



Borehole update: simpleFeature exchange, conceptual UML model

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Borehole update: simpleFeature exchange, conceptual UML model

104th OGC Technical Committee – GeoScience DWG session

Southampton, United Kingdom

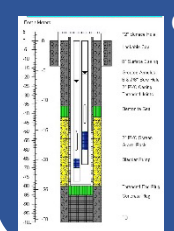
Sylvain Grellet - BRGM

GeoSciML DWG - 12 September 2017





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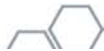
- EPOS Borehole View
- EPOS Borehole conceptual model

EPOS BoreholeView



- GeoSciML BoreholeView with Stronger typing (ex : `gml:ReferenceType` for vocabularies,...)
- Adding extra attributes (esp. to support reference to the complex flows)
- Ex [instance](#)

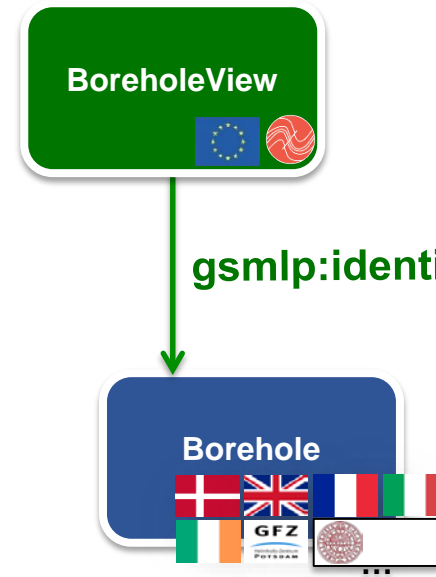
EPOS BoreholeView



```
-<wfs:FeatureCollection numberMatched="unknown" numberReturned="1" timeStamp="2017-09-05T07:42:27.003Z" xsi:schemaLocation="http://www.opengis.net/gml/3.2 http://schemas.opengis.net/gml/3.2.1/gml.xsd http://www.opengis.net/wfs/2.0/wfs.xsd https://forge.brgm.fr/svnrepository/epos/trunk/schemas https://forge.brgm.fr/svnrepository/epos/trunk/schemas/epos-lite.xsd">
- <wfs:member>
- <gml:BoreholeView gml:id="BSS001REWW">
  <gml:description>Borehole description</gml:description>
- <gml:identifier codeSpace="http://www.ietf.org/rfc/rfc2616">
  http://ressource.brgm-rec.fr/data/BoreholeView/BSS001REWW
  </gml:identifier>
  <gml:name>Forage BSS001REWW</gml:name>
- <gml:identifier>
  http://ressource.brgm-rec.fr/data/Borehole/BSS001REWW
  </gml:identifier>
  <gml:purpose xlink:href="http://inspire.ec.europa.eu/codelist/BoreholePurposeValue/hydrogeologicalSurvey" xlink:title="levé hydrogéologique, gestion de l'eau"/>
  <gml:status xlink:href="http://resource.europe-geology.eu/vocabs/BoreholeStatus/drillingCompleted" xlink:title="drilling completed"/>
  <gml:drillingMethod xlink:href="http://resource.europe-geology.eu/vocabs/DrillingMethod/hydraulic_rotary_drilling" xlink:title="hydraulic rotary drilling"/>
  <gml:operator>BRGM (PIEZOMETRIE)</gml:operator>
  <gml:driller>INTRAFOR-COFOR</gml:driller>
  <gml:drillEndDate>1974-11-30Z</gml:drillEndDate>
  <gml:startPoint xlink:href="http://resource.europe-geology.eu/vocabs/BoreholeStartPoint/naturalLandSurface" xlink:title="natural land surface"/>
  <gml:inclinationType xlink:href="http://resource.europe-geology.eu/vocabs/BoreholeInclinationType/vertical" xlink:title="vertical"/>
  <gml:boreholeMaterialCustodian>unknown</gml:boreholeMaterialCustodian>
  <gml:boreholeLength_m uom="http://qudt.org/vocab/unit/M">23.0</gml:boreholeLength_m>
  <gml:elevation_m uom="http://qudt.org/vocab/unit/M">223.87</gml:elevation_m>
  <gml:elevation_srs>http://www.opengis.net/def/crs/EPSG/0/5720</gml:elevation_srs>
- <gml:source>
  http://ficheinfoterre.brgm.fr/InfoterreFiche/ficheBss.action?id=06512X0037/STREMY
  </gml:source>
- <gml:metadata_uri>
  http://www.geocatalogue.fr/Detail.do?fileIdentifier=BR_BSS_BAA
  </gml:metadata_uri>
  <gml:genericSymbolizer>Not provided</gml:genericSymbolizer>
+ <gml:shape></gml:shape>
  <gml:cored>false</gml:cored>
  <gml:accessToPhysicalDrillCore>false</gml:accessToPhysicalDrillCore>
  <gml:boreholeUse xlink:href="http://inspire.ec.europa.eu/codelist/BoreholePurposeValue/groundwaterLevelMonitoring" xlink:title="surveillance du niveau de la nappe phréatique"/>
  <gml:detailedDescription xlink:href="http://www.opengis.net/def/nil/OGC/0/template" xlink:title="template"/>
+ <!-->
  <gml:geophysicalLogs xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
  <gml:geologicalDescription xlink:href="http://ressource.brgm-rec.fr/obs/RawGeologicLogs/BSS001REWW" xlink:title="Borehole BSS001REWW geologic log available."/>
  <gml:groundWaterLevel xlink:href="http://ressource.brgm-rec.fr/data/Piezometre/06512X0037/STREMY.2" xlink:title="Description of Piezometer attached to BSS001REWW. Provides link to SensorObservationService offering"/>
  <gml:groundWaterChemistry xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
  <gml:rockGeochemistry xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
  <gml:poreGasChemistry xlink:href="http://www.opengis.net/def/nil/OGC/0/inapplicable" xlink:title="inapplicable"/>
  <gml:geoTechnicalInfo xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
</gml:BoreholeView>
</wfs:member>
</wfs:FeatureCollection>
```


EPOS BoreholeView – use

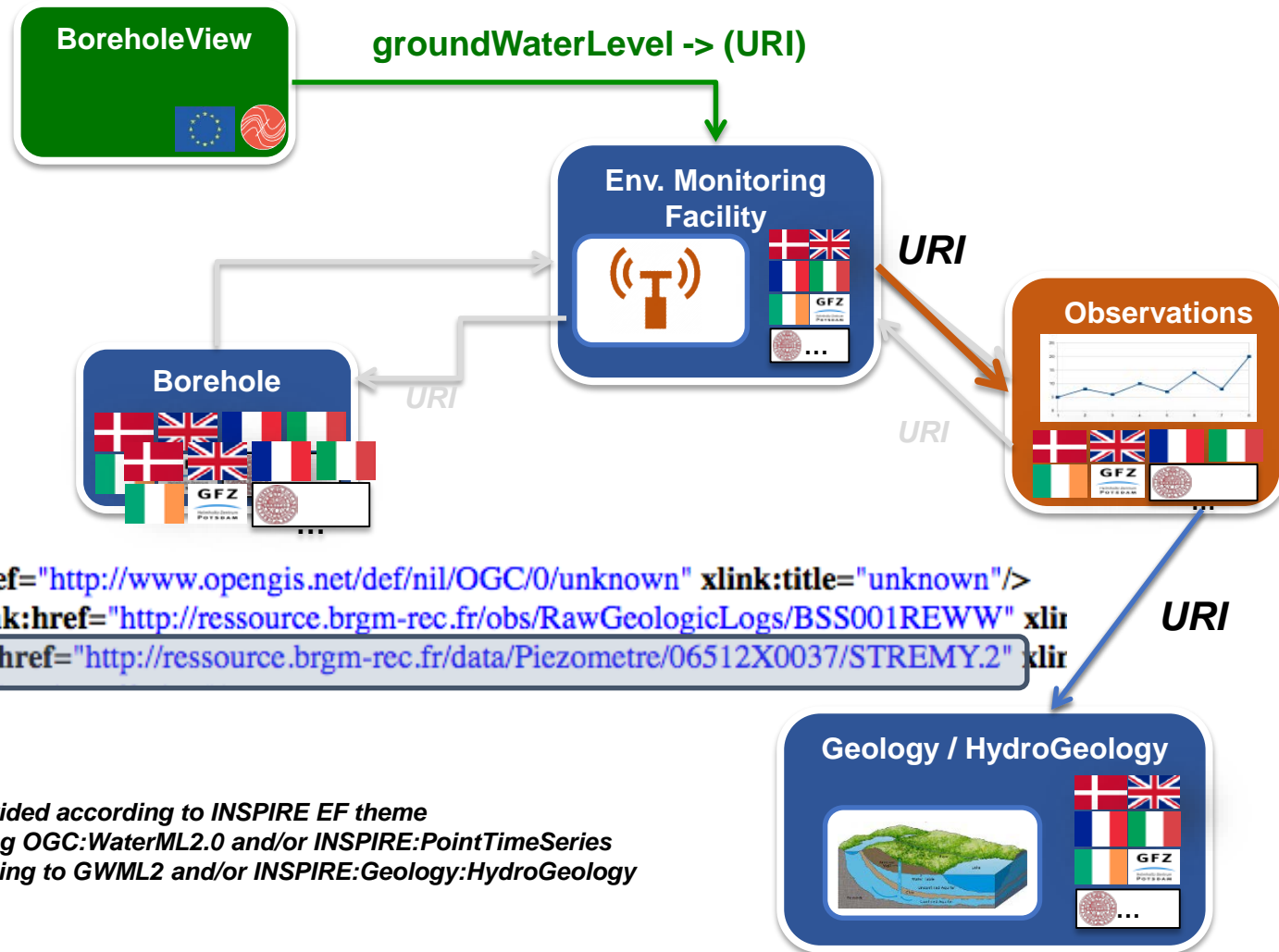
```
- <wfs:FeatureCollection numberMatched="unknown" numberReturned="1" timeStamp="2017-09-05T07:42:27.003Z" xsi:schemaLocation="http://www.opengis.net/
http://schemas.opengis.net/wfs/2.0/wfs.xsd https://forge.brgm.fr/svnrepository/epos/trunk/schemas https://forge.brgm.fr/svnrepository/epos/trunk/schemas/epos-lite.xsd">
- <wfs:member>
- <gmlp:BoreholeView gml:id="BSS001REWW">
  <gml:description>Borehole description</gml:description>
- <gml:identifier codeSpace="http://www.ietf.org/rfc/rfc2616">
  http://ressource.brgm-rec.fr/data/BoreholeView/BSS001REWW
  </gml:identifier>
  <gml:name>Forage BSS001REWW</gml:name>
- <gmlp:identifier>
  http://ressource.brgm-rec.fr/data/Borehole/BSS001REWW
  </gmlp:identifier>
```



gml:identifier SHALL contain a unique identifier for this BoreholeView representation

gmlp:identifier SHOULD resolve to an internationally agreed complexFeature representation of a Borehole (e.g : Inspire Geology, GeoSciML,...)

EPOS BoreholeView – use



```

<gsmpl:geophysicalLogs xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
<gsmpl:geologicalDescription xlink:href="http://ressource.brgm-rec.fr/obs/RawGeologicLogs/BSS001REWW" xlin
<gsmpl:groundWaterLevel xlink:href="http://ressource.brgm-rec.fr/data/Piezometre/06512X0037/STREMY.2" xlin
  
```

Tested Implementation
 Environmental Monitoring Facility provided according to INSPIRE EF theme
 groundWaterLevel provided either using OGC:WaterML2.0 and/or INSPIRE:PointTimeSeries
 HydroGeology feature provided according to GWML2 and/or INSPIRE:Geology:HydroGeology

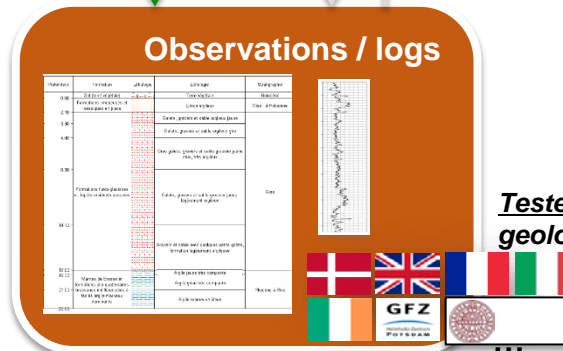
EPOS BoreholeView – use



gsmlp:geologicalDescription
-> (URI)

URI

URI



Tested Implementation

geologicalDescription (log) provided using GWML2:GW_GeologyLogCoverage

`<gsmlp:geophysicalLogs xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>`

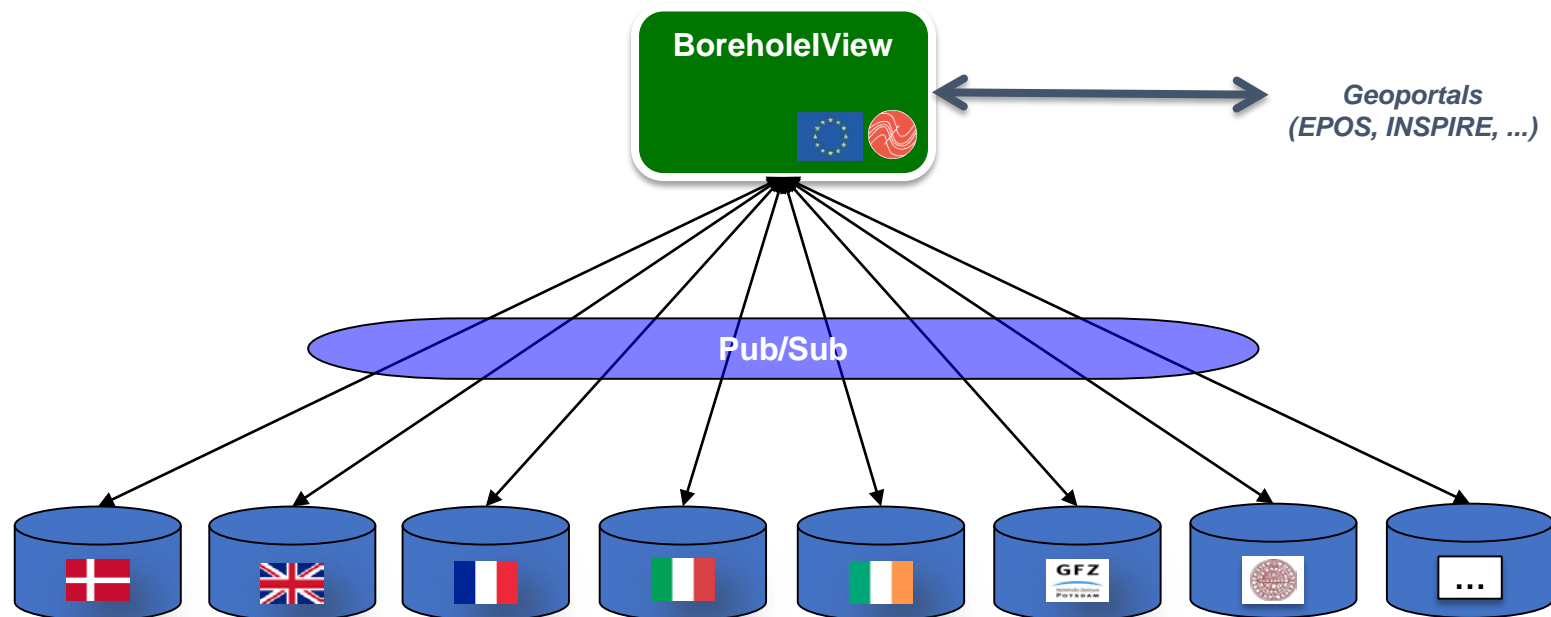
`<gsmlp:geologicalDescription xlink:href="http://ressource.brgm-rec.fr/obs/RawGeologicLogs/BSS001REWW" xlink:title="BSS001REWW" />`

`<gsmlp:groundWaterLevel xlink:href="http://ressource.brgm-rec.fr/data/Piezometre/06512X003//STREMY.2" xlink:title="STREMY.2" />`

EPOS BoreholeView – feeding the index



- Each institution maintains its Borehole BoreholeView (SF-0) service and underlying complexFeature flows
- Only SF-0 flows are harvested at EU level
- The index is up-to-date thanks to a pub/sub approach



EPOS BoreholeView – Conclusions



- Exposing summary Information (SF-0) is easier/faster than complex Feature
 - Allows to add more data providers
- Harvesting simpleFeature is more reasonable than complex Feature
 - WFS on complexFeature is not meant/suited to synchronize millions of instances !
 - Harvesting a 'Borehole vCard' just for discovery makes more sense
- The Borehole index in turns points to National data flows
 - With respect to INSPIRE semantics
 - SF-0 just here to support discovery

EPOS BoreholeView – Conclusions



- ***Data provider***

- So far: BRGM, GEUS, ISPRA, UU-SE
- Coming: BGS, GSI, GFZ, CGS, GeoZS
- Add more EU geological surveys and research partners

- ***IT***

- EU Borehole Index entries now around 3 Million (this will grow)
- ⇒ Need for faster WFS : Studying connexion of GeoServer app-schema with Sol'R index

- ***Having the index indexed by search engines***

- ⇒ Exposing its content in (Geo)JSON-LD
- ⇒ Where is the reference ontology we could point to



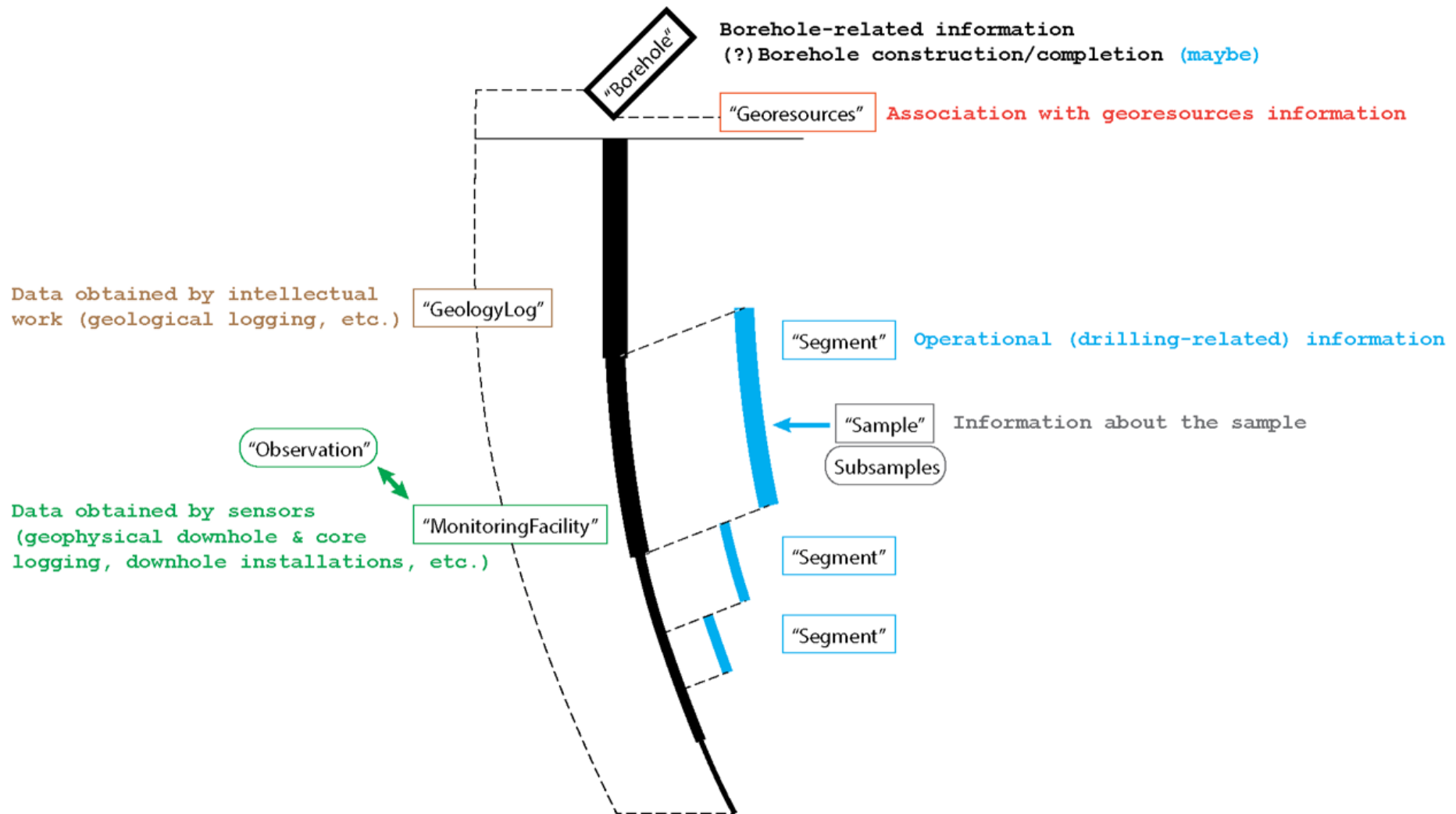
- EPOS Borehole View
- EPOS Borehole conceptual model

EPOS Borehole conceptual model



- To define what should be retrieved from national complexFeature flows
⇒ agree on the semantic
- Bridging the gap between standards
=> Map to pre-existing standards (GeoSciML 4.1, GWML2, BoreholeML, INSPIRE:GE)

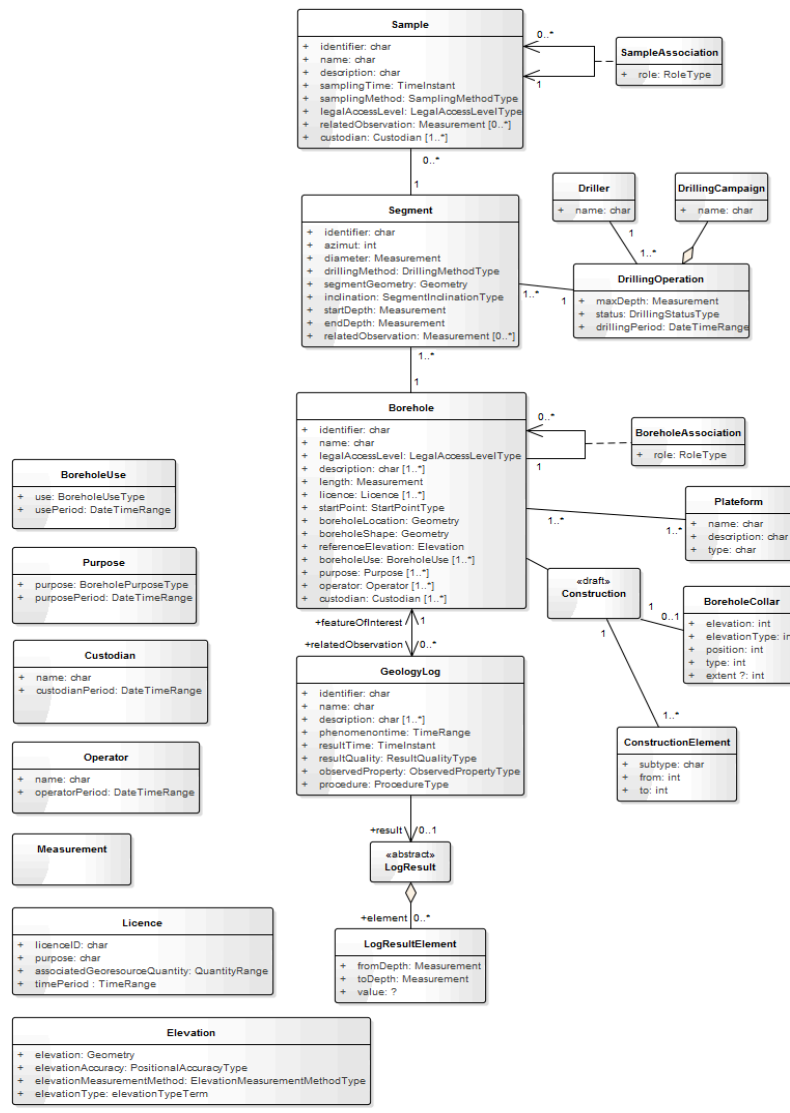
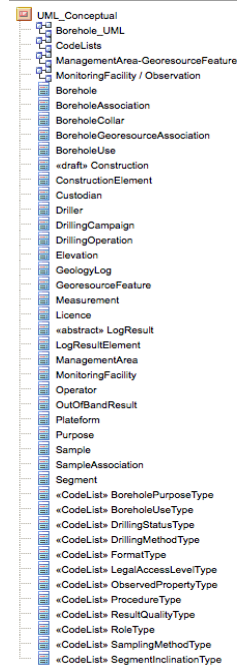
EPOS Borehole conceptual model



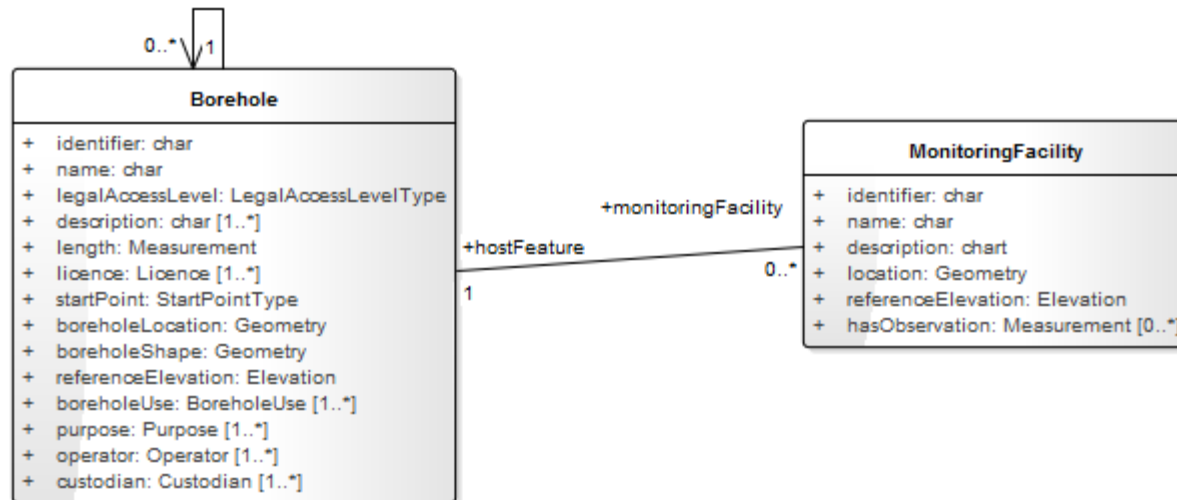
EPOS Borehole conceptual model



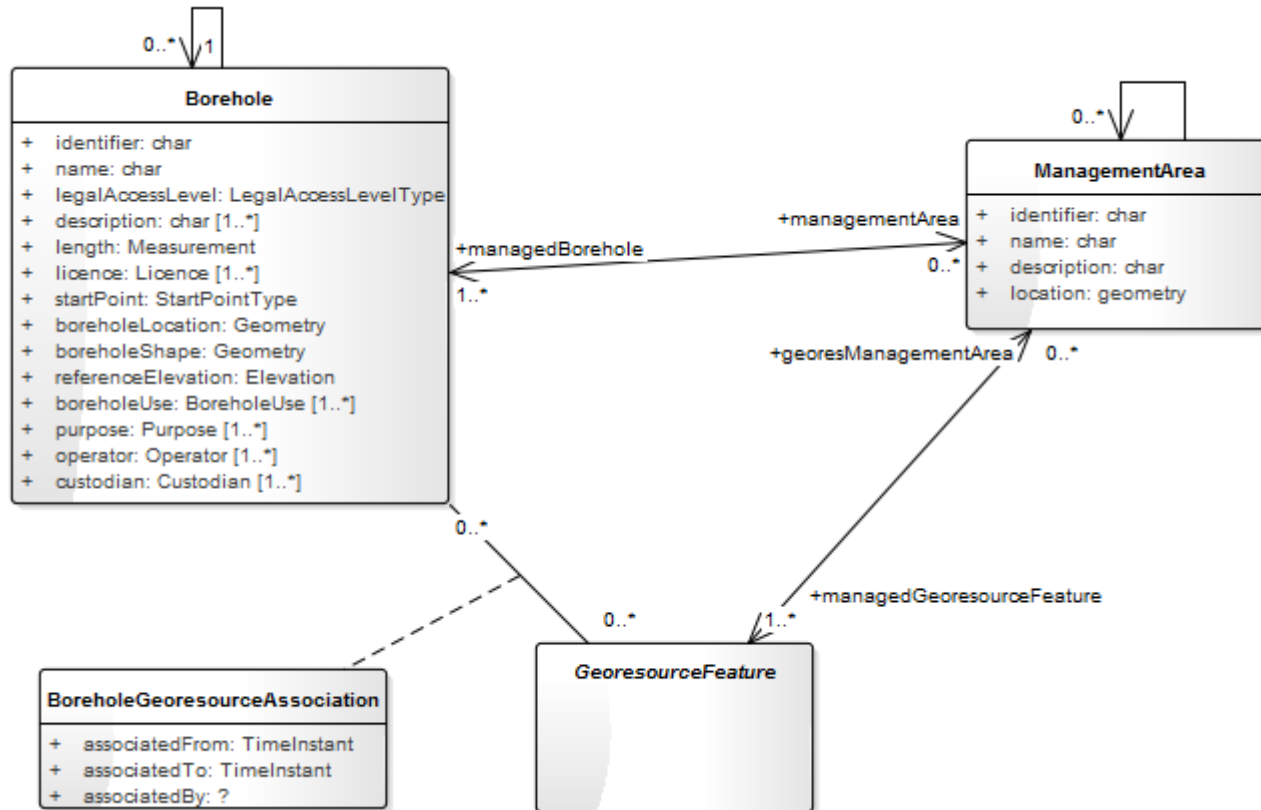
UML_Conceptual



EPOS Borehole conceptual model



EPOS Borehole conceptual model



EPOS Borehole conceptual model – next steps



- Finish first version of conceptual UML model
 - 90% done. Only GWML2 mapping missing
 - Share it with OGC SWGs (GeoSciML, GWML) for feedback
- Decide on logical model for implementation, then services and code lists
- Logical models
 - Within OGC : GeoSciML4.1 / GWML2 overlap on this.
 - Maybe some clarification is needed
- Implement

EPOS Integrating European Research Infrastructures for solid Earth Science

