

EPOS TCS GIM Platform training

Virtual access to onshore and offshore boreholes in Europe

20th May 2026 10:00-12:00 CEST - online

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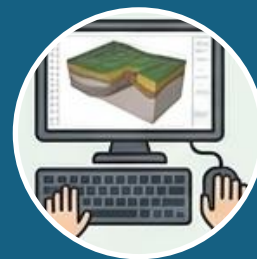
Agenda



**Presentation
of the
EPOS TCS GIM
platform**



**Presentation of
data sets and
data access on
EPOS TCS GIM
platform**



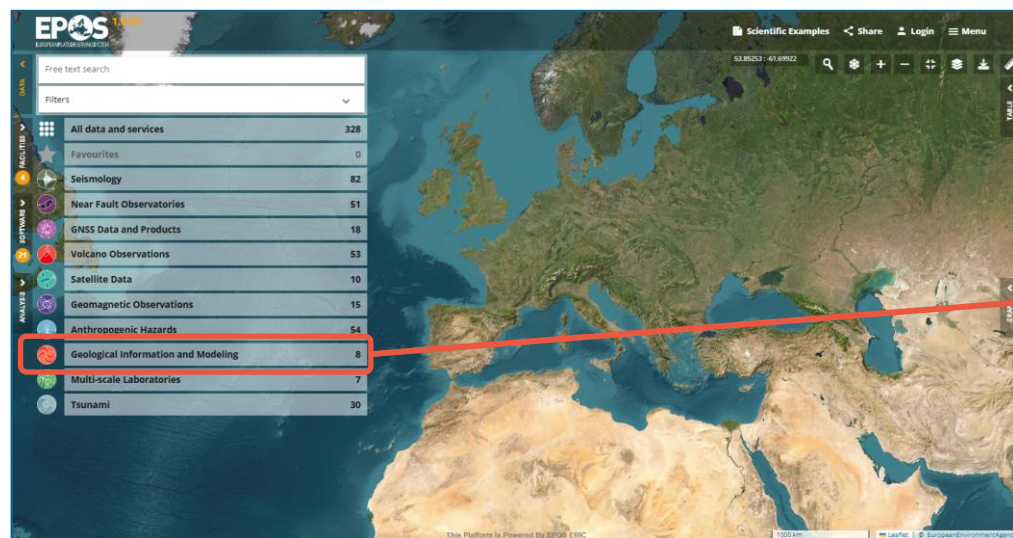
**Hands-on
exercises**



**Feedback from
the participants**

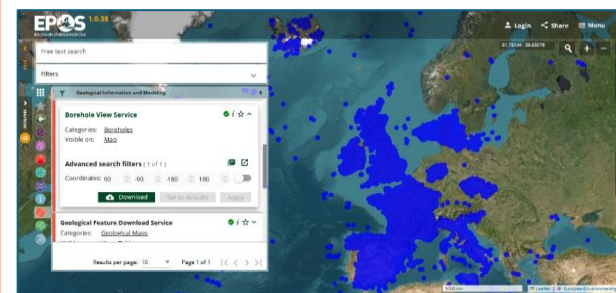


EPOS data portal

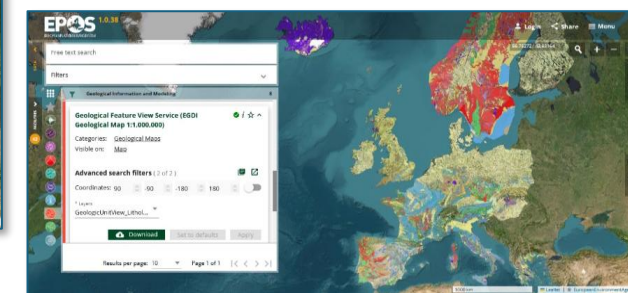


<https://www.epos-eu.org/dataportal>

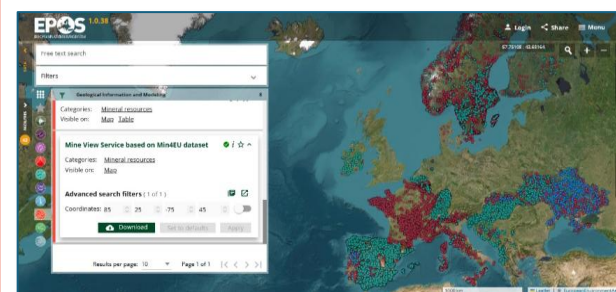
EPOS TCS - Geological Information and Modeling



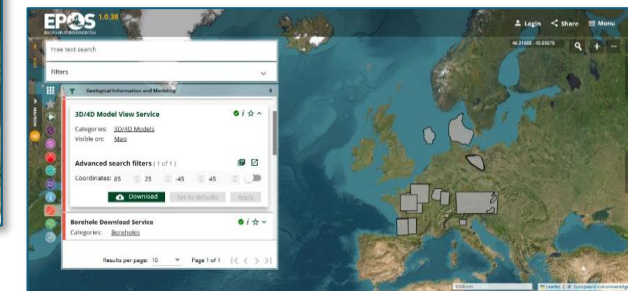
Borehole view service



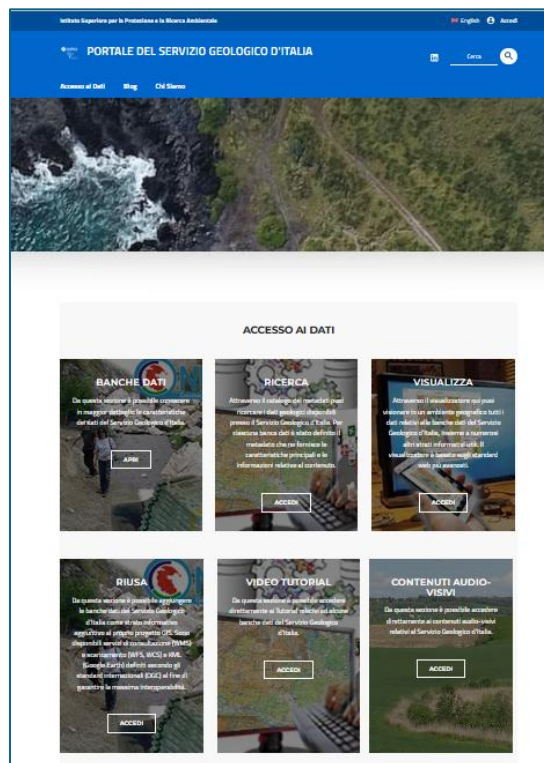
Geological feature view service
(EGDI geomap 1:1M)



Mine view service
(Min4EU dataset)



3D/4D model view service



Geological Survey of Italy portal
<https://portalesgi.isprambiente.it/>



Italian boreholes raster archive
<https://www.videpi.com/videpi/cessati/pdf.asp>



PITOP portal
<https://pitop.ogs.it/index.php>

Establishing efficient, multi-scale access to **geological assets**, including **raw observations**, **geological maps**, **measurements**, and **digital models**.

Leveraging **outcrops** and **boreholes** as the primary methods for **in-situ data collection**, utilizing physical **core samples**, **geophysical logs**, and **real-time sensor data**.

Treating **geological maps** as "living documents" that evolve through the continuous **integration of remote sensing** and **new field discoveries**.

Strategic evolution



Data expansion

Data and geographic expansion

New datasets (Czechia, Spain), 3D volumetric modeling (Italy, France).

Data quality and data granularity

New data services and more detailed information.

FAIR integration

Borehole persistent Identifiers ([IGSN](#)), standardized vocabularies.



Technical optimization

Scalability

Optimizing infrastructure to handle growing **multiscale assets** with minimal latency.

Technical optimization

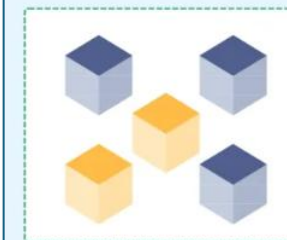
Incremental harvesting, stress-tested infrastructure.

Harvesting

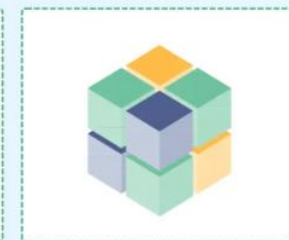
Incremental data harvesting models to ensure "living" maps stay current.



Detailed data



General data

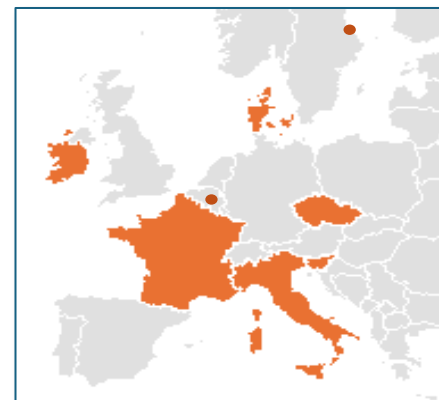


Findable Accessible Interoperable Reusable

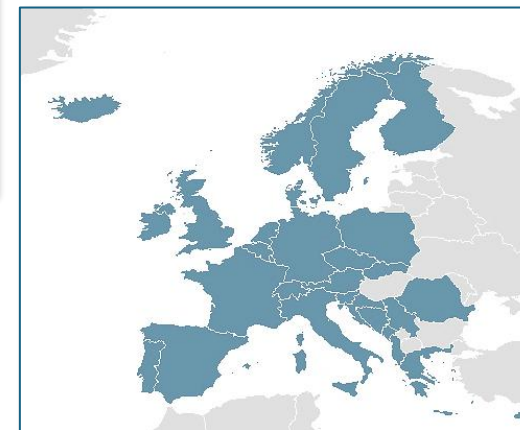


TCS GIM - Consortium Membership & Governance

- **Chair:** EuroGeoSurveys
- **Coordination:** BRGM
- **8 Consortium members:** EuroGeoSurveys + 6 Geological Surveys + Uppsala University
- **7 European countries:** BE, CZ, DK, FR, IE, IT, SI
- **Data Providers:** EGDl members & EPOS GIM members (UU-SE) and Natural Science Institute of Iceland (NSII)
- **IT Contact Point & Service Coordination:** BRGM
- **Service Providers:** BRGM, GEUS and GeoZS
- Quarterly Consortium meetings / Bi-Monthly Data Provider meetings
- Annual Work Plan (MYCA 2024-2028, 19 tasks)



Consortium members



Data providers

Multidisciplinary: TCS GIM & induced seismicity

Collaboration TCS GIM with TCS AH in Geo-INQUIRE Project, WP4 “Access to products enabling curiosity-driven science for georesources exploration and exploitation”.

Objective: Link boreholes and geological models to episodes in the EPISODES Platform.

Work done: To extend the multidisciplinary aspect of the TCS AH episodes a linkage with borehole information has been established through WFS API, thus enabling a direct and dynamic access to relevant borehole data provided by TCS GIM.



<https://episodesplatform.eu/?lang=en>

GEO DATA

- Boreholes** Link to Borehole Download Service, provided by BRGM - Bureau de Recherches Géologiques et Minières, FR. Information on boreholes (hydrocarbon exploration) in the vicinity of Emilia Romagna, Cavone oil field.
- Geological map** Link to the geological map of the Emilia Romagna region

ALL DATA RELATED TO THIS EPISODE AVAILABLE VISUALIZATIONS

EPISODES Platform provides open access to the integrated research infrastructures of **EPOS TCS AH**, giving users the possibility to:

- analyze anthropogenic seismicity and related hazards
- assess the potential impact of georesources exploitation
- use educational resources on anthropogenic hazards

EPISODES Platform - Anthropogenic Hazards Episodes

EPOS TCS AH - Consortium Website

European Plate Induced Seismicity Observations & Datasets within EPOS Services.

Virtual laboratory for research and education, designed for:

- analyzing anthropogenic seismicity and related hazards
- assessment of potential environmental impact of georesource exploitation
- integration of scientific expertise to support safer industrial practices

Provides open access to the integrated RI of EPOS TCS AH:

- Episodes- datasets related to anthropogenic seismicity induced by industrial activities -> impacting factors**
- Applications - software tools to process and analyze data, grouped in thematic categories**
- Workspace + HPC - Each affiliated user is provided a personal workspace where individual data processing and analyzing can be carried out.**

EPOS 1.0.54

Free text search

Filters: Spatial

Coordinates: 45.48 44.3 10.5982 12.00

YYYY-MM-DD HH:mm:ss YYYY-MM-DD HH:mm:ss

☐ Last Month ☐ Last Week ☐ Last Day

Data and Service Providers

Data Visualization

Geological Information and Modeling 8

3D/4D Model Download Service ☒

Categories: 3D/4D Models

Visible on: Map Table

Service Provider: EGD - European Geological Data Infrastructure

3D/4D Model View Service ☒

Categories: 3D/4D Models

Visible on: Map

Service Provider: EGD - European Geological Data Infrastructure

Borehole Download Service ☒

Categories: Boreholes

Visible on: Map Table

Service Provider: EGD - European Geological Data Infrastructure

Borehole View Service ☒

Categories: Boreholes

Visible on: Map

Service Provider: EGD - European Geological Data Infrastructure

Results per page: 10 Page 1 of 1

Multidisciplinary: TCS GIM & CO₂ storage

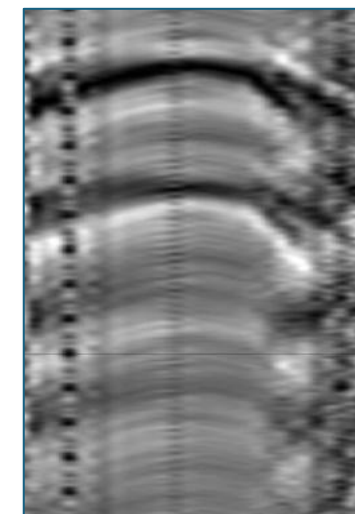
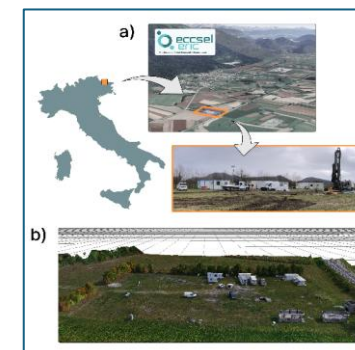
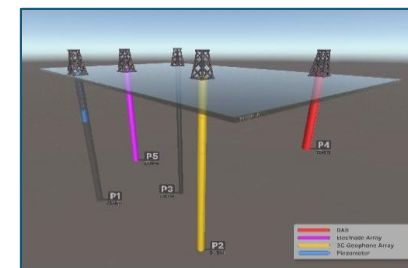
Collaboration EPOS RI with ECCSEL RI in Geo-INQUIRE Project, WP4.

ECCSEL RI: World's largest RI on Carbon Capture, Utilisation and Storage (CCUS) and Carbon Dioxide Removal (CDR) value chain.

Objective: Provide access to ECCSEL borehole experimental data on EPOS Platform
First implementation at “PITOP” platform (operated by OGS, Italy): geophysical test site with cutting-edge equipment for borehole and surface experiments, with possible applications in the fields of CCUS and geoenery. PITOP includes 5 wells used for multidisciplinary tests and research projects.

First stages: borehole data collection -> local capitalisation -> compliance to interoperable data model (TCS GIM BoreholeView).

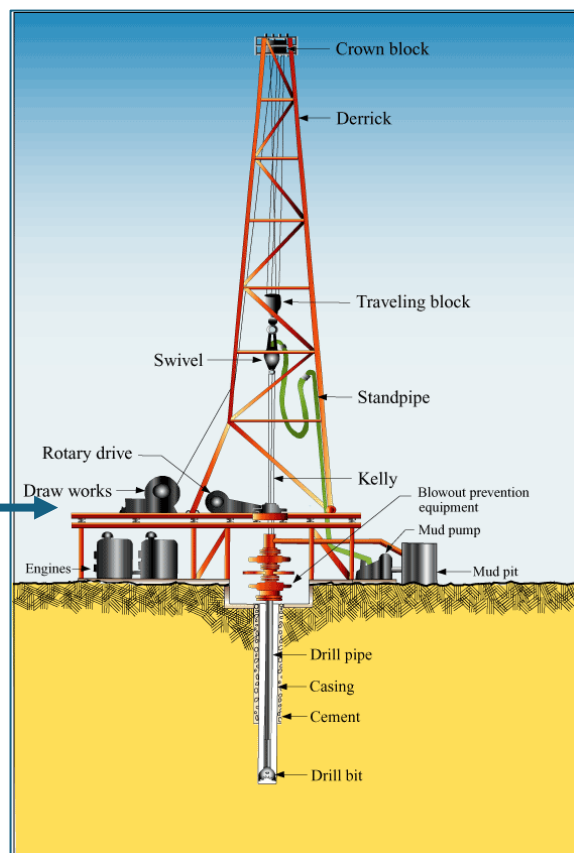
In progress stages: Upload and curation at national level (Italian borehole database) -> harvesting through TCS GIM and access through EPOS Platform.



What is an oil exploratory well?

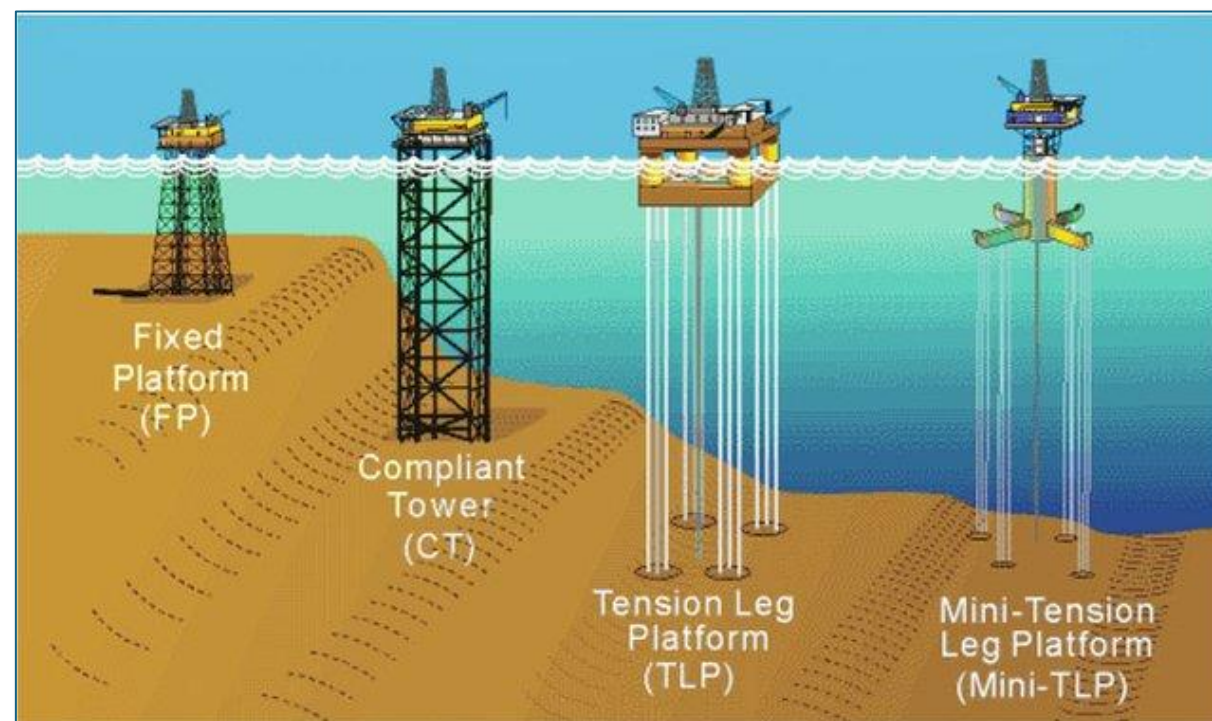


Rotary table



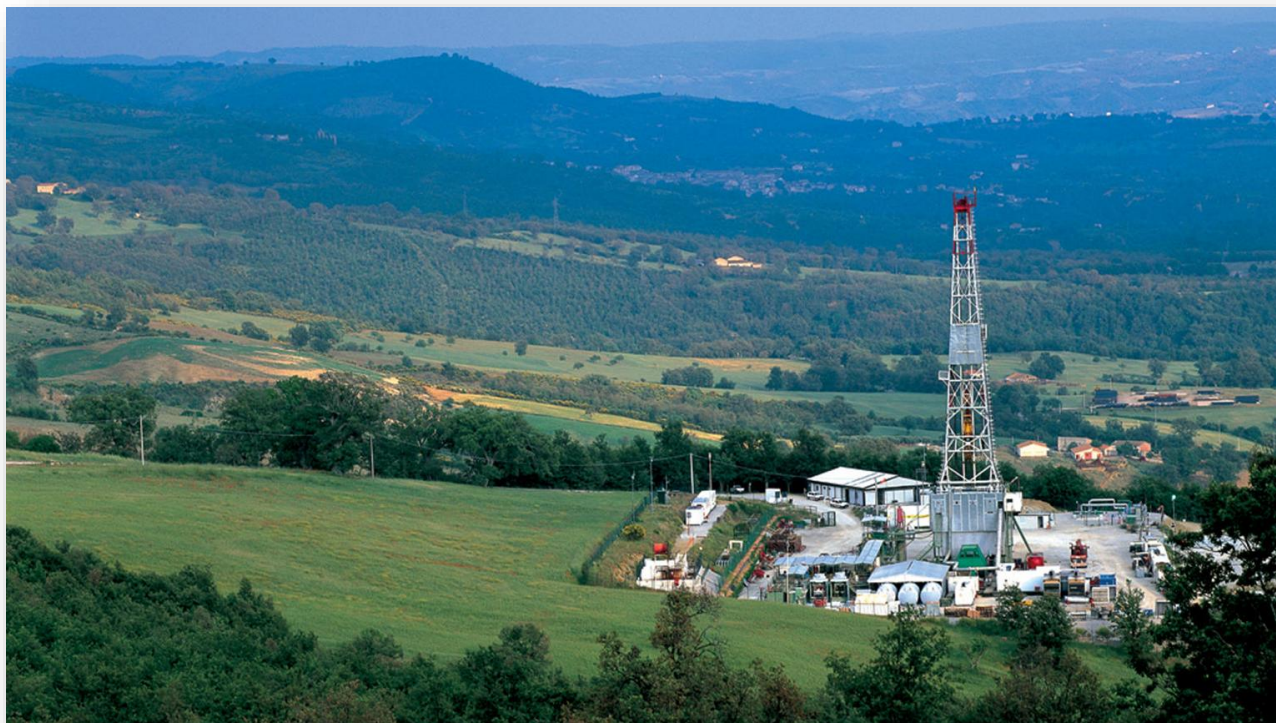
Onshore platform schema

The construction of a deep oil well (High-Pressure High-Temperature (HP-HT) envt)



Different type of offshore platform

Onshore and offshore: environmental interface and structural complexity



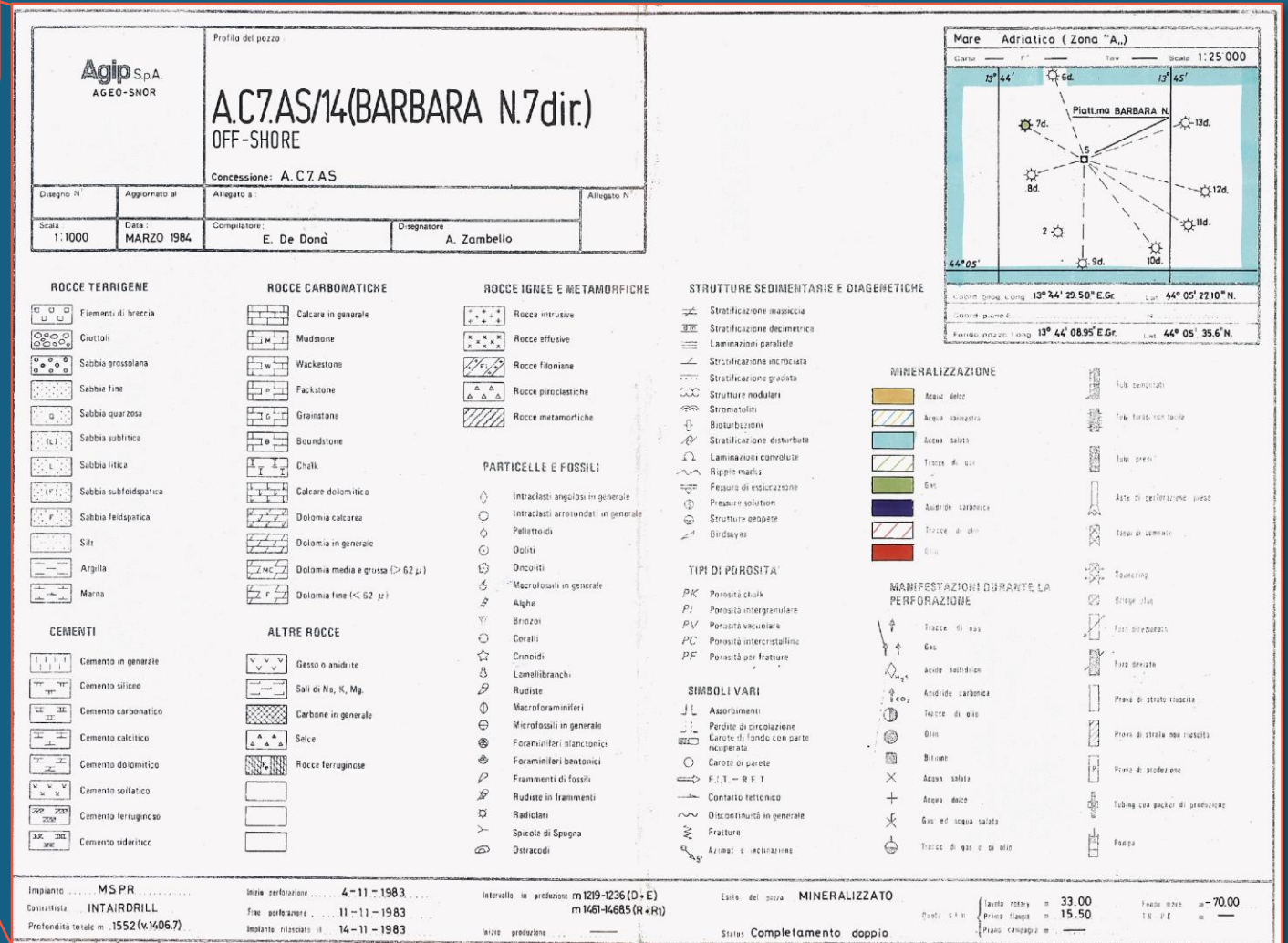
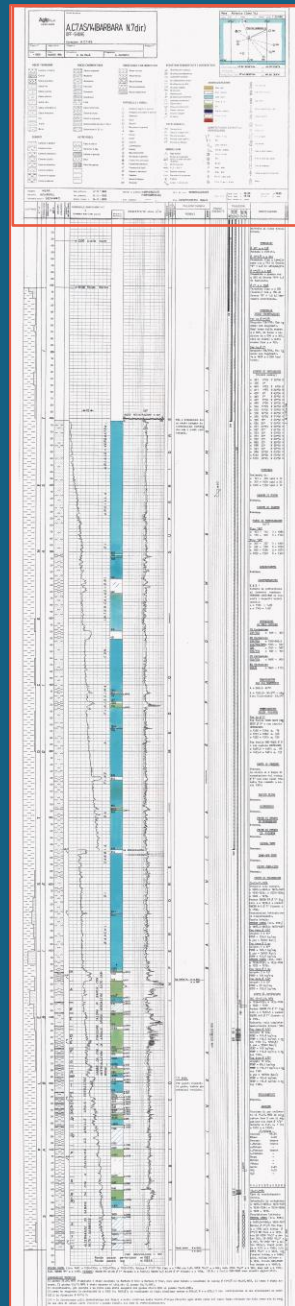
Analysis of results and data reporting



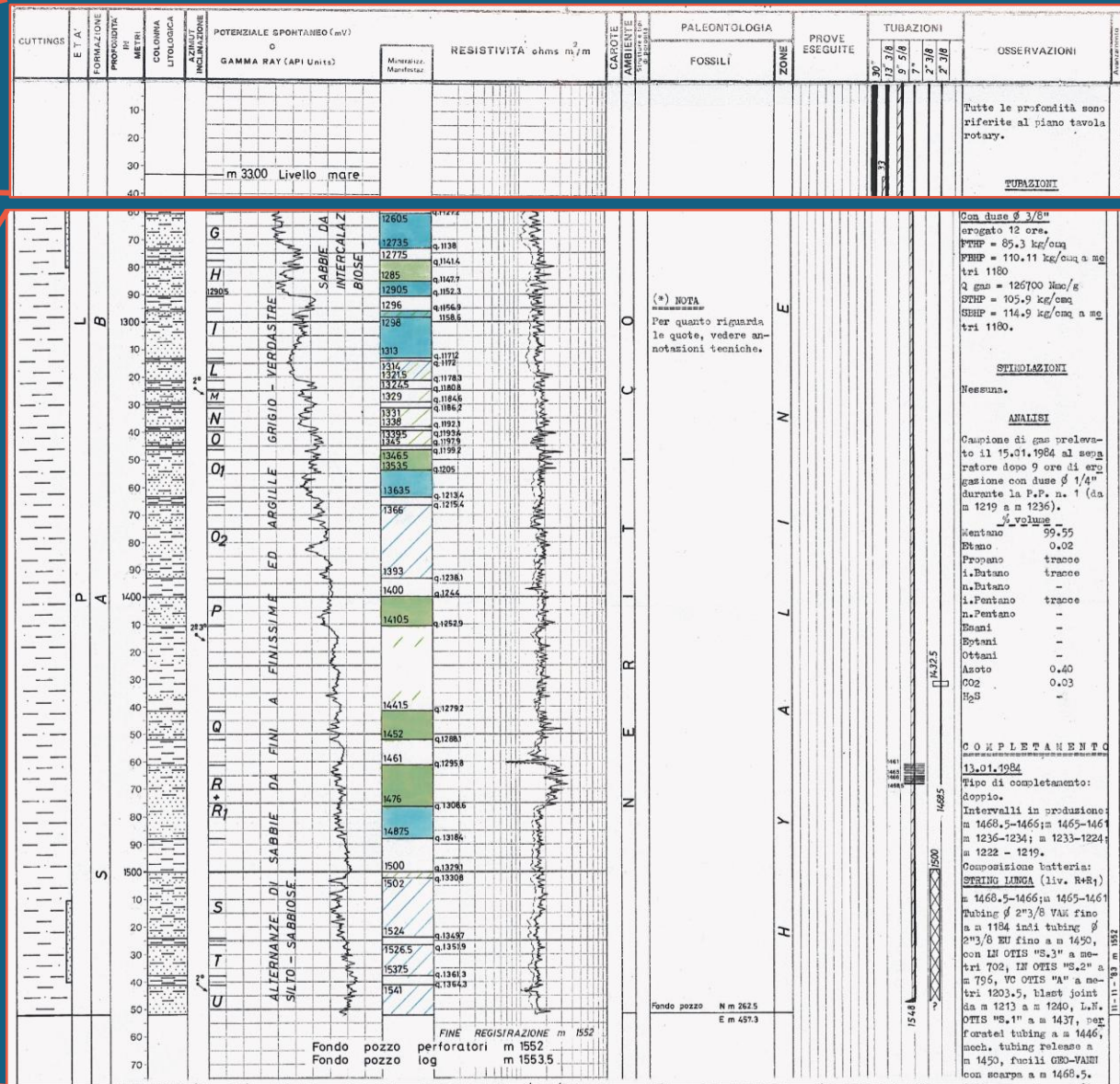
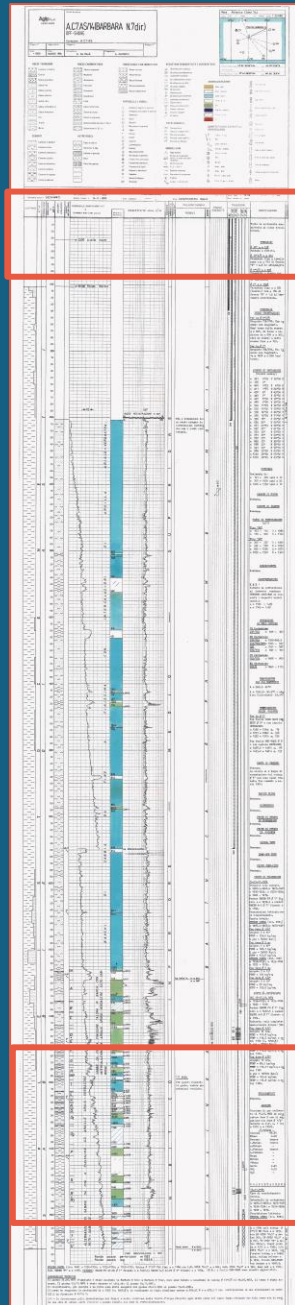
Borehole log (or well log)

(70x310 cm)

Registry data



Geological and geophysical data





Oil exploration wells drilled in Italy (1895 - 2015)

Total executed = **7246**

Depth range = **200 - 7300 m**

Available in UNMIG archive = **3613**

In the public domain (ViDEPI portal) = **2305**



Oil exploration wells drilled in Italy (1895 - 2015)

Total executed = 7246

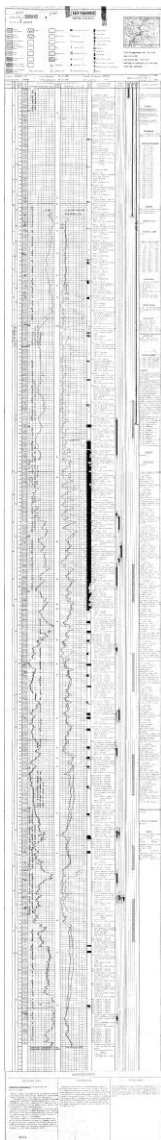
Depth range = 200 - 7300 m

Available in UNMIG archive = 3613

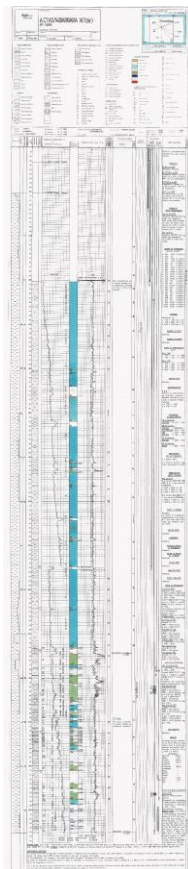
In the public domain (ViDEPI portal) = 2305

Digitized in ISPRA database = 1097

Burano 1



Barbara 7



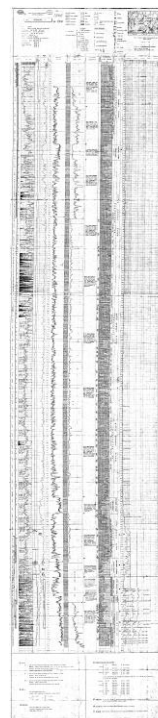
Menfi 1



Onda 1



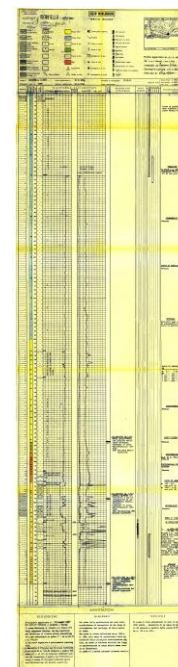
Terenzio 1



Gubbio 1



Marinella 1



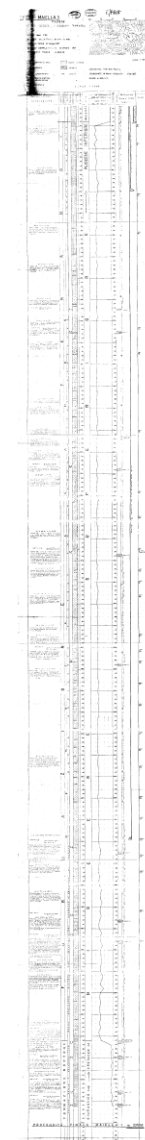
Lemizzone 1



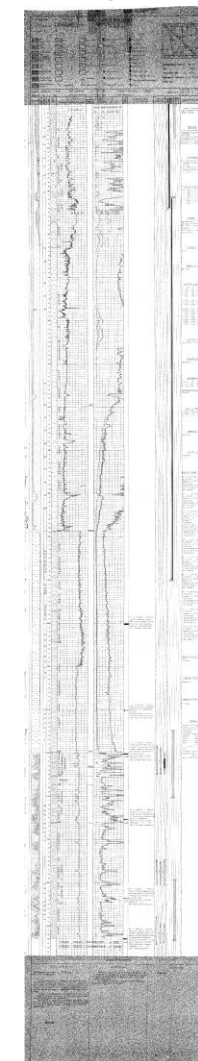
Naftia 1



Maiella 1

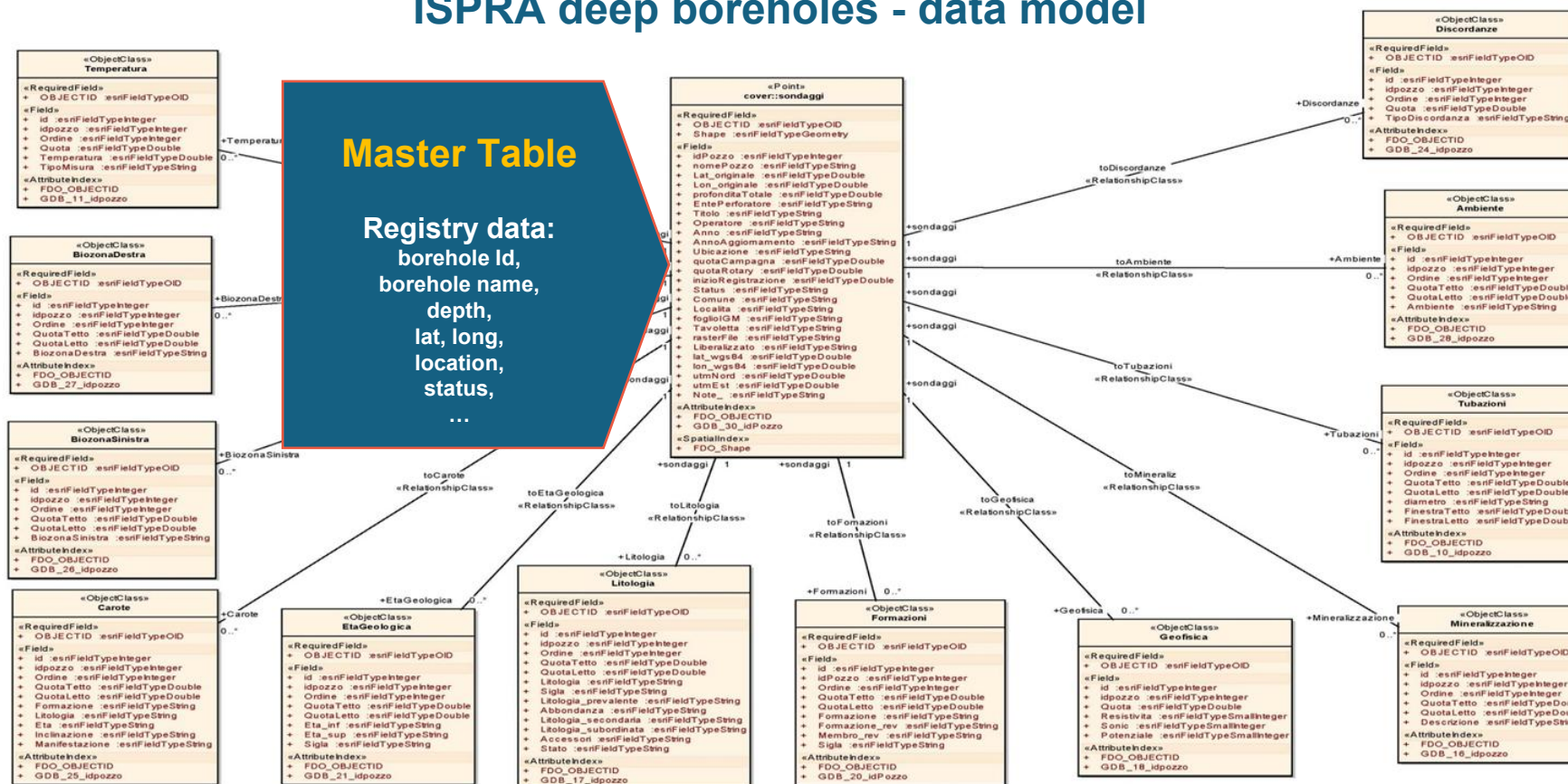


Camignano 1



11/1097 log profiles
Total length = 2,280 km

ISPRA deep boreholes - data model



Lithology data harmonisation (GeoSciML) GeologicFeature:GeologicUnit:CompositionPart

ID pozzo/vello/litolotta originaria	litologia originaria	LITO PREVALENTE	percentuale	LITO SECONDARIA	LITO SUBORDINATA	ACCESSORIO
1	ARGILLA FOSSILIFERA TALORA LEGGERMENTE SABBIOSA	ARGILLA	PREDOMINANTE	SABBIA		
1	WACKSTONE/PACKSTONE E PACKSTONE GRIGIO E MARRONE, FOSSILIFERO,					
2	LOCALMENTE INTRACLASTICO	CALCARE	ALL			
1	MARNA GRIGIO-MARRONE CON QUALCHE 3 INTERCALAZIONE DI WACKSTONE ARGILLOSO	MARNA	PREDOMINANTE	CALCARE	ARGILLA	
1	MUDSTONE, LOCALMENTE WACKSTONE, DA GRIGIO CHIARO A BIANCASTRO, FOSSILIFERO, 4 COMPATTO, CON INTERCALAZIONI DI MARNA	CALCARE	PREDOMINANTE	MARNA		
1	MUDSTONE/WACKSTONE PASSANTE A PACKSTONE, BIANCASTRO, COMPOSTO, 5 FOSSILIFERO, CON DI SELCE	CALCARE	ALL			FOSSILI
1	MUDSTONE, TALORA WACKSTONE, BIANCASTRO, FOSSILIFERO, CON 6 INTERCALAZIONI DI MARNA E NODULI DI SELCE	CALCARE	PREDOMINANTE	MARNA		
1	MARNA GRIGIO-VERDASTRA, CON 7 INTERCALAZIONI DI MUDSTONE ARGILLOSO	MARNA	PREDOMINANTE	CALCARE	ARGILLA	
1	MUDSTONE BIANCASTRO, FOSSILIFERO, LOCALMENTE ARGILLOSO, CON NODULI DI 8 SELCE E INTERCALAZIONI DI MARNA GRIGIO- VERDASTRA	CALCARE	PREDOMINANTE	ARGILLA	MARNA	
1	WACKSTONE GRIGIO CHIARO E VERDE CHIARO, FOSSILIFERO, TALORA SELCIFERO CON INTERCALAZIONI DI MARNA, FREQUENTI LICELLI DI WACKSTONE ROSSO, NODULARE E 9 MARNA ROSSASTRA	CALCARE	PREDOMINANTE	MARNA		FOSSILI
1	MUDSTONE E WACKSTONE A RADIOLARI E SPICOLE DI SPUGNA CON INTERCALAZIONI DI WACKSTONE E PACKSTONE FINI, INTRACLASTICI, FOSSILIFERI, GRIGI, LOCALMENTE DOLOMITICI, DI MARNA E DI ARGILLA SILTOSE. LIVELLI DI PACKSTONE/GRAINSTONE INTRACLASTICI E 10 FOSSILIFER	CALCARE	PREDOMINANTE	MARNA	ARGILLA	FOSSILI
1	ARGILLE NERE, SILTOSE, FOGLIETTATE, ALTERNATE A MUDSTONE RICRISTALLIZZATO O 11 DOLOMITICO	ARGILLA	50	CALCARE	DOLOMIA	
1	ALTERNANZE DI MUDSTONE GRIGIO MARRONE, RICRISTALLIZZATO O DOLOMITICO, LOCALMENTE LAMINATO E DI ARGILLA NERA 12 LAMINATA	CALCARE	50	ARGILLA	DOLOMIA	

lithologyID				
OB	ID	Etichetta	Descrizione	Code
1	http://inspire.ec.europa.eu/codelist/LithologyValue/compound	materiale com	Materiale terroso composto da un'aggregazione di particelle	compoundMaterial
2	http://inspire.ec.europa.eu/codelist/LithologyValue/anthropog	materiale antr	Materiale noto per le sue origini artificiali (antropogeniche); infc	anthropogenicMaterial
3	http://inspire.ec.europa.eu/codelist/LithologyValue/anthropog	materiale con	Materiale consolidato noto per le sue origini artificiali (antropog	anthropogenicConsolidatedMaterial
4	http://inspire.ec.europa.eu/codelist/LithologyValue/anthropog	materiale non	Materiale non consolidato noto per le sue origini artificiali (antr	anthropogenicUnconsolidatedMaterial
5	http://inspire.ec.europa.eu/codelist/LithologyValue/breccia	breccia	Materiale grossolano composto da frammenti angolari di roccia breccia	
			di stato di consolidamento non specificato formato di	compositeGenesisMaterial
			formata da modificazioni geologiche di rocce preesistent	compositeGenesisRock
			formato in seguito a deformazioni fragili associate all	faultRelatedMaterial
9	http://inspire.ec.europa.eu/codelist/LithologyValue/impacu-te	materiale gen	Materiale che contiene elementi indicativi di metamorfismo da i	impacu-technicaleneratedMaterial
10	http://inspire.ec.europa.eu/codelist/LithologyValue/materialFo	materiale form	Materiale derivante da processi di erosione meteorica verificati	materialFormedInSurficialEnvironment
11	http://inspire.ec.europa.eu/codelist/LithologyValue/rock	roccia	Aggregato consolidato di uno o più materiali terrosi, o un corpo rock	
12	http://inspire.ec.europa.eu/codelist/LithologyValue/aphanite	afanite	Roccia a grana troppo fine per essere categorizzata in modo più	aphanite
13	http://inspire.ec.europa.eu/codelist/LithologyValue/sedimenta	roccia sedime	Roccia formata dall'accumulo e dalla cementazione di mate	sedimentaryRock
14	http://inspire.ec.europa.eu/codelist/LithologyValue/tuffite	tuffite	Roccia costituita da particelle di origine piroclastica o epiclastica	tuffite
15	http://inspire.ec.europa.eu/codelist/LithologyValue/sedimenta	materiale sedi	Materiale formato dall'accumulo di materiale frammentato	sedimentaryMaterial
16	http://inspire.ec.europa.eu/codelist/LithologyValue/carbonate	materiale sedi	Materiale sedimentario in cui almeno il 50 % dei costituenti prim	carbonateSedimentaryMaterial
17	http://inspire.ec.europa.eu/codelist/LithologyValue/chemicalSe	materiale sedi	Materiale sedimentario di cui almeno il 50 % è costituito da ma	chemicalSedimentaryMaterial
18	http://inspire.ec.europa.eu/codelist/LithologyValue/clasticSedi	materiale sedi	Materiale sedimentario con stato di consolidamento non specifi	clasticSedimentaryMaterial
19	http://inspire.ec.europa.eu/codelist/LithologyValue/nonClastic	materiale sedi	Materiale sedimentario di cui almeno il 50 % è costituito da ma	nonClasticSiliceousSedimentaryMaterial
20	http://inspire.ec.europa.eu/codelist/LithologyValue/organicRic	materiale sedi	Materiale sedimentario in cui il 50 % o più del materiale sedime	organicRichSedimentaryMaterial
21	http://inspire.ec.europa.eu/codelist/LithologyValue/igneousMa	materiale igne	Materiale terrestre formato in seguito a processi ignei, come pe	igneousMaterial
22	http://inspire.ec.europa.eu/codelist/LithologyValue/fragmental	materiale igne	Materiale igneo con stato di consolidamento non specificato in	fragmentalIgneousMaterial
23	http://inspire.ec.europa.eu/codelist/LithologyValue/acidicIgne	materiale igne	Materiale igneo di cui più del 63 % è costituito da SiO2.	acidicIgneousMaterial
24	http://inspire.ec.europa.eu/codelist/LithologyValue/basicIgne	materiale igne	Materiale igneo con contenuto di SiO2 compreso tra 45 % e 52 %	basicIgneousMaterial
25	http://inspire.ec.europa.eu/codelist/LithologyValue/igneousRo	roccia ignea	Roccia formata in seguito a processi ignei, come per esempio l'ar	igneousRock
26	http://inspire.ec.europa.eu/codelist/LithologyValue/intermedia	materiale igne	Materiale igneo con contenuto di SiO2 compreso tra 52 % e 63 %	intermediateCompositionIgneousMaterial

<http://inspire.ec.europa.eu/codelist/LithologyValue/breccia>

Data flow: from national entity to research infrastructure

