



EPOS GEOLOGICAL INFORMATION AND MODELING

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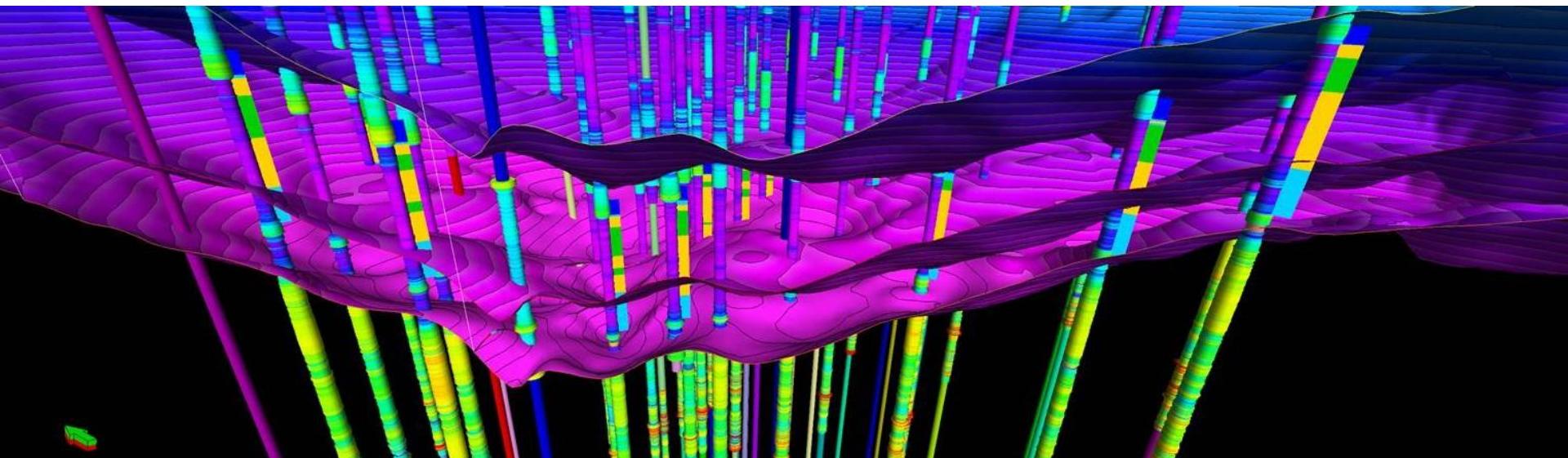
HAL Id: hal-03924684

<https://brgm.hal.science/hal-03924684>

Submitted on 5 Jan 2023

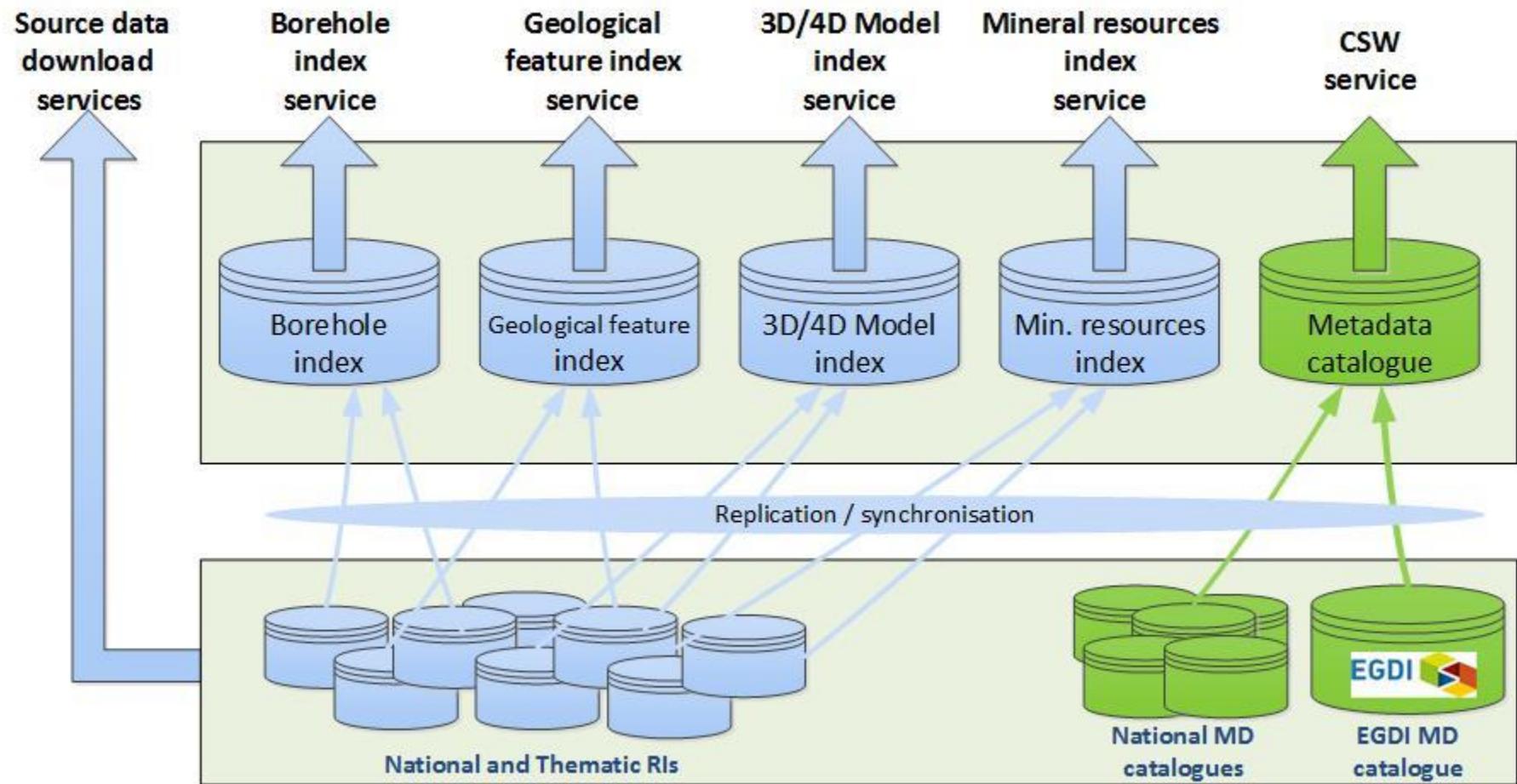
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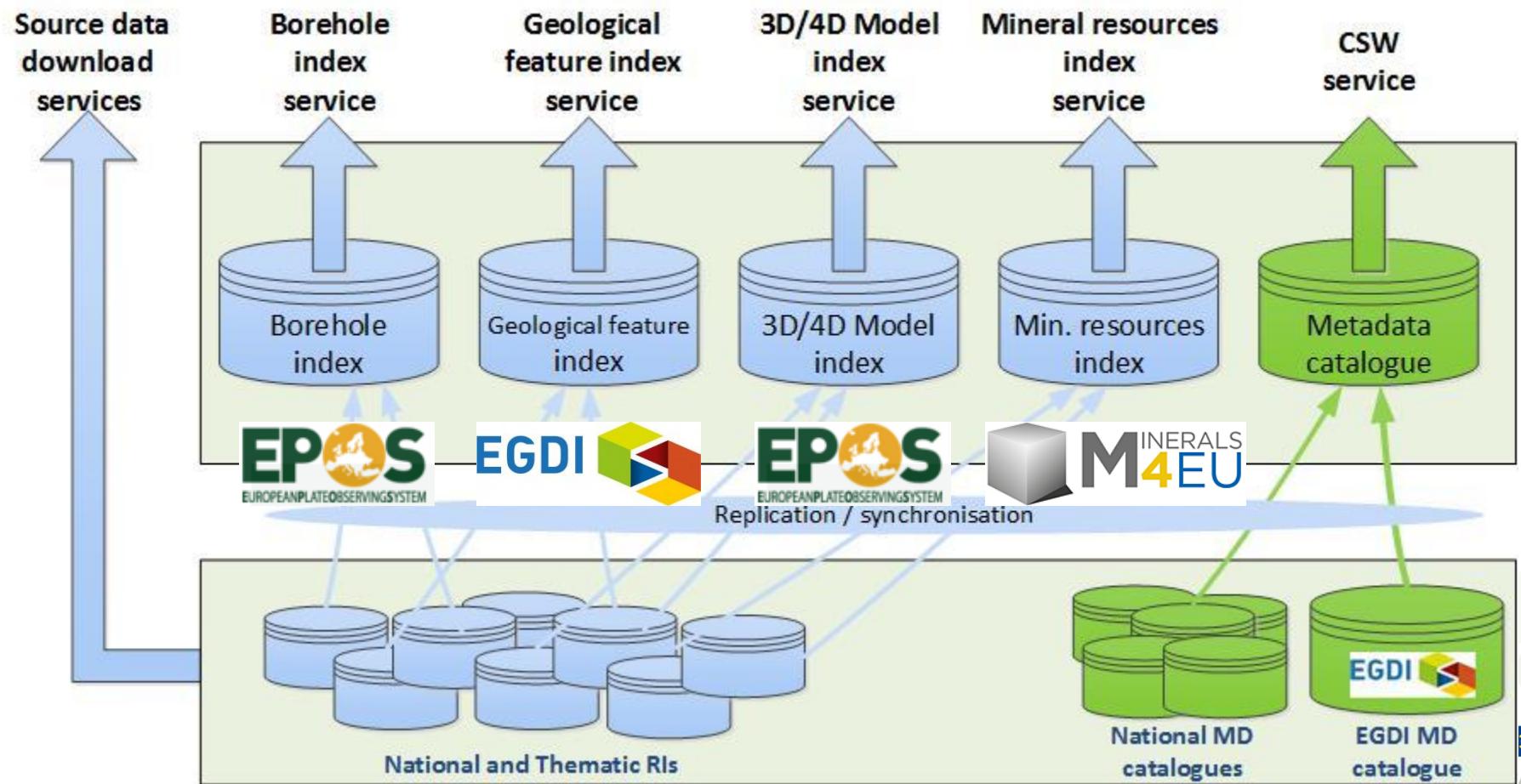


GEOLOGICAL INFORMATION AND MODELING

System architecture

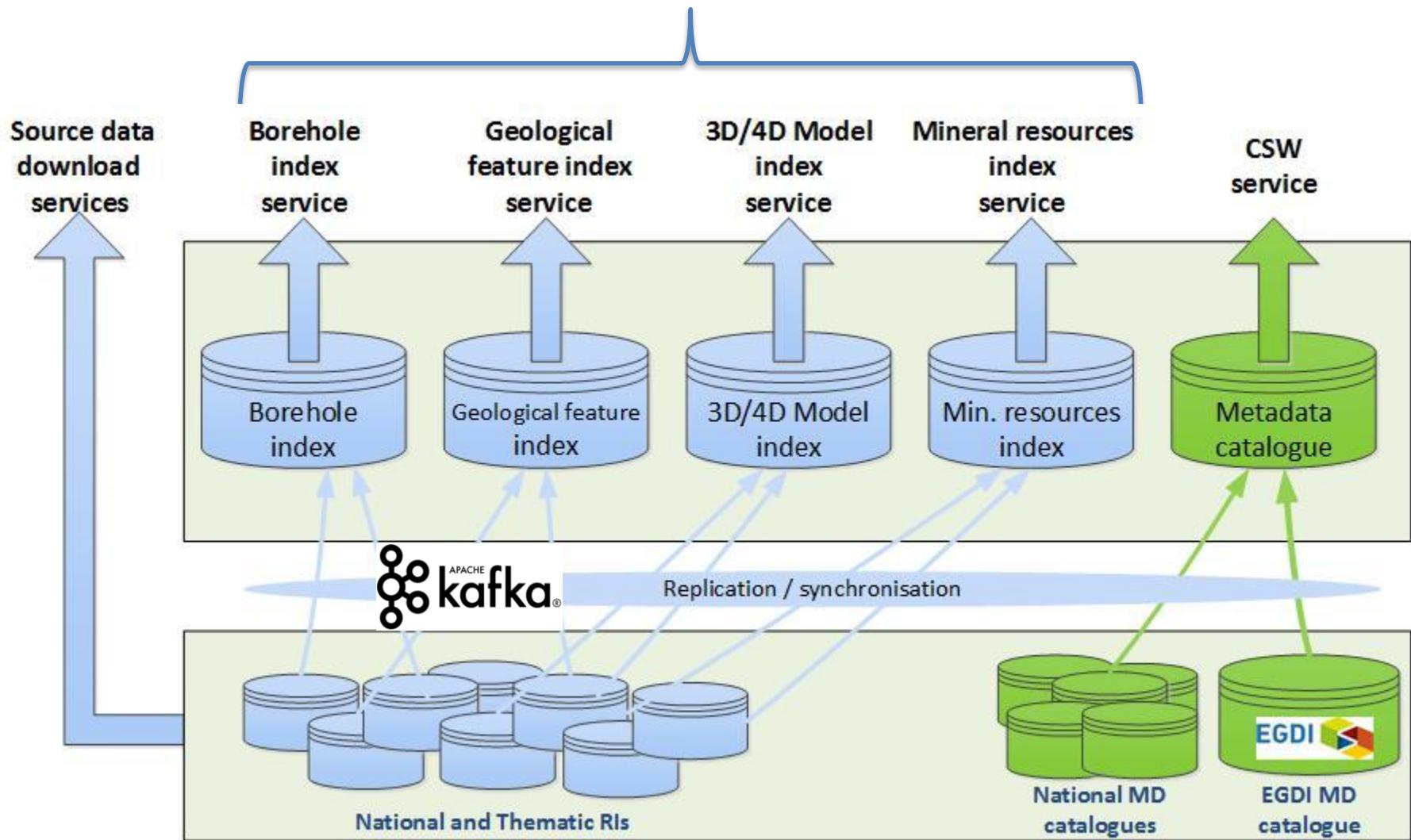


Data sources

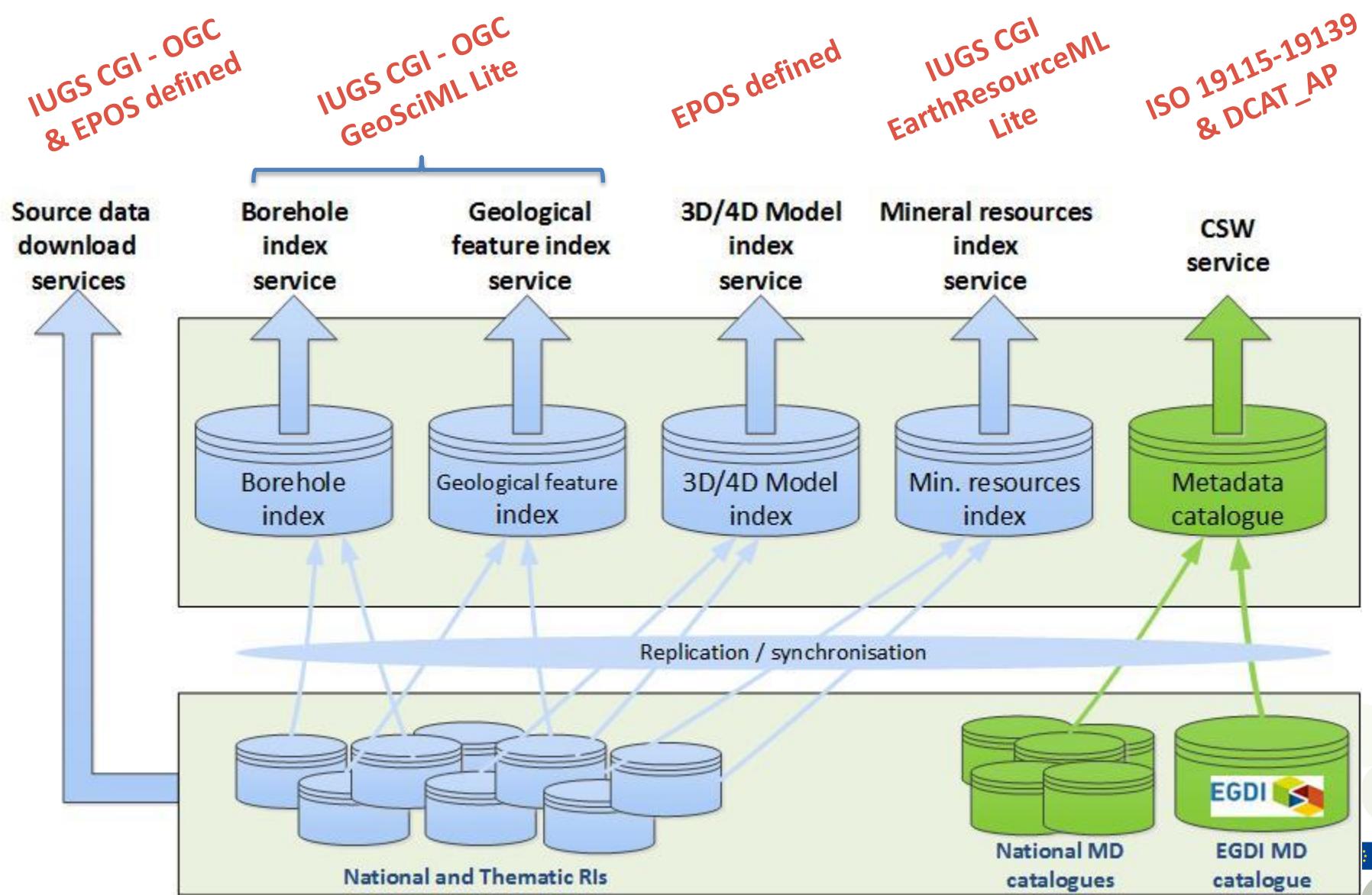


API Services

OGC services WMS & WFS CSW



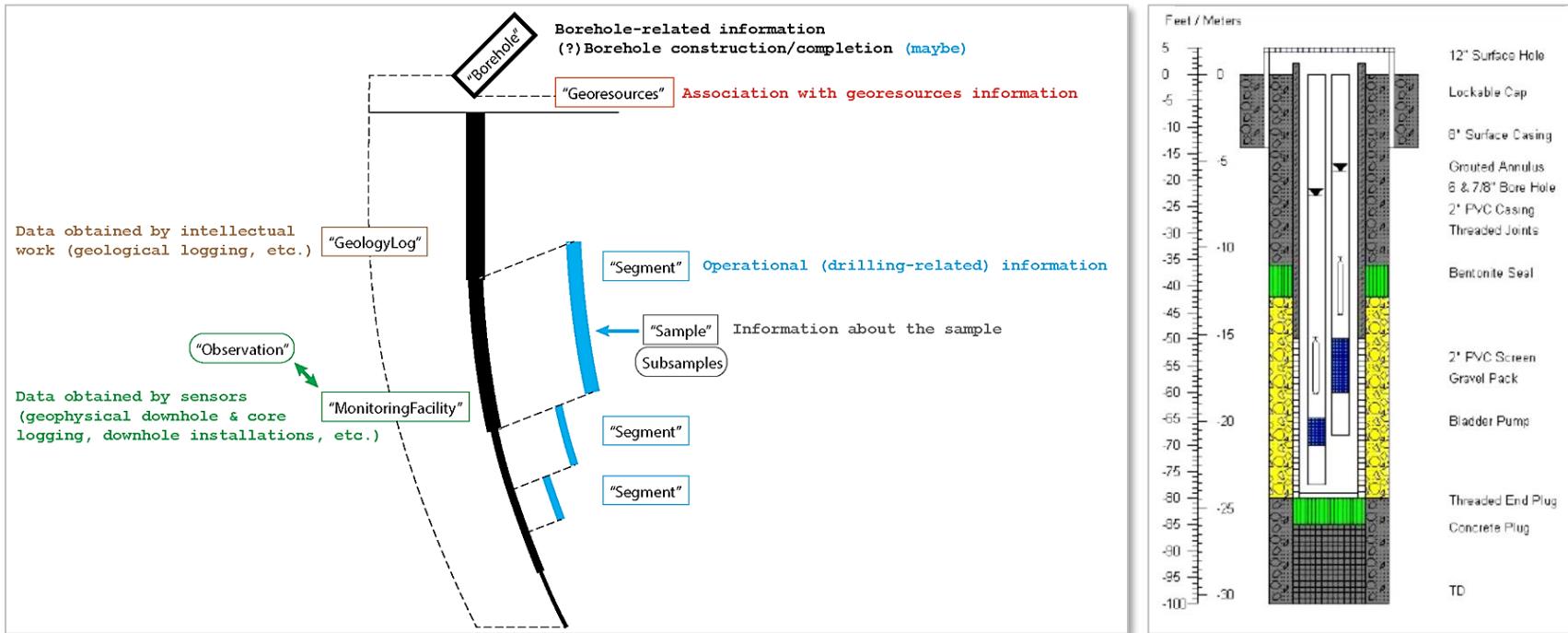
Semantics



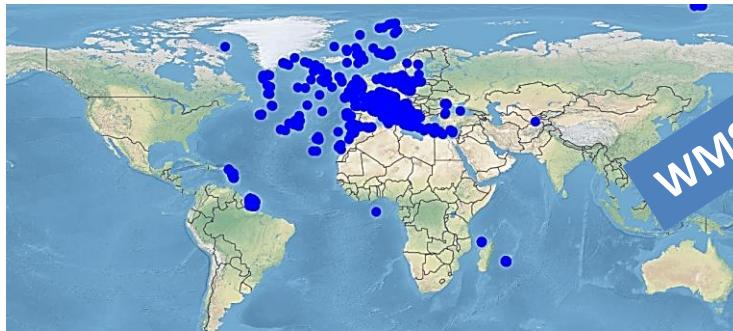
EPOS Borehole model

Pushed to OGC Borehole Interoperability Experiment

<https://github.com/opengeospatial/boreholeie/wiki>



Borehole Index



WMS

```
-<wfs:FeatureCollection numberMatched="unknown" numberReturned="1" timeStamp="2017-09-05T07:42:27.003Z" xsi:schemaLocation="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:coordinates crs="http://www.opengis.net/gml/vertical CRS">
        http://resource.brgm-rec.fr/data/BoreholeView/BSS001REWW
      </gml:coordinates>
      <gml:name>Forage BSS001REWW</gml:name>
      <gmlp:status xlink:href="http://resource.europe-geology.eu/vocab/BoreholeStatus/drillingCompleted" xlink:title="drilling completed"/>
      <gmlp:drillingMethod xlink:href="http://resource.europe-geology.eu/vocab/DrillingMethod/hydraulic_rotary_drilling" xlink:title="hydraulic rotary drilling"/>
      <gmlp:driller xlink:href="http://resource.europe-geology.eu/vocab/Driller/INTRAFOR-COFOR" gmlp:driller>
      <gmlp:drillEndDate>1974-11-30Z</gmlp:drillEndDate>
      <gmlp: startPoint xlink:href="http://resource.europe-geology.eu/vocab/BoreholeStartPoint/naturalLandSurface" xlink:title="natural land surface"/>
      <gmlp: inclinationType xlink:href="http://resource.europe-geology.eu/vocab/BoreholeInclinationType/vertical" xlink:title="vertical"/>
      <gmlp:boreholeMaterialCustodian>Unknown</gmlp:boreholeMaterialCustodian>
      <gmlp:boreholeLength_m uom="http://qudt.org/vocab/unit/M">23.0</gmlp:boreholeLength_m>
      <gmlp:elevation_m uom="http://qudt.org/vocab/unit/M">223.87</gmlp:elevation_m>
      <gmlp:elevation_srs>http://www.opengis.net/def/crs/EPSG/0/5720</gmlp:elevation_srs>
      <gmlp:source>
        http://fichesinfotere.brgm.fr/InfoterreFiche/ficheBss.action?id=06512X0037/STREMY
      </gmlp:source>
      <gmlp:metadata_ur>
        http://www.geocatalogues.fr/Detail.do?fileIdentifier=BR_BSS_BAA
      </gmlp:metadata_ur>
      <gmlp:genericSymbolizer>Not provided</gmlp:genericSymbolizer>
      +<gmlp:shape></gmlp:shape>
      <gmlp:cored>false</gmlp:cored>
      <gmlp:accessToPhysicalDrillCore></gmlp:accessToPhysicalDrillCore>
      <gmlp:boreholeUse xlink:href="http://inspire.ec.europa.eu/codelist/BoreholePurposeValue/groundwaterLevelMonitoring" xlink:title="surveillance du niveau de la nappe phréatique"/>
      <gmlp:detailedDescription xlink:href="http://www.opengis.net/def/nil/OGC/0/template" xlink:title="template"/>
      +<!-->
      <gmlp:geophysicalInfo xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
      <gmlp:geologicalDescription xlink:href="http://resource.brgm-rec.fr/obs/RawGeologicLogs/BSS001REWW" xlink:title="Borehole BSS001REWW geological log available."/>
      <gmlp:groundWaterLevel xlink:href="http://resource.brgm-rec.fr/data/Piezometre/06512X0037/STREMY" xlink:title="Description of Piezometer attached to BSS001REWW. Provides link to SensorObservationService offering."/>
      <gmlp:groundWaterChemistry xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
      <gmlp:rockGeochemistry xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
      <gmlp:poreGasChemistry xlink:href="http://www.opengis.net/def/nil/OGC/0/inapplicable" xlink:title="inapplicable"/>
      <gmlp:geoTechnicalInfo xlink:href="http://www.opengis.net/def/nil/OGC/0/unknown" xlink:title="unknown"/>
      </gmlp:BoreholeView>
  </wfs:member>
</wfs:FeatureCollection>
```

URI to each Borehole Index entry

WFS

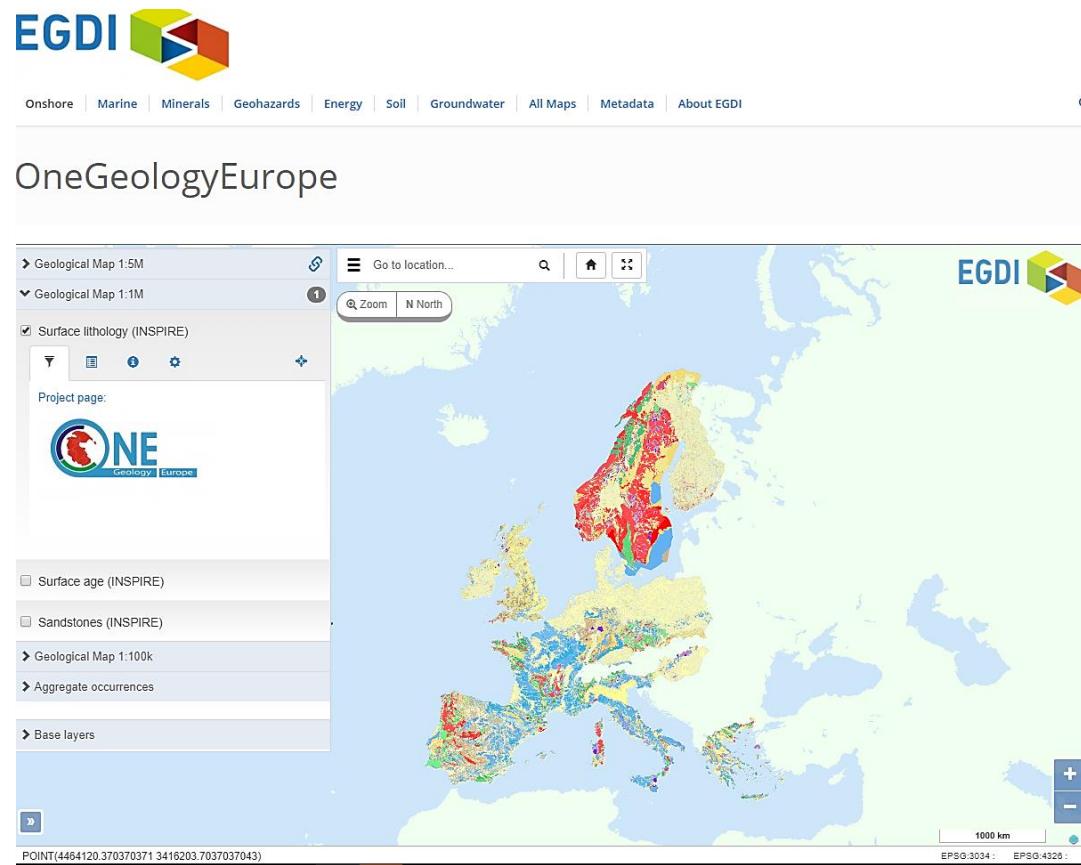
URI to codeList entries (INSPIRE, TCS Geological Information and Modeling)

WFS

URI to richer information resource

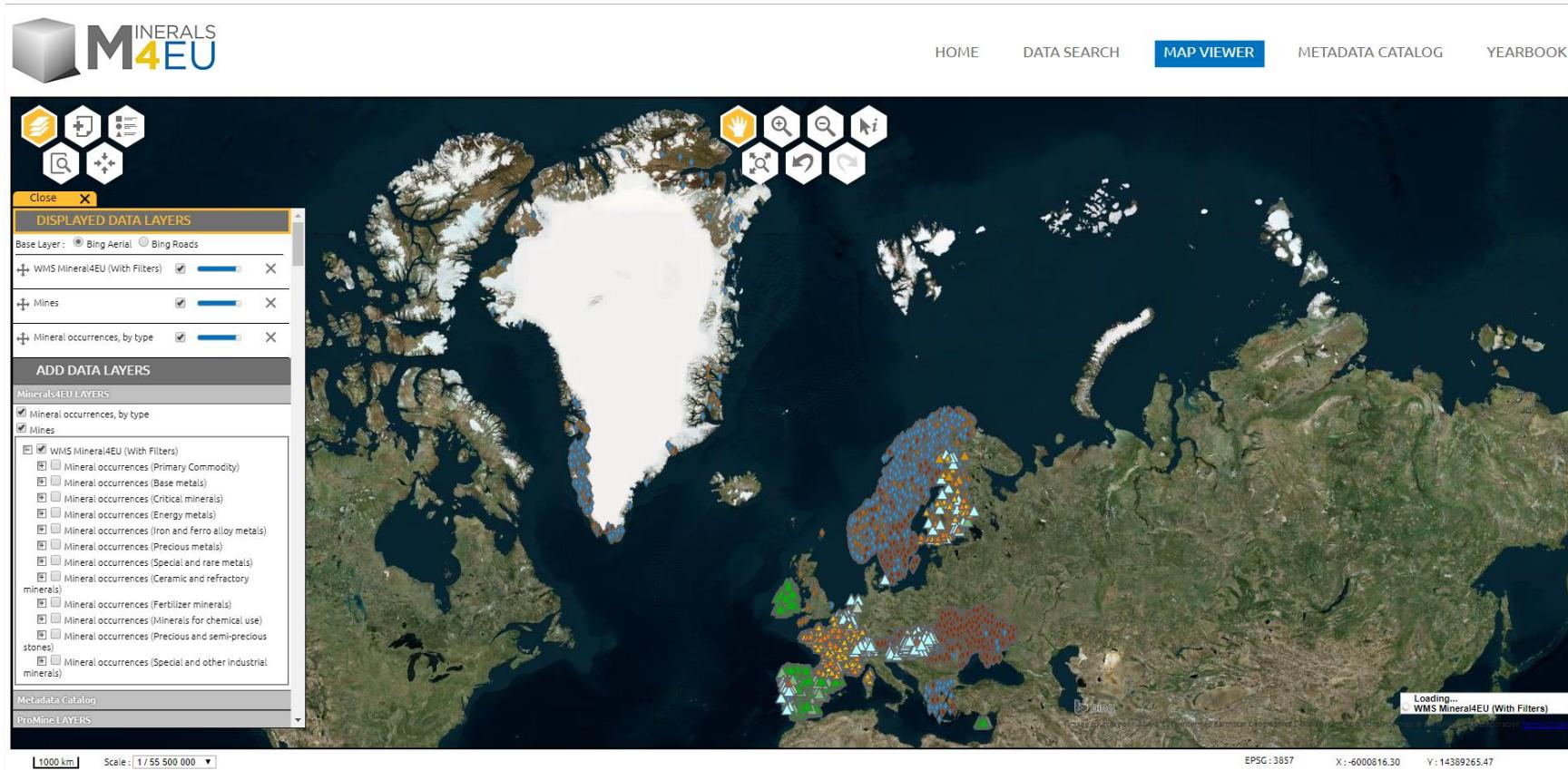
Geological Feature Index

Based on EGDI – European Geological Data Infrastructure



Mineral Resource Index

Based on European Minerals Knowledge Data Platform



3D/4D Model Index

Reuse of the model index: example in QGIS

The screenshot shows a QGIS interface with a map of France. A yellow rectangular selection box is drawn over a specific area in the northeast, covering parts of Luxembourg, Belgium, and France. To the right of the map, a modal window titled "ModelView (boundingBox) :: Total des entités: 2, filtrées: 2, sélectionnées: 1" is open. The window contains an XML editor with the URL <http://ressource.brgm-rec.fr/data/Modelview/Vfr1>. The XML content details a geological model named "Modèle géologique régional 3D du Massif des Vosges et du Fossé rhénan". The XML structure includes elements like gml:identifier, gml:name, gml:creationDate, gml:releaseDate, gml:versionNumber, gml:ptType, gml:purpose, gml:status, gml:boundingBox, gml:pzMin, gml:pzMax, gml:positionalAccuracy, gml:areaOfInterest, gml:modellingSoftwareToolName, gml:modellingSoftwareToolVersion, gml:outputGeometryReference, and gml:distributionFormat.

Element	Value
gml:identifier	http://ressource.brgm-rec.fr/data/Modelview/Vfr1
gml:name	Modèle géologique régional 3D du Massif des Vosges et du Fossé rhénan
gml:creationDate	2013-05-27
gml:releaseDate	2015-08-28
gml:ptType	http://resource.europe-geology.eu/vocabs/ModelType/implicit
gml:purpose	http://resource.europe-geology.eu/vocabs/ModelPurpose/scientificResearch
gml:status	http://resource.europe-geology.eu/vocabs/ModelStatus/finished
gml:boundingBox	
gml:pzMin	-40000
gml:pzMax	3000
gml:positionalAccuracy	http://qudt.org/vocab/unit/M
gml:areaOfInterest	http://sws.geonames.org/3017382/ France
gml:areaOfInterest	http://sws.geonames.org/3038033/ Alsace
gml:areaOfInterest	http://sws.geonames.org/2967681/ Vosges
gml:modellingGeologicFeature	Tertiaire
gml:modellingGeologicFeature	Trias
gml:modellingGeologicFeature	http://ressource.brgm-rec.fr/data/GeologicUnit/au.qmb.2738
gml:modellingSoftwareToolName	Permien
gml:modellingSoftwareToolVersion	GeoModeler
gml:outputGeometryReference	https://data.brgm.fr/files/2015/1dbf1f7c-13f2-49e9-abed-71e6da509513/output.zip
gml:distributionFormat	http://resource.europe-geology.eu/vocabs/DistributionFormat/vox

Vocabulary Registry: *data.geoscience.earth*

data.geoscience.earth/ncl/

Each register and register entity have their URI

Access for human being and machines

[European Geoscience Registry](#)

[Browse](#) [About](#) [Advanced search](#) [Search](#) [Submit](#)

INFO This is a trial service – your feedback will help us to improve it.

<https://data.geoscience.eu/nodc/DrillingMethod>

[View details](#) [Edit details](#) [Delete](#)

[View properties](#) [View relationships](#) [View history](#)

[Core metadata](#) [All properties](#) [Download](#)

Register: Borehole Drilling Method

URI: <https://data.geoscience.eu/nodc/DrillingMethod>

This schema specifies concepts used to describe methods used to drill a borehole, as defined by the IUGS Commission for Geoscience Information (CGI) Geoscience Terminology Working Group. By extension, if it includes all concepts in this conceptScheme, as well as concepts in previous versions of the schema.

Contents (tree view)

- auger** Auger drilling is done with a helical screw which is driven ... [View details](#) [Edit details](#) [Delete](#)
- hand auger** A hand auger consists of extendable steel rods, rotated by ha... [View details](#) [Edit details](#) [Delete](#)
- power auger** Mechanically-driven auger drilling, typically used in hard gr... [View details](#) [Edit details](#) [Delete](#)
- percussion drilling** A drilling method whereby rock or sediment chips or fragments... [View details](#) [Edit details](#) [Delete](#)
- cable tool drilling** A percusion drilling method that uses a heavy drilling tool ... [View details](#) [Edit details](#) [Delete](#)
- rotary air blast drilling** Percussion rotary air blast drilling (RAB) drilling is an 'op... [View details](#) [Edit details](#) [Delete](#)
- rotary hammer drilling** A percusion drilling method using a cutting tool powered by ... [View details](#) [Edit details](#) [Delete](#)
- reverse circulation drilling** The drilling mechanism for reverse circulation (RC) drilling ... [View details](#) [Edit details](#) [Delete](#)
- hydraulic rotary drilling** A drilling method using a drill stem equipped with a bit that... [View details](#) [Edit details](#) [Delete](#)
- core drilling** A core of sediment, soil, or rock is derived by an unspecifie... [View details](#) [Edit details](#) [Delete](#)
- diamond core** Diamond core drilling (or diamond drilling) utilizes an annul... [View details](#) [Edit details](#) [Delete](#)
- direct push** Direct push technology includes several types of drilling rig... [View details](#) [Edit details](#) [Delete](#)
- Extended Core Barrel (XCB)** The Extended Core Barrel (XCB) coring system is used in sedim... [View details](#) [Edit details](#) [Delete](#)
- vibrocore** A core tube is attached to a source of mechanical vibration (... [View details](#) [Edit details](#) [Delete](#)
- sonic** A sonic or vibratory drill head works by sending high frequen... [View details](#) [Edit details](#) [Delete](#)
- air core** Air core drilling and related methods use hardened steel or t... [View details](#) [Edit details](#) [Delete](#)
- box core** A sampling method that obtains a large volume or large surfac... [View details](#) [Edit details](#) [Delete](#)
- sidewall core** A method to extract a core or plug from the sidewall of a bor... [View details](#) [Edit details](#) [Delete](#)
- probe** An object (e.g. penetrometer) inserted into the substrate that... [View details](#) [Edit details](#) [Delete](#)



European Geoscience Registry

This is a trial service – your feedback will help us to improve it.

https://data.geoscienceearth.info / DrillingMethod / _coreDrilling

Entry: core drilling

URl: https://data.geoscienceearth.info/DrillingMethod/coreDrilling

A core of sediment, soil, or rock is derived by an unspecified core drilling method.

Definition

definition: A core of sediment, soil, or rock is derived by an unspecified core drilling method.

narrower: vibracore | Extended Core Barrel (XCB) | direct push | diamond core

notation: 4

pref label: core drilling

source: This vocabulary

top concept of: Borehole Drilling Method

type: Concept

Support

Support and contact information goes here.

About this page

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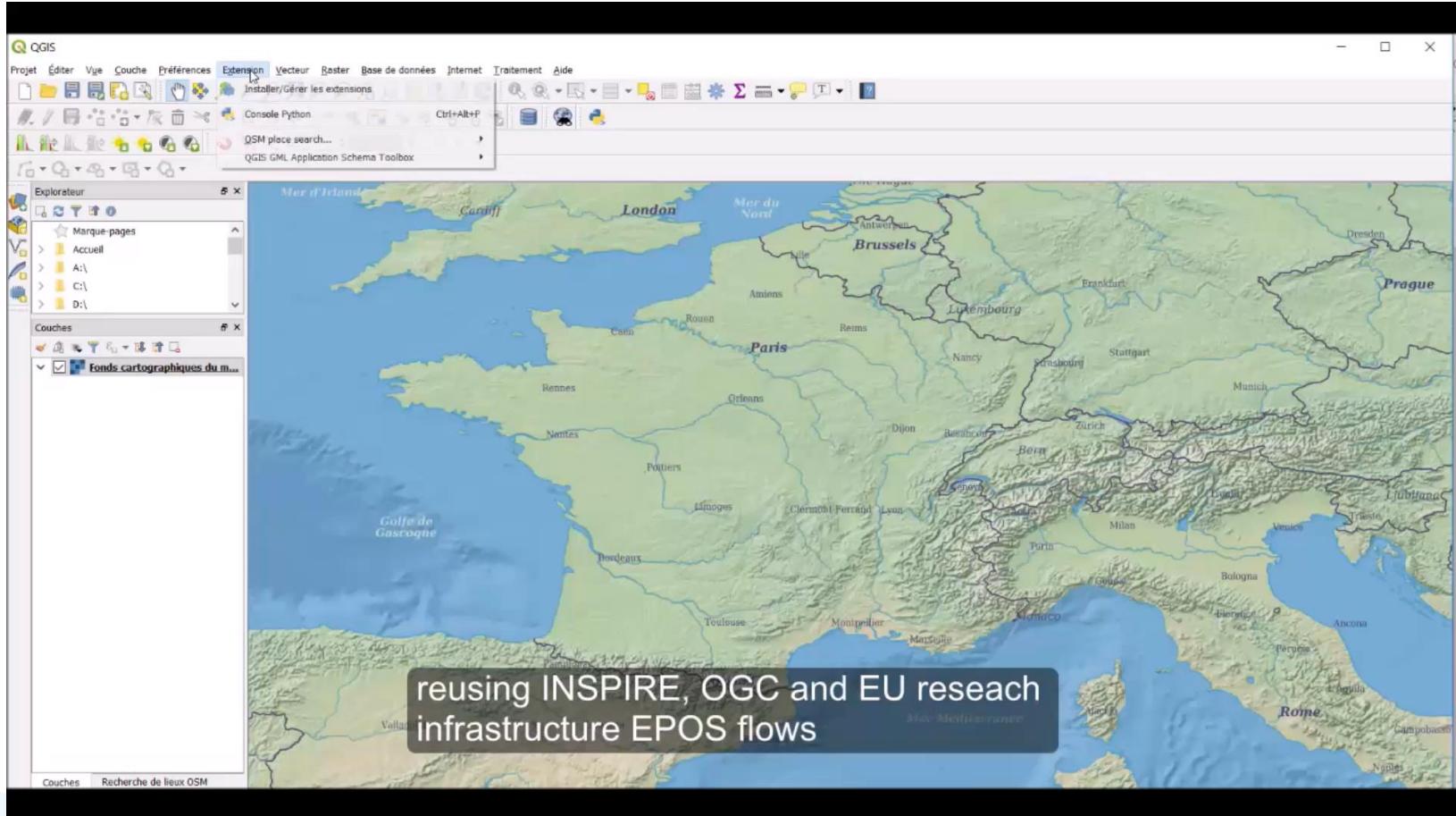
Design and development by Esmondo

```
C:\Users\grellerts>curl -k -L -H "Accept: text/turtle" "https://data.geoscience.earth/ncl/DrillingMethod/XCB"
@prefix cc: <http://creativecommons.org/ns#> .
@prefix void: <http://rdfs.org/ns/void#> .
@prefix org: <http://www.w3.org/ns/org#> .
@prefix odrls: <http://schema.theworld.org/odrls#> .
@prefix ssn: <http://www.w3.org/ns/ssn#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
@prefix env-ui: <http://environmental.data.gov.uk/registry/structure/ui/> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix version: <http://purl.org/linked-data/version#> .
@prefix qb: <http://purl.org/linked-data/cube#> .
@prefix dgu: <http://reference.data.gov.uk/def/reference#> .
@prefix ui: <http://purl.org/linked-data/registry-ui#> .
@prefix dct: <http://purl.org/dc/terms#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix reg: <http://purl.org/linked-data/registry#> .
@prefix ldp: <http://www.w3.org/ns/ldp#> .
@prefix time: <http://www.w3.org/2006/time#> .
@prefix api: <http://purl.org/linked-data/api/vocab#> .
@prefix vann: <http://purl.org/vocab/vann#> .
@prefix vs: <http://www.w3.org/2003/06/sw-vocab-status/ns#> .
@prefix prov: <http://www.w3.org/ns/prov#> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix dc: <http://purl.org/dc/elements/1.1/> .

<https://data.geoscience.earth/ncl/DrillingMethod/XCB>
    a skos:Concept ;
    dct:source <https://http://joidesresolution.org/node/2186> ;
    skos:broad <https://data.geoscience.earth/ncl/DrillingMethod/coreDrilling> ;
    skos:definition "The Extended Core Barrel (XCB) coring system is used in sedimentological, climate, and paleoceanographic studies. The XCB is used to recover 9.5 m long core samples from soft to moderately hard formations. The XCB is typically deployed when the formation becomes too stiff to piston core (i.e., upon piston coring \"refusal\") or when it is not hard enough to permit efficient recovery with the Rotary Core Barrel (RCB).\"@en ;
    skos:notation "4.4^^xsd:ID" ;
    skos:prefLabel "Extended Core Barrel (XCB)"@en .
```

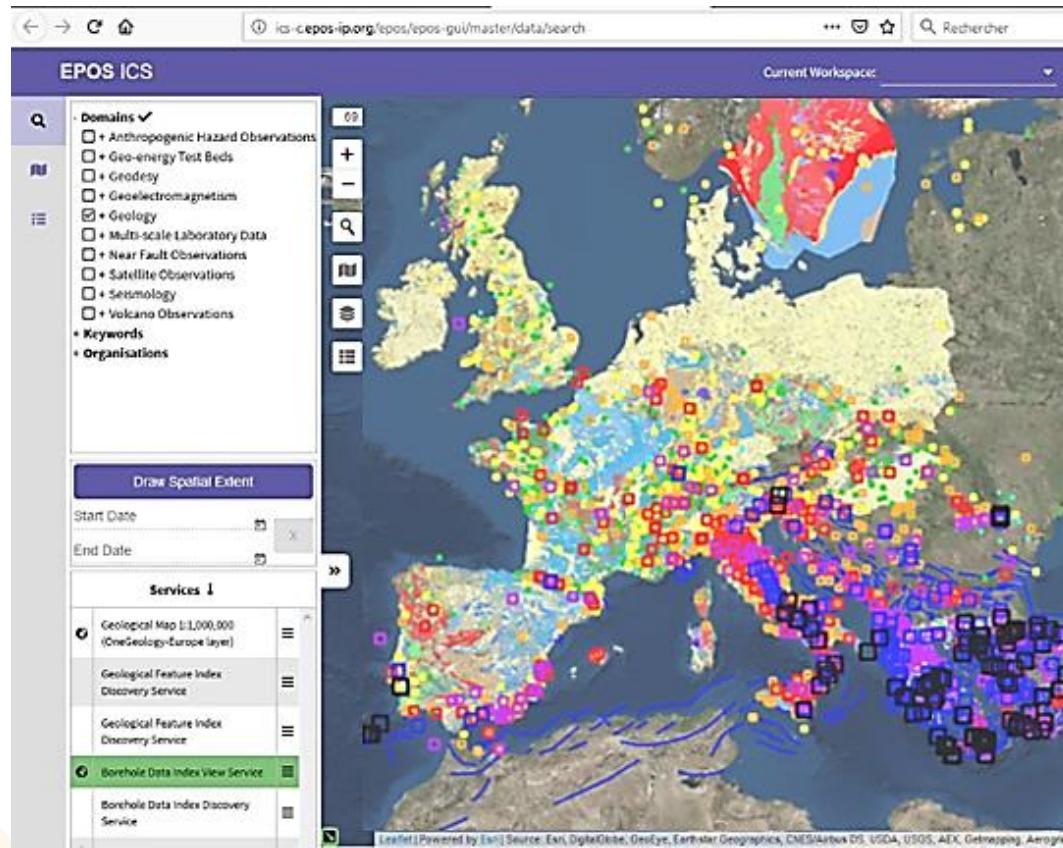
Going through the Borehole data graph

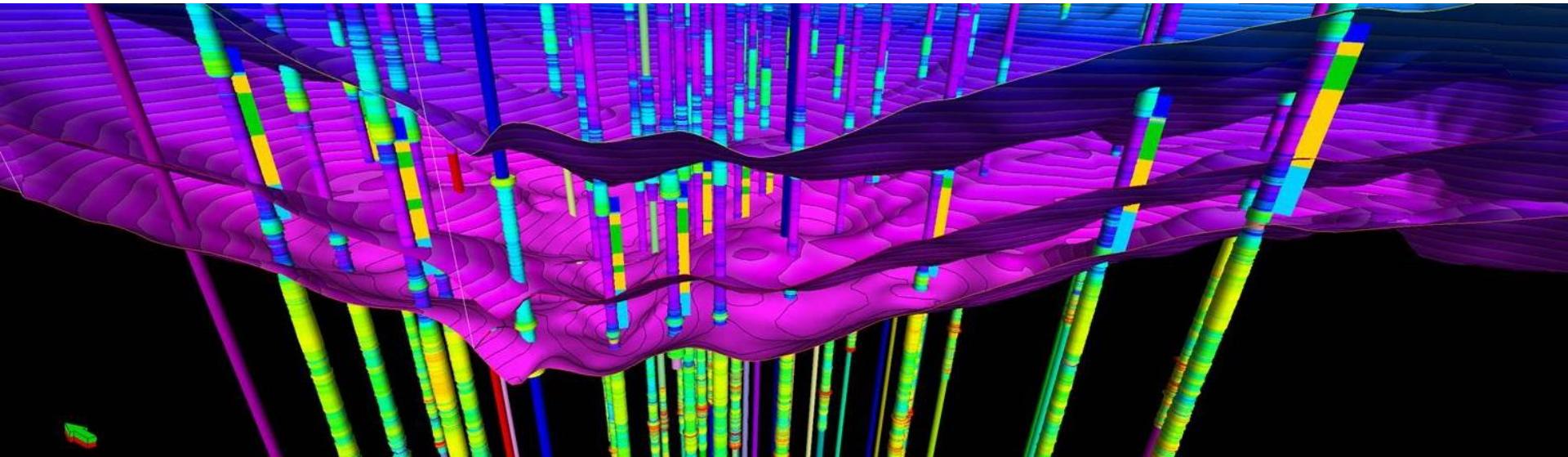
Using QGIS 3 & GML Application Schema Toolbox



EPOS Portal

TCS Geological Information and Modeling data are assessible:
www.epos-ip.org





EPOS

GEOLOGICAL INFORMATION AND MODELING

CONTACT

m.urvois@brgm.fr

www.epos-ip.org/tcs/geological-information-and-modeling