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OGC standards for geoscience - Speed dating with the standards

Sylvain Grellet

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OGC STANDARDS FOR GEOSCIENCE

SPEED DATING WITH THE STANDARDS
Sylvain Grellet



Geoscience for a sustainable Earth

brgm

NAME : GEOSCIML

Logical model of geological features commonly described and portrayed in geological maps, cross sections, geological reports and databases.

Age : V 4.1

Key features

- Covers the domain of geology (earth materials, geological units and stratigraphy, geological time, geological structures, geomorphology, geochemistry) and sampling features common to the practice of geoscience, such as boreholes and geological specimens.

Weight

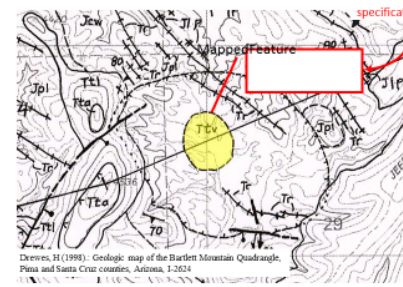
- Full and 'Lite' versions

Children / Family

- Reused by many geological surveys and countries, continent wide spatial data/research infrastructures (INSPIRE, EPOS, AuScope, ...)

Wishes

- Currently moving to the semantic web



Ttv Dacitic vent breccia—Light-medium-gray, finely porphyritic dacitic rock containing inclusions of Jurassic or Proterozoic granite and Jurassic rhyolite (welded tuff) as much as 20 m in diameter. The subcircular outcrop mass of breccia probably is a volcanic vent or throat. A halo of strongly saussuritized rock 0.3–0.5 km wide surrounds this vent. The dacitic matrix consists of phenocrysts (25–35 percent, as much as 2 mm in length) set in a cryptocrystalline granular groundmass. Phenocrysts include albitized(?) plagioclase (12–18 percent), chloritized biotite (2–5 percent), unaltered amphibole (2–10 percent), magnetite (trace to 2 percent), and apatite (trace amount). Quartz is present as a secondary mineral, filling vugs.

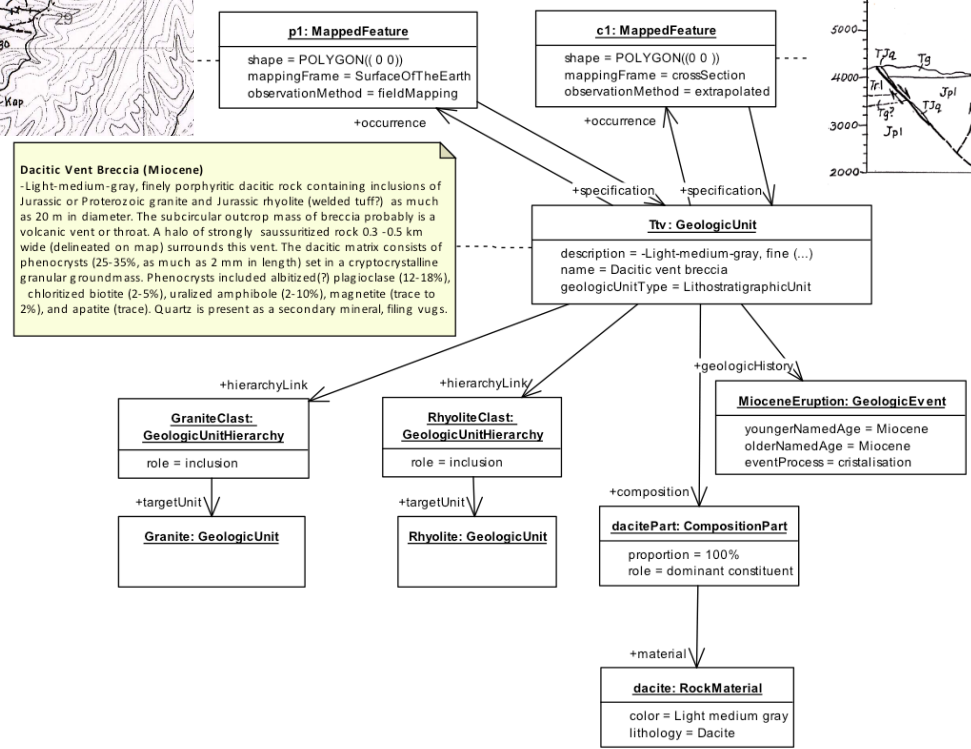
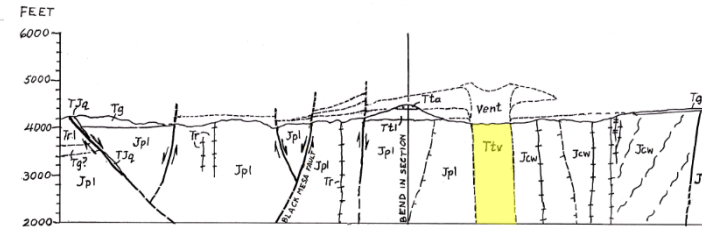
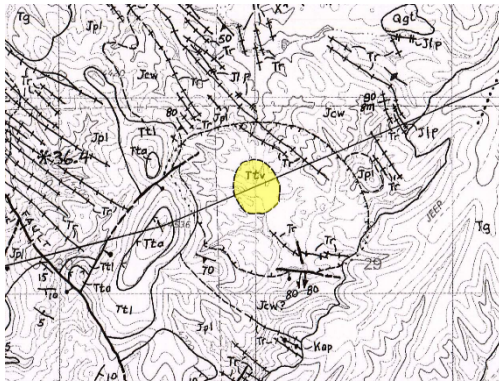
- name: Dacitic vent breccia
- geologicUnitType: LithodemicUnit
- geologicHistory
 - GeologicEvent
 - name: Miocene
 - eventProcess: crystallisation
 - youngerNamedAge: Miocene
 - olderNamedAge: Miocene
- composition
 - CompositionPart
 - proportion: 100%
 - role: dominant
 - material
 - RockMaterial
 - color: Light medium gray
 - lithology: Dacite
- hierarchyLink
 - GeologicUnitHierarchy
 - role: inclusion
 - targetUnit
 - GeologicUnit
 - name: Rhyolite

NAME : GEOSCIML

Contact

<https://www.opengeospatial.org/standards/geosciml>

Other pictures



NAME : GROUNDWATERML2

A conceptual and logical model for groundwater resources management

Age : V 2.2

Key features

- Core groundwater elements such as aquifers, their pores, and fluid bodies,
- Wells and construction component, springs, and monitoring sites
- Observations: constituents (bio, chemical, materials constituent), groundwater flow within/between containers,
- AquiferTest / pump test

Weight

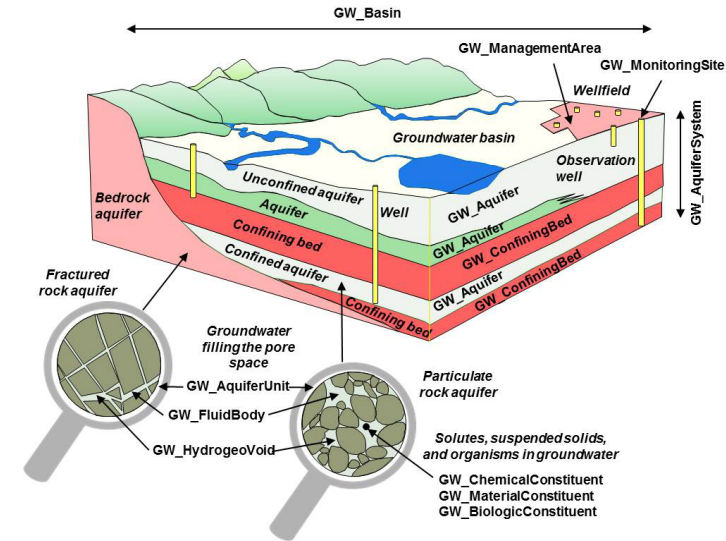
- Full and draft 'Lite' versions

Children / Family

- Reused by many geological surveys

Wishes

- Currently moving to the semantic web

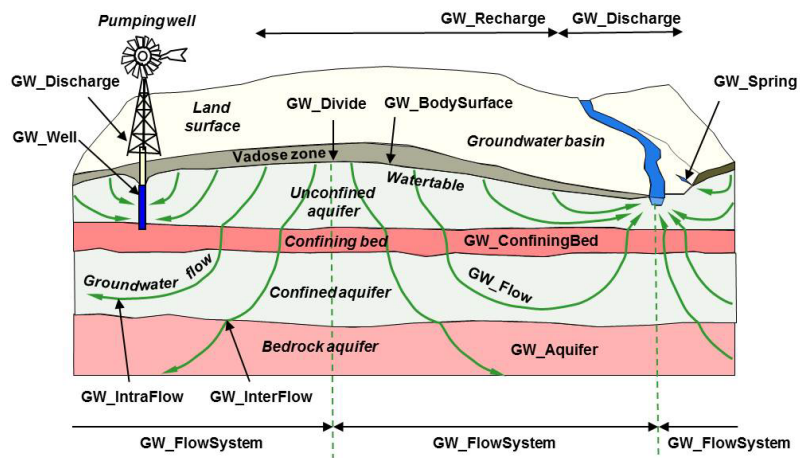


NAME : GROUNDWATERML2

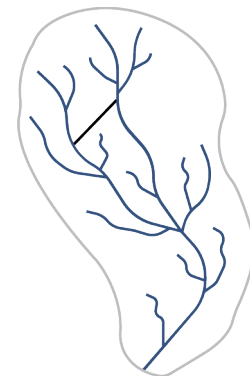
Contact

<https://www.opengeospatial.org/standards/gwml2>

Other pictures



NAME : SURFACE HYDROLOGY FEATURES (HY_FEATURES)



A conceptual model describing hydrology features and their relationships independent of their geometric representation and scale.

Age : V 1.0

Key features

- Hydrology specific feature types, e.g. catchments, drainage networks, rivers, lakes and waterbodies, hydrometric features
- Focus is on surface water features and the networks they form.

Weight

- Full version

Children / Family

- USGS, NrCAN, BRGM, AU Hydrological Geo Fabric

Wishes

- Currently moving to the semantic web

NAME : SURFACE HYDROLOGY FEATURES (HY_FEATURES)

Contact

<http://docs.opengeospatial.org/is/14-111r6/14-111r6.html>

http://opengeospatial.github.io/HY_Features/HY_Features_primer/HY_Features_Primer.html#/

Other pictures

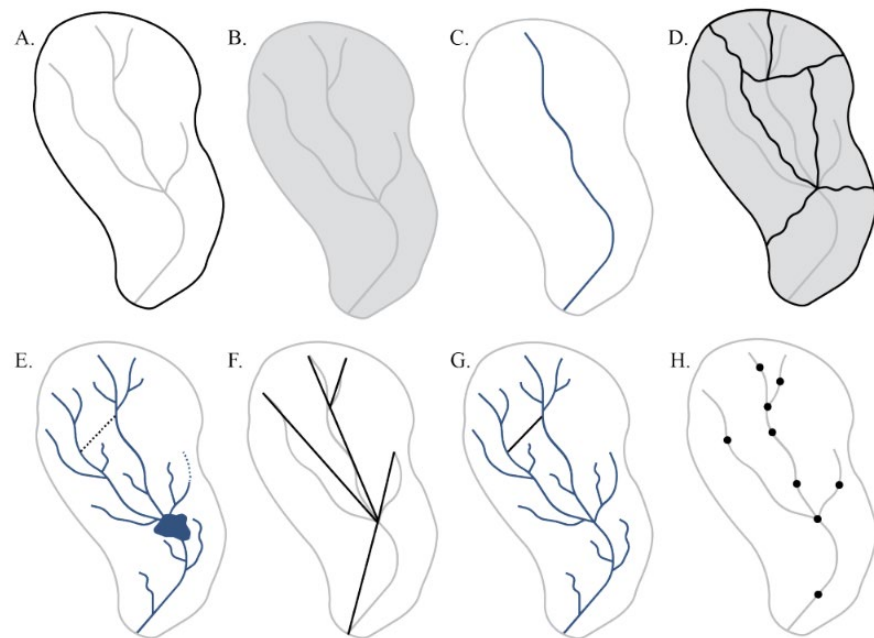
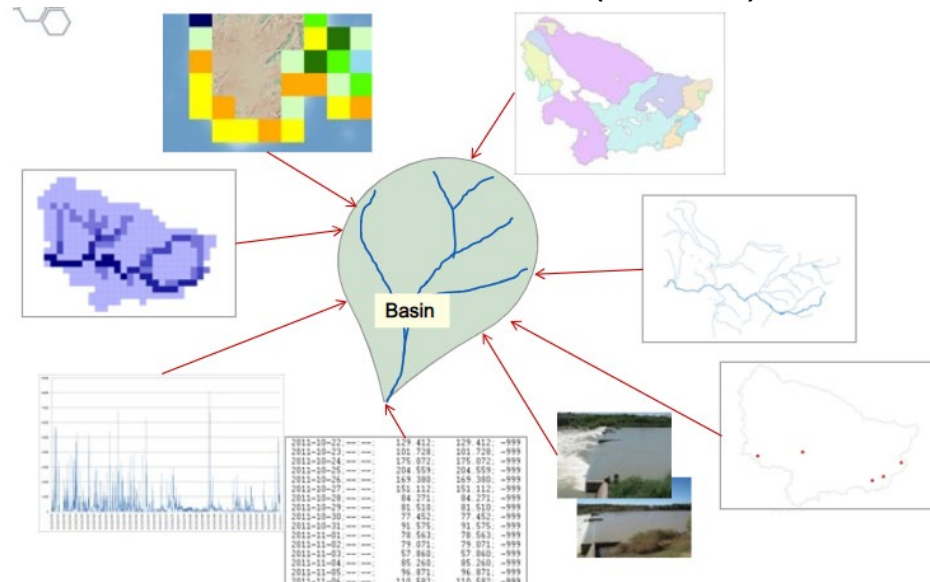


Figure 5. Multiple catchment realizations (top left to bottom right): a) catchment boundary, b) catchment area, c) catchment flowpath, d) subcatchment network, e) hydrographic network, f) geo-schematic network, g) flow network, h) hydrometric network of monitoring stations.

Global Runoff Data Centre (GRDC)



NAME : EARTHRESOURCEML

Logical model for the exchange of digital information for mineral occurrences, mines and mining activity.



Age : V 2.0

Key features

- Geological features of mineral occurrences, their commodities, mineral resources and reserves
- Mines and mining activities, and the production of concentrates, refined products, and waste materials.

Weight

- Full and 'Lite' versions

Children / Family

- Reused by many geological surveys and countries, continent wide spatial data/research projects (INSPIRE, Minerals4EU, EPOS, AuScope, ...)

Wishes

- Currently moving to the waste (urban mine, secondary raw materials)

NAME : EARTHRESOURCEML

Contact

<http://www.earthresourceml.org/>

Comments

Is not OGC but IUGS/CGI (where GeoSciML incubated), is connected to GeoSciML and driven by the 'same' experts.

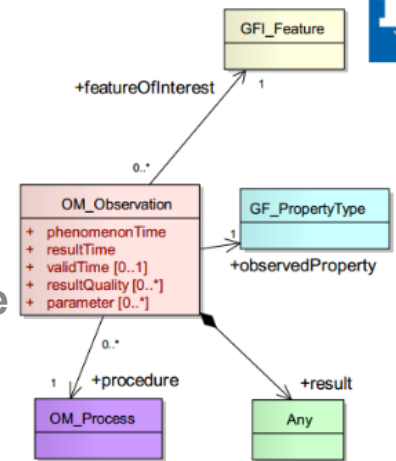
Other pictures

The image displays two screenshots of geoscientific data portals. The left screenshot shows the AUSGIN Geoscience Portal interface, featuring a search bar, a sidebar with categories like 'Mineral Occurrences (new version)', and a map of Australia with numerous pink circular markers representing mineral occurrences. The right screenshot shows the EGD I Metal Map interface, which includes a legend for mineral occurrences (Gold, Silver, Platinum group metals, Palladium, Platinum, Rhodium) and a table of mineral occurrence details.

| Go to | Inspired | Inspires | Commodity | Country | Name | Depositgroup | Deposittype |
|-----------------|----------------|-----------|-----------|---------------|--------------------|--------------|-------------|
| Link | FI.1000179 | palladium | FI | Karhunjupukka | ultramafic / mafic | | |
| Link | FI.1000179 | platinum | FI | Karhunjupukka | ultramafic / mafic | | |
| FI.GTK.M4EU.645 | FI.GTK.M4EU | palladium | FI | Karhunjupukka | ultramafic / mafic | | |
| FI.GTK.M4EU.645 | FI.GTK.M4EU | platinum | FI | Karhunjupukka | ultramafic / mafic | | |
| ORED00202 | SE.SGU.MR.mdep | gold | SE | Käymijärvi 1 | sediment-hosted | | |
| ORED15404 | SE.SGU.MR.mdep | gold | SE | Kursunjoja | Other | | |

NAME : OBSERVATIONS & MEASUREMENTS

Conceptual and logical model for observations and features involved in sampling when making observations for the exchange of information within and between different scientific and technical communities.



Age : V 2.0

Key features

- Description of the observation acts and their results
- A common set of sampling feature types classified primarily by topological dimension, as well as samples for ex-situ observations.
- Relationships between sampling features (subsampling, derived samples)

Weight

- Full and 'Lite' versions

Children / Family

- Many international reuse by communities, profiles

NAME : OBSERVATIONS & MEASUREMENTS

Wishes

- Just arrived in the semantic web

Contact

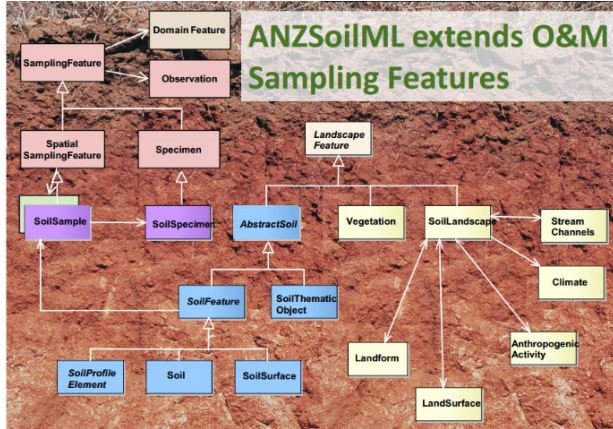
<https://www.opengeospatial.org/standards/om>

Comments

- Previous domain standards **all refer to / build on Observations and Measurements**
- International ISO Standard (ISO 19156:2011)
- Major uptake in
 - Domains (see next slide)
 - Also standardization bodies (ex : W3C SSN/SOSA)

NAME : OBSERVATIONS & MEASUREMENTS

Other pictures

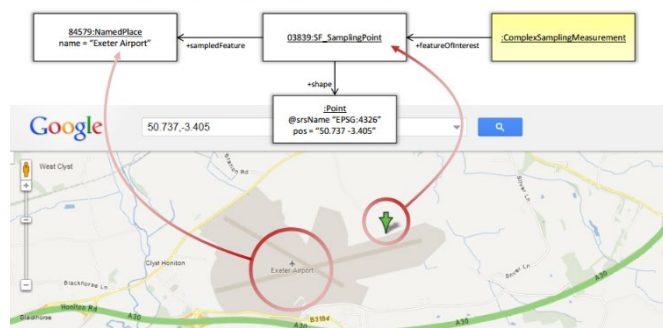


WMO 'METeoroological Community Exchange' model

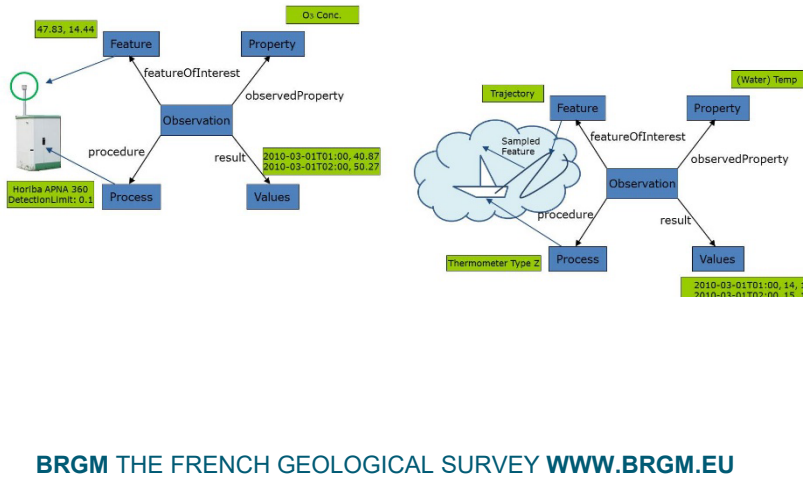


SamplingFeature as OM_Observation.featureOfInterest

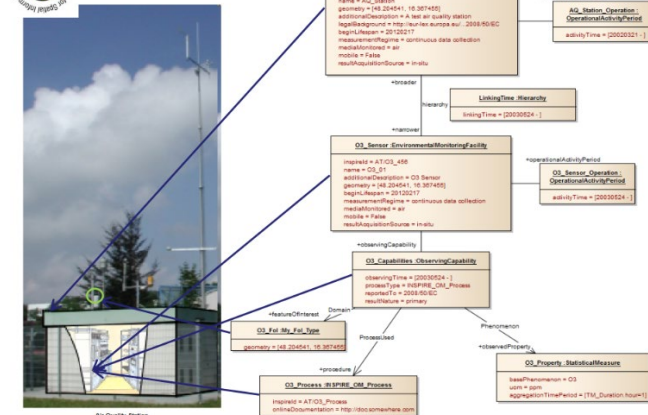
In meteorology, we define a sampling regime that enables us to observe, measure or simulate the real-world. Sampling Features (from ISO 19156 'Observations and measurements') provide a way to characterise this sampling regime and the relationship to the real-world.



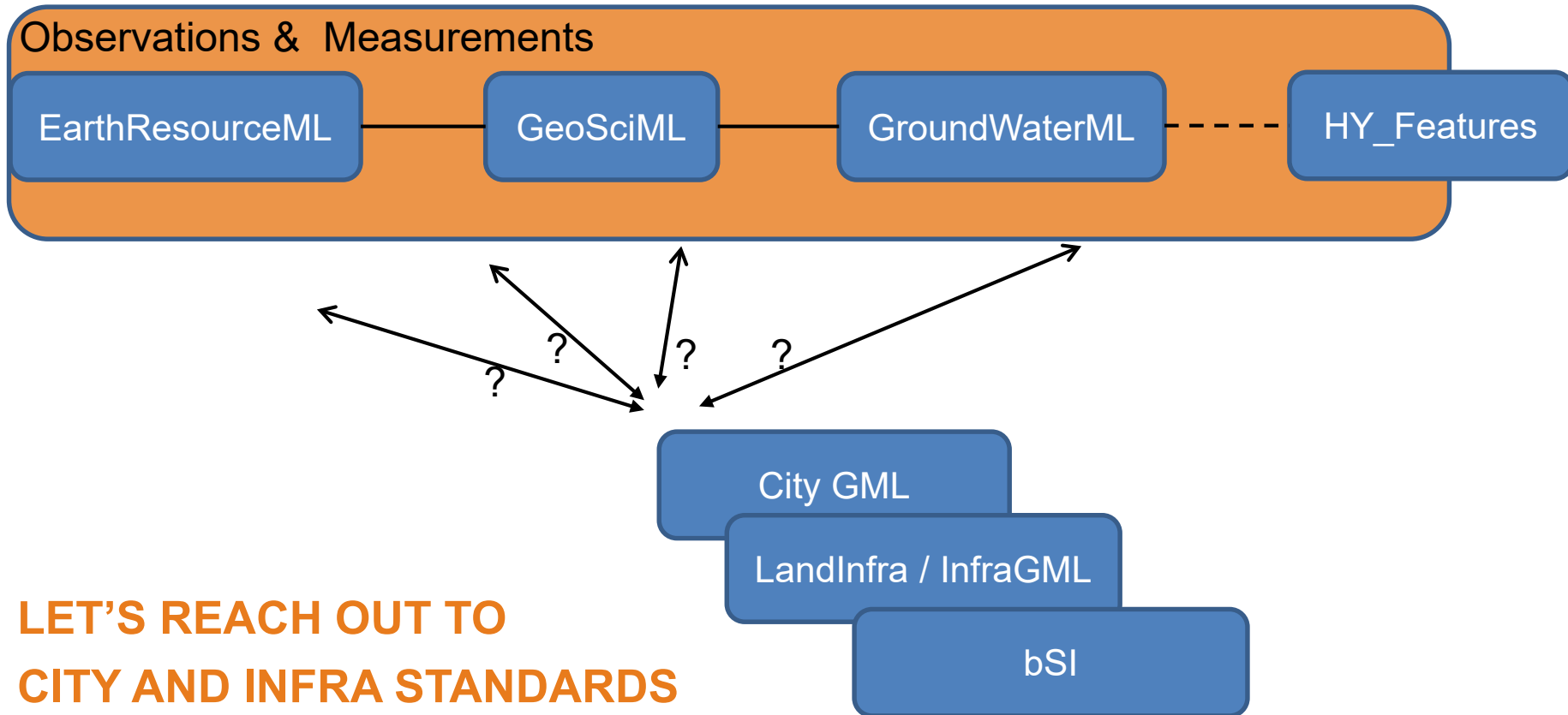
EU INSPIRE guidelines for O&M



EU Air Quality Directive



THOSE GEOSCIENCE DOMAIN STANDARDS ARE LINKED



Note: Other could have been mentioned, like OGC WaterML2 Part 1& TimeseriesML, Soil Interoperability Experiment (IE), Borehole IE

THANK YOU

● S.Grellet@brgm.fr



Additional credits
GeoSciML, GWML2, HY_Features, ERML teams
S.JD.Cox - 2013 Leptoukh Lecture

