

The KINDRA project contribution: Making groundwater visible

*Technical/Scientific session –
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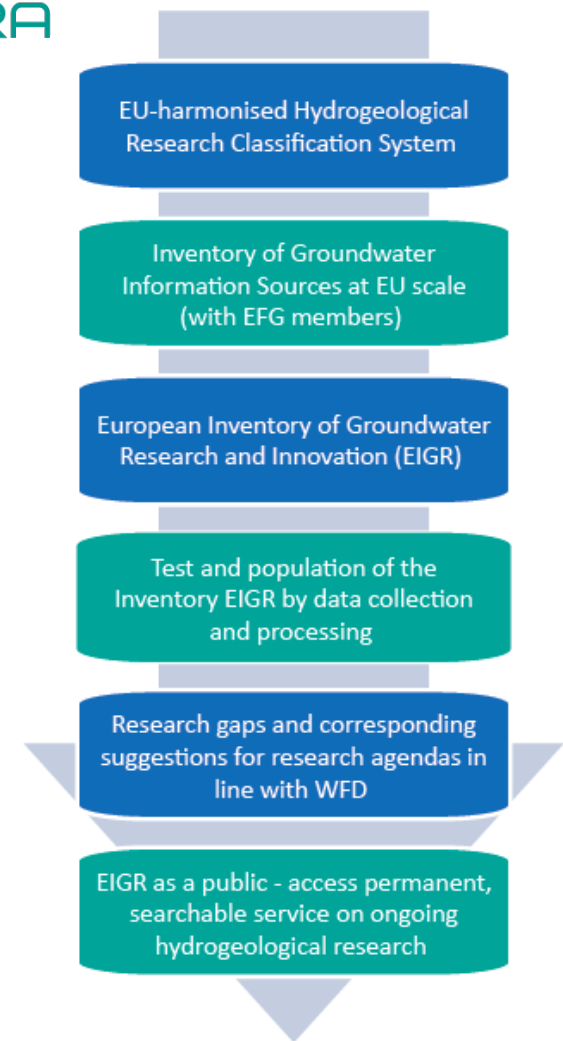
International Association of Hydrogeologists

Project aims (2015-2018)



To create an inventory of GW knowledge and use the inventory to identify critical research challenges in line with the implementation of the WFD and new innovation areas within integrated water resources management based on the latest research.

- Making groundwater visible:**
by dissemination activity along the project, but also raising its role on technical and decision-makers tables inside the “water” community
- Making groundwater accessible:**
By classifying groundwater research & knowledge, intersecting themes in a multidisciplinary approach with reference to societal challenges, and collecting existing information in a public access metadata tool (EIGR)
- Making groundwater treasured:**
By analyzing gaps&trends in groundwater research & knowledge, to identify actions aimed at recognize the fundamental role of groundwater resources in Europe (policy support, research development, knowledge sharing, etc.)



Classification of GW research



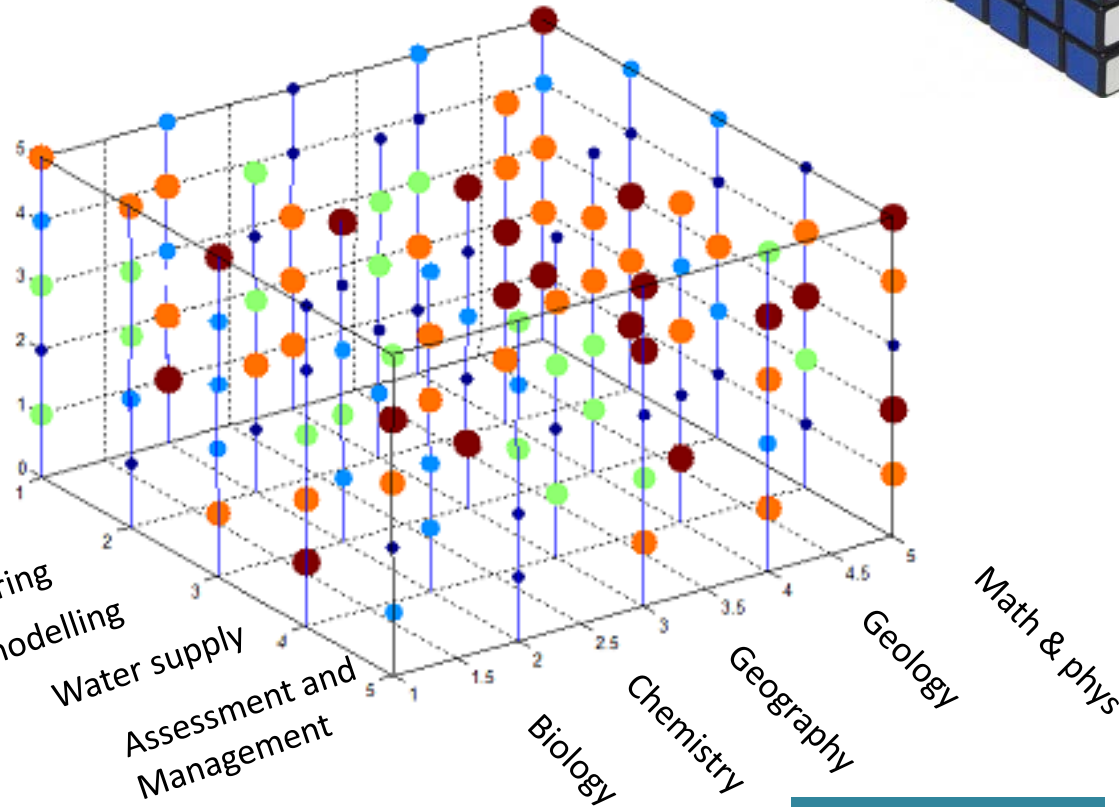
A list of about 280 keywords have been organized in a *tree hierarchy*, identifying *three main categories*: Societal Challenges (SC), Operational Actions (OA) and Research Topics (RT). In each of these three categories, *5 overarching groups* have been defined for easy overview of main research areas, representing level 1. The intersections among SC, OA and RT define the coordinates of each information groundwater related

Societal Challenges

- Policy & innovation
- Climate & environ.
- Energy
- Food
- Health

Operational Actions

- Mapping
- monitoring
- modelling
- Water supply
- Assessment and Management



Research Topics

The European Inventory of Groundwater Research EIGR

The screenshot displays the KINDRA Knowledge Inventory for Hydrogeology Research interface. The header includes the KINDRA logo and the European Union flag. The main content area shows search results for 'KINDRA. KNOWLEDGE FOR HYDROGEOLOGY RESEARCH'. The results are filtered to show 1-10/2102 items on page 1/2111. Three results are visible:

- WATER BASIN MANAGEMENT PLAN OF THE WATER BASINS AT THE WATER DISTRICT OF WESTERN PELOPONESE (GR 01) GREECE**: Abstract describes a master plan for river basins in Greece. Keywords include 'Groundwater resources, Integrated water resources management, Quality, Groundwater body, WFD'. Schema: iso19139. Extent: 21.261322021482 36.602783203125 22.431365966795 37.8662109375.
- UNDERSTANDING RIVER-SEDIMENT-SOIL-GROUNDWATER INTERACTIONS FOR SUPPORT OF MANAGEMENT OF WATERBODIES (RIVER BASIN & CATCHMENT AREAS)**: Abstract discusses the impact of climatic conditions and land use on water quality. Keywords include 'River, Sustainable water use, Pollution, Groundwater resources, Chemical status'. Schema: iso19139. Extent: -25.1875 32.98828125 48.11328125 70.60546875.
- DEVELOPMENT OF REHABILITATION TECHNOLOGIES AND APPROACHES FOR MULTIPRESSURED DEGRADED WATERS AND THE INTEGRATION OF THEIR IMPACT ON RIVER BASIN MANAGEMENT**: Abstract mentions the AQUAREHAB project. Keywords include 'Groundwater resources, Coupled groundwater surface water modeling, Pesticide, Nitrate, Ecology'. Schema: iso19139.

The interface also features a search sidebar with filters for 'WHAT?' and 'WHERE?', a navigation menu on the left, and a 'GeoRSS' link at the bottom.

<http://kindraproject.eu/eigr/>

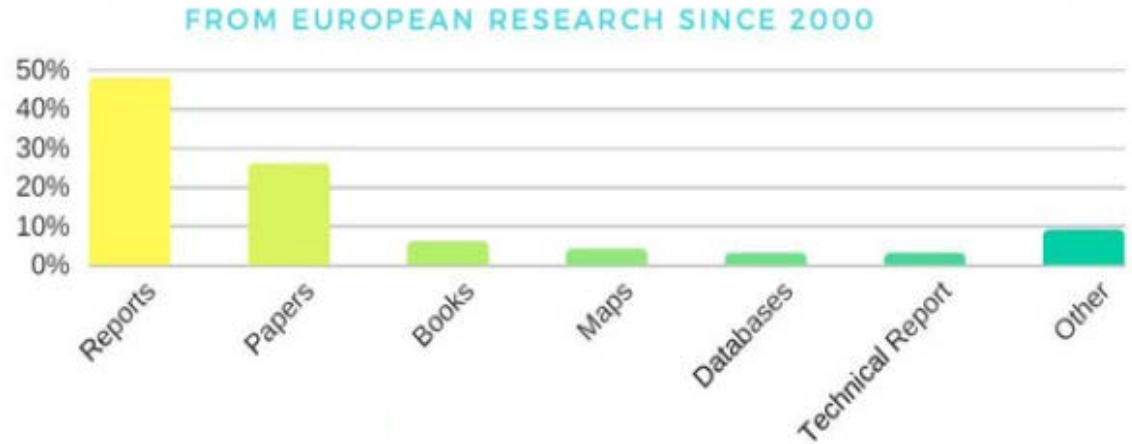
EIGR User Interface:
based on Geonetworks.

EIGR: not only research but also knowledge



Not only peer review papers, but mainly reports, guidelines, databases, etc.

Grey and national literature are included!



Databases



Surveys including relevant data and maps



Consulting reports for ministries and other authorities



Peer review papers



Technical reports and guidances

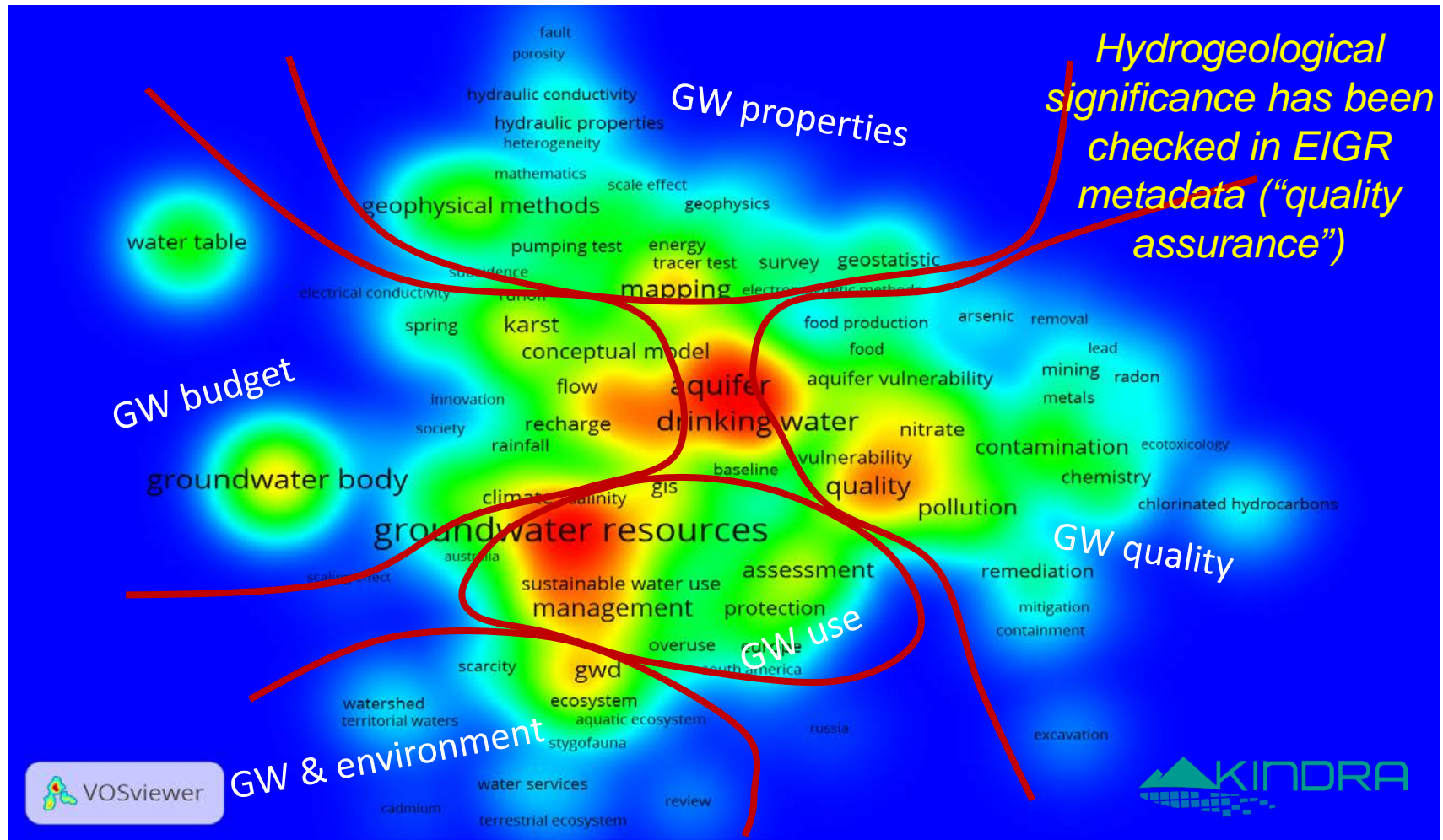


Books and book chapters, monographs, etc.



Research and applied research projects (e.g. EU and Interreg projects)

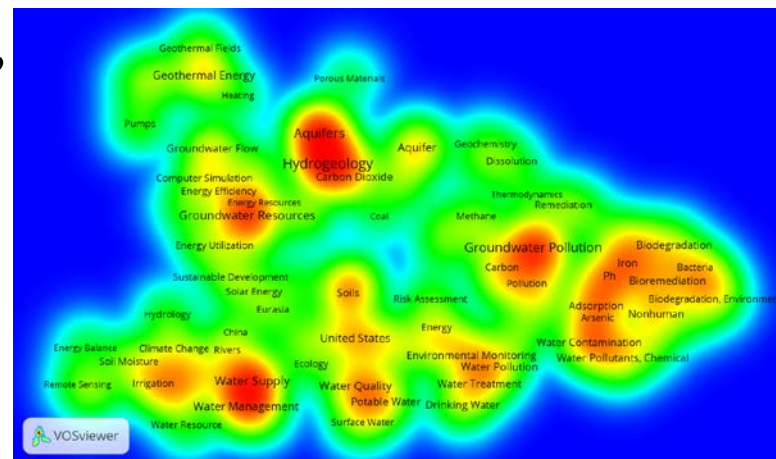
Gap Analysis on EIGR content vs SCOPUS content



Challenges/Lessons/Conclusions



- Collection of papers/report/databases/grey literature (2/3 of records) on groundwater issues previous scattered among EU
- Adoption of a new classification hierarchy by keywords and 3 main categories (societal challenges, operational actions, research topics)
- Inserted metadata (more than 2200 records from 20 countries) subjected to a gap&trend analysis
- Involvement of the hydrogeological community, including researchers and practitioners, both as users and as editors (future insertion of new records, access ensured by KINDRA partners)
- Final results to be used for EU policy support and implementation of water directives (recommendations)



Next steps

- Integration of KINDRA results in new projects is recommended, to extoll groundwater information at EU level.
- Possible developments include:
 - ✓ adopt and/or test our KINDRA classification system in GW researches (e.g. GeoERA EGDI)
 - ✓ increase the number of records of EIGR inserting metadata related to activities and existing databases (“harvesting”) by Geological Surveys and/or Environmental Ministries
 - ✓ integrate our platform with other existing ICT platforms and other databases/projects





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