EPOS ICS Portal User Guidelines

Introduction

EPOS (European Plate Observation System) is a European initiative to create and operate a sustainable, distributed and long-term access to solid Earth science data and services.

EPOS aims at representing a scientific vision and approach in which innovative multidisciplinary research is made possible for a better understanding of the physical processes that have great impact on the solid Earth. It is critically important to understand how the Earth works as a system to modern society. Earth phenomena that have great impact on the society today are volcanic eruptions, earthquakes, floods, landslides, tsunamis, weather, and global climate change. Solid Earth science is the ideal platform for obtaining deeper understanding of these phenomena, their driving mechanisms, and hopefully, ways to predict harmful events.

Solid Earth science brings together a range of disciplines such as geology, seismology, geodesy, volcanology, geomagnetism, geochemistry and geophysics as they all apply to the continuous development of planet Earth. Unravelling the processes responsible for these phenomena requires harmonized, freely accessible data and tools that allow innovative, multidisciplinary and cross-disciplinary research.

This document is an introduction on how to start using the EPOS ICS portal. It contains a brief summary of the basic concept and instructions on how to adopt the portal's main functions. The structure of the document is based on steps of how to start using the portal:

- **"Get started"** – entering the portal
- **"Search/Find"** – how to search/find services
- **"Select"** – selecting relevant data
- **"Display"** – displaying the data
- **"Add to workspace"** – how to add the selected data to workspace
- **"Analyse"** – how to conduct analyses

The purpose of the document is to briefly explain the most important features you need to get started. There are also various training videos available that demonstrate how to use the portal.

How to use the Portal

Get started

It is recommended to use the Google Chrome browser for navigating through this portal. To access the EPOS ICS Portal, use the following link: www.ics-c.epos-eu.org.
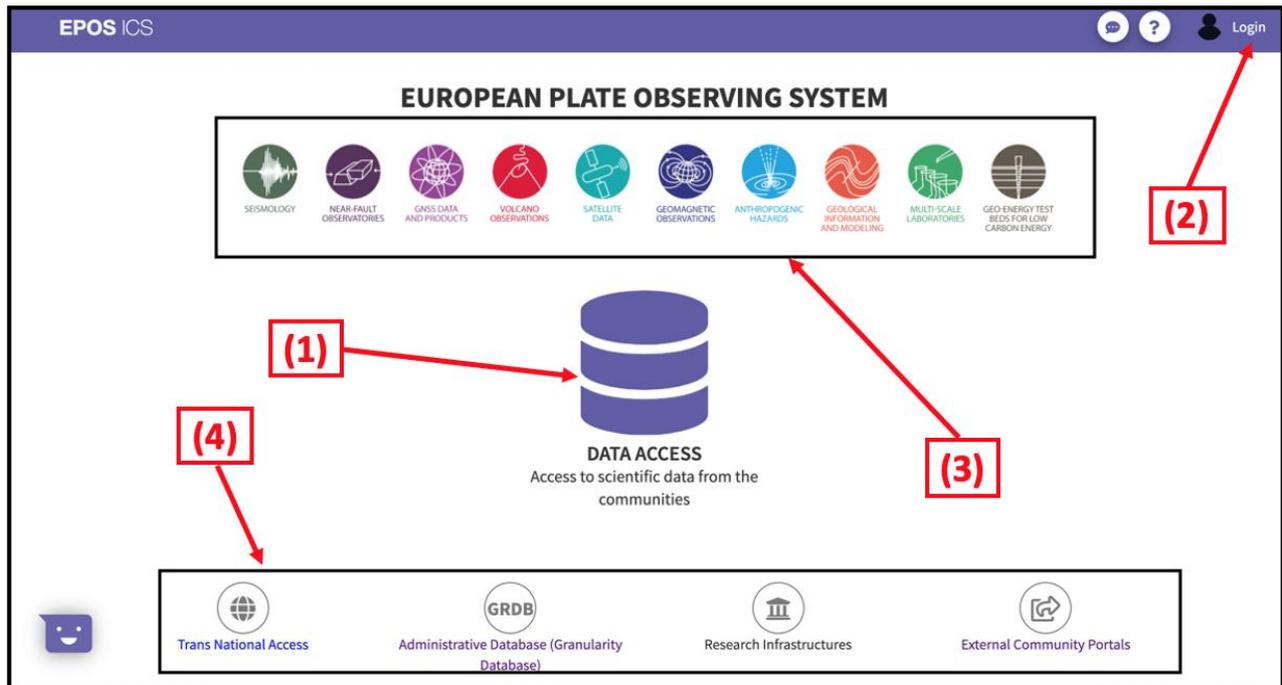

Figure 1: *Default view of EPOS ICS portal's main landing page. Click on "DATA ACCESS" to access the data portal (1). Use the "Login" button to log in and specify your account information (2). Available TCS are shown along the top of the page (3) and four more services are available along the bottom line of the landing page (4).*

Upon entering the portal, a landing page with several options will appear (Fig. 1). Click on the "DATA ACCESS" button to enter the data portal (Fig. 1, (1)). It is recommended to click the "Login" button (Fig. 1, (2)), and either specify your google account or another account that is accepted (see the Authentication section below). Login is required in order to access all the functionalities of the EPOS application. It is also possible to sign in at a later stage.

In the upper part of the EPOS landing page, several icons are shown (Fig. 1, (3)). These icons represent the Thematic Core Services (TCS) which are the community services. Click on the icons to visit a page with all of the various community portals listed. Along the bottom line of the landing page, additional services that are provided by EPOS can be accessed; Trans-National Access, Administrative Database, Research Infrastructures and External Community Portals (Fig. 1, (4)).

Search/Find

Figure 2: "SEARCH" tab (1) for search/find/select data. The data offered through this portal is categorized under "Result" (2). To make the search process easier you can draw a bounding box (3), set coordinates, apply date-time selectors (4) or use the "Advanced Search" (5) by entering a word or selecting keywords. Click "Clear" to delete the chosen keywords.

Exploring the EPOS ICS Data Portal will typically start with a **search for services** in the "SEARCH" tab (Fig. 2, (1)). The data offered through this portal are divided into ten distinct scientific domains, like Anthropogenic Hazards, Geology etc. under "Results" (Fig. 2, (2)). By choosing one of the domains, e.g. Geology, a subset of various categories will appear below. Each domain has a variety of services that provide data and the number of services available for each domain. The subsequent category is given by the respective number in the parentheses. Different tools are available to make the search process easier.

The list of results can be reduced by **filtering the services** through their spatial extent This is achieved by selecting the "Draw Bounding Box" tool (Fig. 2, (3)). By clicking this tool (Fig. 3, (1)), it is possible to draw a square of the desired search area directly on the map. Notice the change in the "Results" list, as it changes to a smaller number after applying the spatial filter. It is possible to draw a new square by clicking on the "box icon" again. It is also possible to manually change the coordinates of the box. Define new coordinates and click the apply button (Fig. 3, (2)). . To remove the spatial filtering completely, clear all the inputs by clicking on the "X" button (Fig. 3, (3)). Date and time constraints can also be applied by the date-time selectors (Fig. 2, (4)). The resulting list of services will be changed accordingly. Go to "Advanced Search" (Fig. 2, (5)) for more advanced search features like search by free-text, keywords or organizations. For example, "earthquake" can be typed into the free-text search field to find all the services that contain this word in their description. It is also possible to choose a predefined set of keywords as an alternative to the free-text search. Click the "Clear" button to clear all of the applied search criteria.
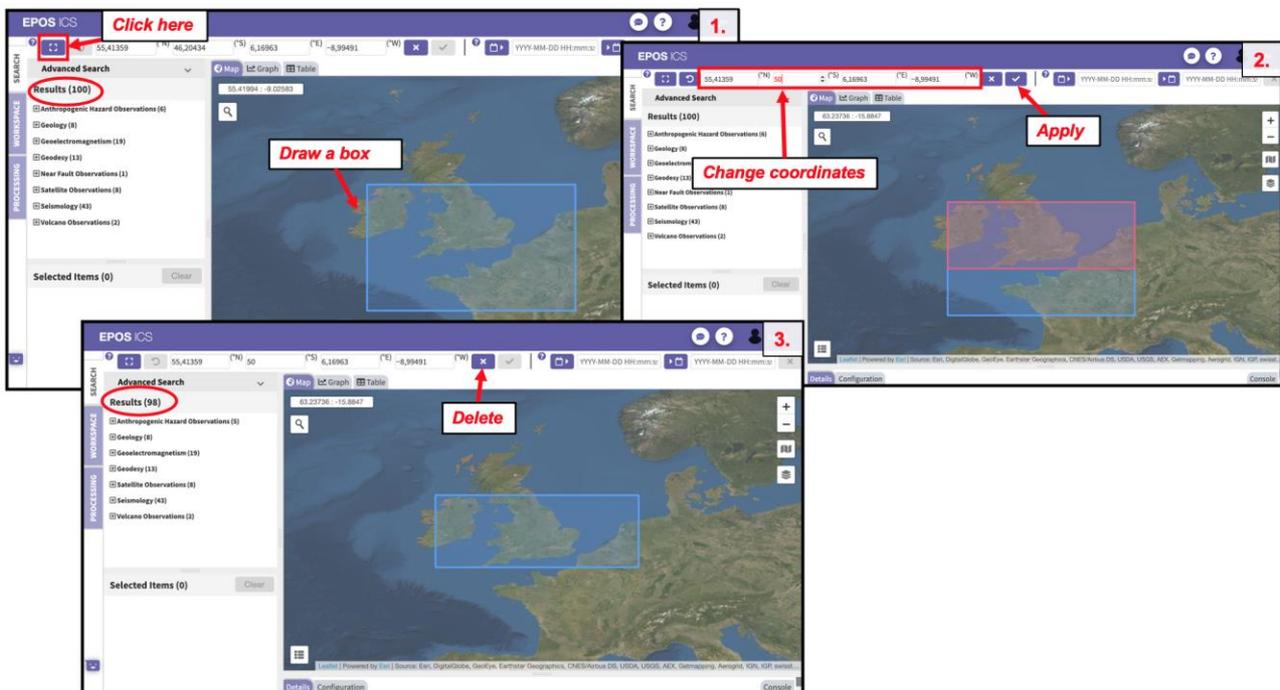

Figure 3: 1- Click the square icon to draw a bounding box. Notice the change in "Results". 2- Change the coordinates manually by typing in relevant coordinates. Click the apply button to activate the changes. 3- Notice again the change in available services under "Results". Click the "X" to delete the box and clear all the inputs.

Select

Available information about the services is found in the "Details" pane. This includes a general **description of the service**, spatial (geographical) and temporal (date and time) coverage, who is offering this service, who is offering the data within the service, license information, etc. In order to view the information, select a service of interest and the information is automatically available

under the "Details" pane (Fig. 4, (1)). It is possible to show the "Spatial coverage" of a service by toggling the show on map option. The coverage is shown in the map with a dashed polygon. To fit the coverage area on the map view, the "center on map" button can be clicked.

While the map pre-visualization can only display one service at a time, multiple services can be **stacked and temporarily stored** within a "Selected Items" list (Fig. 4, (2)). Services can be added to "Selected Items" by clicking the pin icon (Fig. 4, (3)). The added services is automatically assigned with a unique colour to distinguish between the services more easily in both the map view and the selected item list. To remove one or more of the selected services from the list, click the "X" button (Fig. 4, (4)) and then "Unpin" for the services you wish to remove. The "Clear" button (Fig. 4, (5)) will remove all the pinned services.
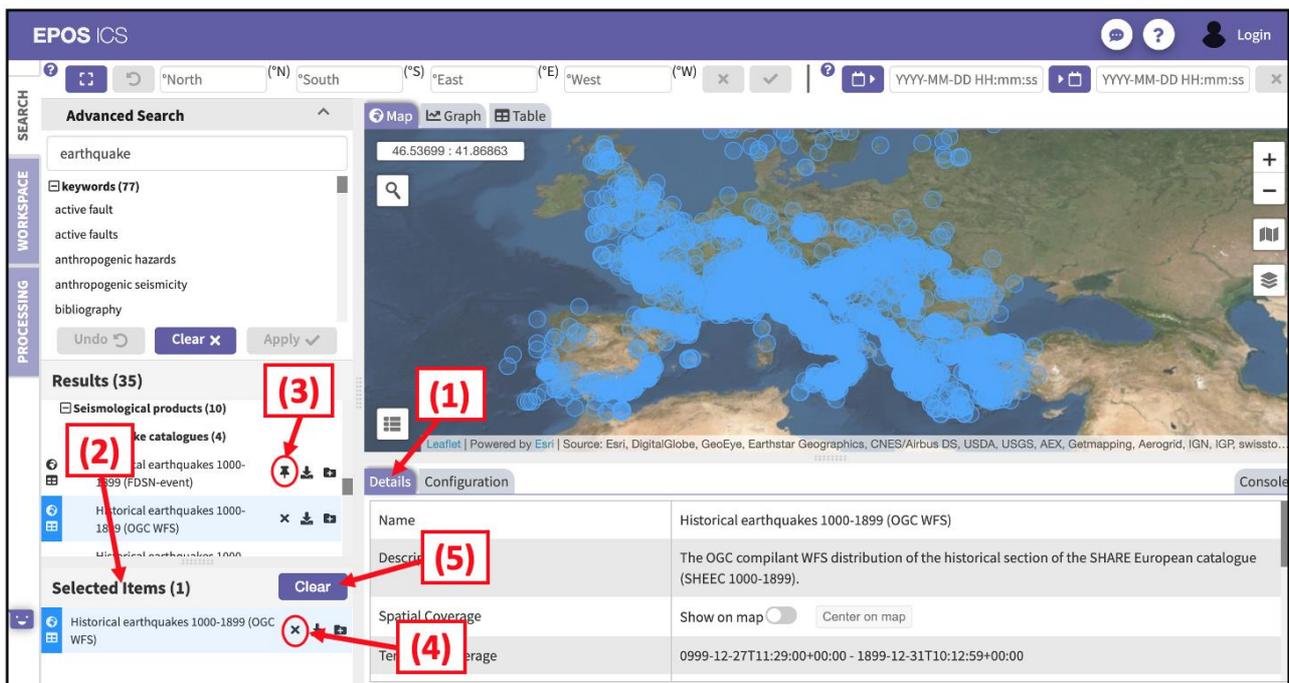

Figure 4: *"Details" contains information about a selected service (1). Under "Selected Items" you can stack and temporarily store selected services (2) by clicking the "pin" icon (3). Click the "X" to delete one or more of the selected services (4) and click "Clear" to delete all of the selected services (5).*

It is possible to **download data** from selected service within the "SEARCH" tab. From the icons alongside the service name (Fig. 5, (1)) we can download the data in supported formats that are available for the service. The GEOJSON format is regarded as the EPOS representable format and is available for all mappable services. Other available formats depend on the service provider. If you choose to download data in JSON or XML, the data will be displayed on a new page within your browser. Other formats initiate a file being downloaded to your machine.

The icons to the left of the services (Fig. 5, (2)) tells the user how the service can be visualized. The globe icon represents map visualization, the table icon represents the table display and a the graph icon represents graph display. Click on the panes (Fig. 5, (3)) to change between different types.

Most services provide additional **configuration options** to better constrain data retrieval. These options are commonly referred to as parameters. Information and editing of parameters take place within the "Configuration" tab (Fig. 5, (4)). Customization of the parameters can be done by editing the various input fields provided for each service. The explanation on how to change the parameters can be found under the topic "Workspace" within this document. In the SEARCH area you can visualize only one configuration per service at a time. Multiple configurations are allowed in the WORKSPACE.
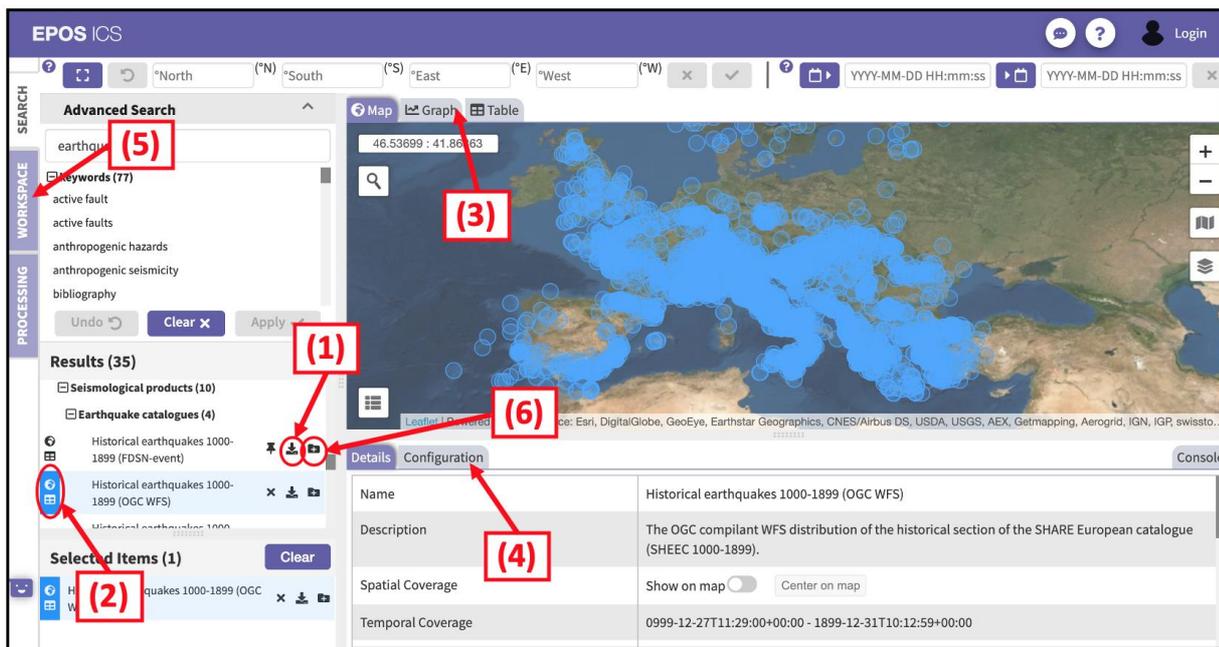

Figure 5: Click the download icon to download the data in different formats (1). The icons to the left of the services (2) tells the user what the service provides. Change to graph or table display over the map (3). Configuration (4) of the services allows the user to set specific parameters. "WORKSPACE" (5) is the place where all added services are organized into one place. Click the "+" to add a service to a workspace (6).

Workspace

After completing the process of search/find and select, all services of interest may be added to the workspace. WORKSPACE area is accessible to authenticated users only (more in section on Authentication). By entering the WORKSPACE (Fig. 6, (1)) a default "Workspace 1" is created. The name and description of the workspaces can be altered in the "Workspace Manager" that appears by clicking the "settings" icon (Fig. 6, (3)). Additional workspaces can be added by clicking the "+"

icon (Fig. 6, (2)). Enter a name for the workspace and click "Add". All work done from this stage will be saved for later use. Select a name for each workspace so that they are easy to distinguish.

In the "Workspace Manager" (Fig. 6, (4)) it is also possible to create a new workspace by clicking the "+" icon , delete or edit the workspace by using the "X" or "pen" icon (Fig. 6, (5)). Selection of the active workspace can be done under "Current Workspace" menu (Fig. 6, (6)).
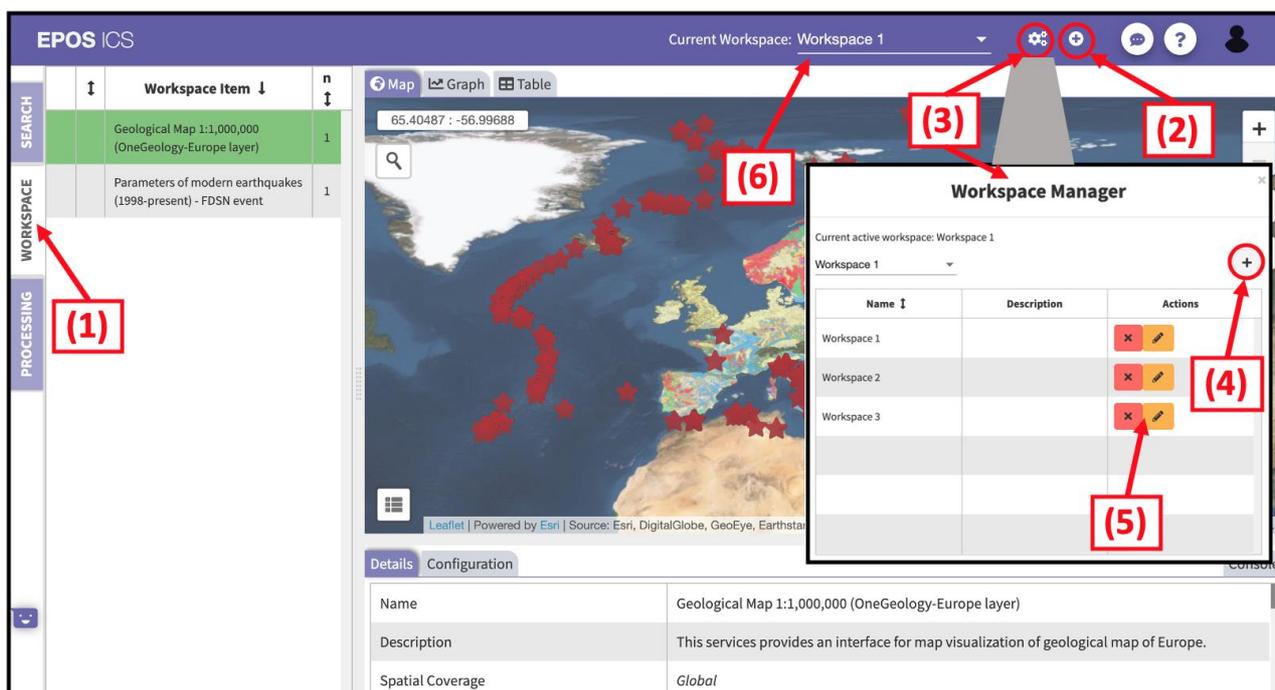

Figure 6: The "WORKSPACE" tab (1). Add a workspace by clicking on the plus icon (2). Navigate and add description to the added workspace by clicking the "settings" icon (next to the plus icon) (3). It is possible to add workspace by the "+" icon in the "Workspace Manager" (4), delete/edit the workspaces by the "X" and "pen" icon (5). Change workspace area under "Current Workspace" (6).

Add services to the workspace from the SEARCH area (Fig. 2, (1)), click on the "+" icon next to the service (Fig. 5, (6)) and then select the workspace. A confirmation message will appear, and the service is then added. You can add multiple services to the workspace. Overview of the added services in the selected workspace is available under "Workspace Item" (Fig. 7, (1)), with an overview of the number of configurations (Fig. 7, (2)).

Information about the services can be found in "Details pane" (Fig. 7, (3)). Most services provide additional configuration options to better constrain data retrieval within the configuration tab (Fig. 7, (4)). These options are commonly referred to as parameters. One of the advantages of the workspace is the ability to create more than one configuration to a service. Click on "Copy" to add

more instances of the service with a different configuration (Fig. 7, (5)). Click on "Delete" (Fig. 7, (6)) to delete a configuration or service from the workspace. After typing in the parameters in the configuration, click "Apply" to confirm the changes (Fig. 8, (1)). Click "Undo" (Fig. 8, (2)) to erase the latest changes and "Set To Defaults" (Fig. 8, (3)) to undo all changes in the parameters and start again with the default settings. It is also possible to download data with the applied configurations. Change the parameters, click "Apply" (Fig. 8, (1)), then "Download" (Fig. 8, (4)) and choose from different formats that are available for the service.
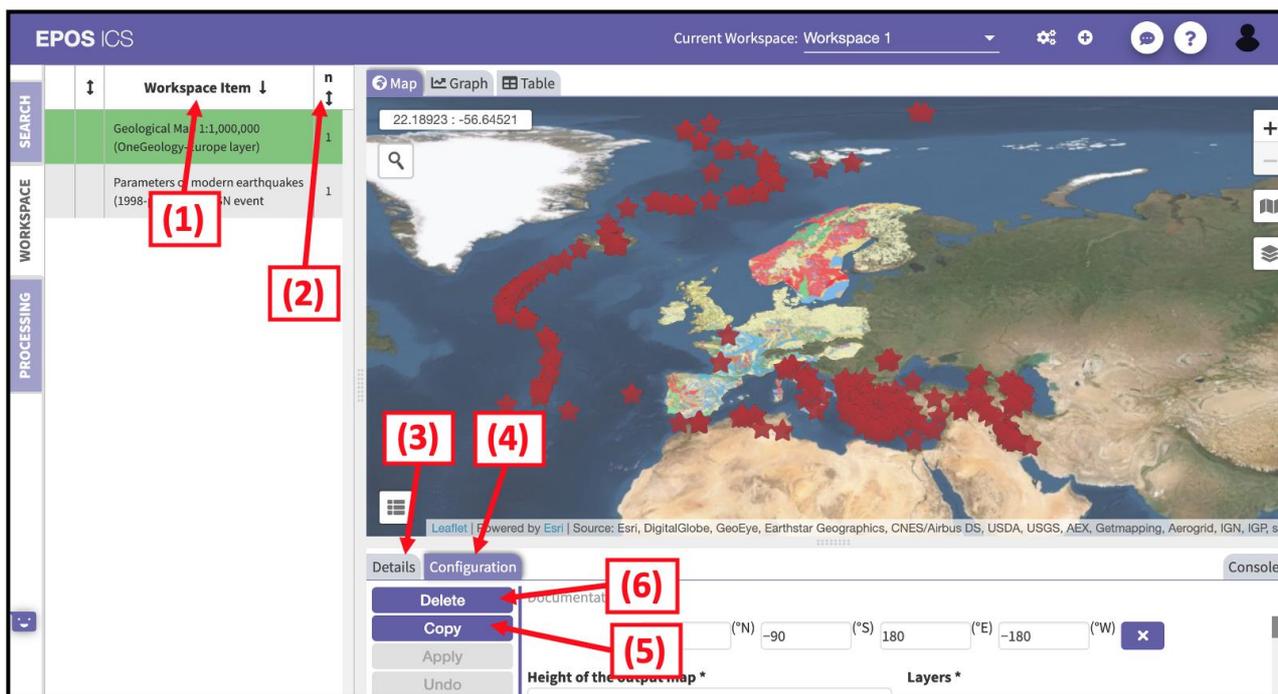

Figure 7: *Overview of the services in a workspace (1) and the number of configurations (2) is under "Workspace Item". Information about the services is found in the lower part of the portal under "Details" (3), together with "Configurations" (4). To add configurations to a service, click on "Copy" (5). "Delete" (6) button is used to delete a configuration or a service from the workspace.*
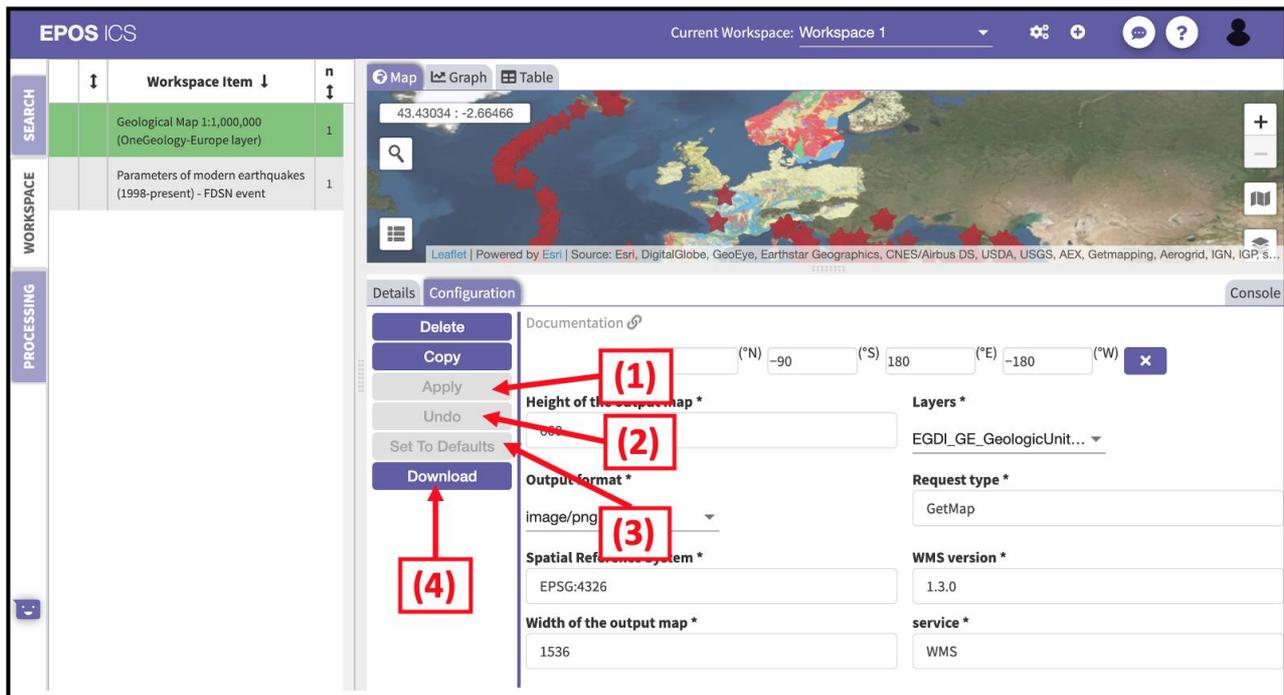
Figure 8: Configuration tab. Set new parameters and click "Apply" to activate them, "Undo" (10) to undo the latest change and "Set To Default" (12) to start over with the default settings. To download the service (to your machine), click the "Download" button (13).

Display

There are three options to display data: map, graph and table view. Icons next to the service indicate what display options are available for that specific service (Fig. 5, (2)). A globe icon marks a service that can be visualized on a map, a table icon marks services that support the table view, and a graph icon represents graph view. Not all services provide all options, and some of the services are only available for download and therefore do not have any icons. Map view is the default view in the portal. Switch to other views by navigating to other panes next to the Map view (Fig. 5, (3)).

In the **map window** you can search for addresses and places (Fig. 9, (1)) and show legend for the displayed services (Fig. 9, (2)). Data from the services can be re-ordered and transparency can be changed (Fig. 9, (3)). Zoom in/out by clicking the plus/minus icons (Fig. 9, (4)) or by mouse wheel.

Switch to Graph pane to display data in a **graph view.** You can customize the graph by choosing what to display (Fig. 10, (A,1)) and how to stack the plots. Click on "Stack" or "Overlay" to change the order of the graphs (Fig. 10, (A,2)). **The table** pane displays the selected services in a table.

Choose between your selected data to view them in the table (Fig. 10, (B,3)). You can filter the data by writing a keyword or a number (Fig. 10, (B,4)).
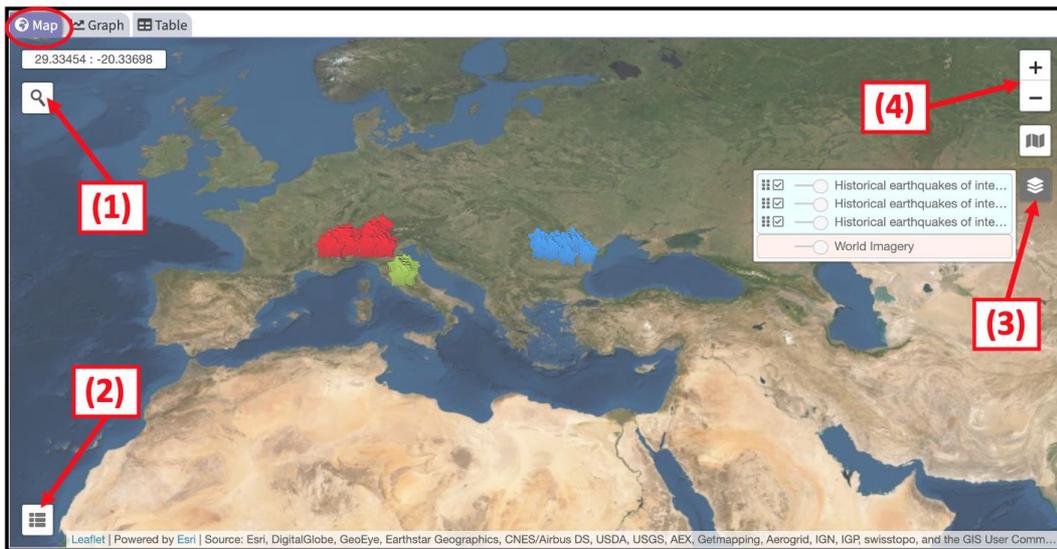

Figure 9: Map tile. Search for addresses (1) and view the legend (2). Filter the data (3) and zoom in/out on the plus/minus icons (4).
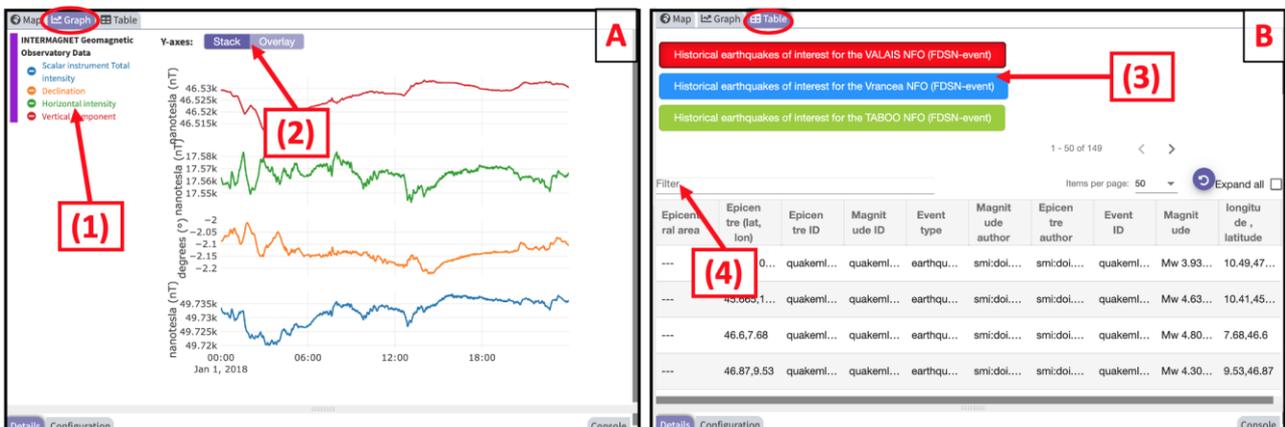

Figure 10: [A] Graph tile. Customize your graph by choosing what to display (1) and to "Stack"/"Overlay" (2). [B] Table tile. Change between the selected services to display the data in the table (3). Filter for names or numbers in "Filter" (4).

Authentication

The SEARCH area is available publicly to anyone entering the portal. However, other areas such as WORKSPACE and PROCESSING require authentication of the users. Users can click the LOGIN button in upper right corner (Fig 11 (1)), or a pop-up window will appear automatically when navigating to WORKSPACE (Fig 11 (2)). Please see (Fig 12) for available authentication options.
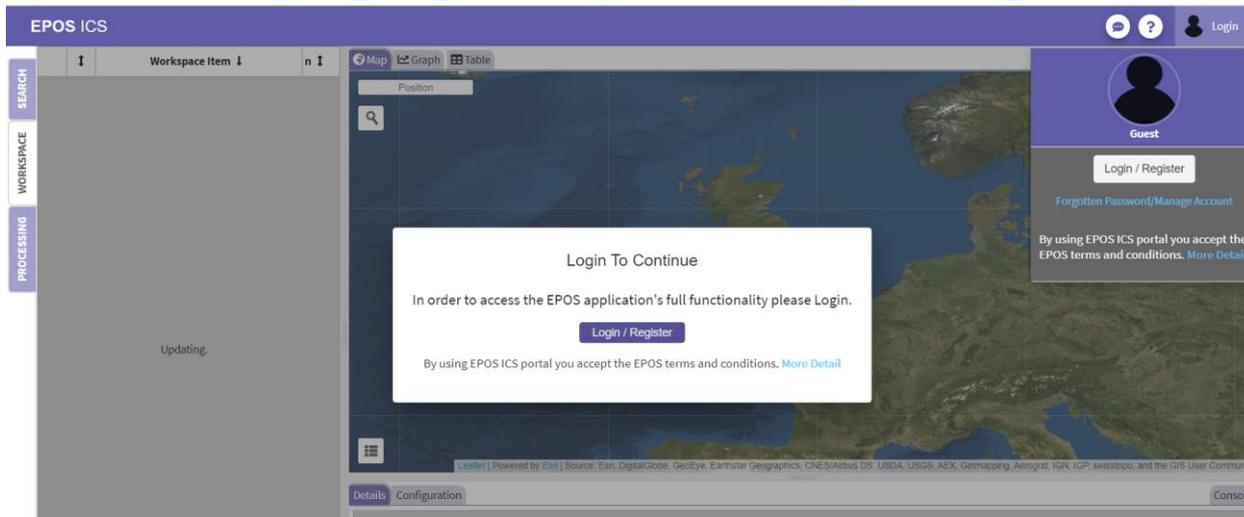
Figure 11: *LOGIN button is placed in upper right corner (1), or a pop-up window will automatically appear when navigating to WORKSPACE (2).*
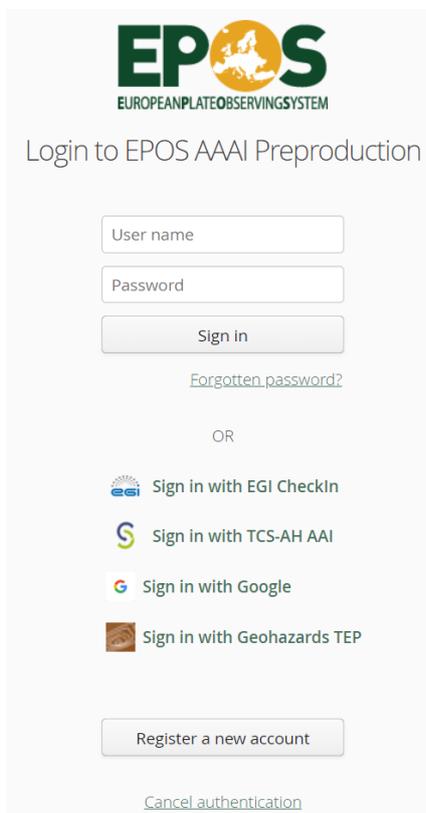

Figure 12: *Authentication interface allows authentication via multiple identity providers or registration of a new account.*

Analyse & Process

Under development. This functionality is related to creating workflows and deploying the various processing actions through external services, (ICS-D - distributed services that are connected via relevant APIs). Here it will be possible to ship your data to other virtual research environments, such as high-performance computing, data storage, visualization and other services.