FREEWAT
Free and Open Source Software Tools for Water Resource Management
EU HORIZON 2020 Project

European Commission

ict4water.eu

Open Workshop
Fostering inclusive and sustainable economic growth, employment and decent work (SDG#8) through ICT job creation tools for ensuring water security (SDG#6)

September 30th 2016

UNESCO

7 Place de Fontenoy - 75007 Paris

A new inventory of groundwater research and knowledge (EIGR): the KINDRA contribution to ICT4water

EIP Water Online Market Place
Matchmaking for water Innovation
MAR Solutions - Managed Aquifer Recharge Strategies and Actions (AG128)

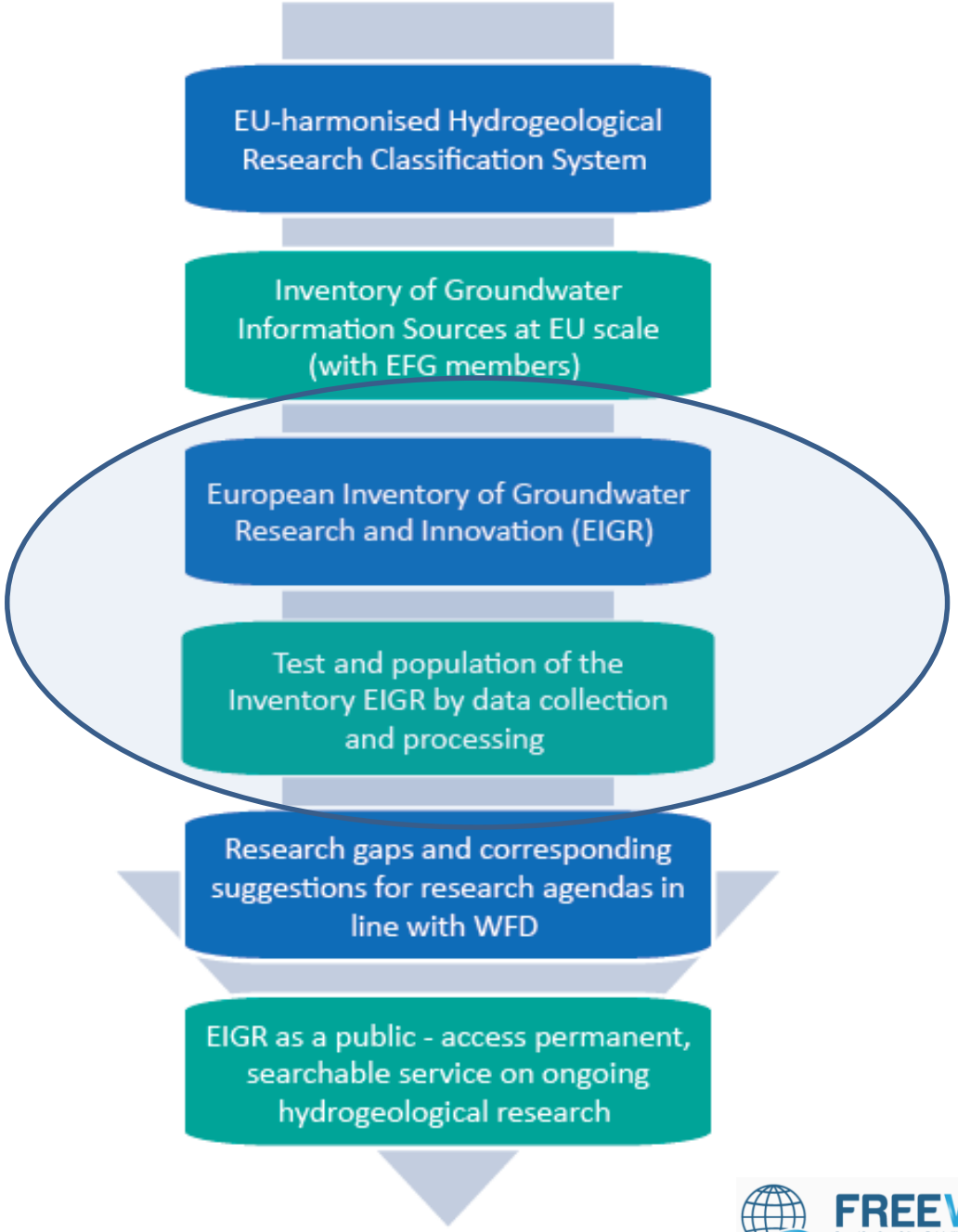
Peter van der Keur (GEUS)

USGS science for a changing world

UNESCO United Nations Educational, Scientific and Cultural Organization · International Hydrological Programme

Taken from: http://stories.undp.org/cultivating-change-in-papua/photos/2990072

Development of EIGR as an information and Communication Technology Tools (ICT) sector to reach the SDG6 target: availability and sustainable management of groundwater


EU-harmonised Hydrogeological Research Classification System
Inventory of Groundwater Information Sources at EU scale (with EFG members)
European Inventory of Groundwater Research and Innovation (EIGR)
Test and population of the Inventory EIGR by data collection and processing
Research gaps and corresponding suggestions for research agendas in line with WFD
EIGR as a public - access permanent, searchable service on ongoing hydrogeological research

Project organisation

WP4 - Dissemination and communication (LPRC)

Dissemination and management

Dissemination and support services

Leveraging dissemination and dialogue

WP1 - Methodology framework development (SAPIENZA)

harmonised framework for reporting hydrogeology-related research and innovation (programmes, projects, results, agendas, etc) in Europe:

-Hydrogeological Research Classification System – HRC – SYS

-European Inventory of Groundwater Research- EIGR

2015 →

WP2 - Data collection and processing (EFG)

EU- wide assessment of existing practical and scientific knowledge on hydrogeology-related research and innovation in Europe:

- National workshops on Hydrogeology
- Data collection and processing
- country reports

2016 →

WP3 - Research gaps and recommendations (GEUS)

Identify research gaps in hydrogeology research that have relevance for the implementation of the Water Framework and Groundwater Directives (WFD and GWD)

-Hydrogeology research evaluated

-Research gaps identified

-Recommendations formulated

WP5 - Project management (SAPIENZA)

Quality Assurance and Risk Management

Project Coordination

Project management

Exploitation of results and IPR

Added values of KINDRA EIGR:

The KINDRA inventory are **exclusively dedicated to groundwater**, differently from other databases

A **dedicated classification system** has been created to classify your research, papers, projects, reports, databases, etc.

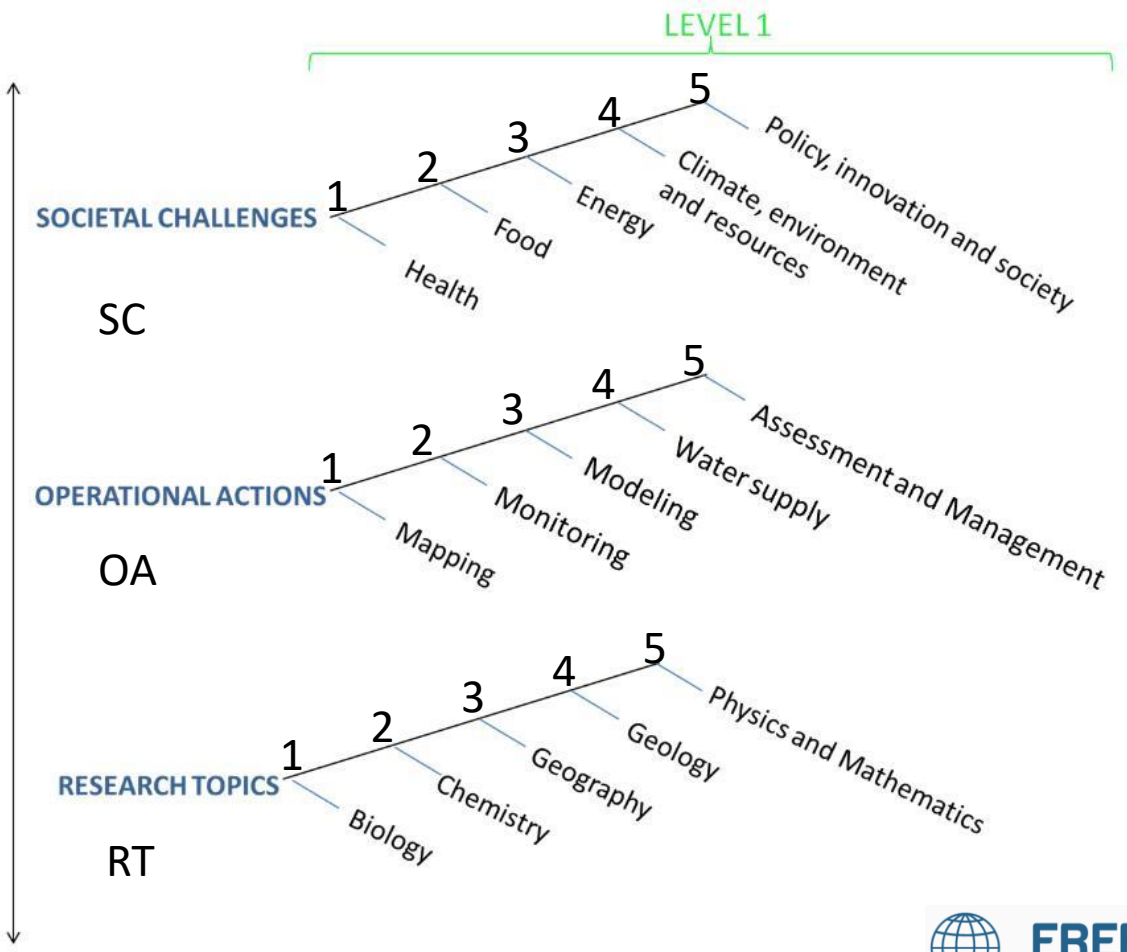
It provides harmonised international access to information on national and European research and knowledge **before research is finally published**

Combining research and knowledge enables and ensures **access and relevance for academics, practitioners and policy makers**

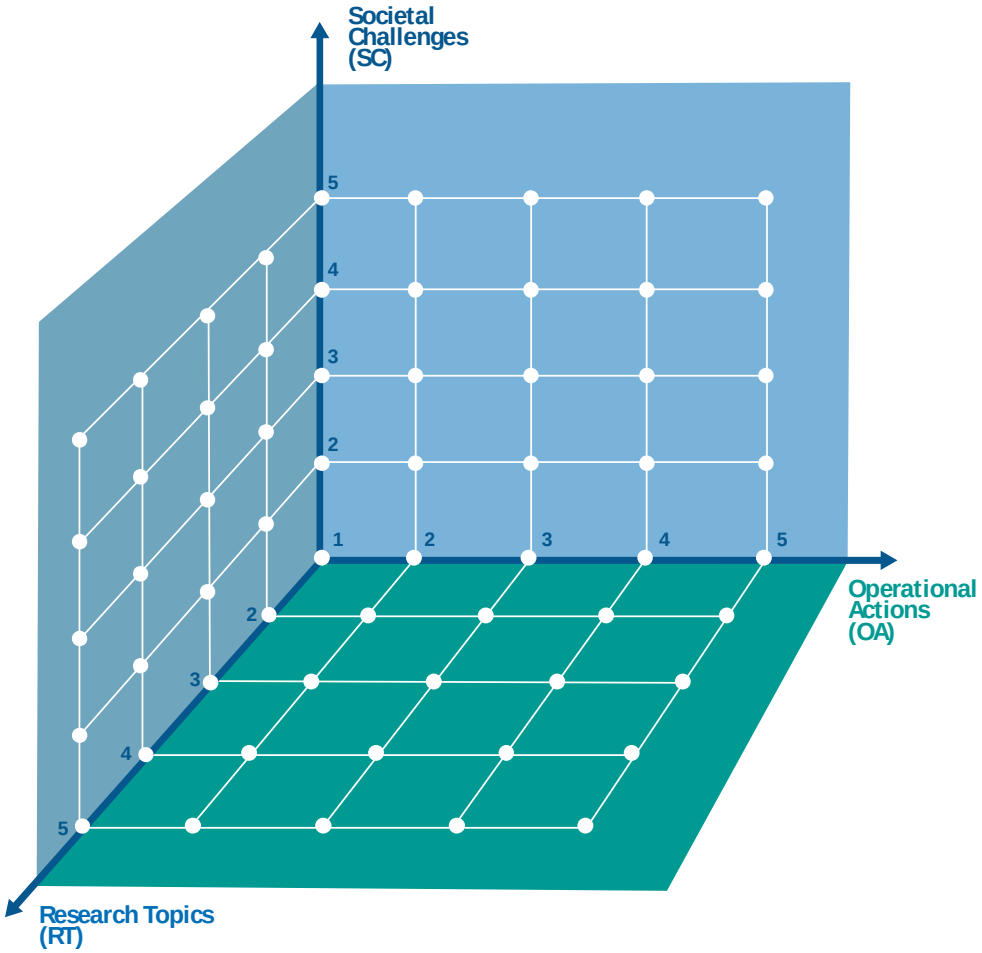
It is developed **BY and FOR hydrogeologists and other "groundwater people", to promote networking** and enlarge our community

Database analyses will be used for **EU policy support** and to **increase the visibility and awareness of the importance of groundwater research in the societal challenges**

Definition of main categories for groundwater research classification (and related keywords from searches)

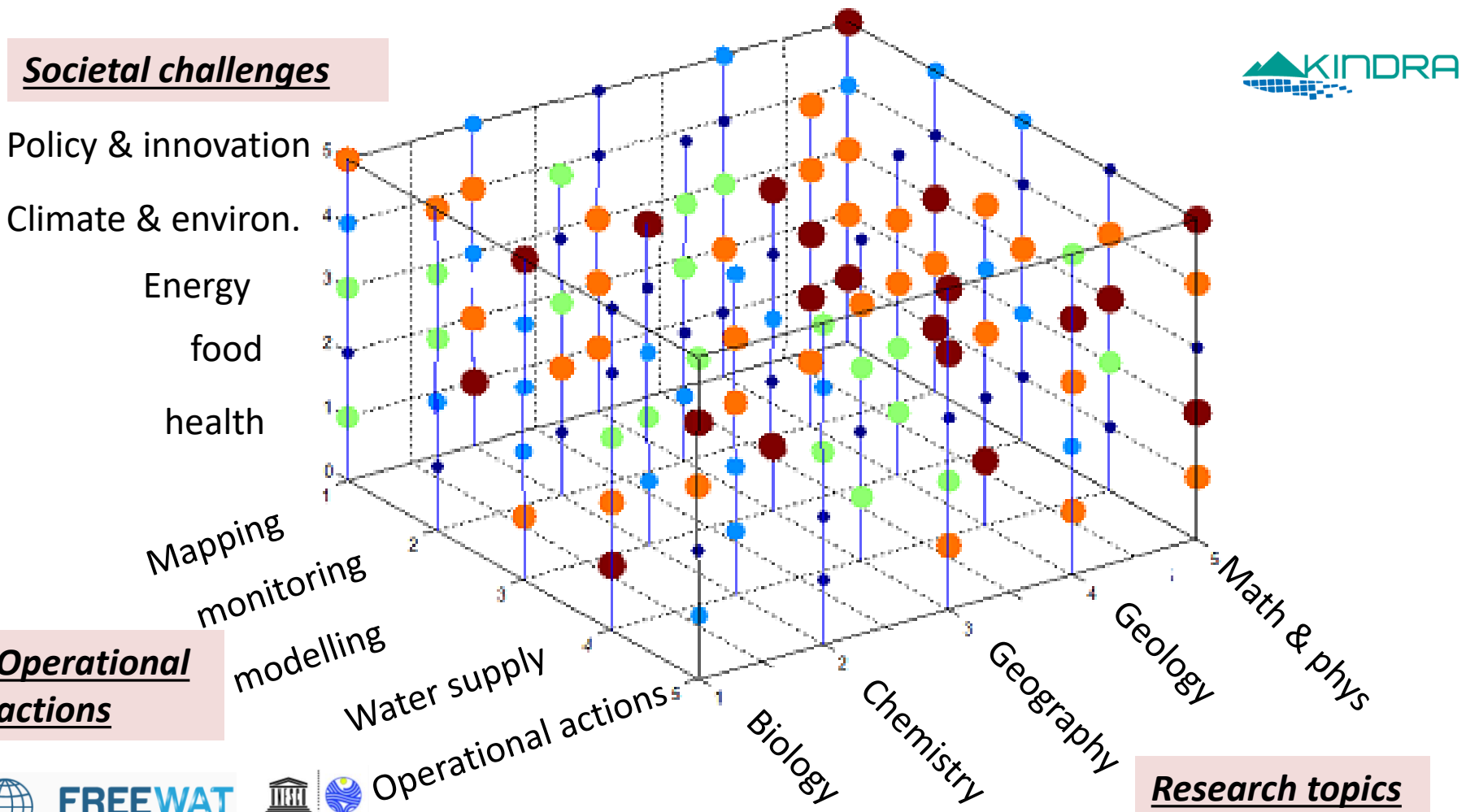


Classification System Approach (HRC-SYS)

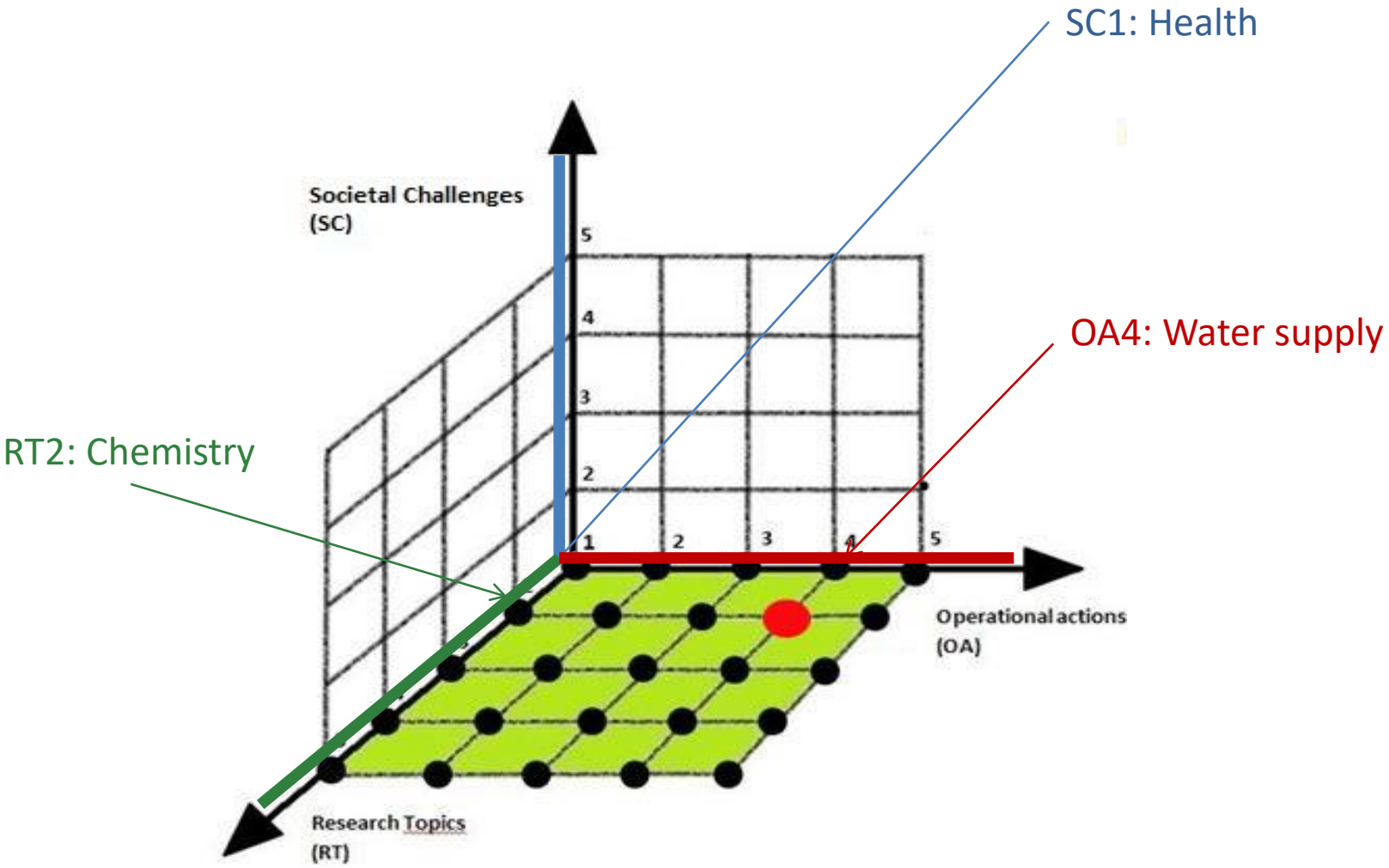


The classification system previews the interaction among the three main categories through a ***3D approach***, where along each axis the 5 overarching groups are indicated. This also results in a ***2D representation*** for each of the Societal Challenges, where Operational Actions and Research Topics intersect in a 5x5 matrix.

3D conceptual illustration of main categories of the HRC-SYS groundwater research classification system (125 research combinations defined at the intersections – size of circles indicate amount of publications / the scientific output)



Example: 2D PLOT FOR SC1: HEALTH



The EIGR is populating by the following national experts of the EFG:

	Country	Organisation	Expert's name
1	Belgium	Belgium-Luxembourg Union of Geologists	(1) Alain Dassargues (2) Dirk de Coste
2	Croatia	Croatian Geological Society	Kosta Urumović
3	Czech Republic	Czech Association of Economic Geologists	Michal Vaněček
4	Denmark	Geological Society of Denmark	Lisbeth Flindt Jørgensen
5	Finland	The Finnish Union of Environmental Professionals	Ulpu Väisänen
6	France	French Geological Society	Patrick Lachassagne
7	Germany	Professional Association of German Geoscientists	Walter Lenz
8	Greece	Association of Greek Geologists	Triantafillos Kaklis
9	Hungary	Hungarian Geological Society	Nóra Gál
10	Ireland	Institute of Geologists of Ireland	Henning Moe
11	Italy	Italian National Council of Geologists	Andrea Del Bon
12	The Netherlands	Royal Geological and Mining Society of the Netherlands	Jan Stafleu
13	Poland	Polish Association of Minerals Asset Valuators	Barbara Tomaszewska
14	Portugal	Portuguese Association of Geologists	Mónica Sousa
15	Serbia	Serbian Geological Society	Vesna Ristic Vakanjac
16	Slovenia	Slovenian Geological Society	Mihael Brenčič
17	Spain	Official Spanish Association of Professional Geologists	Silvino Castaño Castaño
18	Switzerland	Swiss Association of Geologists	Pierre Christe
19	Ukraine	Ukrainian Association of Geologists	Alexander Bobrov
20	United Kingdom	Geological Society of London	Andy McKenzie

Resource types for population of the EIGR (only metadata):

- Research and applied research projects (e.g. EU and Interreg projects)
- Technical reports and guidances
- Surveys including relevant data and maps
- Books and book chapters
- Consulting reports for ministries and other authorities
- Monographs etc., etc.,

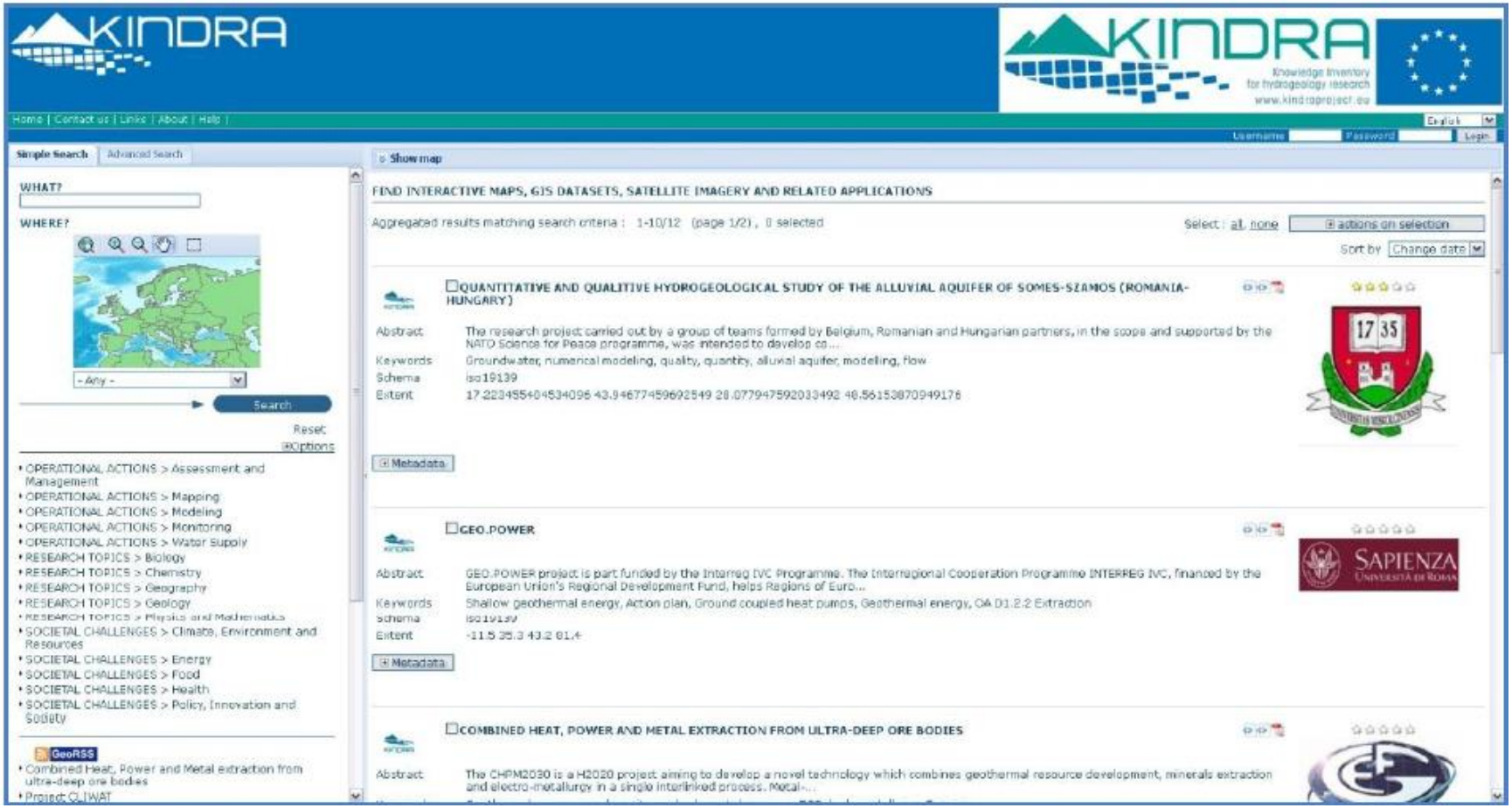
Classification of 'research' and 'knowledge' based on the degree of Quality Assurance

Definition of research and knowledge classes 1 to 4.

Class-1	Class-2	Class-3	Class-4
Articles in peer reviewed journals occuring in WoS or Scopus databases only	Conference proceedings, monographs, book chapters etc. Found in WoS and Scopus extended databases (all entries)	Reports from research projects, National technical journals etc. with internal or external QA (identified by EFG experts) .	Reports, data reports, popular journals, newsletters etc. with no certain QA (identified by EFG experts)

The EIGR user interface (Geonetwork)-

for groundwater research upload and viewing



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

FREEWAT
Free and Open Source Software Tools for Water Resource Management
EU HORIZON 2020 Project

United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme

EIGR Data Catalogue

- **Repository of Metadata** concerning Research and Knowledge linked to Groundwater Research through Europe since 2000.

- The **ISO 19139 Metadata template** is adapted, making it compatible with the specifications of the HRC-SYS.

- Compliance with all the **INSPIRE specifications**

- A **EIGR User Manual** has been drafted in order to allow users to upload contents to the EIGR

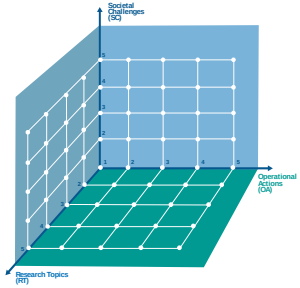
- **Tools** are being developed to exploit the information uploaded

Future data processing: indicators and tools to be adopted for gap and trend analysis

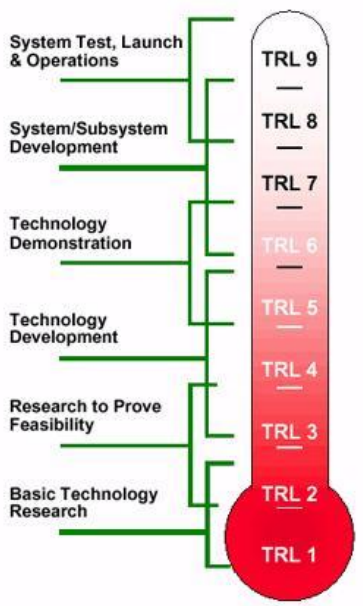
- **Main categories**
  - Societal challenges
  - Research topics
  - Operation actions

- **Research and Knowledge classes: R1 R2 K3 K4**

- **Keyword list related to the main categories: cube approach**



- **Technology Readiness Levels classification**

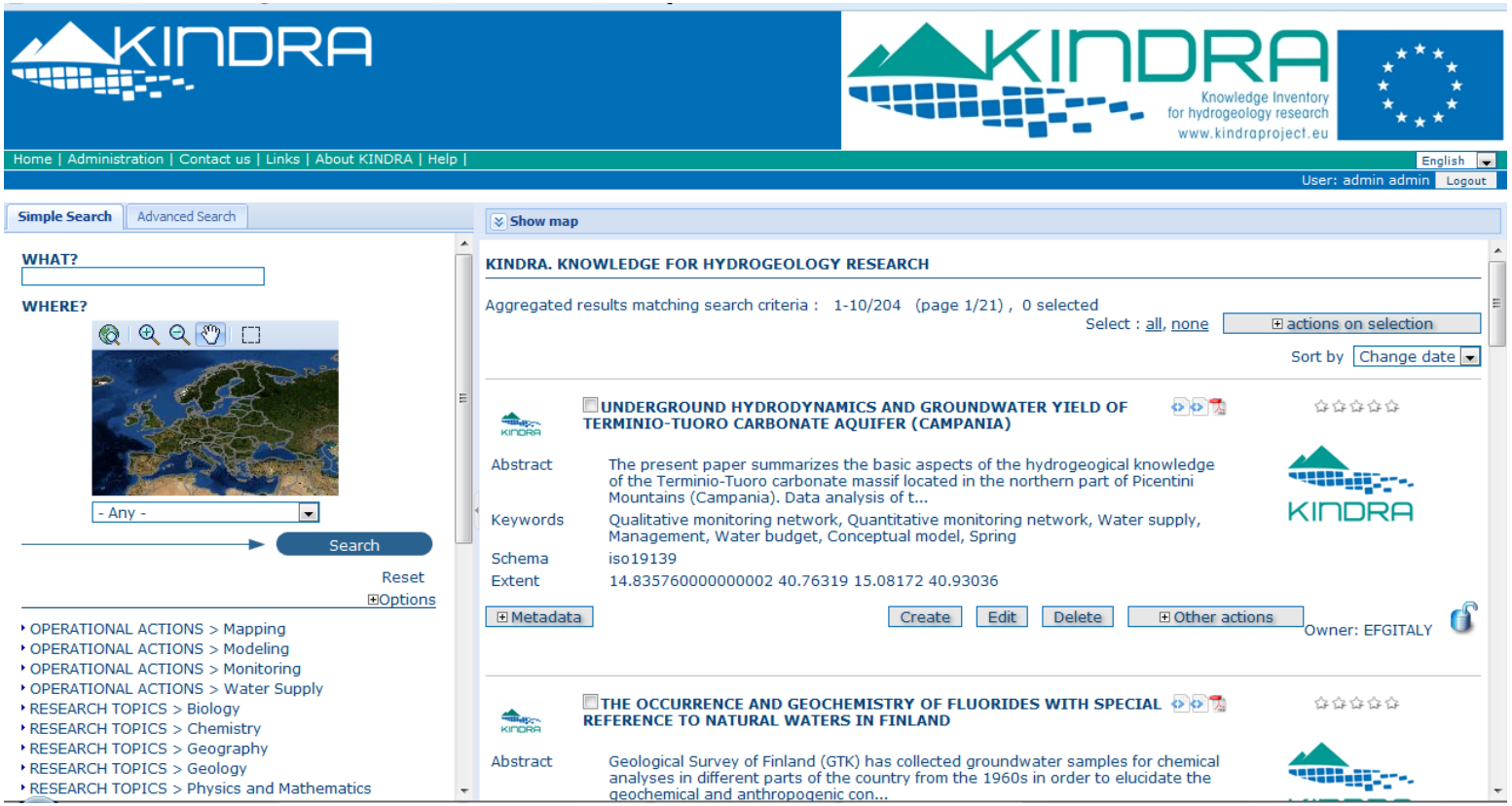


- **Geographical location of the classified document**

- **Patents**

EIGR user interface

Information Search Tool



EIGR data repository (1/2)

• Information inserted in the EIGR must be as complete as possible.

• This is to allow the **tools** we are developing to carry out a thorough **information analysis**.

• The EIGR will not only serve as a **repository of knowledge**, but as a tool that will allow for **queries and searches** based on keywords, **generating statistics, diagrams and other functions** to help support the exploitation of the catalogued information.

EIGR data repository (2/2)

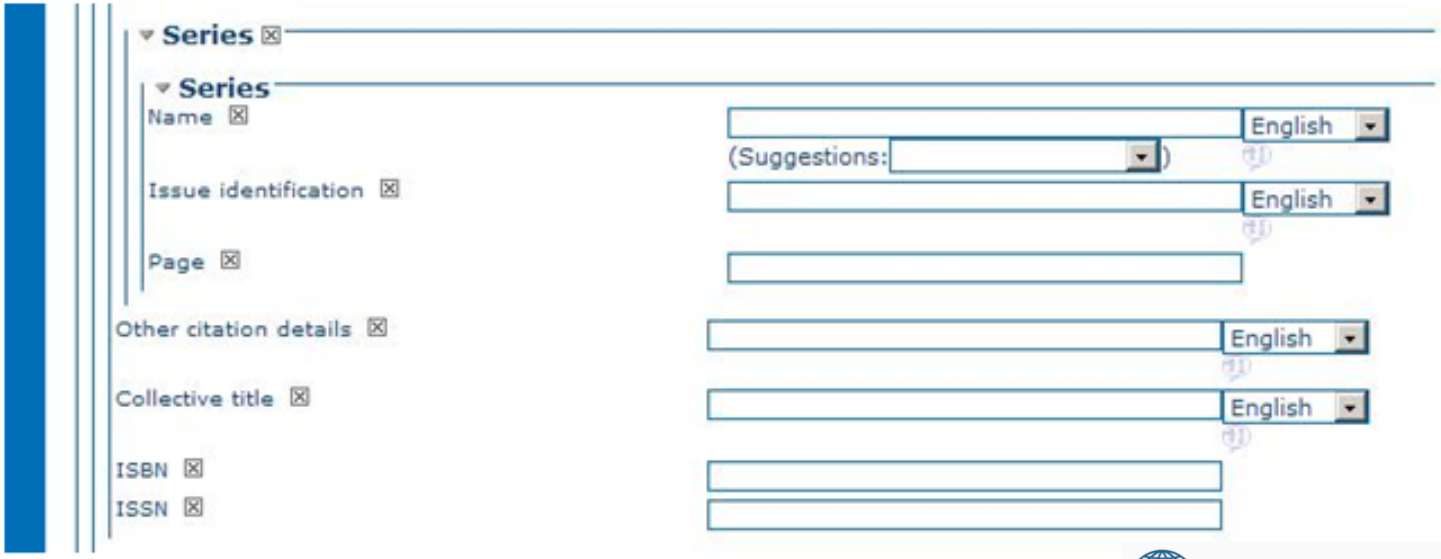
The inclusion of resources into the EIGR is carried out by completing a number of fields included in the EIGR Metadata template

The **EIGR Metadata** template is divided into four Main Sections:

- RESOURCE IDENTIFICATION INFORMATION
- DISTRIBUTION INFORMATION
- DATA QUALITY INFORMATION
- METADATA INFORMATION

RESOURCE IDENTIFICATION INFORMATION

Series: (Information concerning the series or collection to which the resource belongs to.)
Name: (Name of the series or collection to which the resource belongs to.)
Issue identification: (Issue of the series or collection to which the resource belongs to.)
Page: (Details on which pages of the publication the resource was published.)
Collective title: (Title of the collective series or collection to which the resource belongs to.)
ISBN: (International Standard Book Number.)
ISSN: (International Standard Serial Number.)

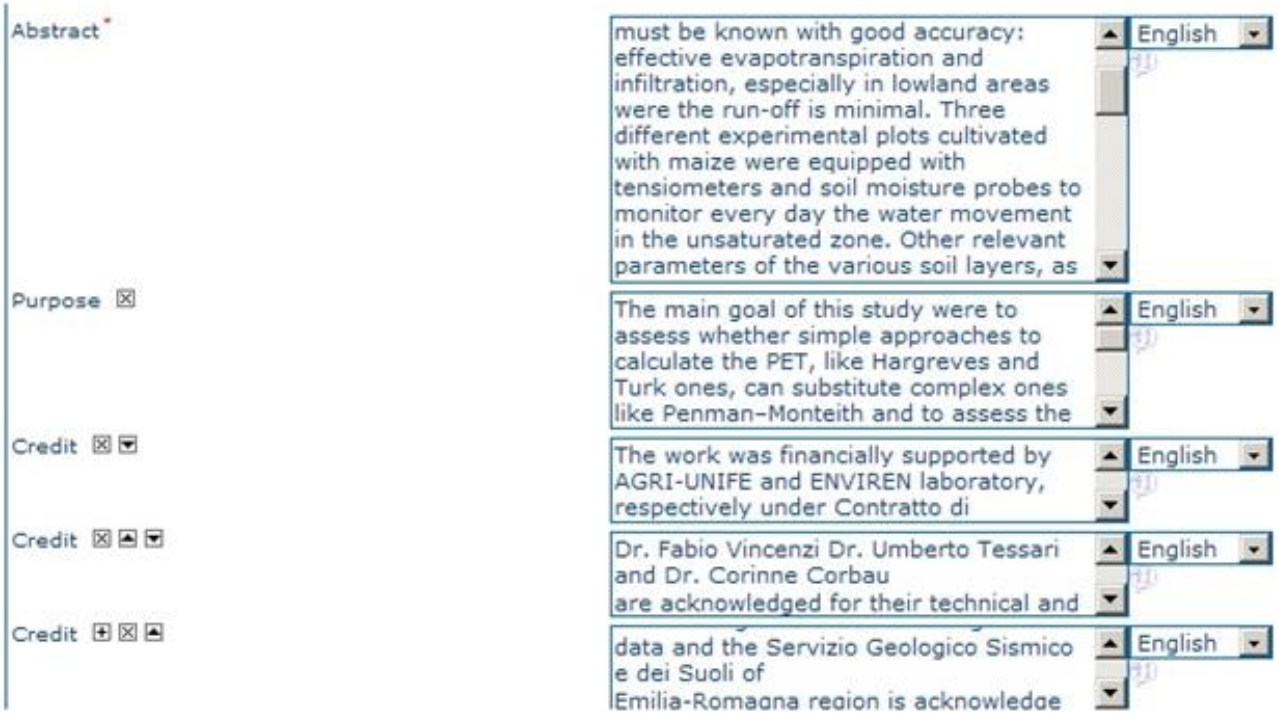


RESOURCE IDENTIFICATION INFORMATION

Abstract*: (a brief narrative summary of the content of the resource)

Purpose: (Purpose for which the resource was created)

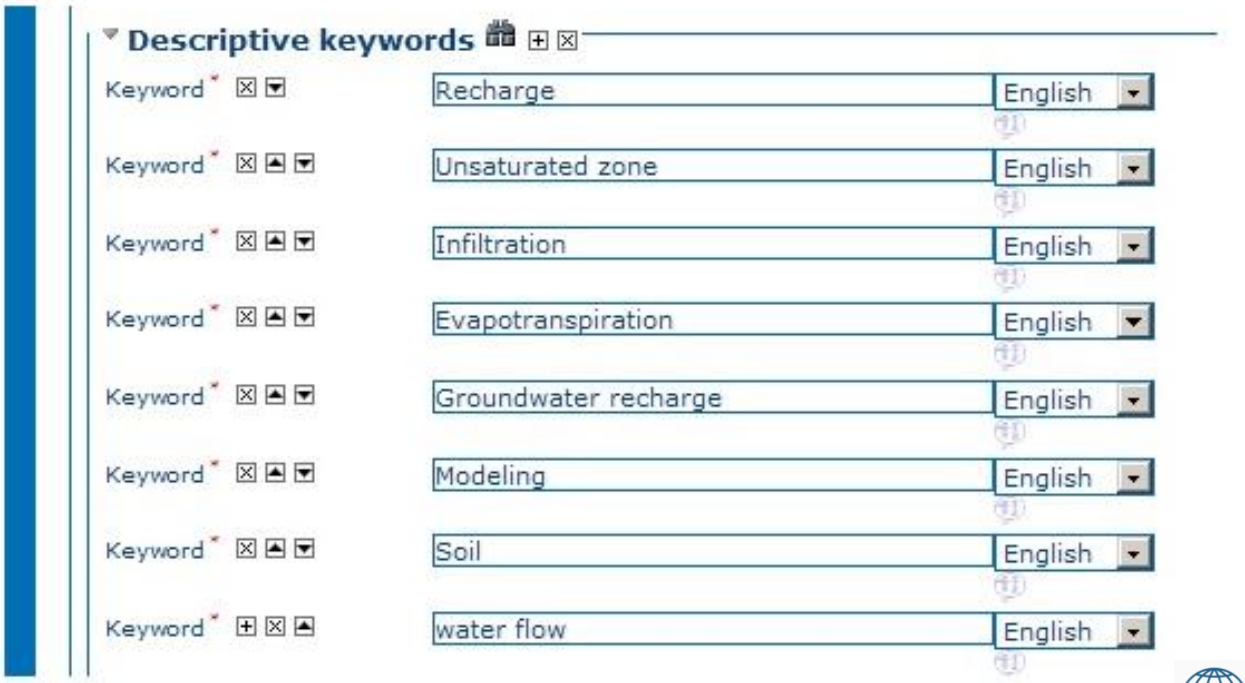
Credit: (Recognition of the organizations or programs who contributed to the resource and/or are responsible for funding, amount of funding or total budget. The field may be included as many times as may be required according to the amount of existing organizations)



RESOURCE IDENTIFICATION INFORMATION

Descriptive Keywords*: (The keyword value is a commonly used word, formalized word or phrase used to describe the subject. They help narrowing a full text search and allow for structured keyword search)

NOTE! Insertion of keyword is mandatory



RESOURCE IDENTIFICATION INFORMATION

Resource constraints: (Provides information about constraints that apply to the resources)

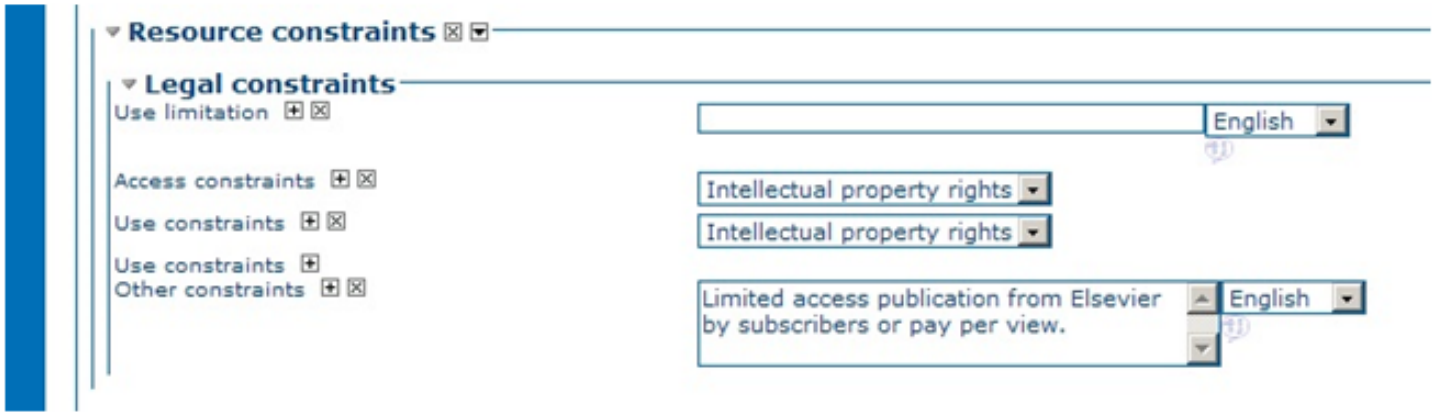
Legal constraints: (Restrictions and legal prerequisites for accessing and using the resource or metadata)

Use limitations: (Limitation affecting the fitness for use of the resource, for example if it is not apt to be employed for further research efforts due to specific conditions)

Access constraints: (Restrictions to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource: License, Patent, Pending Patent, restricted, Trademark, Copyright)

Use constraints: (Restrictions to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the resource: License, Patent, Pending Patent, restricted, Trademark, Copyright)

Other constraints: (Other constraints or legal prerequisites for accessing and using the resource)



RESOURCE IDENTIFICATION INFORMATION

Topic categories*: These are the overarching categories defined by the HRC-SYS: Societal Challenges (SCs), Operational Actions (OAs) and Research Topics (RTs). It is mandatory to classify the record individuating at least one main SC, one main OA and one main RT.

RESOURCE IDENTIFICATION INFORMATION

Extent: (Spatial reference of the resource)

Geographic Element: (The geographic component of the extent referring to the resource)

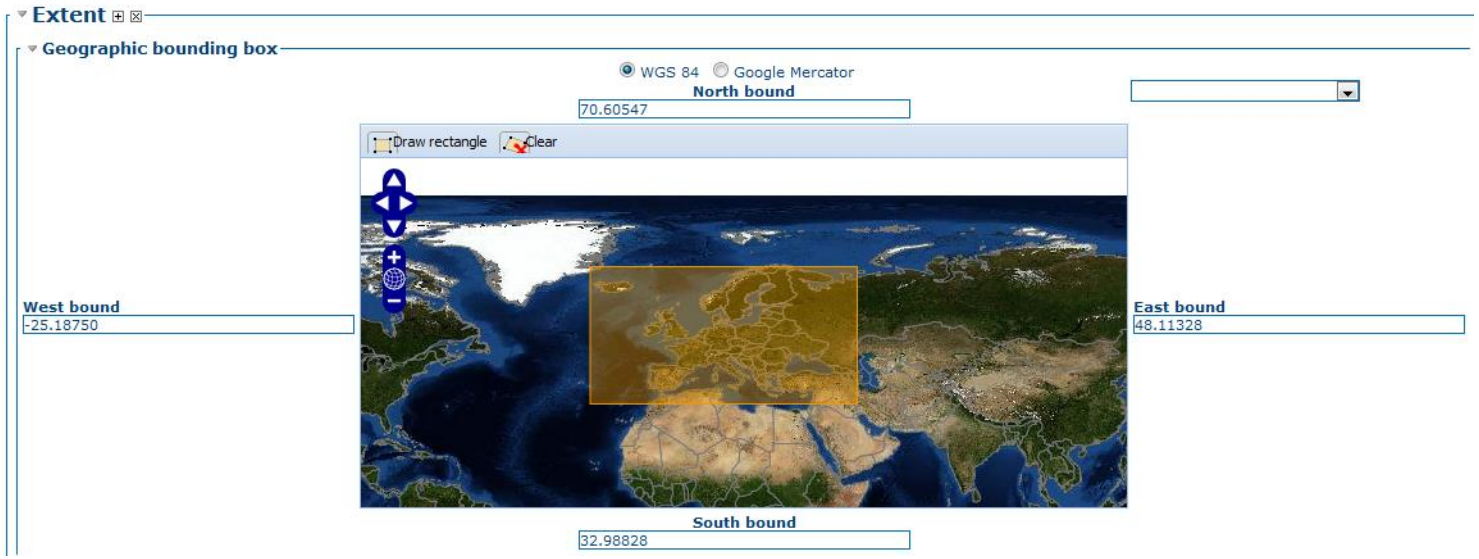
Geographic bounding box: This is the geographic position of the resource given as a bounding box where the following items can be specified:

West longitude:

East longitude:

North latitude:

South latitude:



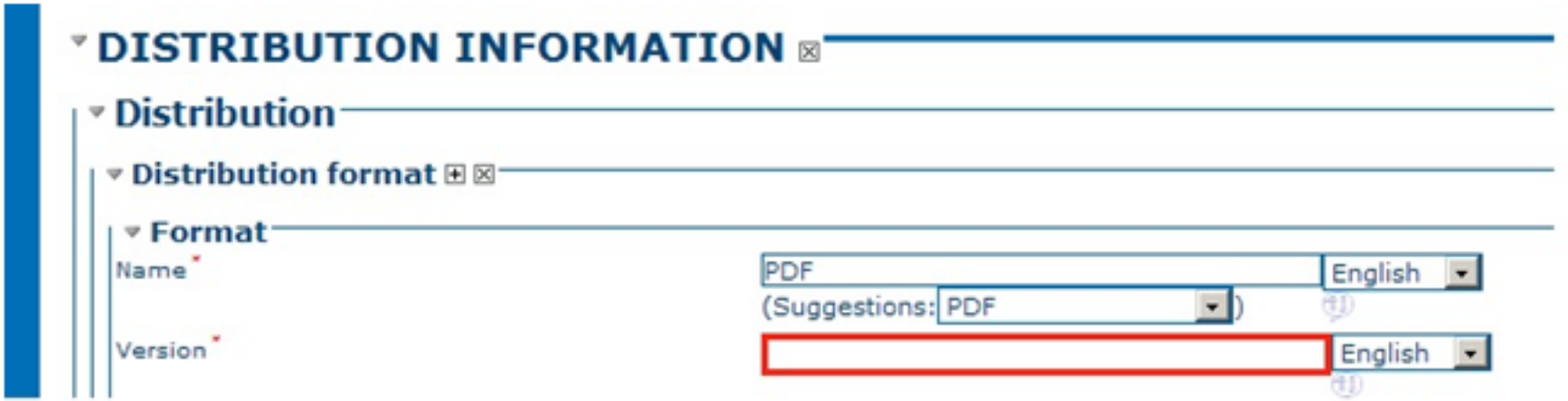
DISTRIBUTION INFORMATION

Distribution format: (Provides a description of the format of the data to be distributed)

Format*: (Description of the availability of the resource, be it either a file, message, storage device or transmission method)

Name*: (name of the data transfer format)

Version*: (version of the format)



DISTRIBUTION INFORMATION

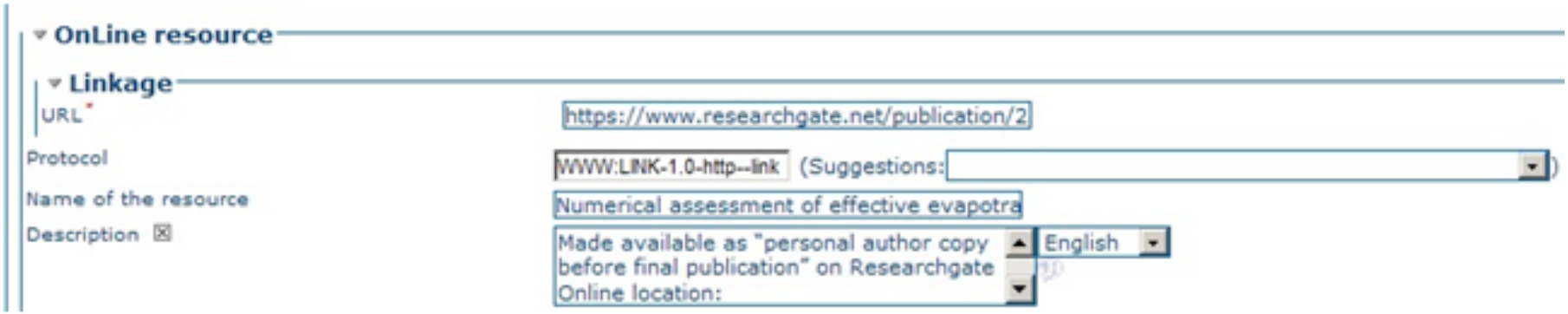
Online resource: (defines the online sources or link(s) from which the resource can be obtained)

Linkage: (Location (address) for online access using a Uniform Resource Locator (URL) address)

Protocol: (Connection protocol to be used)

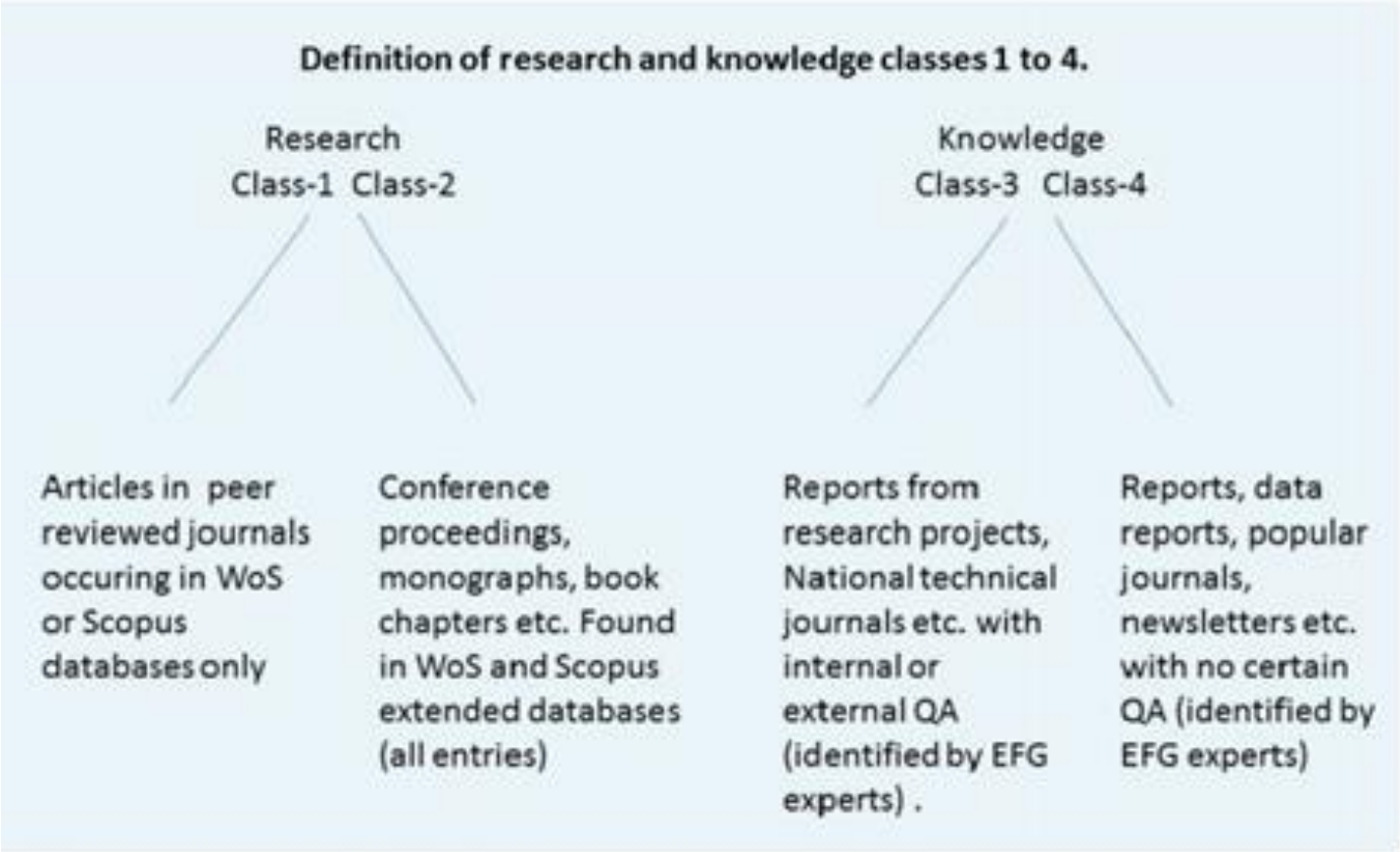
Name of the resource

Description: (Detailed text description of what the online resource is/does)



DATA QUALITY INFORMATION

Provides an overall assessment of the resources by classifying the work according to Research and Knowledge classes and TRL as defined by the HRC-SYS.



EIGR ICT

The development of **EIGR as an Information and Communication Technology Tools (ICT)** and subsequent use by professionals in the groundwater sector is helping the water sector to reach the SDG6 target to ensure availability and sustainable management of (ground)water

It does so by:

- providing an ICT which:
  (1) **supports the research, practitioner and decision making community** by providing an **information tool useful for targeting sustainable groundwater management**
  (2) is used to **identify research gaps and trends** to be addressed to support SDG6 targets

- increasing the **visibility of the groundwater** topic and enhancing the **awareness of groundwater availability and sustainability**

Thank you for your attention !