

## WP4/WP7 – Implementation of Joint Activities:



Eugenio Trumpy, Adele Manzella CNR

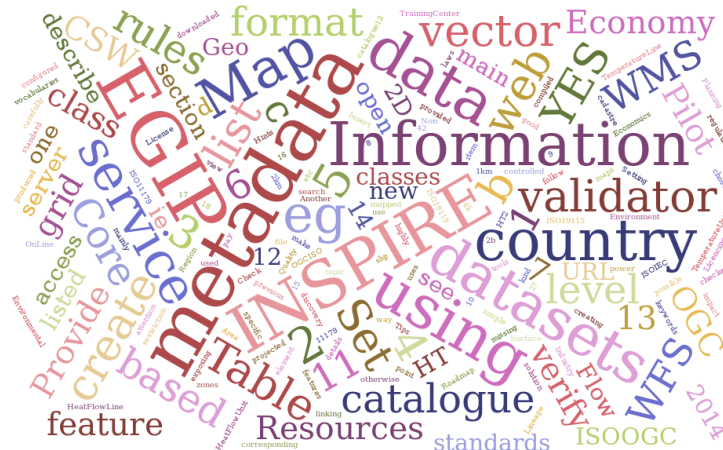


# EGIP pilot concepts:

The aim of this early stage is to prove the **effectiveness** and **efficiency** of **EGIP**

The initial development of the pilot project involved setting up a geothermal **common data model** and the management and optimization of **services**

**EGIP** is designed to fully satisfy the end-user by providing easy and useful *data retrieval* and *cost containment*, in compliance with **INSPIRE** rules for building a (spatial) Data Infrastructure



# EGIP Architecture overview I



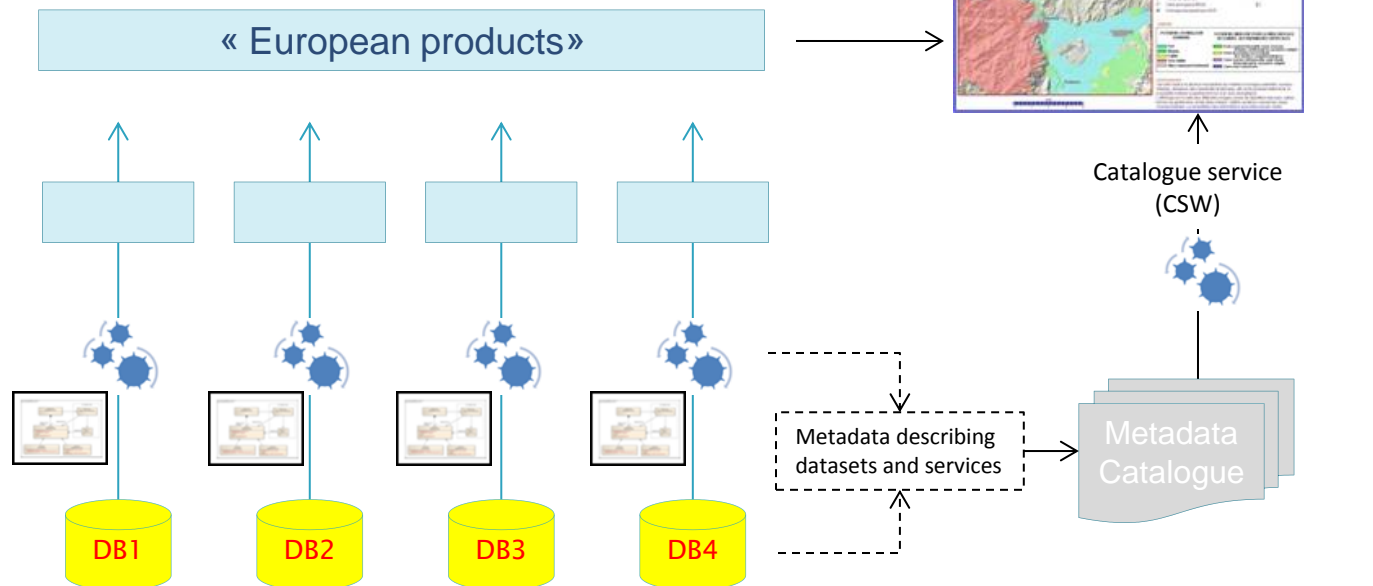
## Common rules for:

### 1. Metadata (INSPIRE)

### 2. Web Services:

- View
- Access (download)
- Process

### 3. Common data model, used by services to deliver and process data



Each provider delivers a piece of the puzzle:

Which can be map



or data

8			4
20			20
20			20
25	55	30	20
10			10
25	13	30	20

For the services:

- View and access/download services are well specified in INSPIRE
- Process services have to be compliant with a general framework only

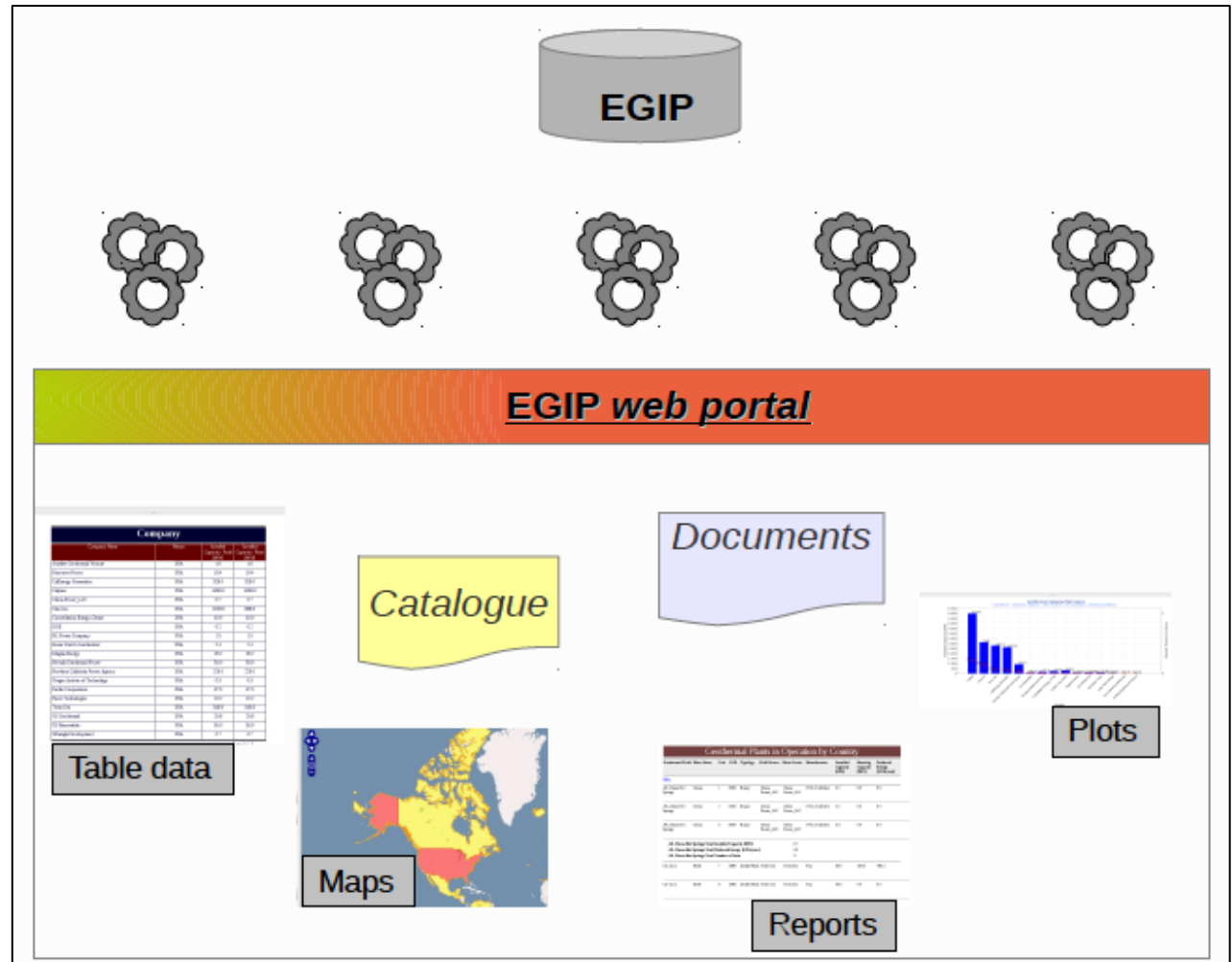
For the common data model to be used by the access, download and process services:

- to specify this data model : input from existing DB, and INSPIRE requirements
- Development of vocabularies (code-lists)



# EGIP Functionalities overview II

**EGIP** tools have to guarantee a 360° data browsing (e.g., browsing from a catalogue to a document, from a document to a tabled info or spatial data) and **allowing a deep survey** into the **geothermal knowledge**.



# Set-up EGIP pilot:

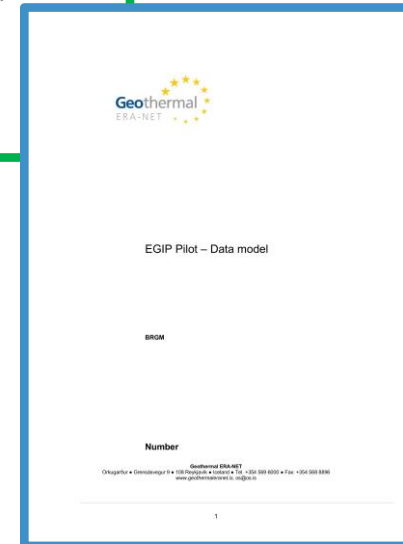
Startup conference call with BRGM 02/04/2014

Produced documents:

- [EGIP.xsd](#)
- [EGIP\\_Pilot\\_data\\_model\\_1.0.pdf](#)
- [EGIP-Pilot\\_Implementation\\_Games\\_Rules.pdf](#)

○ **Conference call minute with volunteer partners:**

- ✓ Conf #1 01/07/2014
- ✓ Conf #2 16/07/2014
- ✓ Conf #3 31/07/2014
- ✓ Conf #4 06/08/2014
- ✓ Conf #5 25/08/2014
- ✓ Conf #6 04/09/2014



# EGIP Architecture overview II



## The EGIP @ national level:

1. Collecting/preparing the data
2. Data mapping (if needed)
3. Creating catalogue of the metadata (following the INSPIRE rules)
4. Implementing discovery, view, download services



## The EGIP @ EU level:

1. Preparation of the xsd file and EGIP data model documentation
2. Web portal implementation
3. Setting up the portal on web services retrieved from the confederate national portals
4. Checking the EU-portal functionalities



# EGIP pilot – Stage 1: list of data

Table 1: List of information to include in EGIP Pilot.

Data number	Information	Format	Spatial	Typology Definition	INSPIRE topic category	INSPIRE theme category
1	Temperature maps	Structured	YES	Map coverage (i.e. 2D grid format. This is <b>preferred</b> ) or vector format	Geoscientific information	Energy Resources
2	Surface Heat Flow	Structured	YES	Map coverage (i.e. 2D grid format. This is <b>preferred</b> ) or vector format	Geoscientific information	Energy Resources
3	Exploration and production licenses and (projected) power production	Structured	YES	Map (vector)	Exploration and production licenses	Area management / restriction / regulation zones
4	Environmental impact laws	Un-Structured	NO Country	Document	Environment	-
5	Licensing regulations (exploration/exploitation)	Un-Structured	NO Country	Document	Planning cadastre	-
6	Legal conditions for grid access	Un-Structured	NO Country	Document	Structure	-
7	Geothermal roadmaps	Un-Structured	NO Country	Document	Economy	-
8	Insurance	Un-Structured	NO Country	Document	Economy	-
9	Royalties & taxes, support scheme (feed-in tariffs, grants, ...)	Un-Structured	NO Country	Document	Economy	-
10	List of education & research institutes	List	YES	Map (vector)	Structure	-
11	List of Industries	List	YES	Map (vector)	Structure	Production and industrial facilities

Step-by-step plan:

- First step - **Stage 0:**
- **Short term – Stage 1**
- Medium term – **Stage 2**
- Long term – **Stage 3**





# The **EGIP** consortium:



The volunteers participating countries up to now:



National Research Council of ITALY



Bureau de Recherches Géologiques et Minières - FRANCE



Swiss Federal Office of Energy (with Swiss Geological Survey)



Magyar Foldtani és Geofizikai Intézet - HUNGARY

Coming soon:



OS Orkustofnun - ICELAND



Slovenia Geological survey





## How does **EGIP** work?



pilot initiative deploy a **data infrastructure** aimed at facilitating open access, the sharing of data, collaborative analysis, processing and mining processing, as well as the dissemination of newly generated knowledge.

The EGIP pilot offers a flexible and secure **web-based, community-centric** platforms, so geothermal stakeholders can work together on common challenges

The EGIP platform uses a specific Virtual Research Environment (**VRE**) set-up exploiting some of the **D4Science** infrastructure capabilities, which are developed and operated employing the **gCube** technology

The EGIP follows the **INSPIRE** specification and deploy **OGC** standard services

Powered by:



**D4SCIENCE.ORG**



# What does **EGIP** exploit?

**EGIP** pilot is exploiting a **Hybrid Data Infrastructure** combining over 500 software components into a coherent and centrally managed system of hardware, software, and data resources

Infrastructure: key characteristics

- ✓ Efficient and tailored **storage technologies**
- ✓ **Computational environments** dealing with the volume of the data
- ✓ **Elastic management** of the resources, monitoring, alerting, recovery
- ✓ **Collaborative environment** to support scientific communities
- ✓ **Rich portfolio of applications** to perform access, validation, enriching, processing, sharing, and mash-up of data

# The EGIP apps



application in EGIP belongs three different domains



ConnectCube applications are a comprehensive suite of tools, which support a **collaborative**, standards-oriented data publication environment:

- Shared workspace
- Social Network facilities



GeosCube applications help practitioners dealing with geospatial information to properly **access** and **consume**:



Geospatial Data Discovery



Metadata catalogue

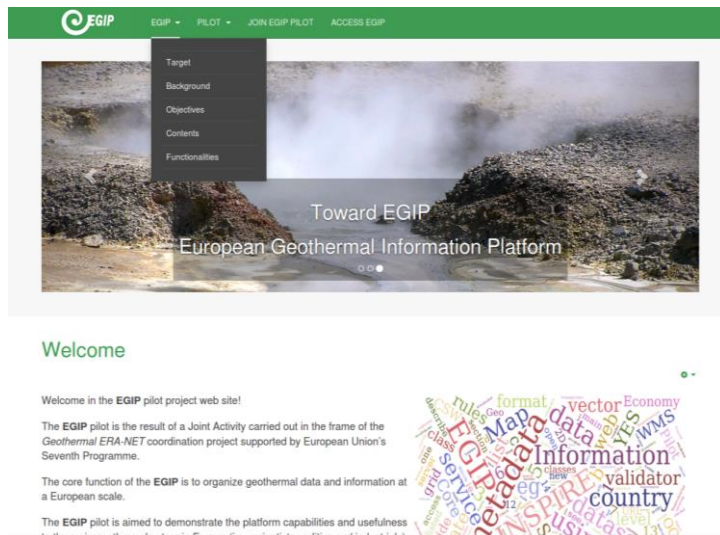


StatCube applications make up analytical tools:



Statistical manager





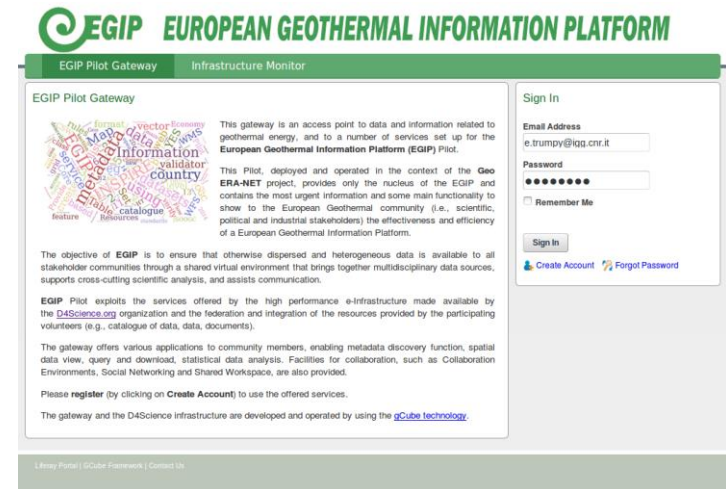
# EGIP pilot website



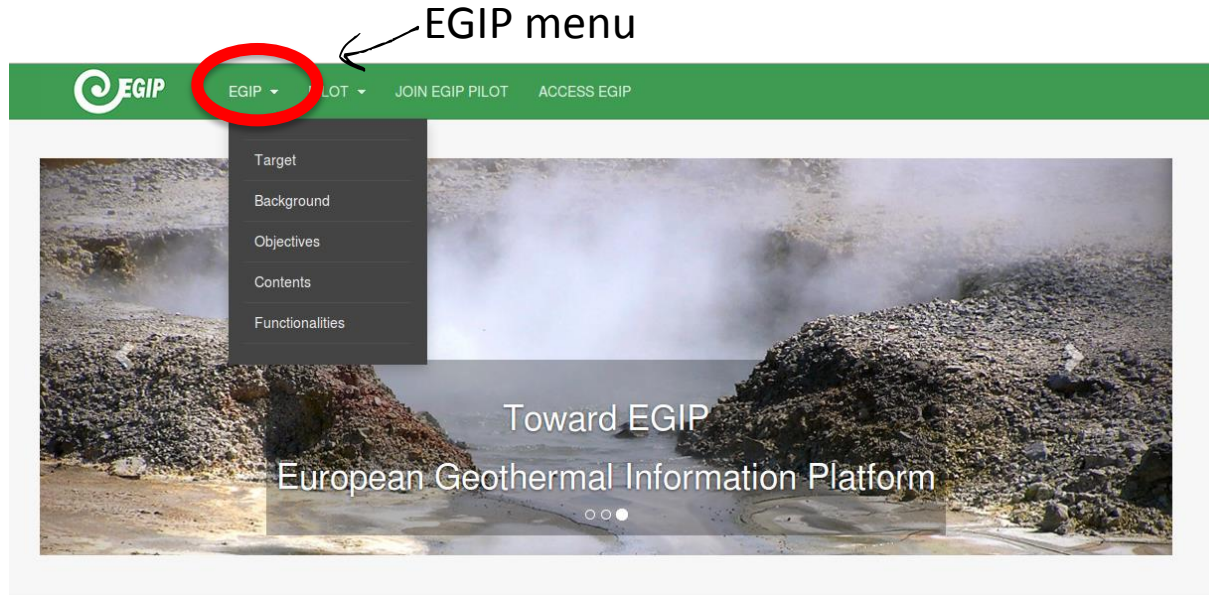
Access EGIP

Registration and access

# EGIP pilot platform



# EGIP web site I



## EGIP menu:

- Target
- Background
- Objectives
- Contents
- Functionalities

## Welcome

Welcome in the **EGIP** pilot project web site!

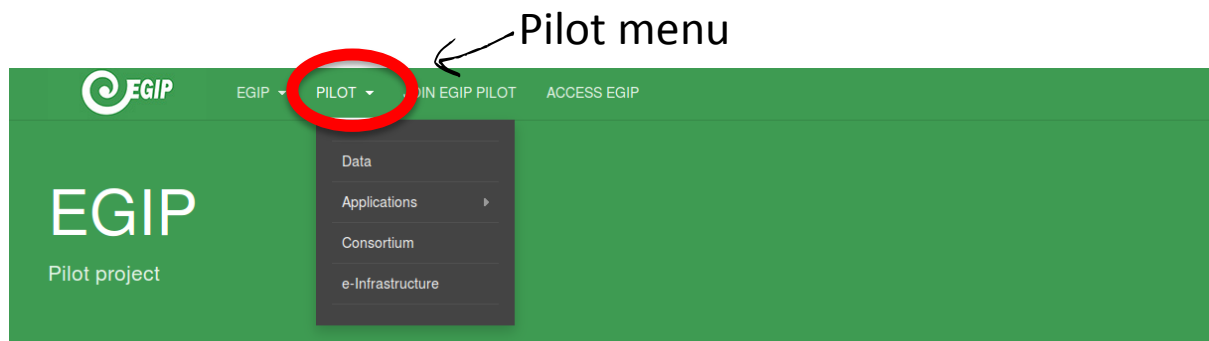
The **EGIP** pilot is the result of a Joint Activity carried out in the frame of the *Geothermal ERA-NET* coordination project supported by European Union's Seventh Programme.

The core function of the **EGIP** is to organize geothermal data and information at a European scale.

The **EGIP** pilot is aimed to demonstrate the platform capabilities and usefulness to the main geothermal sectors in Europe (for scientists, politics and industrial).



# EGIP web site II



## Pilot project

This is the portal of the European Geothermal Information Platform (EGIP) pilot project, offering a number of services, information and data specially set up for the [Geothermal ERA-NET project](#). EGIP pilot exploits the services offered by the high performance e-Infrastructure made available by D4Science.org organization [see the detailed description] and the federation and integration of the resources provided by the participating volunteers (e.g., Catalogue of data, data, web services and documents).

This pilot provides only the nucleus of the EGIP and contains only the most urgent information and some main functionality to prove to the European Geothermal community the effectiveness and efficiency of a European Geothermal Information Platform.

When you **ACCESS** the available applications allow you to enable metadata discovery function; spatial data view, query and download, statistical data analysis. Facilities for collaboration, such as Collaboration Environments, Social Networking and Shared Workspace are also provided.

*Please [register](#) to use the offered services*

## Pilot menu:

- Data
- Applications
  - connectCube
  - geosCube
  - statCube
- Consortium
- E-infrastructure





# EGIP web site III



This are the instructions for preparing data, contact us for details:

#### National Research Council of Italy - CNR

1, G. Moruzzi street  
56124 Pisa, Italy  
P: (+39) 050 621 2324

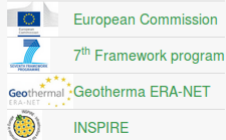
#### CNR - IGG

e.trumpy at igg.cnr.it

Title	Author	Hits
EGIP data model	Written by Super User	Hits: 23
Games rules	Written by Super User	Hits: 17
egip.xsd	Written by Super User	Hits: 17

You are here: [Home](#) / [Join EGIP pilot](#)

#### Links



#### Pilot consortium

CNR - National Research Council of Italy  
BRGM - Bureau de Recherches Geologiques et Minieres  
SFOE - Swiss Federal Office of Energy (with Swiss Geological Survey)  
MFGI - Magyar Foldtani es Geofizikai Intezet

#### Powered by



#### Acknowledgement:

All the graphs have been realized by [Lorenzo Gori](#) - CNR

- Contact references
- Documents describing how to join in EGIP pilot





# EGIP web site IV




search workspace

## EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM

Home Profile

Welcome to EGIP Pilot Gateway

### EGIP VRE





The **EGIP** capabilities, as established for the **EGIP** pilot, are here provided within **EGIP** Virtual Research Environment (VRE). The **EGIP** VRE deploys services offered by the high performance e-Infrastructure D4Science and the federation and integration of resources provided by participating volunteers.

Up to now **EGIP** provides community members with different applications not only enabling metadata discovery function; spatial data view, query and download, statistical data analysis but also facilities for collaboration, such as Collaboration Environments, Social Networking and Shared Workspace.

Enter the EGIP Virtual Research Environment [Enter now](#)

The **EGIP** VRE supports by default two important applications: the **Virtual Workspace** and the **Social Network facilities**, which provide a collaborative, standard-oriented data publication environment, including semantic technologies.

Other available EGIP VRE applications are:

-  **Metadata Catalogue:** harvests geothermal metadata, via the OGC CSW protocol, from the EGIP pilot National volunteer partners. It shows the registered metadata according to the INSPIRE requirements. The catalogue allows users to search and discover the Geothermal information belonging to EGIP.
-  **Geo Explorer:** allows to insert all spatial layers registered in the Metadata Catalogue in a map. Geo Explorer has main webGIS functionalities such as zoom in, zoom out, pan, data selection and data interrogation. For each layer the user can: i) adjust the opacity, ii) setup a data filter and iii) see the legend. Both the assembled map and each layer can be exported and downloaded locally or saved in the workspace available in the EGIP VRE to be shared with other registered users.
-  **Statistical manager:** provides a large number of tools to analyse the available datasets. In EGIP VRE, as demonstration of this powerful tool, only a few and simple algorithms has been implemented, to examine the Geothermal Energy production trend in the Geothermal ERA-NET partner countries.

Click here to enter

Spatial data  
discovery,  
view and  
download

Dataset  
analysis

## EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM

EGIP Administration Data Catalog Geo Explorer Statistical Manager Calendar



Platform  
home  
page

Metadata  
catalogue



# EGIP platform: Data Catalogue



EGIP Administration Data Catalog Geo Explorer Statistical Manager

Data Catalog

Geothermal ERA-NET

Home | Administration | Contact us | Links | About | Help | English

User: Eugenio Trumpp Logout

Simple Search Advanced Search

WHAT?

WHERE?

Map view: - Any -

Search Reset Options

Applications  
Audio/Video  
Case studies, best practices  
Conference proceedings  
Datasets  
Directories  
Interactive resources  
Maps & graphics  
Other information resources  
Photo  
Physical Samples  
Registers  
Z3950 Servers

Find interactive maps, GIS datasets, satellite imagery and related applications

Aggregated results matching search criteria : 1-10/87 (page 1/9) , 0 selected  
Select : all, none actions on selection  
Sort by Relevance

**TEMPERATURE AT 3 KM DEPTH, HUNGARY**

Abstract Map of temperature at 3 km depth (below ground level), Hungary  
Keywords geothermal energy, map, Hungary, Energy resources, EGIP, MFGI  
Schema iso19139  
Extent 16.1899332211423 45.7131597785264 22.9348095750262 48.5414018776899  
2009-01-01T00:00:00 2014-01-19T00:00:00

Metadata Interactive Map Other actions

**HEAT FLOW LINES**

Abstract Heat flow line data for EGIP  
Keywords geothermal energy, Energy resources, Switzerland, EGIP (European Geothermal Information Platform)  
Schema iso19139  
Extent 5.835 45.658 10.978 47.857

Metadata Interactive Map Other actions

CS-W catalogue:

- Harvests the metadata from partners metadata catalogues
- Metadata collection for spatial dataset
- Metadata collection for documents
- INSPIRE Standard ISO-19139
- Dublin-core
- Spatial search
- Text search



# EGIP platform: GeoExplorer



EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM

EGIP Administration Data Catalog Geo Explorer Statistical Manager Calendar

GisViewer

GeoExplorer Add Selected Layers Remove All Layers Add External WMS Layer

Search for Title enter a text

Layer Title	Abstract	Keywords	Layer Name
<input checked="" type="checkbox"/> TrainingCenter Publication Date: Tue Jul 22 19:28:11 GMT+200 2014 Scope Code: DATASET	List of education and research centres with geothermal course...	geothermal energy, D4Science, map, Italy, EGIP, TrainingCenter	IGG:TrainingCenter
<input checked="" type="checkbox"/> TrainingCenter Publication Date: Thu Aug 28 16:44:18 GMT+200 2014 Scope Code: DATASET	The class TrainingCenter was created to present a list of Educ...	France, Education, TrainingCenter, EGIP	TrainingCenter
<input checked="" type="checkbox"/> TemperatureUnit Publication Date: Thu Aug 28 16:44:16 GMT+200 2014 Scope Code: DATASET	The class TemperatureUnit presents a temperature map. Tem...	France, TemperatureUnit, EGIP	TemperatureUnit
<input checked="" type="checkbox"/> TemperatureLine Publication Date: Thu Aug 28 16:44:15 GMT+200 2014 Scope Code: DATASET	The class TemperatureLine presents a temperature map. Tem...	TemperatureLine, France, EGIP	TemperatureLine
<input checked="" type="checkbox"/> Temperature map at 3 km depth Publication Date: Wed Jun 25 11:31:37 GMT+200 2014 Scope Code: DATASET	Temperature map at 3km depth (below ground level) of Italy	geothermal energy, Energy resources, D4Science, map, Italy, ...	IGG:area_temp_3000
<input checked="" type="checkbox"/> Temperature map at 2 km depth Publication Date: Wed Jun 25 11:31:37 GMT+200 2014 Scope Code: DATASET	Temperature map at 2km depth (below ground level) of Italy	geothermal energy, Energy resources, D4Science, map, Italy, ...	IGG:area_temp_2000
<input checked="" type="checkbox"/> Temperature map at 1 km depth Publication Date: Wed Jun 25 11:31:35 GMT+200 2014 Scope Code: DATASET	Temperature map at 1km depth (below ground level) of Italy	geothermal energy, Energy resources, D4Science, map, Italy, ...	IGG:area_temp_1000
<input checked="" type="checkbox"/> Temperature at 3 km depth, Hungary Publication Date: Thu Aug 28 14:24:08 GMT+200 2014 Scope Code: DATASET	Map of temperature at 3 km depth (below ground level), Hungary	geothermal energy, MFGI, EGIP, map, Energy resources, Hun...	temp3000
<input checked="" type="checkbox"/> Temperature at 2 km depth, Hungary Publication Date: Thu Aug 28 14:24:07 GMT+200 2014 Scope Code: DATASET	Map of temperature at 2 km depth (below ground level), Hungary	geothermal energy, MFGI, EGIP, map, Energy resources, Hun...	temp2000
<input checked="" type="checkbox"/> Temperature at 1 km depth, Hungary Publication Date: Thu Aug 28 14:23:59 GMT+200 2014 Scope Code: DATASET	Map of temperature at 1 km depth (below ground level), Hungary	geothermal energy, MFGI, EGIP, map, Energy resources, Hun...	temp1000
<input checked="" type="checkbox"/> Temperature Isoline at 3 km depth Publication Date: Wed Jun 25 11:31:31 GMT+200 2014 Scope Code: DATASET	Temperature map at 3km depth (below ground level) of Italy	geothermal energy, Energy resources, D4Science, map, Italy, ...	IGG:iso_3000

Page 1 of 2 Displaying 1 - 12

## Geo-explorer capabilities:

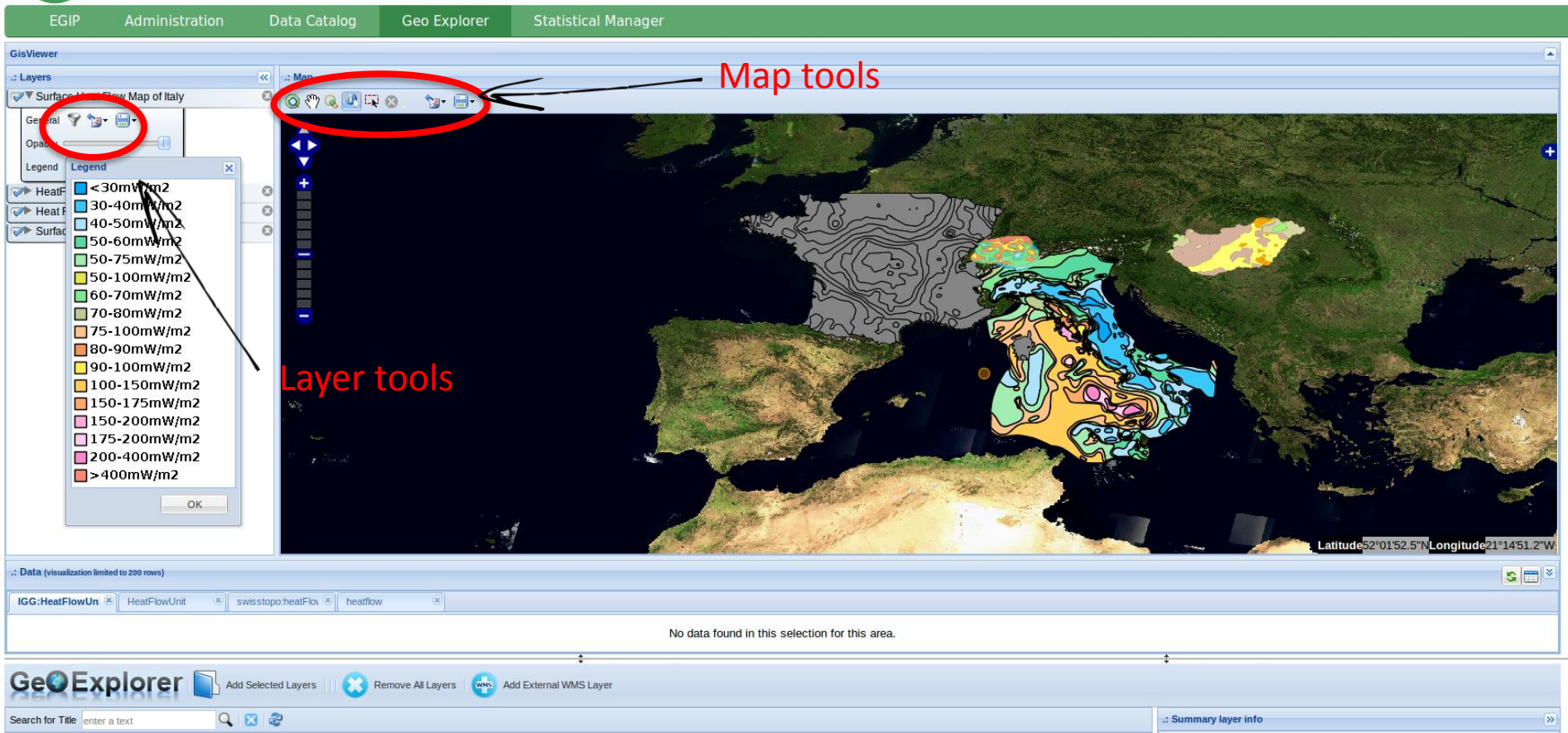
- Harvest the spatial dataset from partners
- Show spatial layers
- Browse map: zoom, pan
- Query spatial layer
- Manage the layer opacity
- Save & Share the layers and maps
- Metadata outlook



# EGIP platform: GeoExplorer

- HeatFlowUnit among volunteers participants

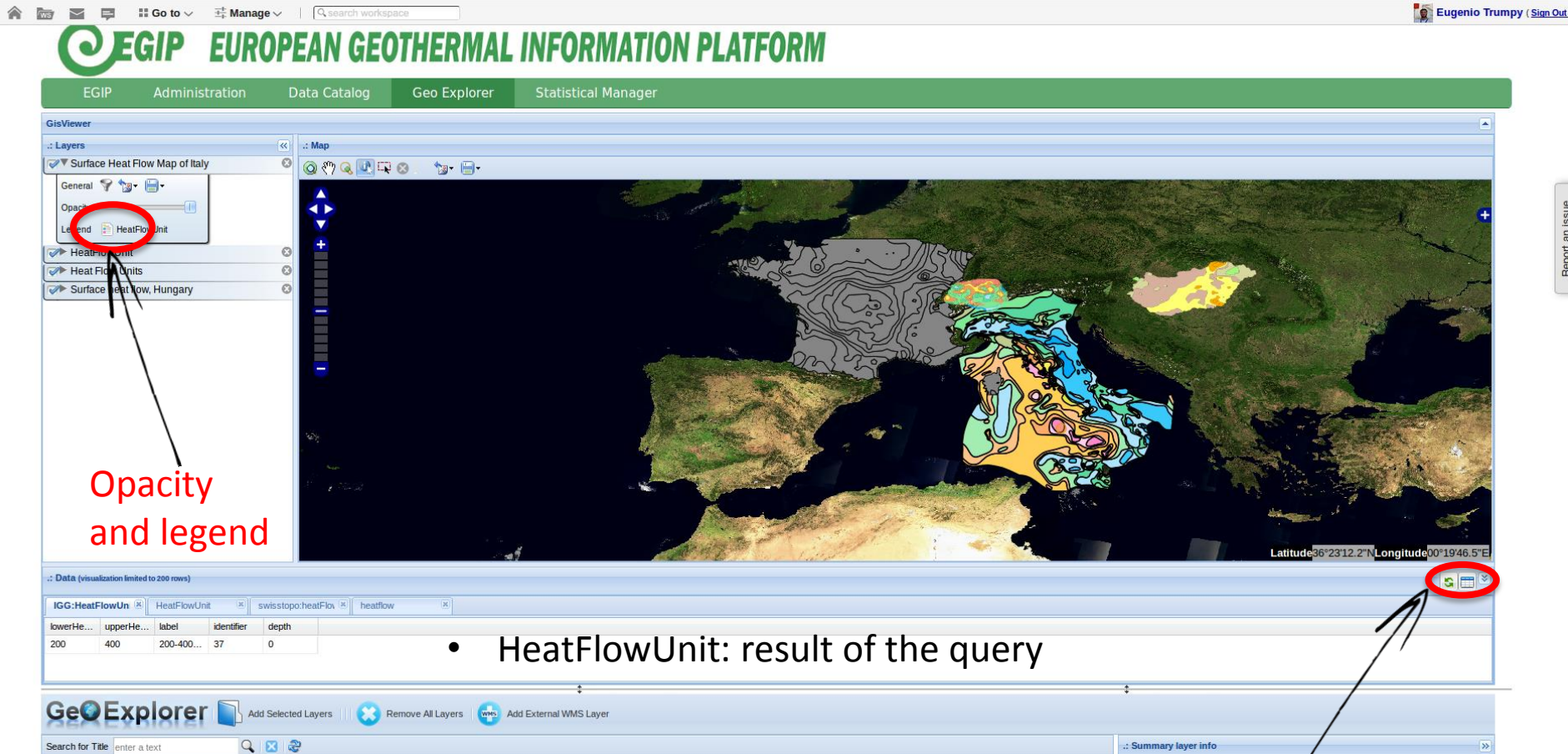
## EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM





# EGIP platform: GeoExplorer

- HeatFlowUnit among volunteers participants



EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM

EGIP Administration Data Catalog Geo Explorer Statistical Manager

Layers

- Surface Heat Flow Map of Italy
- HeatFlowUnit
- HeatFlowUnits
- Surface Heat Flow, Hungary

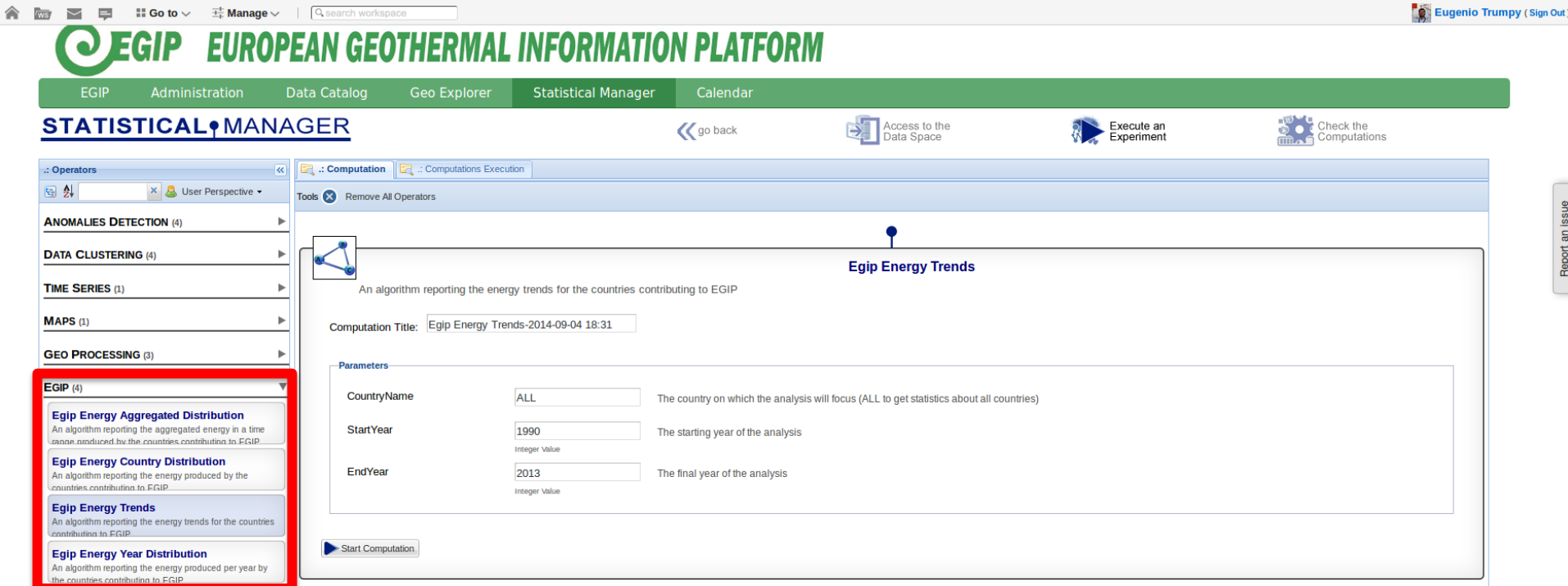
Opacity and legend

HeatFlowUnit: result of the query

Download dataset

lowerHe...	upperHe...	label	identifier	depth
200	400	200-400...	37	0

# EGIP platform: Statistical Manager



The screenshot shows the EGIP Statistical Manager web interface. At the top, there's a navigation bar with links to EGIP, Administration, Data Catalog, Geo Explorer, Statistical Manager (selected), and Calendar. Below this is a header for 'STATISTICAL MANAGER' with a 'go back' button and icons for 'Access to the Data Space', 'Execute an Experiment', and 'Check the Computations'. The main area is divided into a left sidebar and a central workspace. The sidebar lists various operators: ANOMALIES DETECTION (4), DATA CLUSTERING (4), TIME SERIES (1), MAPS (1), GEO PROCESSING (3), and EGIP (4). The EGIP (4) section is highlighted with a red box and contains four sub-items: 'Egip Energy Aggregated Distribution', 'Egip Energy Country Distribution', 'Egip Energy Trends' (selected), and 'Egip Energy Year Distribution'. The central workspace displays the 'Egip Energy Trends' configuration page. It includes a description: 'An algorithm reporting the energy trends for the countries contributing to EGIP'. Below this is a 'Computation Title' field with the value 'Egip Energy Trends-2014-09-04 18:31'. A 'Parameters' section contains three input fields: 'CountryName' (set to 'ALL'), 'StartYear' (set to '1990'), and 'EndYear' (set to '2013'). Each field has a description: 'The country on which the analysis will focus (ALL to get statistics about all countries)', 'The starting year of the analysis', and 'The final year of the analysis' respectively. At the bottom of the workspace is a 'Start Computation' button.

## Statistical analysis:

- Analysis served by WPS
- Import dataset
- Define analysis name
- Manage series
- Execute and get results as different chart & plot
- Share your analysis

# EGIP platform: Statistical Manager

EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM

EGIP Administration Data Catalog Geo Explorer Statistical Manager Calendar

STATISTICAL MANAGER

Access to the Data Space Execute an Experiment Check the Computations

Operators

- ANOMALIES DETECTION (4)
- DATA CLUSTERING (4)
- TIME SERIES (1)
- MAPS (1)
- GEO PROCESSING (3)
- EGIP (4)
  - Egip Energy Aggregated Distribution
  - Egip Energy Country Distribution
  - Egip Energy Trends
  - Egip Energy Year Distribution**

Computation Computations Execution

Tools Remove Computations Log

The computation Egip Energy Year Distribution finished.

The algorithm produced Multiple Results.

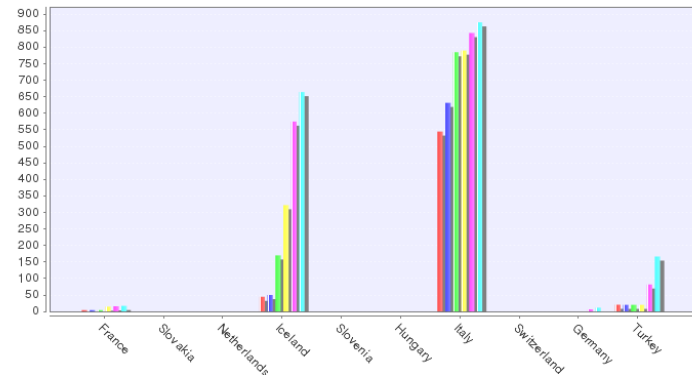
Images

Images

Save all images on the Workspace.

MegaWatt Electrical

Histogram Chart



MegaWatt Thermal

## Statistical analysis:

- Execute and get results as different chart & plot
- Save the results of your analysis
- Share your results exploiting connectionCube apps (Workspace and Social)



## EGIP platform: Collaborative environment



*A single place to*

- Manage all the portal extension

***Notifications Page***

***Workspace***

***Search in your Workspace***



***Home Social***

***Messages***

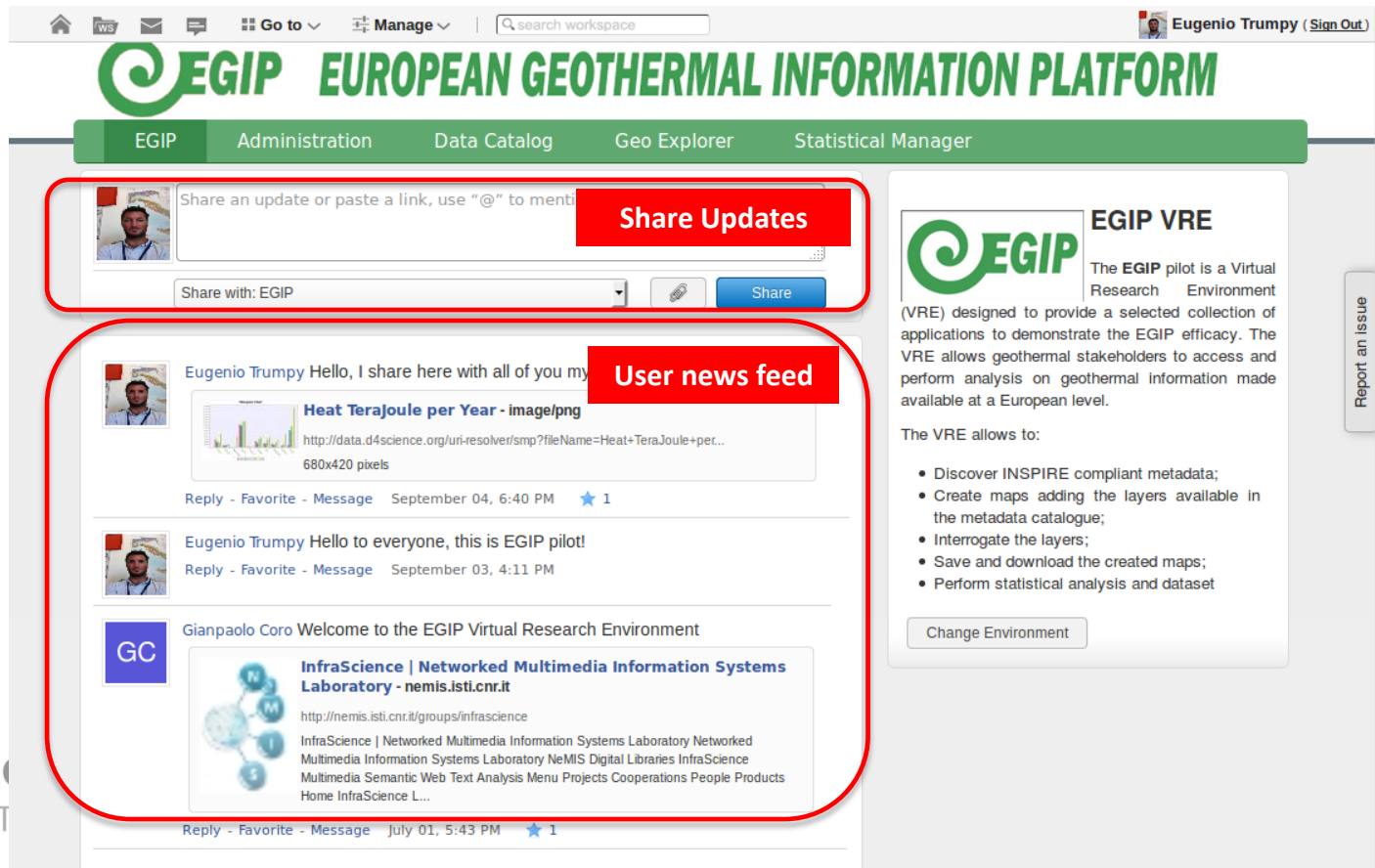
***Manage user profile***



# EGIP platform: Collaborative environment, Social facilities

## *A single place to*

- Get status and updates from applications and other users
- Get notifications about messages, jobs completion, new generated products, etc.



The screenshot displays the EGIP (European Geothermal Information Platform) web interface. At the top, the navigation bar includes links for EGIP, Administration, Data Catalog, Geo Explorer, and Statistical Manager. The main content area is divided into two primary sections. On the left, a 'Share Updates' section features a text input field for sharing updates or links, a dropdown menu for sharing with 'EGIP', and a 'Share' button. Below this is a 'User news feed' section, which displays a list of user posts. The first post is from Eugenio Trumpy, dated September 04, 6:40 PM, with a star icon and a '1' indicating a single response. The second post is also from Eugenio Trumpy, dated September 03, 4:11 PM. The third post is from Gianpaolo Coro, dated July 01, 5:43 PM, and includes a link to the 'InfraScience | Networked Multimedia Information Systems Laboratory' website. On the right side of the interface, there is a section titled 'EGIP VRE' (Virtual Research Environment), which describes the platform's purpose and lists its capabilities: discovering INSPIRE compliant metadata, creating maps, interrogating layers, saving and downloading maps, and performing statistical analysis. A 'Change Environment' button is located at the bottom of this section. A vertical sidebar on the far right contains a 'Report an issue' button.

EGIP EUROPEAN GEOTHERMAL INFORMATION PLATFORM

EGIP Administration Data Catalog Geo Explorer Statistical Manager

Share an update or paste a link, use "@" to mention a user

Share Updates

Share with: EGIP

Share

Eugenio Trumpy Hello, I share here with all of you my

Heat TeraJoule per Year - image/png

http://data.d4science.org/uri-resolver/smp?fileName=Heat+TeraJoule+per...

680x420 pixels

Reply - Favorite - Message September 04, 6:40 PM ★ 1

Eugenio Trumpy Hello to everyone, this is EGIP pilot!

Reply - Favorite - Message September 03, 4:11 PM

GC Gianpaolo Coro Welcome to the EGIP Virtual Research Environment

InfraScience | Networked Multimedia Information Systems Laboratory - nemis.isti.cnr.it

http://nemis.isti.cnr.it/groups/infra-science

InfraScience | Networked Multimedia Information Systems Laboratory Networked Multimedia Information Systems Laboratory NeMIS Digital Libraries InfraScience Multimedia Semantic Web Text Analysis Menu Projects Cooperations People Products Home InfraScience L...

Reply - Favorite - Message July 01, 5:43 PM ★ 1

EGIP VRE

The EGIP pilot is a Virtual Research Environment (VRE) designed to provide a selected collection of applications to demonstrate the EGIP efficacy. The VRE allows geothermal stakeholders to access and perform analysis on geothermal information made available at a European level.

The VRE allows to:

- Discover INSPIRE compliant metadata;
- Create maps adding the layers available in the metadata catalogue;
- Interrogate the layers;
- Save and download the created maps;
- Perform statistical analysis and dataset

Change Environment

Report an issue

# EGIP platform: Collaborative environment Workspace

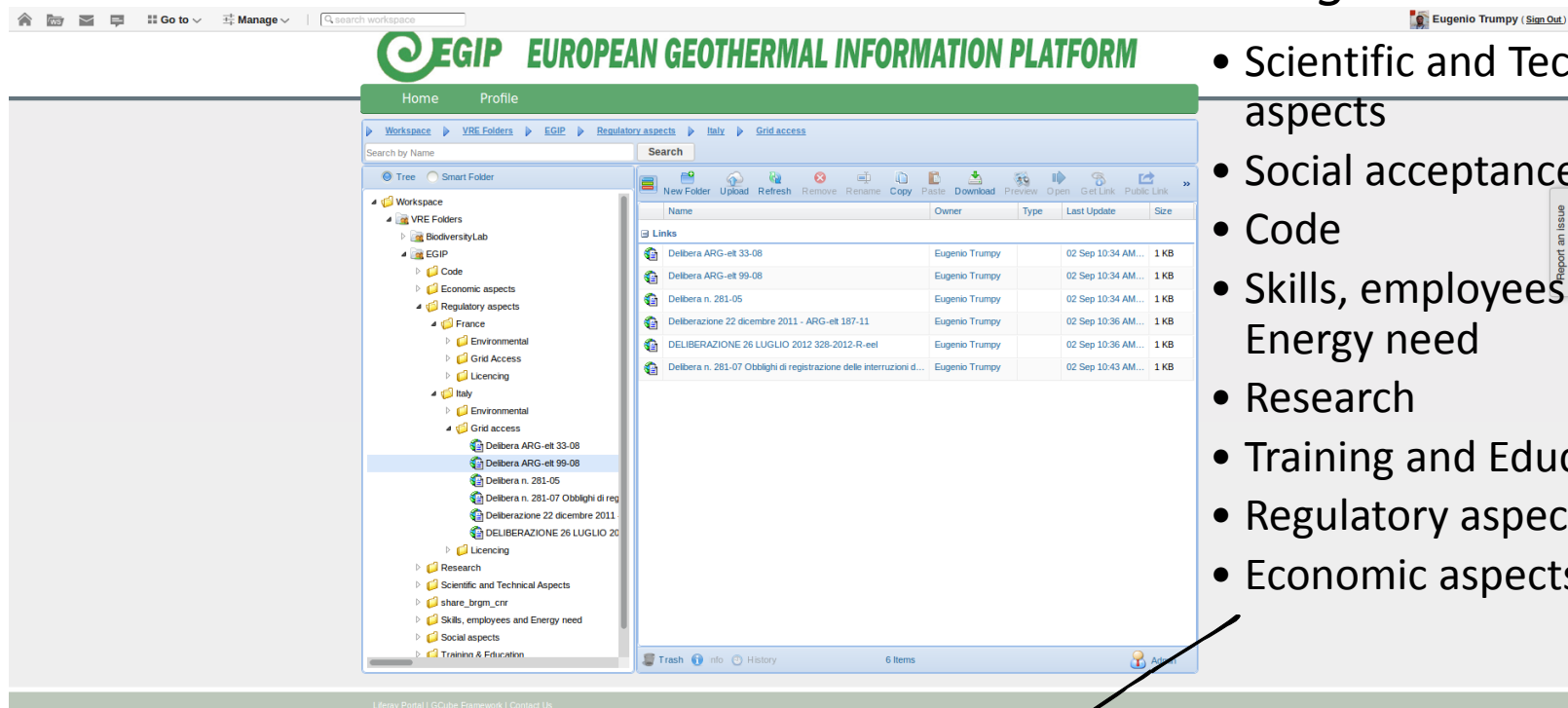


*A single place to*

- Manage data, store and preserve them
- Share data
- Share your analysis & Maps

*EGIP documents  
categories*

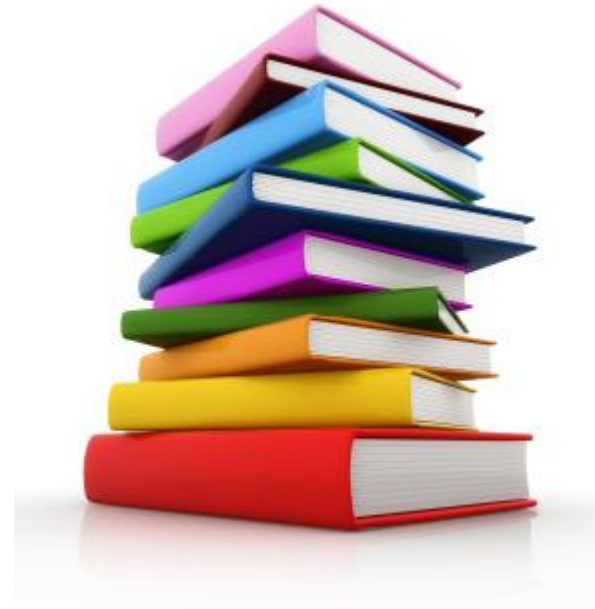
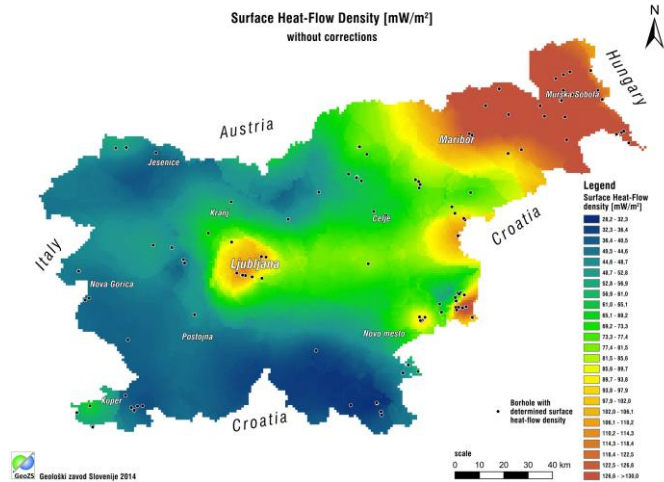
- Scientific and Technical aspects
- Social acceptance
- Code
- Skills, employees and Energy need
- Research
- Training and Education
- Regulatory aspects
- Economic aspects



## EGIP pilot benefit:

- Guaranteed data **interoperability**: retrieval, viewing and access of information from partners (via WMS, WFS e.g. TemperatureUnit, HeatFlowline, ...)
- Harmonized geothermal domain at a European level
- **Efficiency**, thanks to the multiplicity of data sources, the latter being directly related to national databases
- Guaranteed ownership: data **belong** to and **stay** in the country they are related to
- Durability and maintainability
- Economically viable, requiring only coordination with respect to what each country would need to develop independently
- Productivity, by covering all published data in the long term

# We want you!



Now we propose:

- to continue the pilot for those countries who could not join yet

## WP4/WP7 Joint Activity



<http://egip.igg.cnr.it>



**Thank you for your attention!!**

