

The data Center of deep Geothermal energy

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OUTLINE:

- What is the data Center of deep Geothermal energy?
- What data are distributed?
- Who provides the data and how are they distributed?
- What is the link between the data Center of deep Geothermal energy?
- What are the objectives for the data Center of deep Geothermal energy?

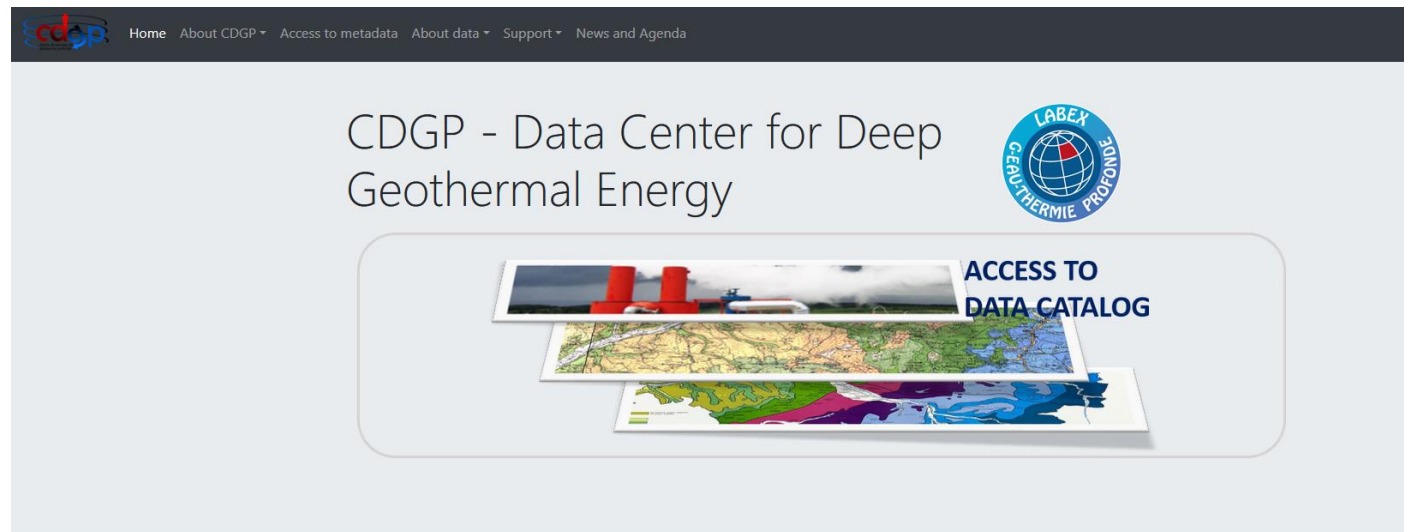


What is the data Center of deep Geothermal energy ?



The data Center of deep Geothermal energy (CDGP) :

- Launched in 2016 by the LabEx G-EAU-THERMIE PROFONDE-now ITI GeoT
- Objective of the CDGP: to collect data collected on geothermal sites in Alsace, to archive them and to distribute them to the scientific community for R&D activities
- The data are distributed on the CDGP website : <https://cdgp.u-strasbg.fr/>



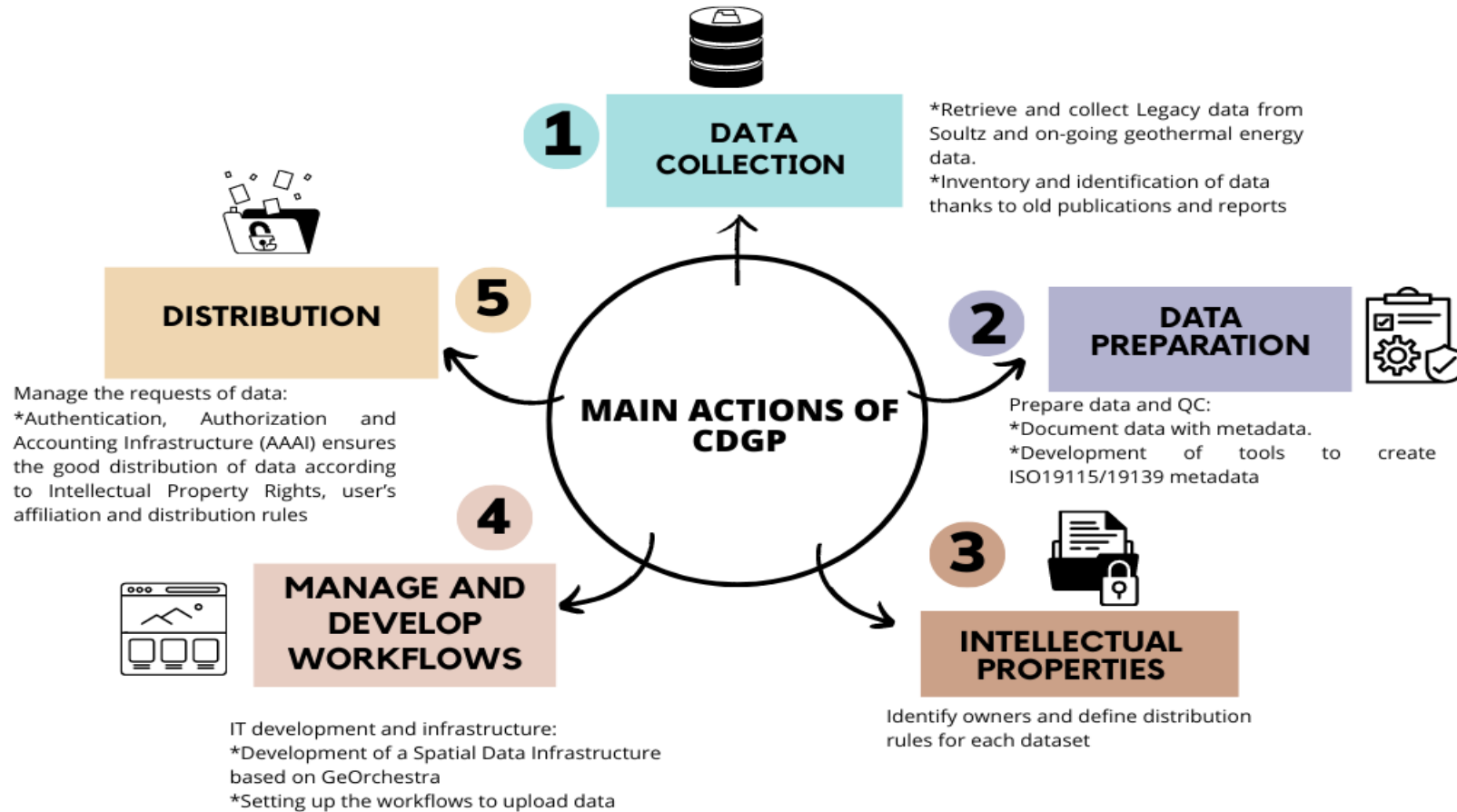
Project

The **LabEx G-EAU-THERMIE PROFONDE** is a research program on deep geothermal energy founded by the French Ministry of Research and Education in the framework of the "Laboratories of Excellence" initiative. CDGP is set to archive the high quality data collected in the Upper Rhine Graben geothermal sites and to distribute them to the scientific community for R&D activities, taking Intellectual Property Rights into account.

Data available on the platform

Data distributed by the CDGP consist of seismological and hydraulic data that have been acquired during stimulation or circulation phases at Soultz-sous-Forêts pilot plant. They are gathered into "episodes": time-correlated collections of geophysical, technological and other relevant geo-data over a geothermal area. Other geophysical data (gravimetric, magnetic, InSAR) will be also inserted into the datastore in the future.

Main actions of the data Center of deep Geothermal energy (CDGP) :



Statistics on data Center of deep Geothermal energy (CDGP) :

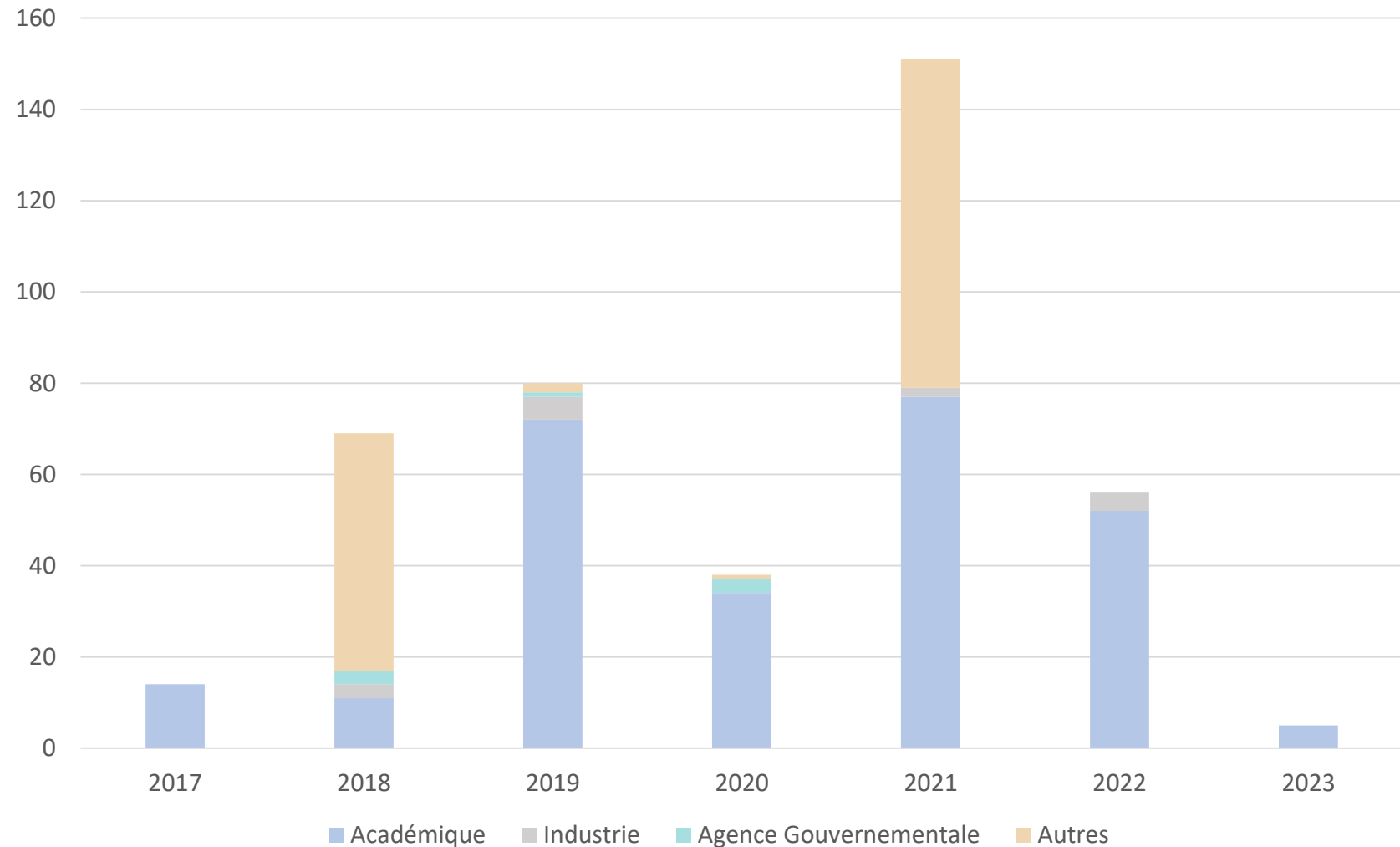
88

88 datasets

780

780 requests

Data requests from 2017 to present



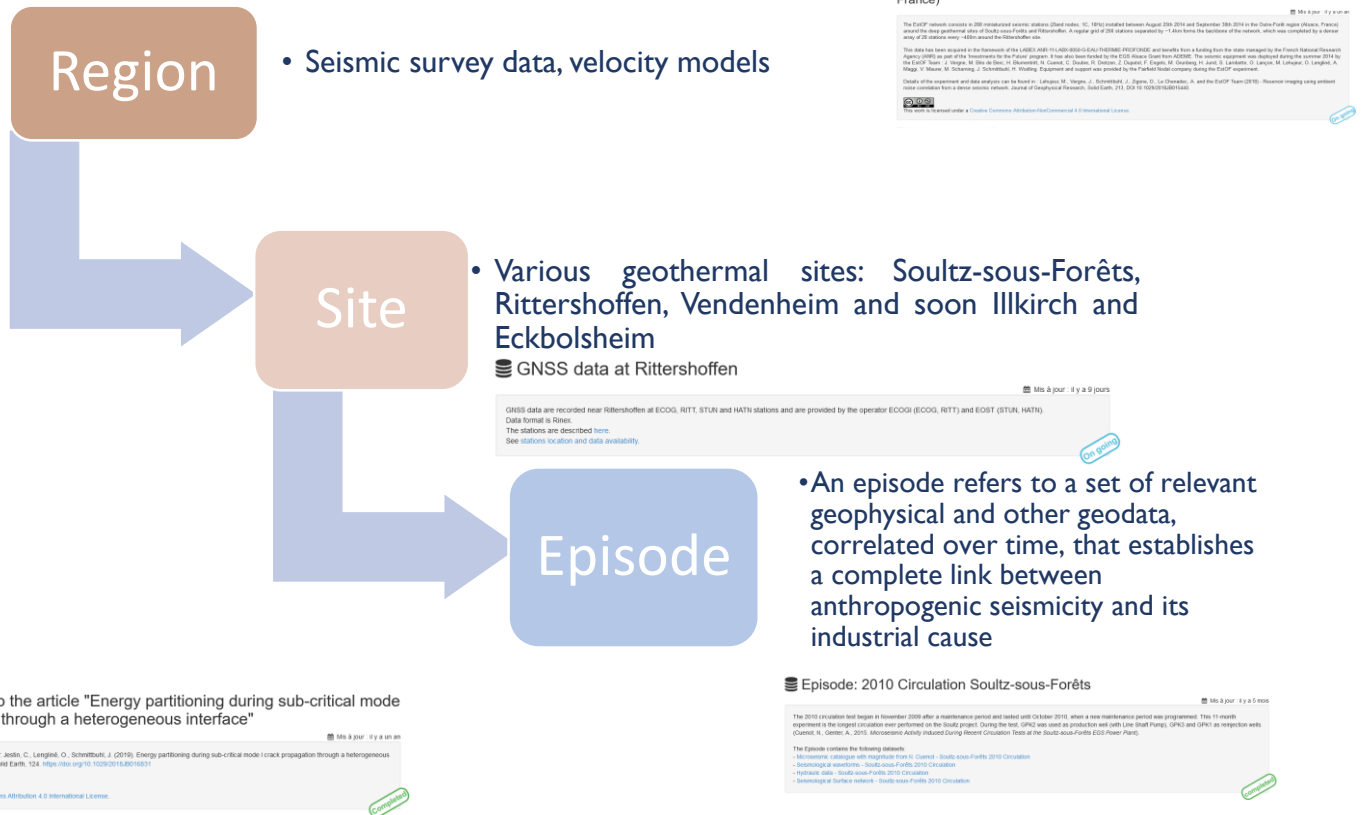


What data is distributed by the data Center of deep Geothermal energy ?



Data from the data Center of deep Geothermal energy (CDGP) :

The data are seismological (catalogs, waveforms, focus mechanisms), seismic, hydraulic, geological (fault model, logs) and all data related to the anthropogenic hazard



Publication: Data produced as part of a thesis or publication

Data from the data Center of deep Geothermal energy (CDGP) catalog :

CDGP catalog

The image shows a screenshot of the CDGP catalog website. At the top, there is a search bar with the text "Rechercher parmi 101 jeux de données, services et cartes, ..." and a search button. Below the search bar, there are several resource cards, each with a thumbnail and a title. The cards include:

- GNSS data at Rittershoffen
- Dataset related to the article Shu, Lengline and Schmittbuhl, Collective behavior of asperities before large stick-slip events (submitted to JGR)
- Episode: 2005 Stimulation Soultz-sous-Forêts
- Seismological waveforms - Soultz-sous-Forêts 2005 Stimulation
- Seismological waveforms - Soultz-sous-Forêts 2004 Stimulation
- Hydraulic data - Soultz-sous-Forêts 2004 Stimulation
- Hydraulic data - Soultz-sous-Forêts 2003 Stimulation
- 3D velocity model of the whole Upper Rhine Graben

Below the main grid, there is a search bar with the year "2000" entered. To the right of the search bar, there is a "Search" label. Below the search bar, there are several search results, each with a thumbnail and a title. The results include:

- Episode: 2000 Stimulation Soultz-sous-Forêts
- Seismological waveforms - Soultz-sous-Forêts 2000 Stimulation
- Microseismic catalogue of the downhole network by B. Dyer - Soultz-sous-Forêts...
- Velocity model and station corrections used by B. Dyer to locate seismic events...

On the left side of the image, there is a detailed view of the "Microseismic catalogue of the downhole network by B. Dyer - Soultz-sous-Forêts 2000 Stimulation" page. This page contains the following information:

- Microseismic catalogue of the 2000 episode at Soultz-sous-Forêts calculated by B. Dyer (Semore Seismic) using the downhole network. Number of events: 13986.**
- Microseismic monitoring of the hydraulic program at Soultz took place between June 30th and July 18th. During the program, a total of 31511 potential seismic events were recorded from which 13986 seismic events were located. The catalogue covers the two hydraulic tests realized during the 2000 episode. Only the events with an RMS ratio > 10 ms were accepted. This corresponding to the corrected waveforms distributed on the CDGP has been added.**
- Time period: 30/06/2000 19:09:38 - 18/07/2000 07:54:17 (UTC time).**
- The data parameters are the following:**
 - Column 1: Event number
 - Column 2: Date (local)
 - Column 3: Time (local)
 - Column 4: Date (UTC)
 - Column 5: Time (UTC)
 - Column 6: Date corresponding to the corrected waveforms distributed by the CDGP (UTC)
 - Column 7: Time corresponding to the corrected waveforms distributed by the CDGP (UTC)
 - Column 8: Easting from GPK1 wellhead
 - Column 9: Northing from GPK1 wellhead
 - Column 10: Depth from GPK1 wellhead
 - Column 11: Latitude WGS84
 - Column 12: Longitude WGS84
 - Column 13: Elevation WGS84
- * The UTC time has been calculated from the local time.**
- ** Same date and time corresponding to the corrected waveforms are missing. Discrepancies in the time were found with the waveforms for 87 events. Thus, the time corresponding to the corrected waveforms is given for 13986 events only.**
- ** The local coordinate system is based on the UTM22 system.**
- **** Latitude, longitude and elevation have been derived from easting, northing and depth from GPK1 wellhead.**
- The description of the downhole network is available [here](#).**
- The seismological waveforms recorded by the downhole and the surface network during the 2000 episode are available [here](#).**
- Last update of date: 28/06/2021**

At the bottom of the detailed view, there is a section titled "Téléchargements et liens" with a download button and a link to the catalogue. Below this, there is a section titled "À propos de cette ressource" with a list of categories and keywords.

Example of metadata

Metadata catalog

Search

Example of metadata from the data Center of deep Geothermal energy :

Microseismic catalogue of the downhole network from CSMA - Soultz-sous-Forêts 1995 Stimulation and Hydraulic Tests

Mis à jour : il y a 2 ans

Catalogue of microseismicity recorded at Soultz-sous-Forêts during 1995 stimulation, injection and circulation tests. Number of events: 5295.
Time period: 15:15:45 14/06/1995 to 04:33:27 15/08/1995.

The data parameters are the following:
Column 1: Seismic ID
Column 2: Time and date (yyyy-mm-dd hh:mm:ss)
Column 3: Easting from GPK1 wellhead *
Column 4: Northing from GPK1 wellhead *
Column 5: Depth from GPK1 wellhead *
Column 6: Latitude WGS84 **
Column 7: Longitude WGS84 **
Column 8: Elevation WGS84 **

3636 events from this catalogue are in the other catalogue for 1995 (available [here](#)) as well. There are differences of location for 3287 events between the two catalogues, probably due to the use of different models for the relocation.

* The local coordinate system is based on the UTM32 system.

** Latitude, longitude and elevation have been derived from easting, northing and depth from GPK1 wellhead.

Last update of data: 12/07/2019

Completé!

Téléchargements et liens



SSFS1995-Catalogue_all

Ouvrir le lien

À propos de cette ressource

Catégories

Mots-clés

- Seismology, Earthquakes, Seismic sources, Micro-seismicity
- Hydraulic Stimulation
- Injection test
- Circulation Test
- GPK1
- Soultz-sous-Forêts (67250)
- Upper Rhine Graben
- Alsace
- France
- GPK2
- Seismic catalogue
- Geoscientific information

Langue	• Anglais
Contraintes légales	Confidentiality Level 3: Case-by-case How to cite: Baumgärtner, J., Jung, R., Gérard, A., Baria, R. and Garnish, J., 1996. The European HDR project at Soultz-sous-Forêts: stimulation of the second deep well and first circulation experiments, Proceedings of the 21st Workshop on Geothermal Reservoir Engineering, Stanford University, Stanford, California, January 22-24, 1996.
Contact pour la ressource	✉ Distributor CDGP - EOST cdgp@eost.unistra.fr 5 rue René Descartes, Strasbourg, 67000, FRANCE ✉ Owner GEIE - Exploitation Minière de la Chaleur info-geie@cdgp.u-strasbg.fr Route de Soultz, Kutzenhausen, 67250, FRANCE
Status	• Completed
Informations techniques	
Fréquence de mise à jour	As needed
Type de représentation	Vector
Système de coordonnées	• :WGS 1984
Format	• csv
Informations sur les métadonnées	
Contact	✉ Point of contact CDGP - EOST cdgp@eost.unistra.fr 5 rue René Descartes, Strasbourg, 67000, FRANCE
Langue de la fiche	• Anglais
Identifiant	SSFS1995-Catalogue_all

Example of metadata from the data Center of deep Geothermal energy :

Title



Mis à jour : il y a 2 ans

Abstract

Catalogue of microseismicity recorded at Soultz-sous-Forêts during 1995 stimulation, injection and circulation tests. Number of events: 5295. Time period: 15:15:45 14/06/1995 to 04:33:27 15/08/1995.

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Last update of data: 12/07/2019

Compléte

Level of confidentiality

Langue • Anglais

Contraintes légales Confidentiality Level 3: Case-by-case

HOW TO CITE: Baumgartner, J., Jung, R., Gerard, A., Bärle, R. and Garmish, J., 1996. The European HDR project at Soultz-sous-Forêts: stimulation of the second deep well and first circulation experiments, Proceedings of the 21st Workshop on Geothermal Reservoir Engineering, Stanford University, Stanford, California, January 22-24, 1996.

Contact pour la ressource

Distributeur

CDGP - EOST
cdgp@eost.unistra.fr
5 rue René Descartes, Strasbourg, 67000, FRANCE

Owner

GEIE - Exploitation Minière de la Chaleur
info-geie@cdgp.u-strasbg.fr
Route de Soultz, Kutzenhausen, 67250, FRANCE

Distributor and owner

Status • Completed

Informations techniques

Fréquence de mise à jour As needed

Type de représentation Vector

Système de coordonnées • :WGS 1984

Format **csv**

Informations sur les métadonnées

 Télécharger la fiche

Contact

Point of contact

CDGP - EOST
cdgp@eost.unistra.fr
5 rue René Descartes, Strasbourg, 67000, FRANCE

Langue de la fiche • Anglais

Identifiant SSFS1995-Catalogue_all

Téléchargements et liens

The data request



SSFS1995-Catalogue_all

Ouvrir le lien

À propos de cette ressource

Keywords

Catégories

Mots-clés

- Seismology, Earthquakes, Seismic sources, Micro-seismicity
- Hydraulic Stimulation
- Injection test
- Circulation Test
- GPK1
- Soultz-sous-Forêts (67250)
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Last update of data: 12/07/2019

Completed

Téléchargements et liens



SSFS1995-Catalogue_all

Ouvrir le lien

À propos de cette ressource

Catégories

Mots-clés

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Details on data

3636 events from this catalogue are in the other catalogue for 1995 (available [here](#)) as well. There are differences of location for 3287 events between the two catalogues, probably due to the use of different models for the relocation.

Coordinate system

* The local coordinate system is based on the UTM32 system

** Latitude, longitude and elevation have been derived from easting, northing and depth from GPK1 wellhead.

Last update of data: 12/07/2019

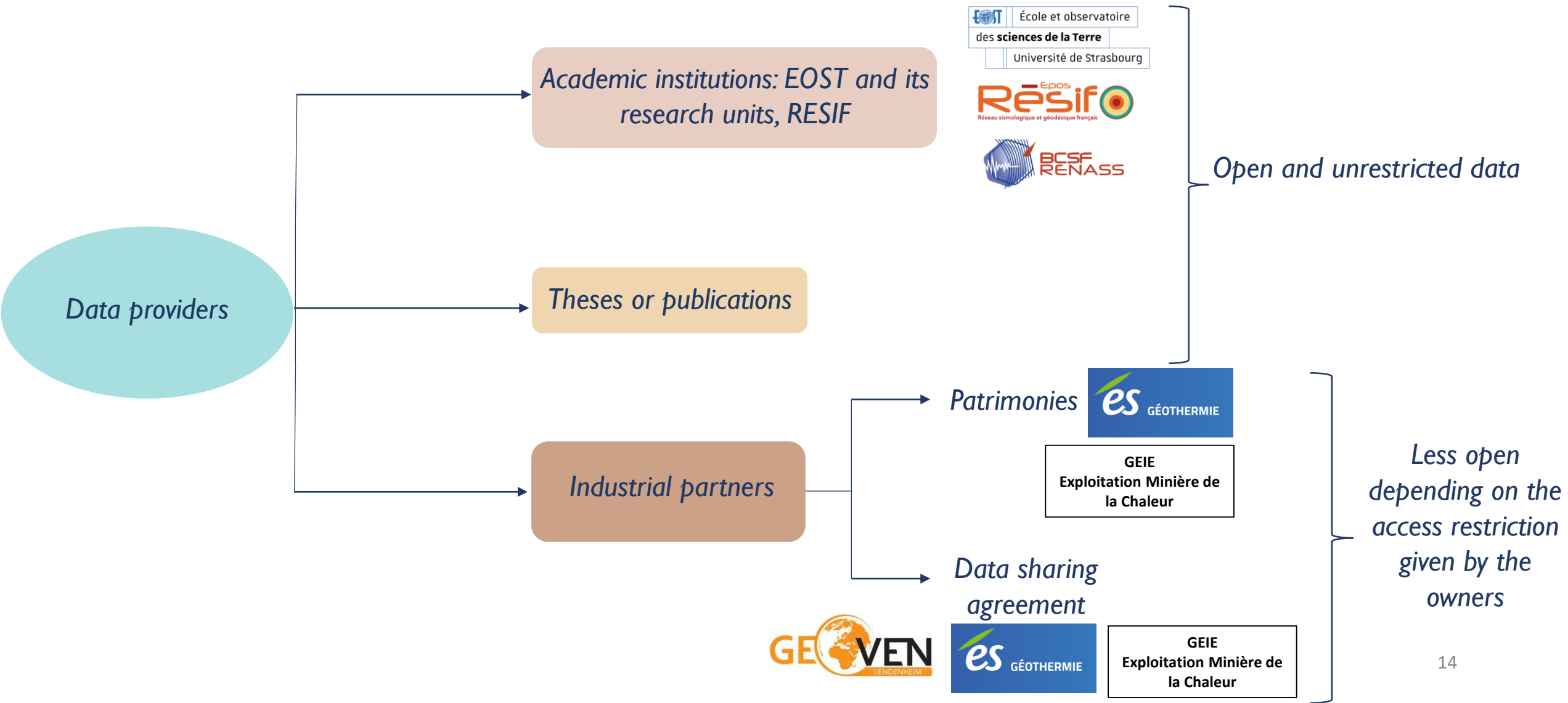
Completed



Who provides the data and how is it distributed?



Data providers of the data Center of deep Geothermal energy (CDGP) :



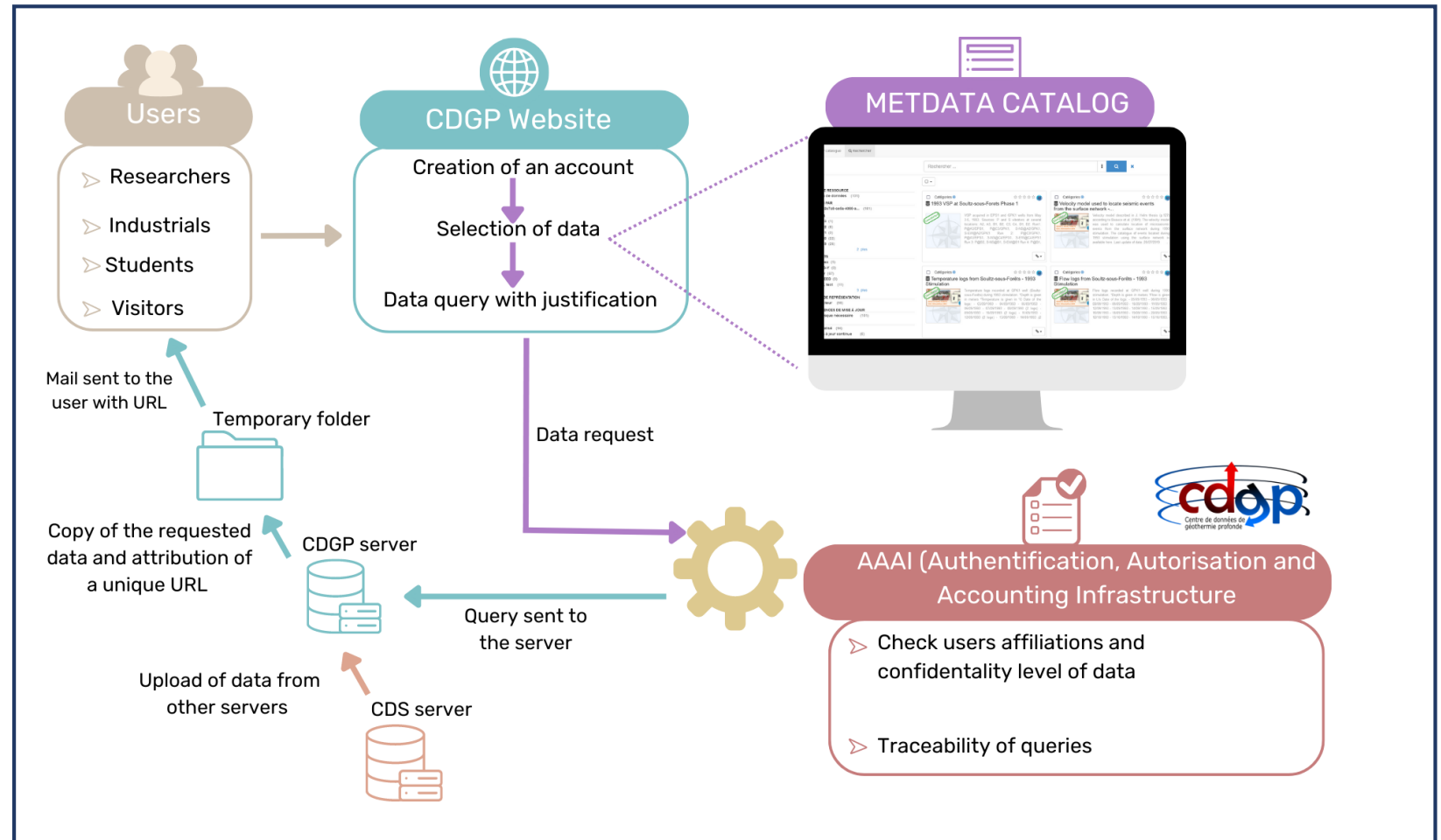
Limit access to data from the data Center of deep Geothermal energy (CDGP) :

Distribution rules have been established to define access to the data :

Level of confidentiality	Restrictions
0 – Public	No restrictions. Access to non-sensitive data: all users have access.
1 – Public and traceability	Data accessible to anyone with a CDGP account, need for traceability.
2 – Reserved for the academic community	Data for academic researchers (project researchers and students). Before downloading the data, the user must provide details of the project they are working on.
3 – Case-by-case	Restricted data : the owner of the data is contacted to allow access.

Access to data from the data Center of deep Geothermal energy (CDGP) :

- The CDGP has implemented an Authentication, Authorization and Traceability Infrastructure (AAAI) to manage the distribution rules.
- In order to access the data, users may have to register on the CDGP website and specify their affiliation (academic, industrial,...). The affiliation is verified manually by a CDGP administrator. The AAAI tool gives access to the data according to the data distribution rules and the user's affiliation. If necessary, the user's request is forwarded to the provider who can accept or refuse.



Functional diagram of the CDGP data access

The Center of deep Geothermal energy (CDGP) and Suppliers :

The distribution rules have been established to gain and maintain the trust of data providers.

➡ Regular reports listing the datasets distributed to users are sent to vendors every six months.

2022

Philippe Danré, Louis De Barros, Frédéric Cappa, 2022 Inferring fluid volume during earthquake swarms using seismic catalogs
Geophysical Journal International, ggac345. [10.1093/gji/ggac345](https://doi.org/10.1093/gji/ggac345)
[SSFS1996][SSFS1993][SSFS2000][SSFS2003]

Yu Feng, Arnaud Mignan, Didier Sornette, Ke Gaos, 2022 Investigating Injection Pressure as a Predictor to Enhance Real-Time Forecasting of Fluid-Induced Seismicity: A Bayesian Model Comparison
Seismological Research Letters. [10.1785/0220220309](https://doi.org/10.1785/0220220309)

2021

Alexandrov, D., Eisner, L., bin Waheed, U. and Cornet, F.H., 2021 Full-stress inversion from focal mechanisms and borehole data at Soultz-sous-Forêts
SEG Technical Program Expanded Abstracts : 1996-2000. [10.1190/segam2021-3583329.1](https://doi.org/10.1190/segam2021-3583329.1)
[SSFS2000]

Alexandrov, D. (Seismik s.r.o.), co-authored by L. Eisner, F. H. Cornet, and Umair bin Waheed, 2021 Full stress inversion from microseismic data and borehole constraints
Séminaire de la faculté de mathématiques et de physique, Prague, 2021-04-16 <http://geo.mff.cuni.cz/seminarSeis.htm>
[SSFS2000]

de Barros, L., Wynants-Morel, N., Cappa, F., Danré, Ph., 2021 Migration of fluid-induced seismicity reveals the seismogenic state of faults.
Journal of Geophysical Research : Solid Earth, American Geophysical Union, , 126 (11), pp.e2021JB022767. [10.1029/2021JB022767](https://doi.org/10.1029/2021JB022767)
[SSFS1993,SSFS1995,SSFS1996,SSFS2000,SSFS2003]

Drif, K., Lengliné, O., Kinscher, J., and Schmittbuhl, J., 2021 Energy analysis of microseismicity induced by fluid-injection in the Soultz-sous-Forêts geothermal reservoir.
Poster at EGW2021.
[SSFS1993][SSFS1995][SSFS1996][SSFS2000][SSFS2003][SSFS2004][SSFS2005]

Haagenson, R., Rajaram, H., 2021 Seismic diffusivity and the influence of heterogeneity on injection-induced seismicity
ESSOAr, 10.1002/essoar.10506096.1
Haagenson, R., & Rajaram, H., 2021 Seismic diffusivity and the influence of heterogeneity on injection-induced seismicity.
Journal of Geophysical Research: Solid Earth, 126. e2021JB021768.
[10.1029/2021JB021768](https://doi.org/10.1029/2021JB021768)
[SSFS2000][TCS-AH]

Javani, D., Schmittbuhl, J, Cornet, F., 2021 Hydro-Mechanical Modeling of the Year 2000 Hydraulic Stimulation of GPK2 Well, Soultz-sous-Forêts, France
EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-15088
[10.5194/egusphere-egu21-15088](https://doi.org/10.5194/egusphere-egu21-15088)
[SSFS2000]

Maury, J. and Aochi, H., 2021 Comparison of the seismicity evolution during the 2000 and 2003 stimulations at Soultz-sous-Forêts.
EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-8864, [10.5194/egusphere-egu21-8864](https://doi.org/10.5194/egusphere-egu21-8864).
[SSFS2000][SSFS2003]

Mignan, 2021 - Induced seismicity completeness analysis for improved data mining. Frontiers in Earth Sciences, Advances in Monitoring, Modeling and Managing Induced Seismicity.
[10.3389/feart.2021.635193](https://doi.org/10.3389/feart.2021.635193)
[SSFS1993][SSFS2000][SSFS2003][SSFS2004][SSFS2005]

Węglińska, E. and Andrzej Leśniak, A., 2021 - Induced Seismicity and Detailed Fracture Mapping as Tools for Evaluating HDR Reservoir Volume.
Energies 2021, 14, 2593.
[10.3390/en14092593](https://doi.org/10.3390/en14092593)
[SSFS1993]



What is the link between the CDGP and EPOS?



The Center of deep Geothermal energy (CDGP) and EPOS for anthropogenic hazards :

The CDGP is a local node of the EPOS platform for anthropogenic hazards (TCH-AH). The EPISODES platform provides access to some episodes of the CDGP.

EPISODES PLATFORM Plate-forme EPISODES Documents Support

FR CONNEXION S'INSCRIRE

Welcome to EPISODES Platform

Conçu pour vous aider dans:

- l'analyse de la sismicité anthropique et des risques connexes
- évaluation de l'impact environnemental potentiel de l'exploitation des géoressources
- éducation

ESSAYEZ LA PLATE-FORME EPISODES

45 Épisodes mondiaux

72 Services dédiés

334k Éléments de données

>1600 Utilisateurs professionnels

Website of the EPISODES platform

The Center of deep Geothermal energy (CDGP) and EPOS DATA PORTAL :

Some episodes are also available on the EPOS data portal.

EPOS
EUROPEAN PLATEAU OBSERVING SYSTEM

CONTACT US INTRANET

ABOUT EPOS ▾ USERS ▾ SERVICES ▾ PROJECTS ▾ PARTNERS ▾ COMMUNICATION ▾

Welcome to the EPOS DATA PORTAL

A multi-disciplinary open data portal for integrated access to Solid Earth science datasets

[Data Access](#)

87
Data and Service Providers

>800
Terabytes of Integrated Data

242
Data Services

>12000
Unique Visitors

EPOS 1.0.18

Free text search

Filters

All data and services	242
Seismology	63
Near Fault Observatories	40
GNSS Data and Products	13
Volcano Observations	31
Satellite Data	8
Geomagnetic Observations	15
Anthropogenic Hazards	38
Geological Information and Modeling	8
Multi-scale Laboratories	6
Tsunami	20
Favourites	0

Data cannot be visualised in a tabular format.

Website of the EPOS platform



What are the objectives for the next few years?



Objectives of the Center of deep Geothermal energy (CDGP) :

- Integrate GNSS data into a common format for scientists.
- Example of what the CDGP is currently proposing:

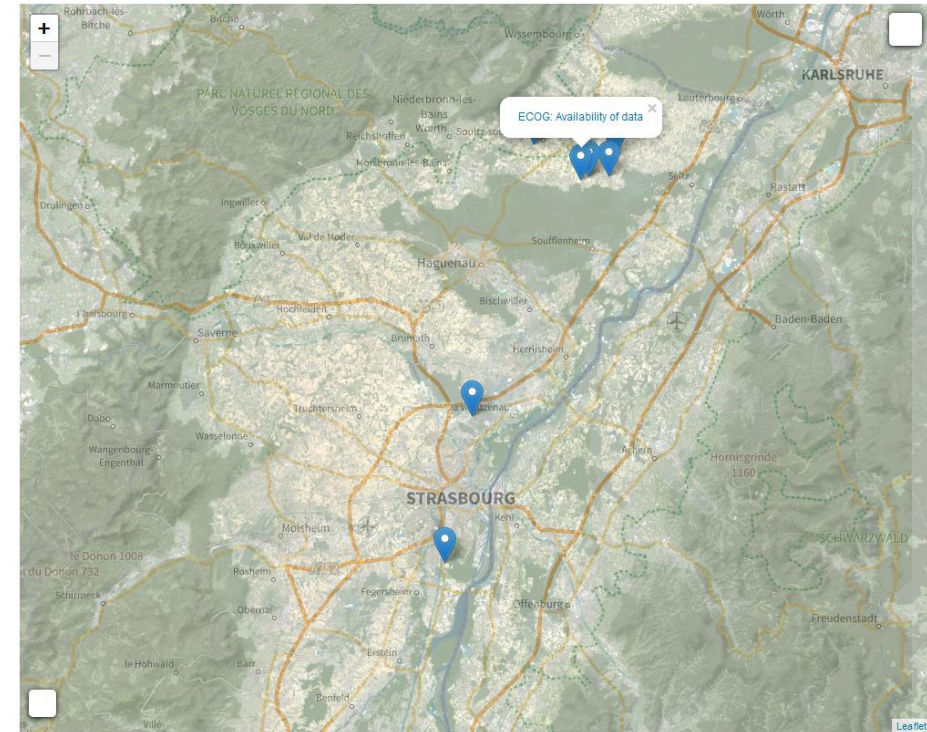
Localisation of Obsnef sites

According to a partnership agreement, the companies involved in deep geothermal energy in Alsace (The GEIE "Exploitation Minière de la chaleur", for the Sultz-sous-Forêts power plant, ECOGI, for the Rittershoffen plant, Électricité de Strasbourg, for the Illkirch project, and Fonroche Géothermie, for the Vendenheim and Eckbolsheim projects) have signed a partnership agreement with EOST under the patronage of the DREAL.

On this site, one can find the geodetic data made available to EOST by the industrials for the monitoring of surface deformations around geothermal sites as well as EOST data. A map of the different instrumented sites and data availability are presented.

Last data:

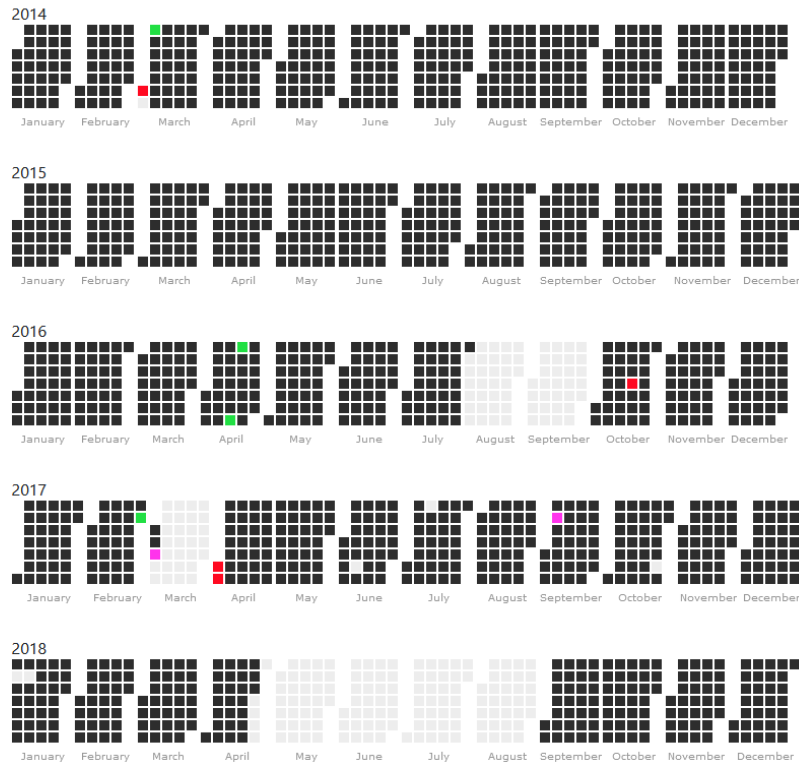
ECOG: Sun May 7 22:00:00 GMT 2023
GPK1: Sun May 7 22:00:00 GMT 2023
GPK2: Sun May 7 22:00:00 GMT 2023
HATN: Thu Nov 3 23:00:00 GMT 2016
ILLK: Wed Jun 8 22:00:00 GMT 2022
REIC: Sun May 7 22:00:00 GMT 2023
RITT: Tue Jan 16 23:00:00 GMT 2018
STUN: Sun May 7 22:00:00 GMT 2023



Objectives of the Center of deep Geothermal energy (CDGP) :

- Integrate GNSS data into a common format for scientists.
- Example of what the CDGP is currently proposing:

Data availability at Obsnef for station ECOG



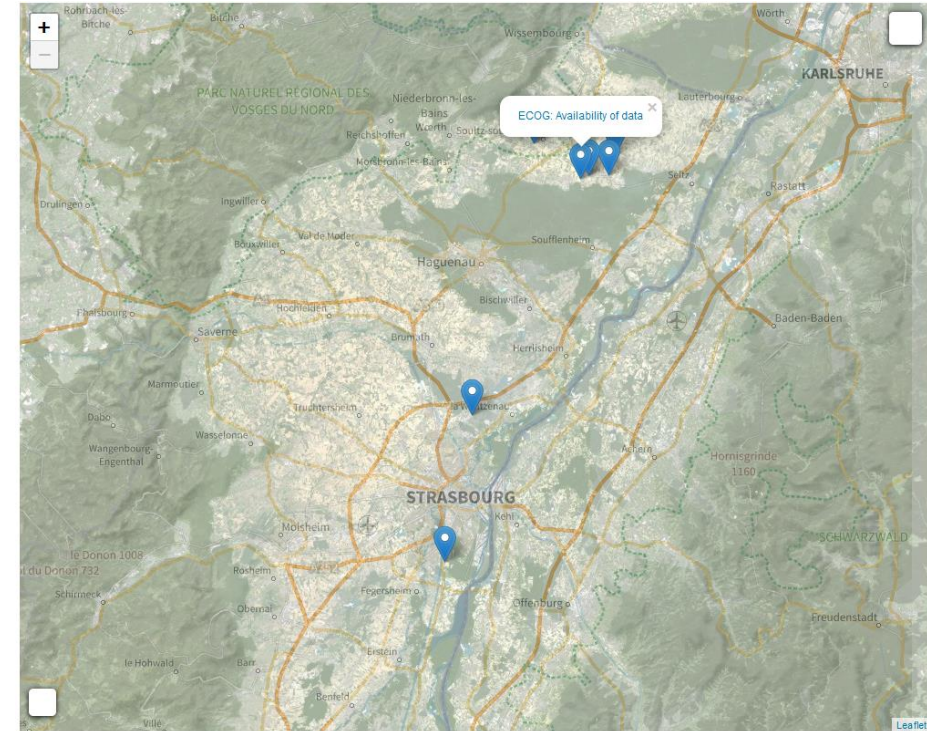
The CDGP works to :

-Offer services: for example, a daily average...

-Add more information on GNSS stations

LEGEND:

- No data
- Less than 50% of data
- Between 50% and 60% of data
- Between 60% and 80% of data
- Between 80% and 90% of data
- Between 90% and 100% of data



Objectives of the Center of deep Geothermal energy (CDGP) :

- Integrate geological data.
- Integrate laboratory data.
- Broaden the spectrum of data: geodesy, hydrology...

Conclusion :

- The CDGP is a Data Infrastructure that distributes different types of data via the web site: <https://cdgp.u-strasbg.fr/>.
- Quality controls are performed on the distributed data. The CDGP distributes enough information for the data to be used and cited.
- Data distribution is controlled through the Authentication, Authorization and Traceability Infrastructure according to the level of confidentiality established by the provider.
- The CDGP aims to integrate more data and distribute it through its website and through the EPOS platform.