specified
Borehole logs	GWML2 (GeologyLogCoverage)	EPOS	Specified
Geothermy properties	INSPIRE PointTimeSeriesObs°	BRGM ADEME platform	WIP
Coastline erosion observation (CitizenScience)	Under discussion	EnergicOD	Under discussion

SOS > Focus on Groundwater RawData Levels



> Some examples:

- Latest GroundWaterLevel observation from one piezometer:
  - WaterML 2.0 format: http://ressource.brgm-rec.fr/obs/RawOfferingPiezo/00463X0036/H1.2&responseFormat=http://www.opengis.net/waterml/2.0&temporalFilter=om%3AphenomenonTime%2Clatest
  - JSON format: http://ressource.brgm-rec.fr/obs/RawOfferingPiezo/00463X0036/H1.2&responseFormat=application/json&temporalFilter=om%3AphenomenonTime%2Clatest

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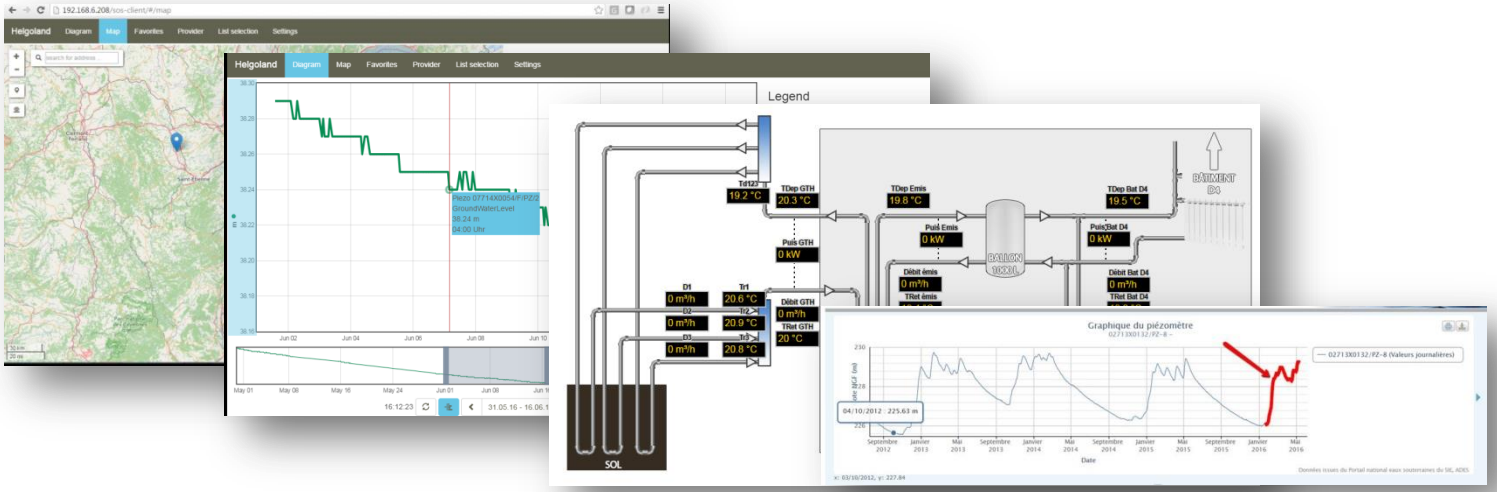
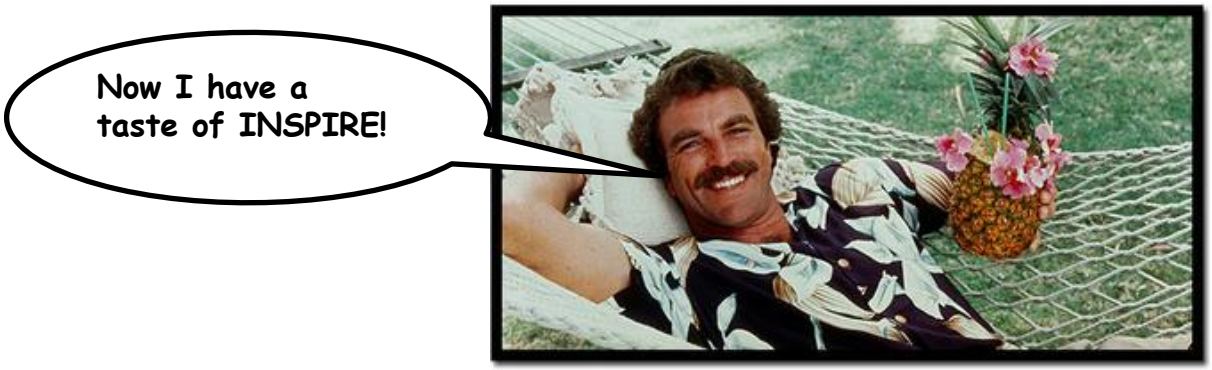
SOS > Positive feedback

> It’s worth the effort!

- Lot of reuse (websites, QGIS client plugin)



- Our domain colleagues are happy!



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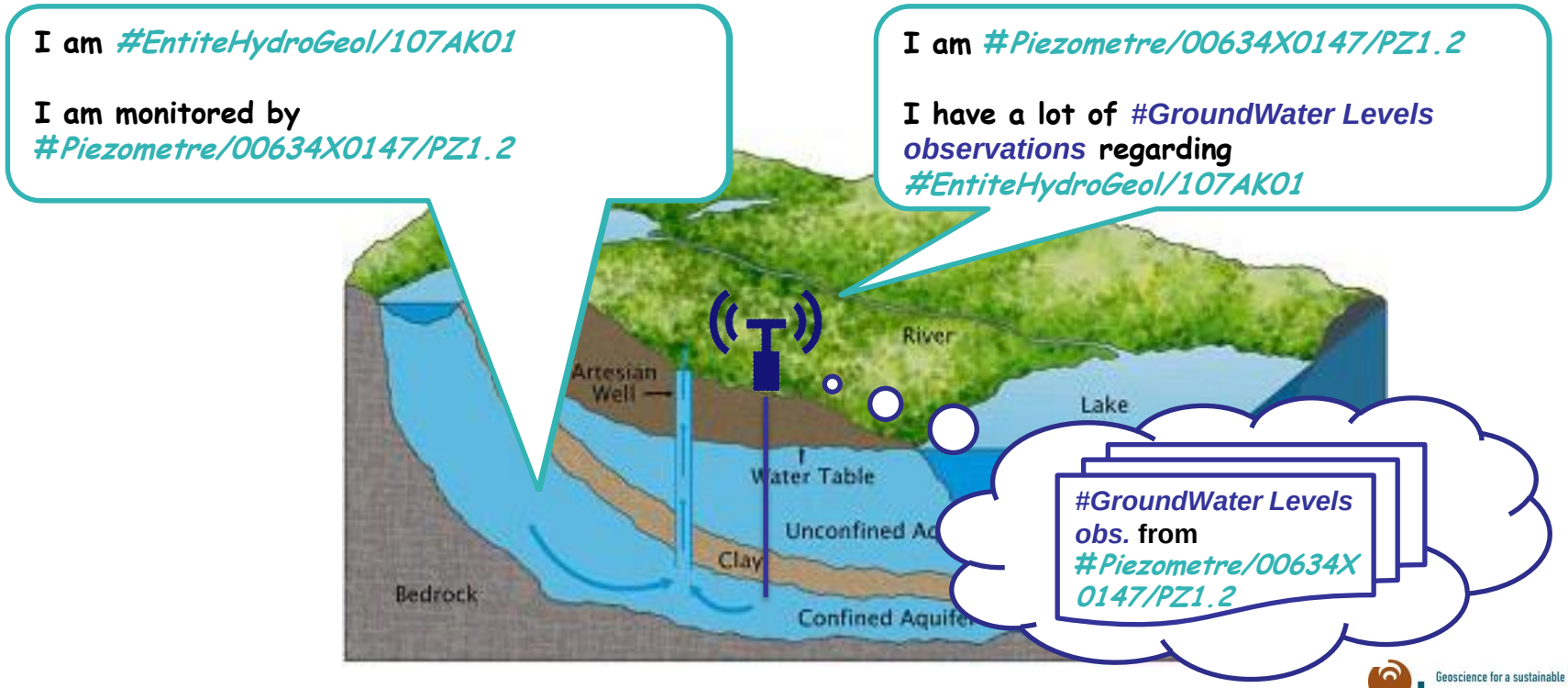
Identifiers and resolvers

URIs to link data

> Objectives

- To provide stable and resolvable links to resources
- To allow reference / data citation
- Independant from underlying technologies used to provide data



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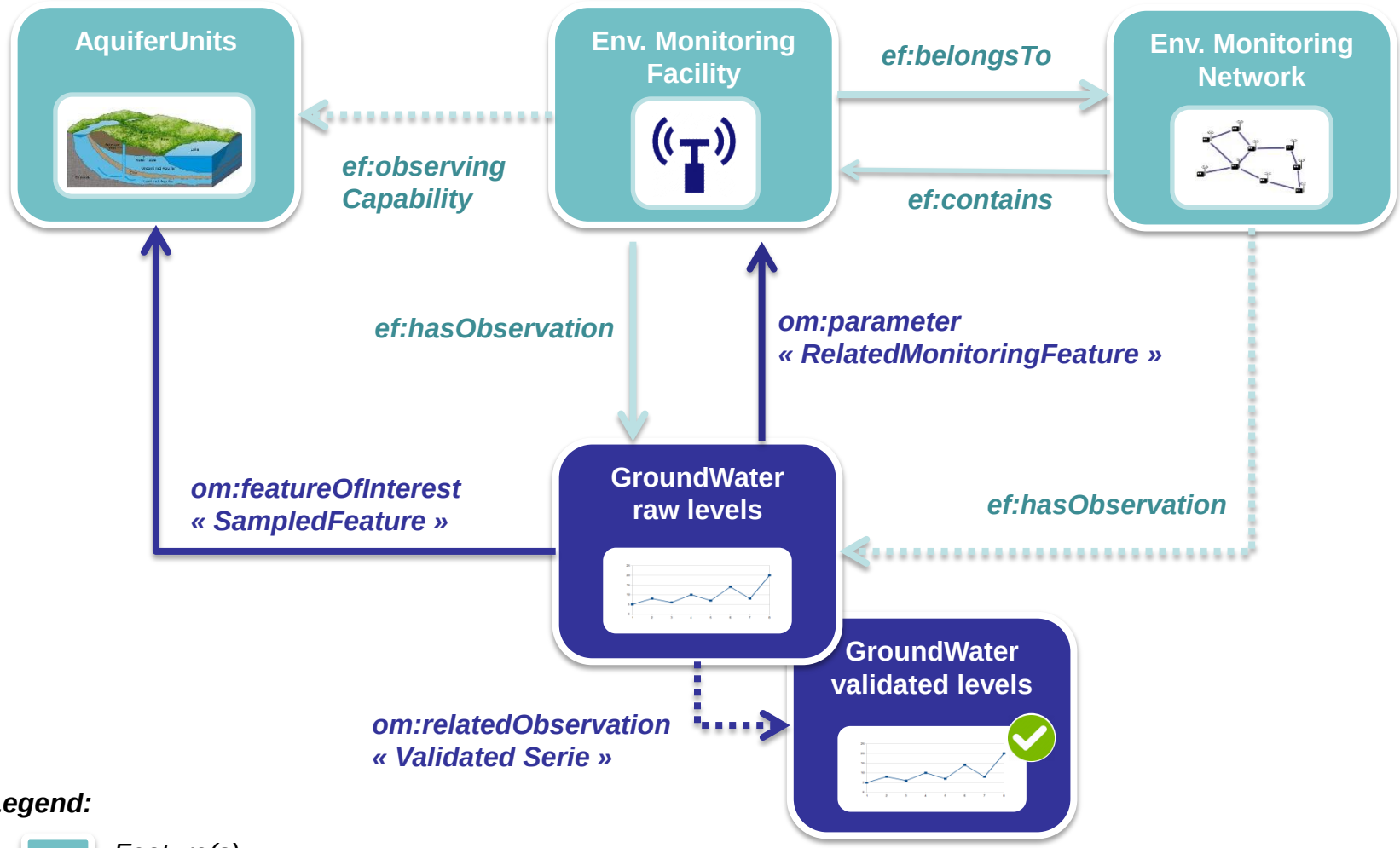
URIs > Groundwater Levels use case: model view

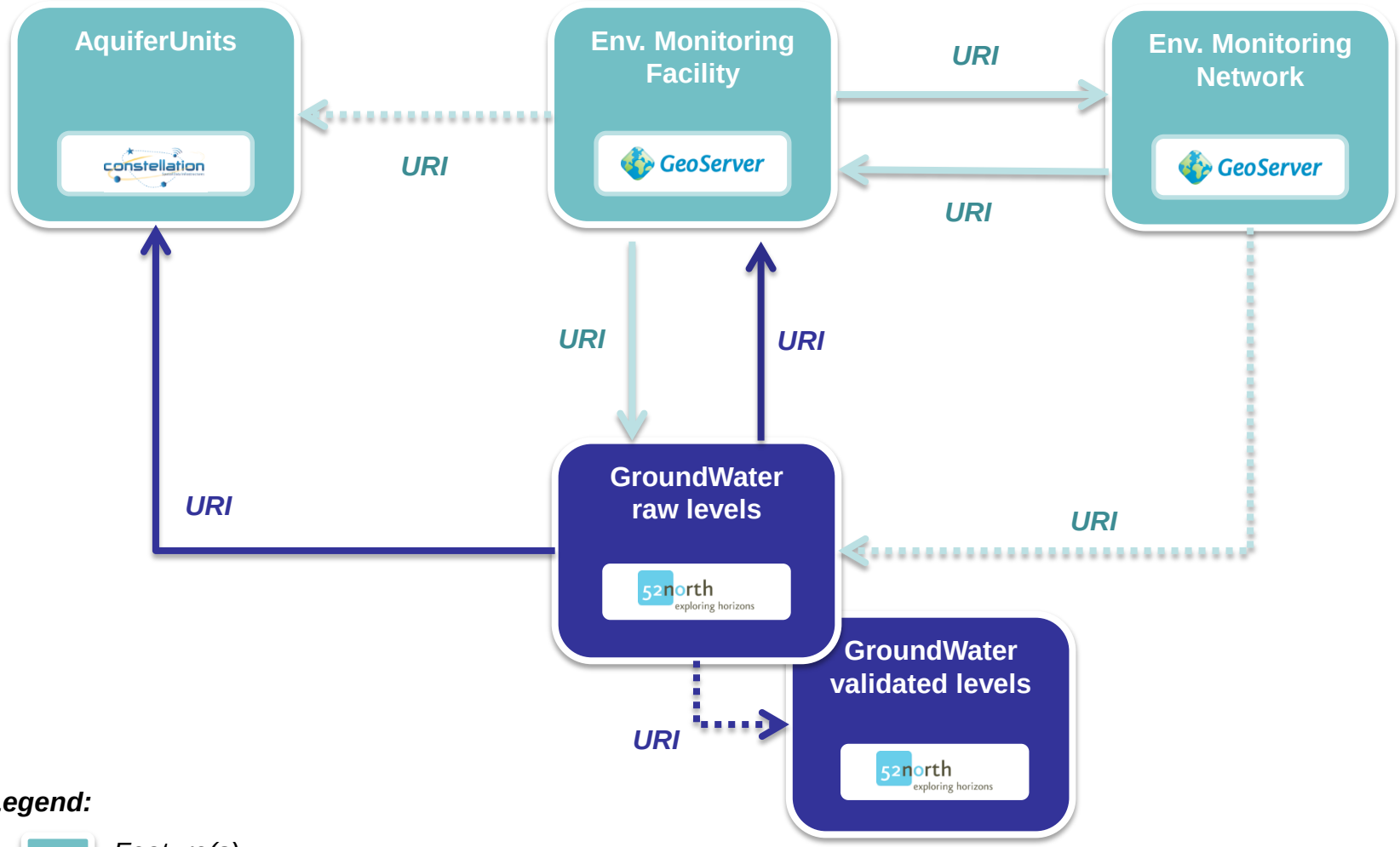


Legend:

Feature(s)

Observation(s)

URIs > Groundwater Levels use case: service view



Legend:

Feature(s)

Observation(s)

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URIs > Implementation

> Topics of discussion

- Identifier nomenclature (language, pluralism, separators)
- When should we define specific identifiers ?
  - Different representations of the same resource
  - Data versions
  - Data granularity

> Choice

- http://ressource.brgm-rec.fr/ to centralize BRGM data resources
  - **./data** for data objects (e.g. geologic units, piezometers, …)
  - **./obs** for observations (e.g. groundwater levels, …)
  - **./vocabs** for controled vocabularies (e.g. groundwater sampling for quality analysis, …)
  - **./services** for web services endpoint
- POC Apache rewritting rules

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URIs > Some examples of identifiers and resolvers

http://ressource.brgm-rec.fr/data/EntiteHydroGeol/107AK01

Rewrite in proxy mode

http://gwml2poc.brgm-rec.fr/WS/wfs/BRGM:GWML2?service=WFS&version=2.0.0&request=GetFeature&typeNames=gwml-main:GW_Aquifer&storedQuery_Id=urn:ogc:def:query:OGC-WFS::GetFeatureById&id=**EntiteHydroGeol.107AK01**

> Other examples:

- One piezometer: http://ressource.brgm-rec.fr/data/**Piezometre/00634X0147/PZ1.2**
- One GroundWaterLevel offering: http://ressource.brgm-rec.fr/obs/**RawOfferingPiezo/00463X0036/H1.2**&responseFormat=http://www.opengis.net/waterml/2.0

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User interfaces

User interface

> Objectives

- Enhance INSPIRE services readability
- Emphasizes data connectivity
- Break the No client <-> No data loop

> QGIS GML Application Schema Toolbox

- Funded by BRGM and developed by Oslandia
- Available for download on QGIS plugin store
- Developed for QGIS v2.14 +

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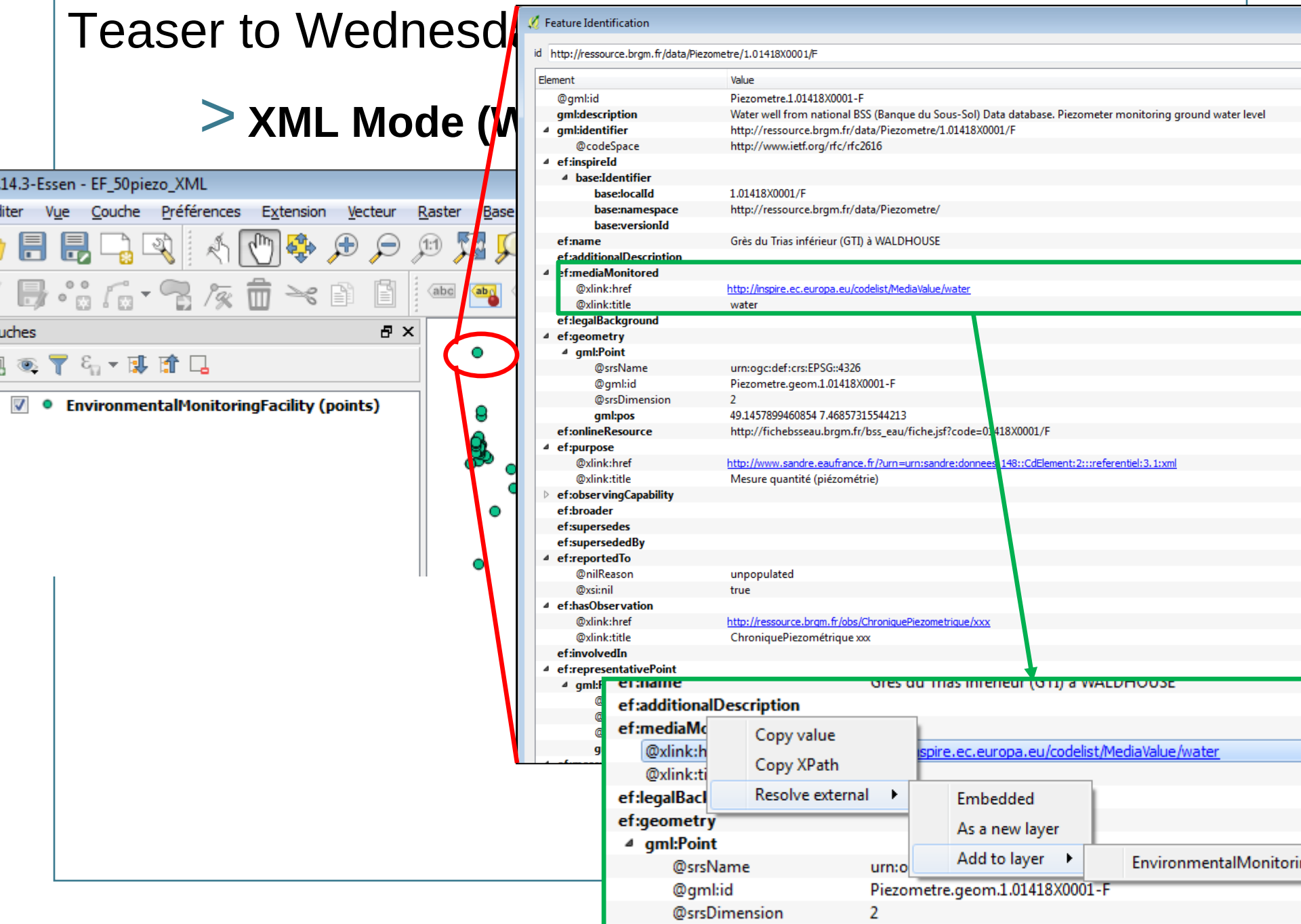
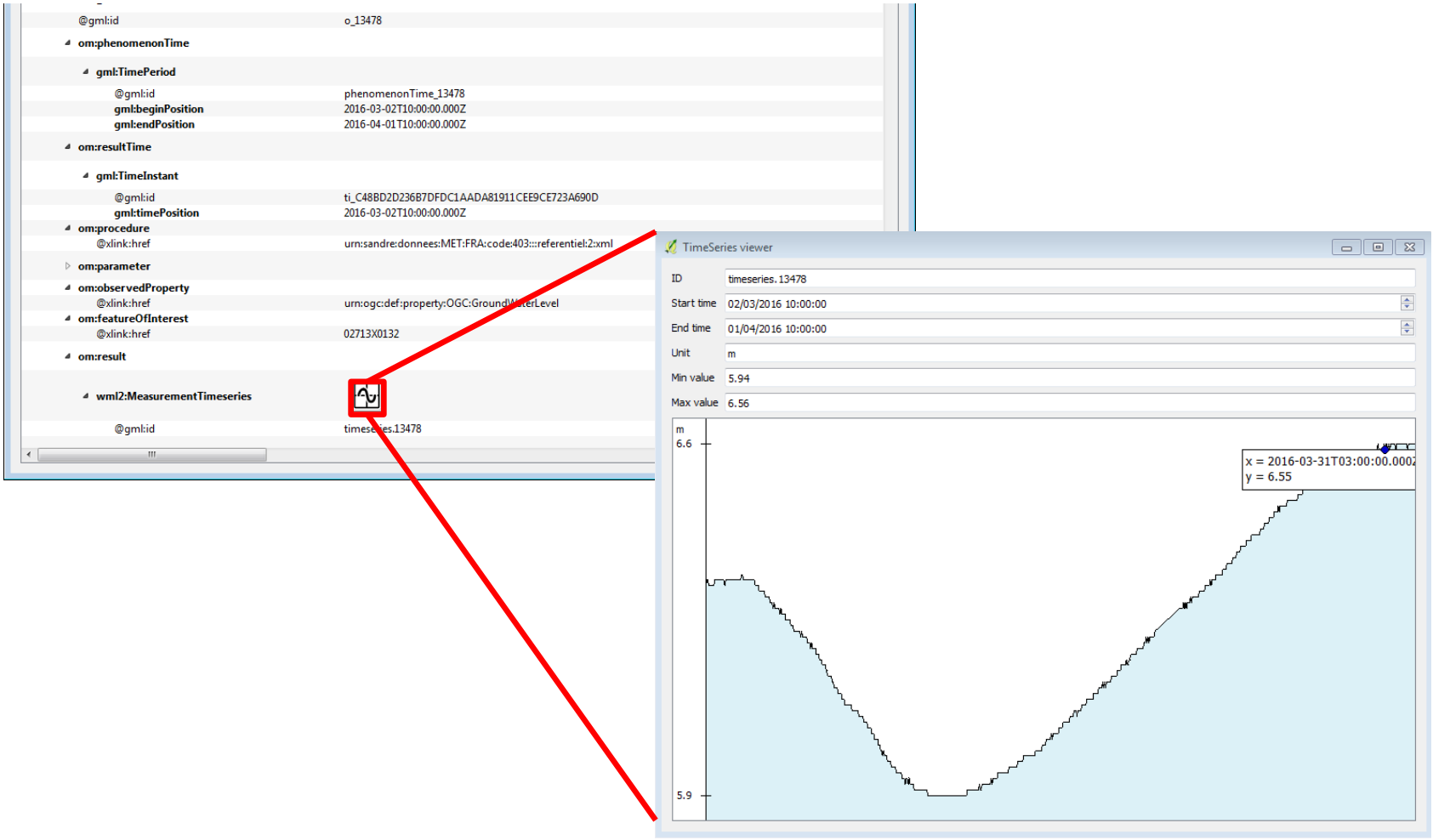
Teaser to Wednesda

> XML Mode (W



Teaser to Wednesday 28th presentation

> XML Mode (SOS)



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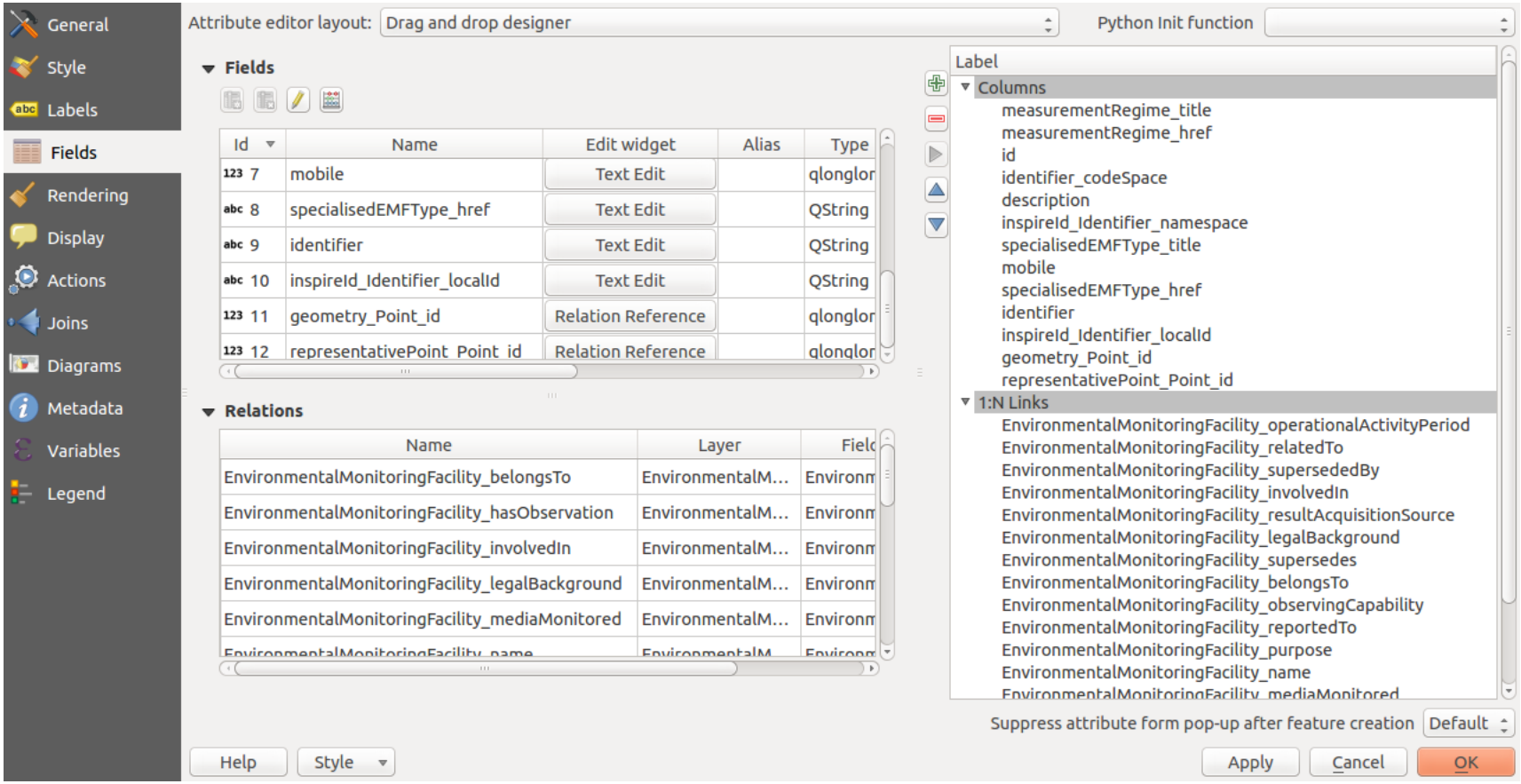
Teaser to Wednesday 28th presentation

> Relational mode



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Conclusion

In a (coco)nutshell

> Very encouraging points:

- WFS & SOS enable to provide data for basic usage
- Identifiers and resolvers enable to link data
- QGIS plugin increase data consumption pleasure
- Domain colleagues can now taste INSPIRE (SOS)!

> Challenges to overcome:

- Configuration of WFS App Schema is not really accessible
- SOS implementation need one instance per use case
- Scalability and performances must be enhanced to reach production mode

> Can we can team up to finance it?

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Cheers!

m.beaufils@brgm.fr

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