



KINDRA DELIVERABLE D1.5

EUROPEAN INVENTORY OF GROUNDWATER RESEARCH: EIGR DEMO VERSION

Summary:

This document presents the KINDRA project EIGR Online Data Catalogue Demo Version: <http://kindra.kindraproject.eu:8080/geonetwork/srv/eng/main.home>. It incorporates background information on its development, design, structure and technical aspects of the “Alpha” version of the EIGR (European Inventory of Groundwater Research).

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1. Executive summary

This document provides a general presentation of the KINDRA Project EIGR DEMO VERSION “Alpha” describing its format, design, the development process and functionalities. The deliverable is the EIGR Online Data Catalogue itself (available at <http://kindra.kindraproject.eu:8080/geonetwork/srv/eng/main.home>) rather than a formal paper. Nevertheless, this document presents an overview of the activity carried out corresponding to the task (Task 1.4) and of the EIGR DEMO VERSION (as of September 2015 – M9).

2. List of acronyms & abbreviations

HRC-SYS: Harmonised Terminology and Methodology for classification and reporting hydrogeology related research in Europe

EIGR: European Inventory of Groundwater Research and Innovation

3. Objectives of the EIGR

The KINDRA EIGR is a result of Task 1.4 “EIGR Programming” carried out under WP1 – Methodology framework development. The objective of this task is to provide the work package with a tool that will allow to inventory information sources regarding Hydrogeological Research Knowledge and Information according to the principles defined by D1.2 HRC-SYS: Harmonised Terminology and Methodology for classification and reporting hydrogeology related research in Europe, for which the project Online Data Catalogue will represent the core pillar. The first steps taken which have led to setting up the EIGR DEMO VERSION have consisted in:

- ✓ Setting up a server with the technical specifications to support the installation of the online platform for the EIGR;
- ✓ Configuring and adjusting the online platform to define an interface which will allow for the initial uploading of contents into the EIGR DEMO VERSION.

During 2016, the National Experts identified by the European Federation of Geologists, who will be receiving a specific training session on how to operate the EIGR DEMO VERSION, will cooperate with KINDRA by populating it with related and relevant contents and resources.

4. Technical aspects

The EIGR DEMO VERSION Online Data Catalogue has been prepared through the cooperation between LPRC and REDIAM and is hosted by LPRC. The server specifications system setup has been carried out according to the following installation:

- ✓ Distributor ID: Ubuntu
- ✓ Description: Ubuntu 14.04.3 LTS
- ✓ Release: 14.04
- ✓ Codename: trusty
- ✓ Tomcat7 (port:8080)
- ✓ OpenJDK7
- ✓ PostgreSQL 9.3 + postgres
- ✓ Postfix mailing system
- ✓ Daily backup
- ✓ Logcheck
- ✓ Softraid reporting
- ✓ Firewall
- ✓ SSH with rsa key based authentication.

The Tomcat server (Fig. 1) can be accessed at the following URL:

<http://kindra.kindraproject.eu:8080/welcome.html>

The Administrator Section is accessed through the following URL:

<http://kindra.kindraproject.eu:8080/manager/html>

The screenshot shows the Apache Tomcat Manager web interface. At the top, there's a header with the Apache Software Foundation logo and a cat icon. Below the header, the title 'Gestor de Aplicaciones Web de Tomcat' is displayed. A message box shows 'Mensaje: OK'. Below this, there's a navigation bar with links: 'Listar Aplicaciones', 'Ayuda HTML de Gestor', 'Ayuda de Gestor', and 'Estado de Servidor'. The main content area is a table titled 'Aplicaciones' with the following columns: 'Trayectoria', 'Versión', 'Nombre a Mostrar', 'Ejecutándose', 'Sesiones', and 'Comandos'. The table lists several applications:

Trayectoria	Versión	Nombre a Mostrar	Ejecutándose	Sesiones	Comandos
/	Ninguno especificado		true	0	Arrancar Parar Recargar Replegar Expirar sesiones sin trabajar > 30 minutos
/docs	Ninguno especificado	Tomcat Documentation	true	0	Arrancar Parar Recargar Replegar Expirar sesiones sin trabajar > 30 minutos
/examples	Ninguno especificado	Servlet and JSP Examples	true	0	Arrancar Parar Recargar Replegar Expirar sesiones sin trabajar > 30 minutos
/geonetwork	Ninguno especificado	geonetwork	true	2	Arrancar Parar Recargar Replegar Expirar sesiones sin trabajar > 180 minutos
/host-manager	Ninguno especificado	Tomcat Host Manager Application	true	0	Arrancar Parar Recargar Replegar Expirar sesiones sin trabajar > 30 minutos
/manager	Ninguno especificado	Tomcat Manager Application	true	1	Arrancar Parar Recargar Replegar Expirar sesiones sin trabajar > 30 minutos

Figure 1: Tomcat Server Administration Section

The software employed for installing and setting up the EIGR DEMO VERSION, according to the previously indicated server specifications, is Geonetwork (open source) <http://geonetwork-opensource.org/>. It was developed as a pilot project on behalf of the Food and Agriculture Organization of the United Nations and is widely used by different administrations and organizations throughout the world. Although the latest version available when discussing the preparation for the EIGR Online Data Catalogue was 3.0, we proceeded to the installation of version 2.10.4 as it is more stable.

The Geonetwork site has available user and developer manuals alike <http://geonetwork-opensource.org/docs.html>.

Geonetwork is the recommended solution for the KINDRA project EIGR as it has many features which adjust to the required conditions as per the description of Task 1.4 included in the KINDRA Project Grant Agreement. It allows for information to be available, accessible and usable through services implementing relevant INSPIRE catalogue and download services. It serves as a data catalogue that allows for searching, consulting and downloading information which has been collected and stored. The catalogue can contain metadata records. It can act as a “distributed catalogue” where Users and Data Providers can create and modify their own metadata. It allows for the definition of ETL tools (Extract, Transform and Load), provides the capacity for query functions for data evaluation and the production of statistics, diagrams, Web Services, a Client application that allows viewing Web Services by different users, it follows ISO standards and guidelines for organizing and structuring information and metadata. It allows for the creation of categories and groups and it also allows for the creation of a specific Thesaurus (a list of thematic keywords).

Although Geonetwork allows for working with a great variety of metadata profiles, based on different schemas and templates, KINDRA has opted for working with the one which is the most extended on an international level and which also follows the INSPIRE directive specifications, the ISO 19139 multilingual template. The purpose is to create the opportunity for editing and publishing a multilingual Data Catalogue.

After having installed Geonetwork 2.10.4, we proceeded to edit the interface and the contents to adjust it to the requirements for setting up the KINDRA Project EIGR DEMO VERSION Online Data Catalogue and according to the HRC-SYS premises.

The appearance of the EIGR DEMO VERSION Online Catalogue reflects the community image of KINDRA.

5. Structure & design

The EIGR offers two possibilities for browsing the catalogue; one of which is the default viewer in HTML5 (Fig. 2) which all users find when accessing the catalogue through the following address:

<http://kindra.kindraproject.eu:8080/geonetwork/srv/enq/search>

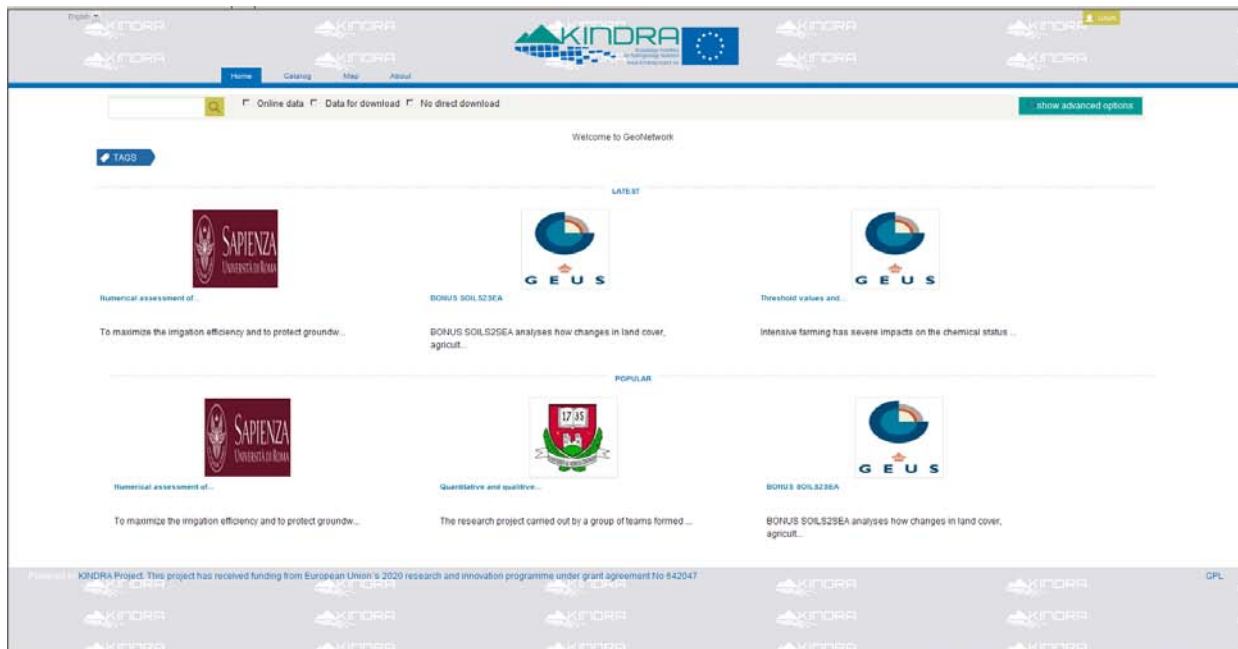


Figure 2: EIGR DEMO VERSION default HTML5 home page

The larger website “frame” includes the project logo in the header with the logo of the European Commission and the reference to the Grant Agreement “*This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under grant agreement number 642047*” is indicated in the footer.

By clicking on the SIGN IN section which is located at the upper right side of the screen, users will identify themselves by specifying their username and password (Fig. 3), and as a result be granted access to the EIGR DEMO VERSION Online Data Catalogue:



Figure 3: EIGR DEMO VERSION Sign in dialog box

There are different sections which are accessible by selecting specific tabs (Fig. 4):

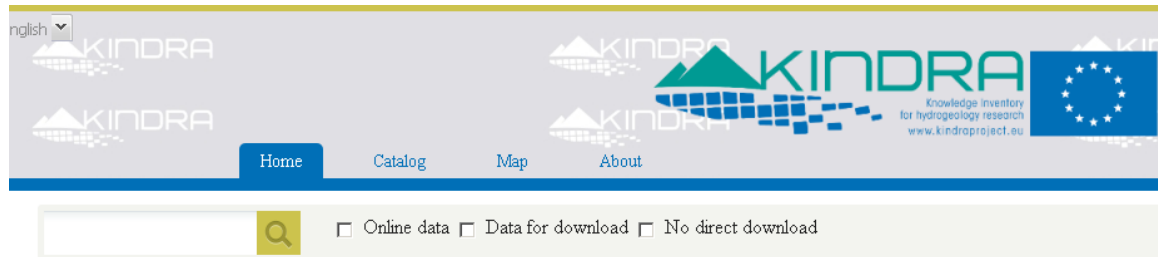


Figure 4: EIGR DEMO VERSION tabs

The Home tab takes users to the welcome page (Fig. 5) where they can view the latest contents uploaded to the EIGR DEMO VERSION as well as the most popular ones.

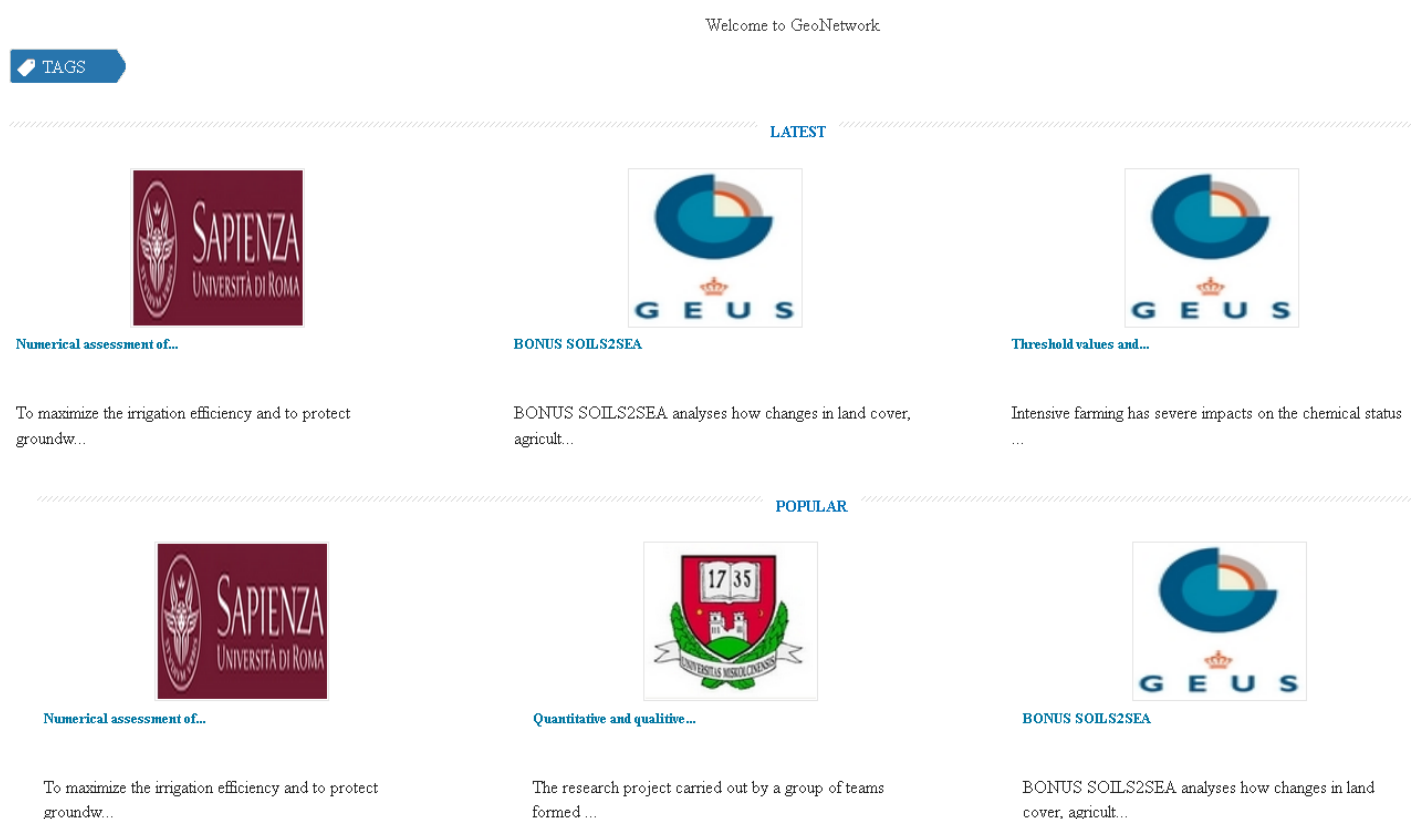


Figure 5: EIGR DEMO VERSION welcome page

Users can select any one of the contents shown, which will then lead them to the registry selected (Figs. 6 and 7):



Figure 6: EIGR DEMO VERSION selection of one of the registries

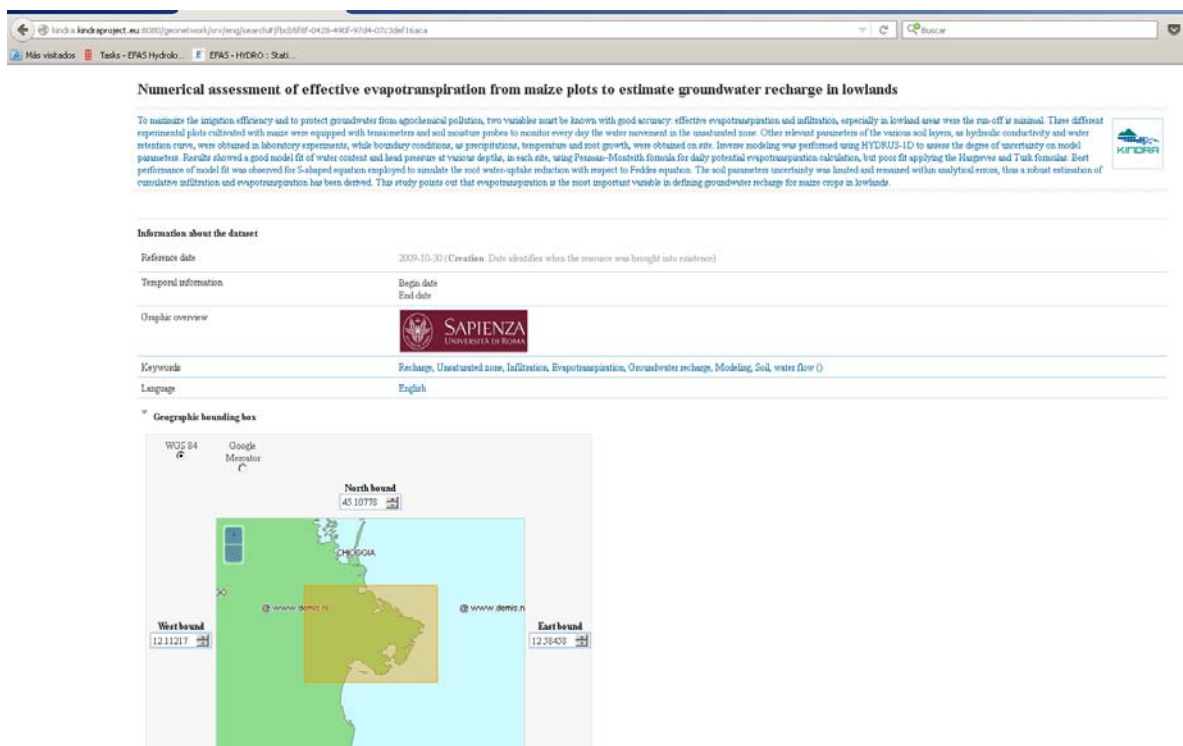


Figure 7: EIGR DEMO VERSION registry generic information

There is also a search tool which can be accessed under two different options.

The default one which is directly available upon access (Fig. 8): users can fill out the field with a term and click on the magnifying glass icon to carry out the search. Specific options are available for restricting search results depending on if the contents are requested to contain Online Data, have Data Available for Download or No direct download.

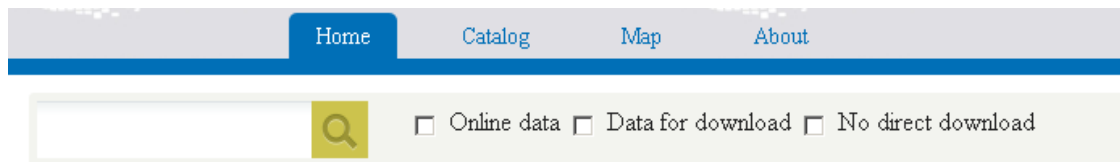


Figure 8: EIGR DEMO VERSION default search tool

This leads to the Catalogue section (Fig. 9) which will directly show results according to the criteria indicated or selected. These results are brief descriptions of the resources queried for.

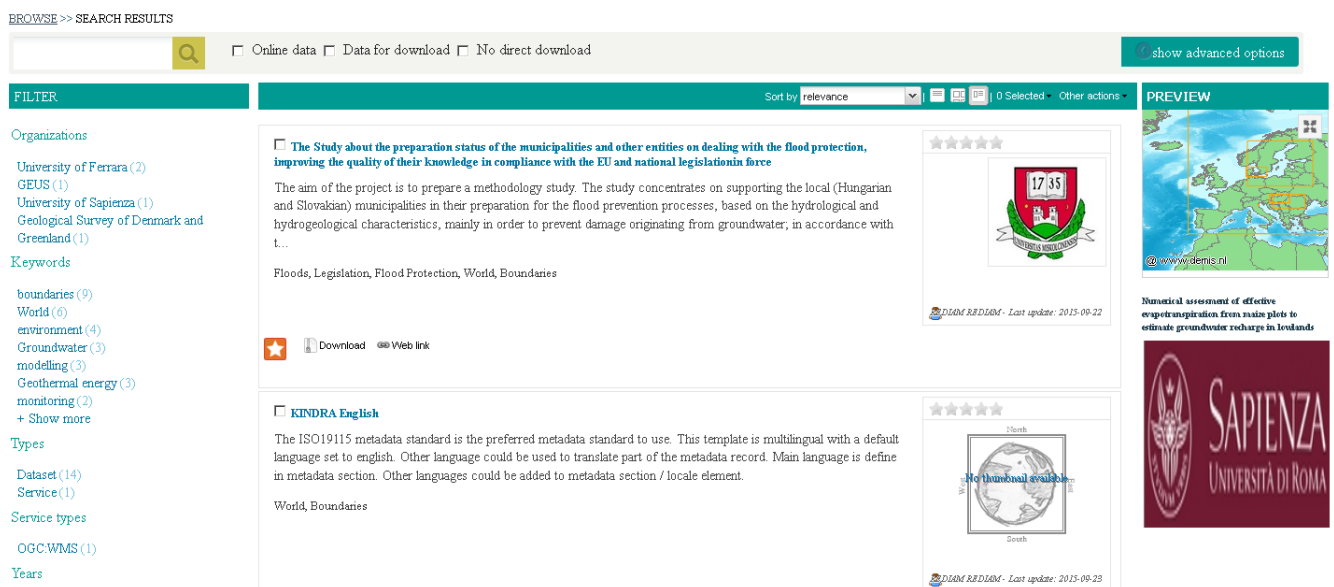


Figure 9: EIGR DEMO VERSION default search result

There exists the possibility to access an advanced search tool by clicking on the show advanced options button which is located on the right side of the screen (Fig. 10).

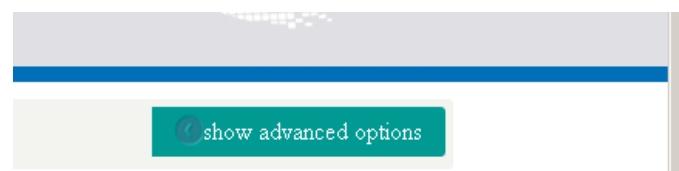


Figure 10: EIGR DEMO VERSION advanced search options

This deploys an advanced menu which offers a larger amount of search criteria (Fig. 11) that may be defined simultaneously in order to provide a narrower and more specific search on the resources uploaded to the EIGR (specific keywords, organizations, geographical location, etc.).

Figure 11: EIGR DEMO VERSION advanced search options menu

By clicking on the TAGS tab, it deploys the list of keywords (Fig. 12) which have been employed in the description of the contents uploaded to the EIGR with the amount of times they have been included in the registries present:

Figure 12: EIGR DEMO VERSION TAGS menu

Selecting the Catalog tab brings users to the screen to access resources which have been uploaded to the EIGR DEMO VERSION. The centre contains the different resources uploaded with their summary (Figs. 13 and 14).

The screenshot displays the EIGR DEMO VERSION Catalog section. At the top, there is a navigation bar with links for Home, Catalog, Map, and About. Below this, a search bar is visible with a magnifying glass icon and a dropdown menu for search options: Online data, Data for download, and No direct download. A 'show advanced options' button is located to the right of the search bar.

The main content area is divided into two columns. The left column, titled 'FILTER', contains sections for 'Organizations' (listing University of Ferrara (2), GEUS (1), University of Sapienza (1), Geological Survey of Denmark and Greenland (1)) and 'Keywords' (listing boundaries (9), World (6), environment (4), Groundwater (3), modelling (3), Geothermal energy (3), monitoring (2), and a '+ Show more' link). Below these are 'Types' (Dataset (14), Service (1)) and 'Service types' (OGC:WMS (1)).

The right column displays search results. The first result is titled 'Numerical assessment of effective evapotranspiration from maize plots to estimate groundwater recharge in lowlands'. It includes a brief description: 'To maximize the irrigation efficiency and to protect groundwater from agrochemical pollution, two variables must be known with good accuracy: effective evapotranspiration and infiltration, especially in lowland areas where the run-off is minimal. Three different experimental plots cultivated with maize were equipped with tensiometers and soil moisture...'. Below the description, it lists keywords: 'Evapotranspiration, Groundwater Recharge, Infiltration, Modeling, Recharge, Soil, Unsaturated Zone, Boundaries, Water Flow'. To the right of the text is a preview image showing a map of Europe with a red box highlighting a specific area, and a logo for SAPIENZA UNIVERSITÀ DI ROMA. Below the preview image is a small text box that reads 'University of Sapienza DIAM REDIAM - Last update: 2015-10-30'.

The second result is titled 'BONUS SOILS2SEA'. It includes a brief description: 'BONUS SOILS2SEA analyses how changes in land cover, agricultural practices and climate may affect the nutrient load to the Baltic Sea and to test how robust nutrient load reduction measures are towards plausible climate change and land use scenarios. A main aim is to develop new governance concepts targeted at differentiated output based regulation...'. Below the description, it lists keywords: 'Nitrogen, World, Agriculture, Climate Change, Ecosystems, Environment, Groundwater, Modelling, Monitoring, Phosphorus, Status, Streams, Threshold'. To the right of the text is a preview image showing a logo for GEUS.

Figure 13: EIGR DEMO VERSION Catalog section

The screenshot displays the EIGR DEMO VERSION detail of the resource summary descriptions. At the top, there is a navigation bar with links for Home, Catalog, Map, and About. Below this, a search bar is visible with a magnifying glass icon and a dropdown menu for search options: Online data, Data for download, and No direct download. A 'show advanced options' button is located to the right of the search bar.

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Figure 14: EIGR DEMO VERSION detail of the resource summary descriptions which appear in the centre of the Catalog section

The left side of the screen will show more specific filter options, such as further keyword selection, organizations, according to the information contained in the resources uploaded to the EIGR DEMO VERSION (Fig. 15).



Figure 15: EIGR DEMO VERSION detail of the filters which appear on the left of the Catalog section

The right side of the screen in this section shows a small map (Fig. 16) which serves as a shortcut to access the Map section of the EIGR DEMO VERSION.

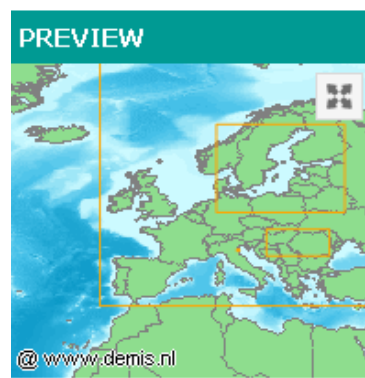


Figure 16: EIGR DEMO VERSION detail of the shortcut to the Map section

The Map tab leads to the section of the EIGR DEMO VERSION Online Data Catalogue which is still under development. Its main function will be to serve as a visual geographical reference of the resources uploaded to the EIGR and will support further functionalities for supporting the identification of research trends and gaps.

The About tab is a direct link to the home page of the Geonetwork: <http://geonetwork-opensource.org/>

The other option for viewing and browsing the catalogue is accessing the traditional Geonetwork interface (Fig. 17). When you access the catalog administration through the HTML5 view, it will switch to this one. It can also be accessed through the following address:

<http://kindra.kindraproject.eu:8080/geonetwork/srv/eng/main.home>

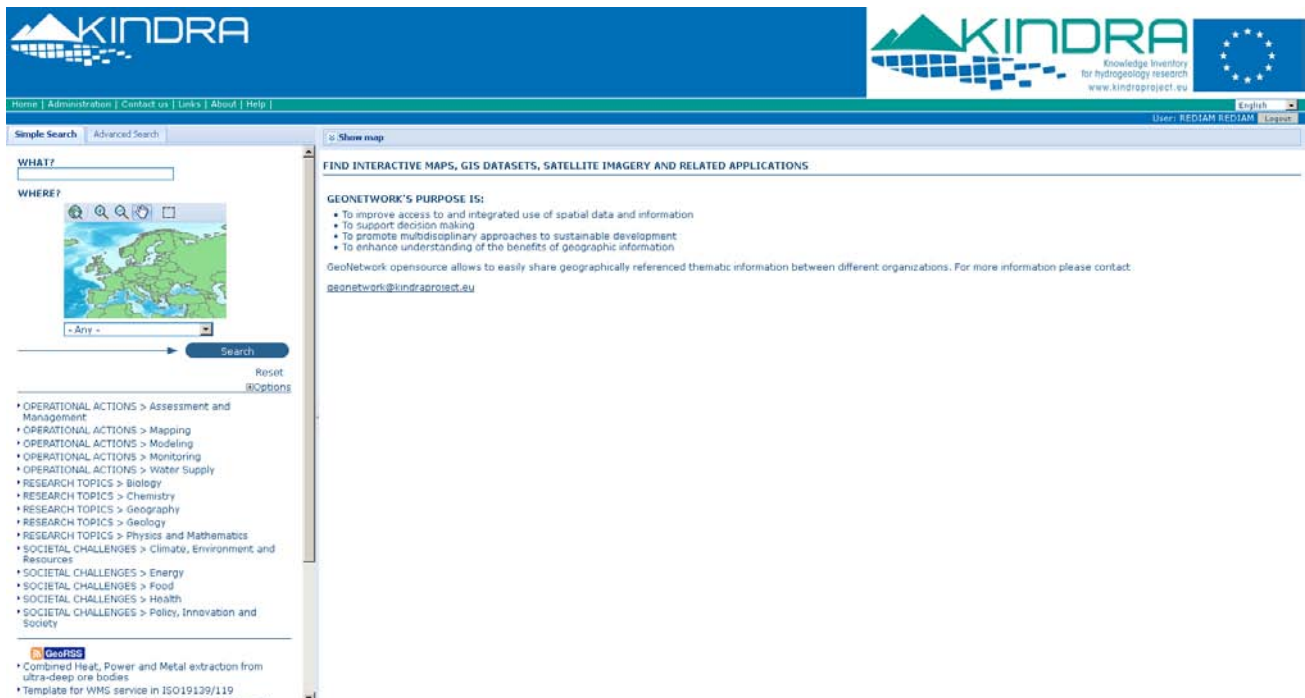


Figure 17: EIGR DEMO VERSION access through the traditional Geonetwork interface

The tabs accessible through this alternative are basically the same, although the distribution of the contents differs from the alternate access.

The right side of the screen has the quick access to the map function to be implemented. It also offers two tabs for selecting the simple search functions or the advanced search functions of the EIGR (Fig. 18).



Figure 18: EIGR DEMO VERSION access to the simple and advanced search tabs as well as quick access to the map search function

Below this section one can find an options menu (Fig. 19) which offers users the possibility to define basic quick search criteria options such as: sorting by relevance, number of hits per page and the type of output (full content of the resource or simply a text version). Additionally we find the list of overarching categories which have been defined by the HRC-SYS. By clicking on one of them a user has quick access to the list of resources which have been uploaded to the EIGR DEMO VERSION Online Data Catalogue which have been categorised in the selected classification branch.

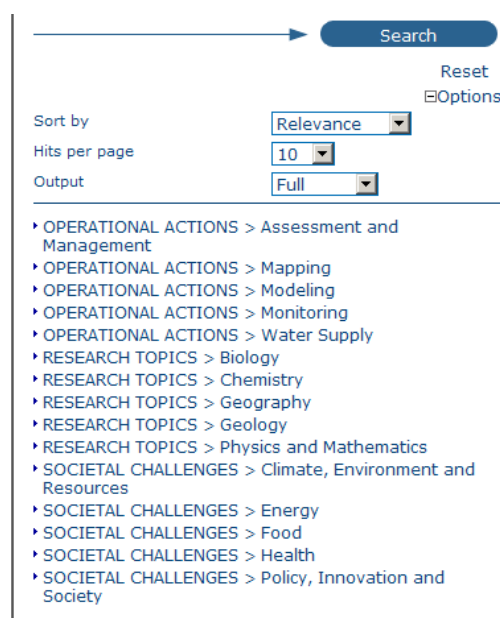


Figure 19: EIGR DEMO VERSION simple search options and list of HRC-SYS categories under which the resources are classified

The advanced search tab opens a menu (Fig. 20) in which the users can define the search criteria by indicating specific terms, title, abstract, keyword, geographical location (either setting coordinates of the bounding box area or selecting a specific area or region on the map) and even by defining the temporal extent of either the metadata record uploaded to the EIGR or the timestamp of the resource itself.

Figure 20: EIGR DEMO VERSION advanced search options

These are the most relevant functionalities developed for the Alpha EIGR DEMO VERSION Online Data Catalogue. Further developments are underway in order to have a Beta version of the EIGR DEMO VERSION Online Data Catalogue in order for its population on behalf of the group of national experts identified by the EFG, who will cooperate throughout 2016 with the identification and inclusion of relevant resources to be uploaded to the EIGR.

6. Further developments foreseen: From Alpha to Beta version

The EIGR Online Data Catalogue is conceived as a tool which will support KINDRA not only as a repository of knowledge for resources linked to Hydrogeological Research throughout Europe, it has also been defined as a tool which must help implement the HRC-SYS as well as provide additional means to support carry out assessments in order to allow the identification of the existing trends and gaps which are related to Hydrogeological Research. In order to achieve this, the first steps taken have been focused on defining and setting up the core structure of the EIGR Online Data Catalogue by identifying the most suitable options available, main purpose of the development of the Alpha version of the EIGR DEMO VERSION.

This Alpha version is basically the frame of the EIGR, where KINDRA has defined a basic template according to ISO standards and compatible with INSPIRE Directives, and criteria defined in the HRC-SYS, in order for users to be able to upload resources to the EIGR DEMO VERSION. To this date efforts have basically consisted in the technical setup of the server which will host the EIGR Online Data Catalogue as well as the platform which will serve as basis for developing the functionalities desired.

The following steps to be taken are completing the functionalities of the interface to allow users to be able to begin to populate the EIGR with the resources which meet the criteria defined by the D1.2 HRC-SYS as well as those indicated in the D1.3 EIGR Guidance Manual. By the end of December 2015 a Beta version of the EIGR DEMO VERSION will be available (Fig. 21). This Beta version is foreseen to have fully implemented all functionalities related to cataloguing and uploading contents to the EIGR Online Data Catalogue by the community of users which will be composed by the National Experts drafted by the EFG for their active participation in the identification of resources for the EIGR and populating the EIGR.

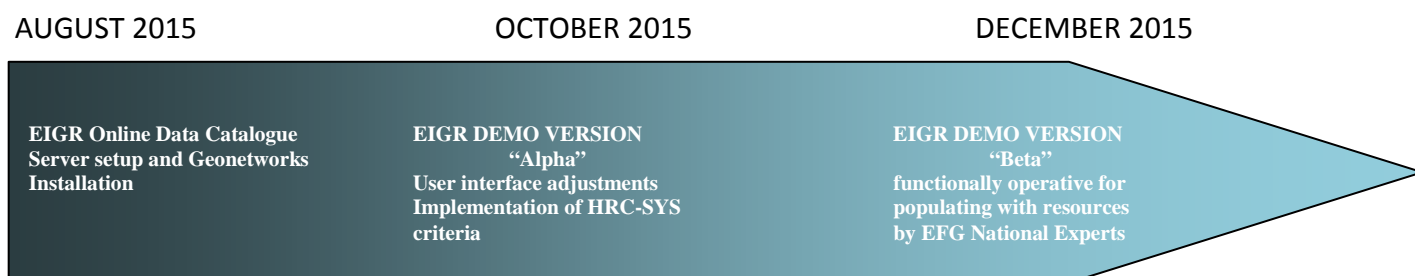


Figure 21: EIGR preparation steps into KINDRA project

A workshop will be held in Brussels on November 25th 2015, where one of the sessions will be dedicated to how to operate the Beta EIGR DEMO VERSION in order to capacitate the National Experts for populating and consulting resources uploaded to the EIGR. It will mainly focus on the user interface, the Template which must be completed for the upload of resources to the EIGR according to the HRC-SYS which has been defined by KINDRA and the basic consultation tools the EIGR will offer. The National Experts will be populating the EIGR throughout 2016.

This process will be a crucial step for the finalisation of the works related to the EIGR Online Data Catalogue, bringing it from its Beta version to its final version. After 2016, the amount of resources uploaded to the EIGR will serve to define the most functional and appropriate tools for the exploitation of the information concerning the resources uploaded to the EIGR, supporting KINDRA in the identification of research trends and gaps as well as foreseen functionalities as per descriptions included in the annexes of D1.2. All will be subject to the amount and quality of the resources identified and uploaded to the EIGR.

7. Conclusions

The KINDRA EIGR Online Data Catalogue is a work in progress highly dependent of the training workshop which will be celebrated during the 25th of November 2015 and of the “EIGR population phase” which will be carried out during 2016. The cooperation of the EFG National Experts in this “EIGR population phase” will be critical as the amount and quality of the resources they will upload to the EIGR Online Data Catalogue will serve as basis for the development of the applications and tools for exploiting the data and information related to Hydrogeological research in Europe. During 2016 different “calendar check points” will be set for carrying out interim assessments on the progress of the “EIGR population phase” and to begin identifying opportunities for data exploitation tools. This calendar is yet to be determined.