



International Groundwater Resources Assessment Centre

# The Global Groundwater Information System (GGIS)

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Improved Groundwater Management in the Arab Region

Cairo, 30 Octobre 2023

<https://ggis.un-igrac.org/>



Ministerie van Infrastructuur  
en Waterstaat



WORLD  
METEOROLOGICAL  
ORGANIZATION

# IGRAC – International Groundwater Resources Assessment Centre

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## Who we are?

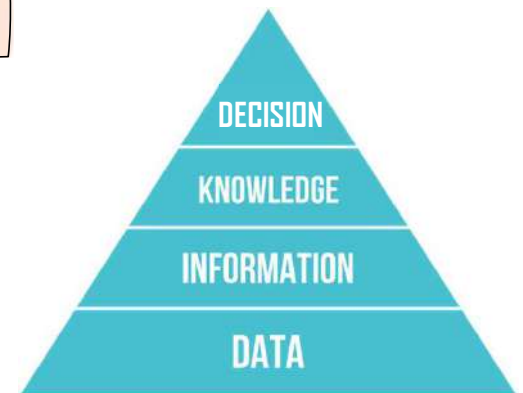
*Global groundwater centre under the auspices of UNESCO and WMO*

## Our mission

*We provide evidence-based information & knowledge on groundwater worldwide to support decision-making for a sustainable planet.*

## What do we do?

- *Acquire and manage global groundwater data*
- *Groundwater assessment and research*
- *Advocacy and awareness raising.*



# Global Groundwater Information System (GGIS)

The screenshot shows the homepage of the Global Groundwater Information System (GGIS). At the top, there is a navigation menu with links for Data, Maps, Dashboards, GeoStories, Users, and About. The IGRAC logo is on the right, along with a search bar and links for Register, Sign in, and English. The main banner features a photograph of a large crowd of people, with the text: "The Global Groundwater Information System (GGIS). The GGIS is an interactive portal for sharing data and information on groundwater resources around the world. It gives access to map layers, documents, and well and monitoring data. It also contains several thematic map viewers." Below the banner are two buttons: "Visit IGRAC Website" and "Hide this banner".

## Featured

- Transboundary Aquifers of the World map**  
The global map of transboundary aquifers (TBAs) shows the surface delineation of aquifers extending...
- Global Groundwater Monitoring Network (GG...)**  
The Global Groundwater Monitoring Network (GGMN) is a participative, web-based network of networks, set up to improve quality and accessibility of groundwater monitoring information and...
- MAR Portal**  
The MAR Portal contains the Global MAR Inventory, an inventory of over 1200 sites where Managed...
- Senegalo-Mauritanian Aquifer Basin (SMAB) /...**
- Dinaric Karst (DIKTAS Project)**
- Transboundary Aquifers (TWAP Project)**

Version 4.1.1

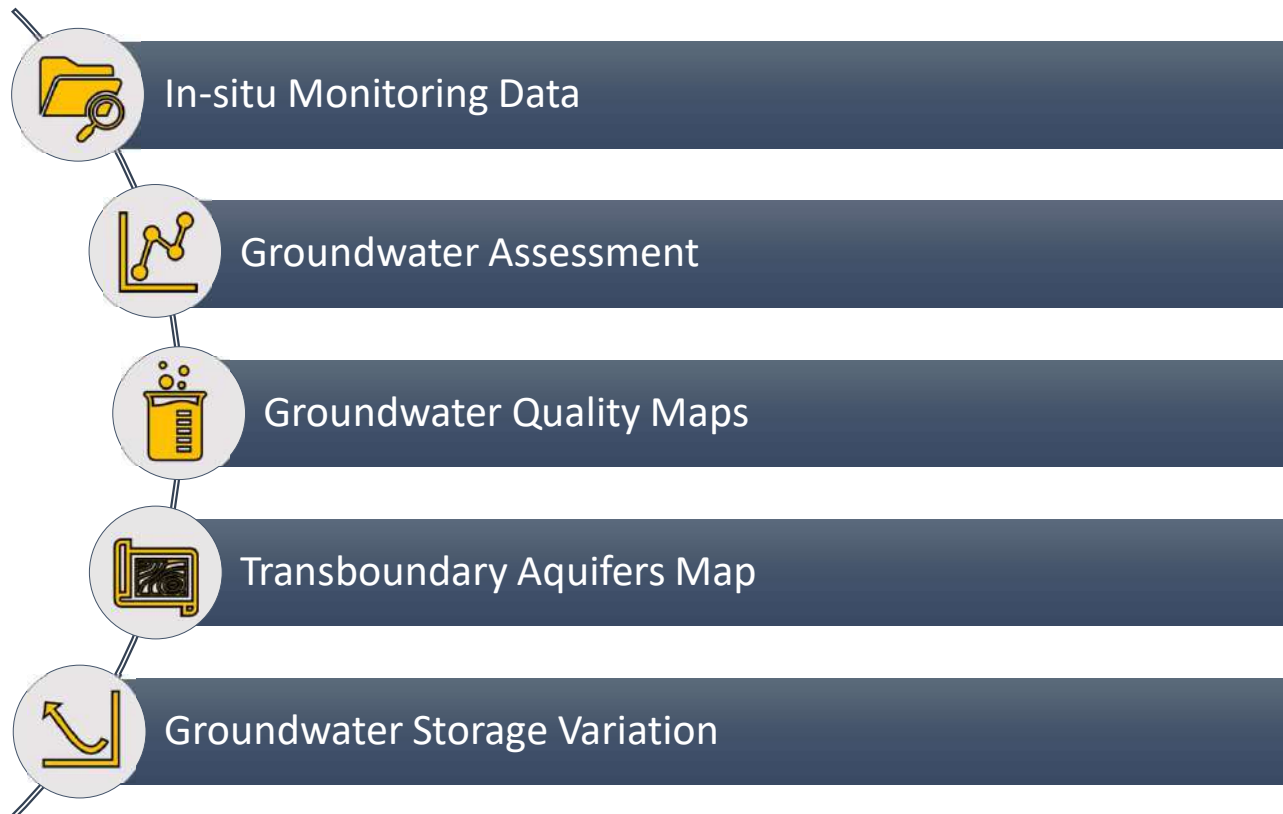
Brought to you by Igrac Web site developed by

Recognizing the value of transboundary water systems and the fact that many of them continue to

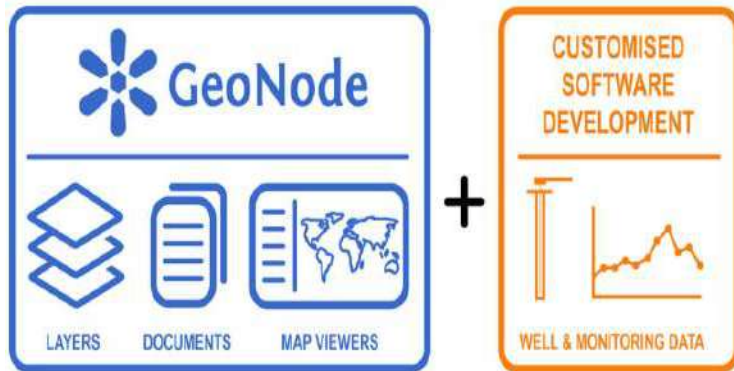
<https://ggis.un-igrac.org/>

## Data in the GGIS

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# GGIS Structure



Architecture of the GGIS

## Data Catalogue

Filter 324 Resources found

Order by

- AF 1-Karoo Sedimentary Aquifer**

This Transboundary Aquifers information sheet has been produced as part of the Groundwater Component of the...

admin View
- AS126-Saq-Ram Aquifer System (West)**

This Transboundary Aquifers information sheet has been produced as part of the Groundwater Component of the...

admin View
- AS 127 -Wasia-Biyadh-Aruma Aquifer System (North) Sakaka-Rutba**

This Transboundary Aquifers information sheet has been produced as part of the Groundwater Component of the...

admin View
- AS122-Kura River Valley Aquifer**

This Transboundary Aquifers information sheet has been produced as part of the Groundwater Component of the...

admin View

< 1 ... 11 12 13 14 >

Transboundary Aquifer Information Sheet

**AS126 - Saq-Ram Aquifer System (West)**

<p><b>Geography</b></p> <p>Total area (TA) (km<sup>2</sup>): 150 000          No. countries sharing: 2          Countries sharing: Jordan, Saudi Arabia          Population: 4 600 000          Climate zone: Arid          Main lithology: Sedimentary rock - sandstone</p>	<p><b>Hydrogeology</b></p> <p>Aquifer type: Multi-layered, hydraulically connected          Degree of confinement: Mostly confined, some parts unconfined          Main lithology: Sedimentary rock - sandstone</p>
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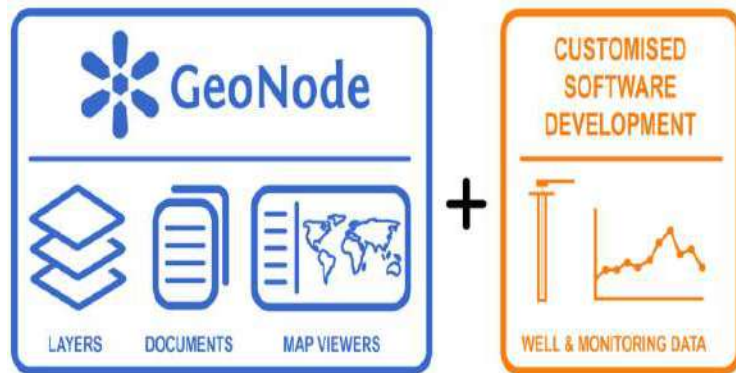
**AS126-Saq-Ram A...**

a document from admin / December 18th 2020

This Transboundary Aquifers information sheet has been produced as part of the Groundwater Component of the GEF Transboundary Water Assessment Programme (GEF TWAP). GEF TWAP is the first truly global comparative assessment of transboundary groundwater, lakes, rivers, large marine ecosystems and the open ocean. More information on TWAP can be found on [www.geftwap.org](http://www.geftwap.org). The Groundwater component of TWAP carried out a global comparison of 199 transboundary aquifers and the groundwater systems of 41 Small Island Developing States. The data used to compile this transboundary aquifer information sheet has been made available by national and regional experts from countries involved in the TWAP Groundwater project. For aquifers larger than 20 000 km<sup>2</sup> and which are not overlapping, additional data are available from modelling

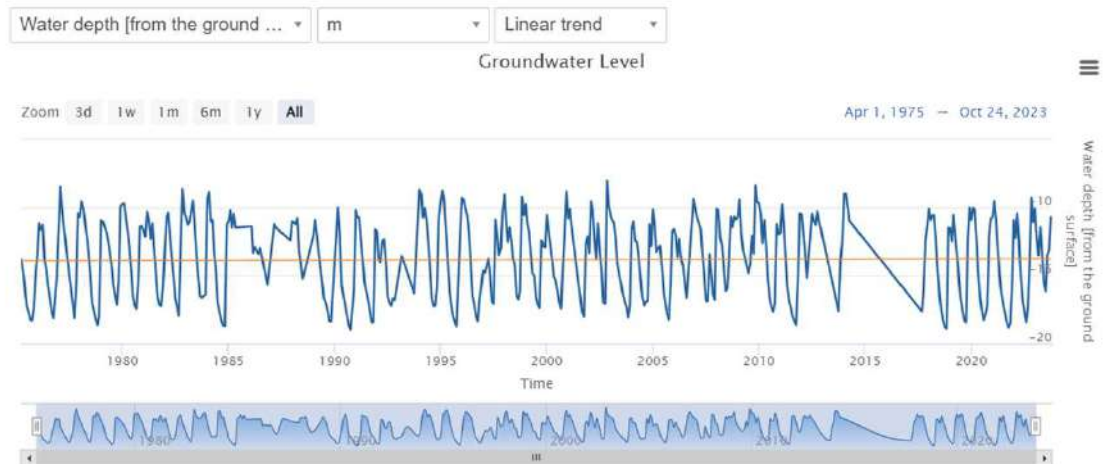
## Map Viewer

# GGIS Structure



*Architecture of the GGIS*

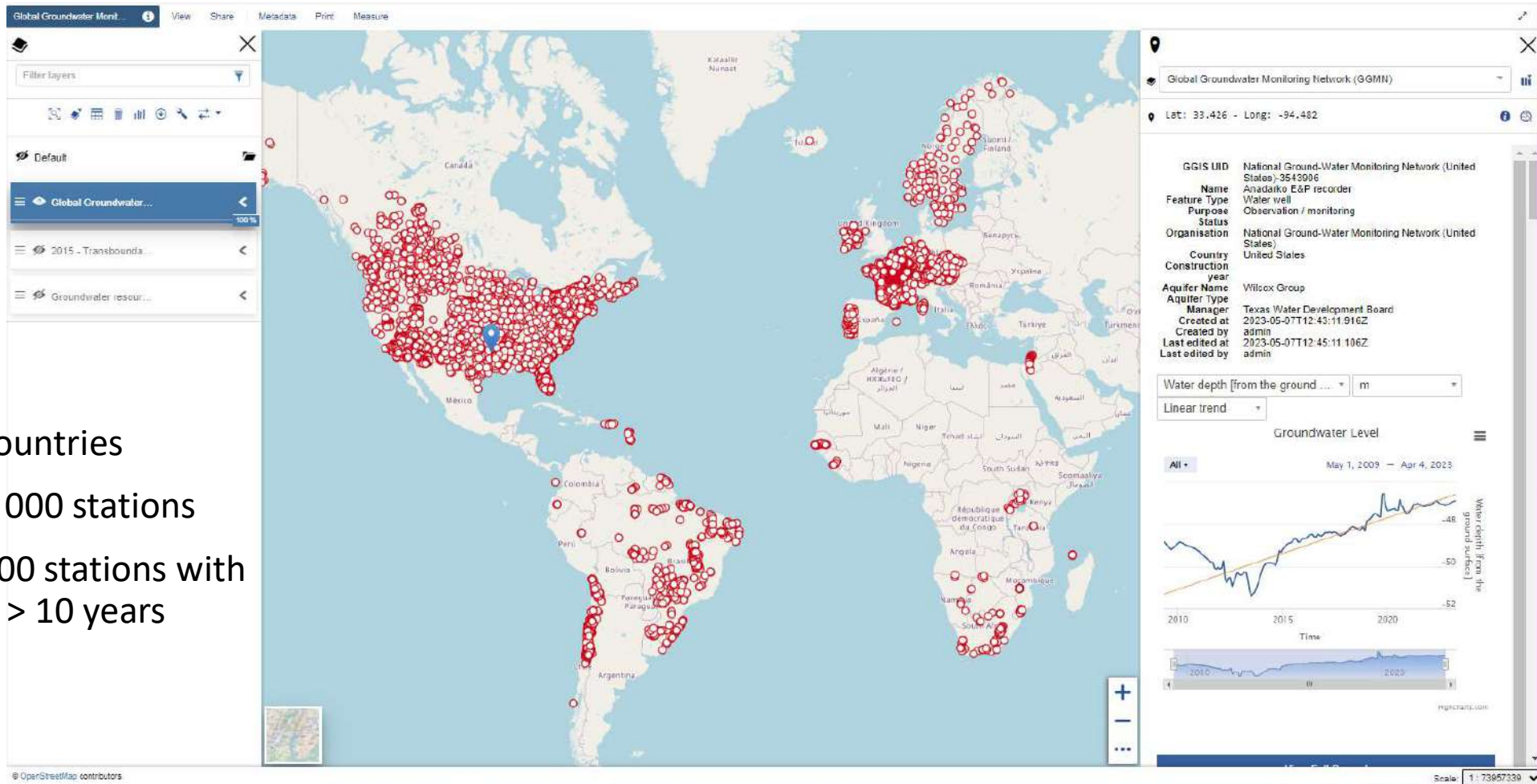
## Illustration Example



## Metadata:

- Name and type of well
- Latitude Longitude
- Elevation
- Country
- Drilling and construction
- Hydrogeology (Aquifer name and properties)
- Hydraulic properties
- Management Information

# Global Groundwater Monitoring Network (GGMN)



- 30 countries
- > 15 000 stations
- ~ 6000 stations with data > 10 years

# Global Groundwater Monitoring Network (GGMN)

## GENERAL INFORMATION

### Identification

GGIS UID ⓘ Wells for G3P evaluation-362718089552301

Original ID ⓘ 362718089552301

Name ⓘ 362718089552301

Feature type ⓘ Water well

Purpose Observation / monitoring

Status Active

Photo ⓘ



Description ⓘ This well was obtained at USGS (<https://cida.usgs.gov/ngwmn/>) as a candidate to be used in the evaluation of the Global Gravity-based Groundwater Product (G3P). For more information about the G3P project please visit <https://www.g3p.eu/>

### Location

Latitude ⓘ 36.4551111

Longitude ⓘ -89.9230278

Ground surface elevation ⓘ

Top of well elevation ⓘ

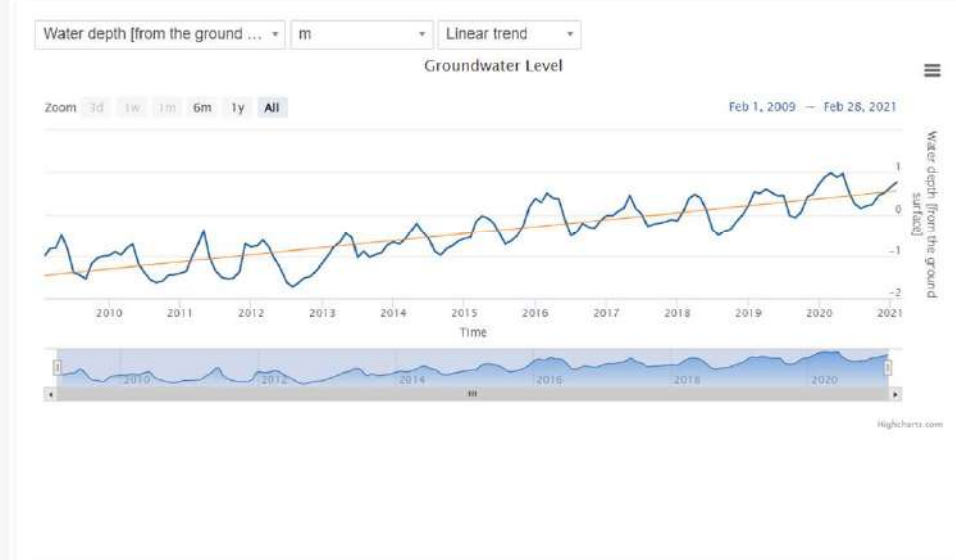
Country United States

Address ⓘ

## Measurement

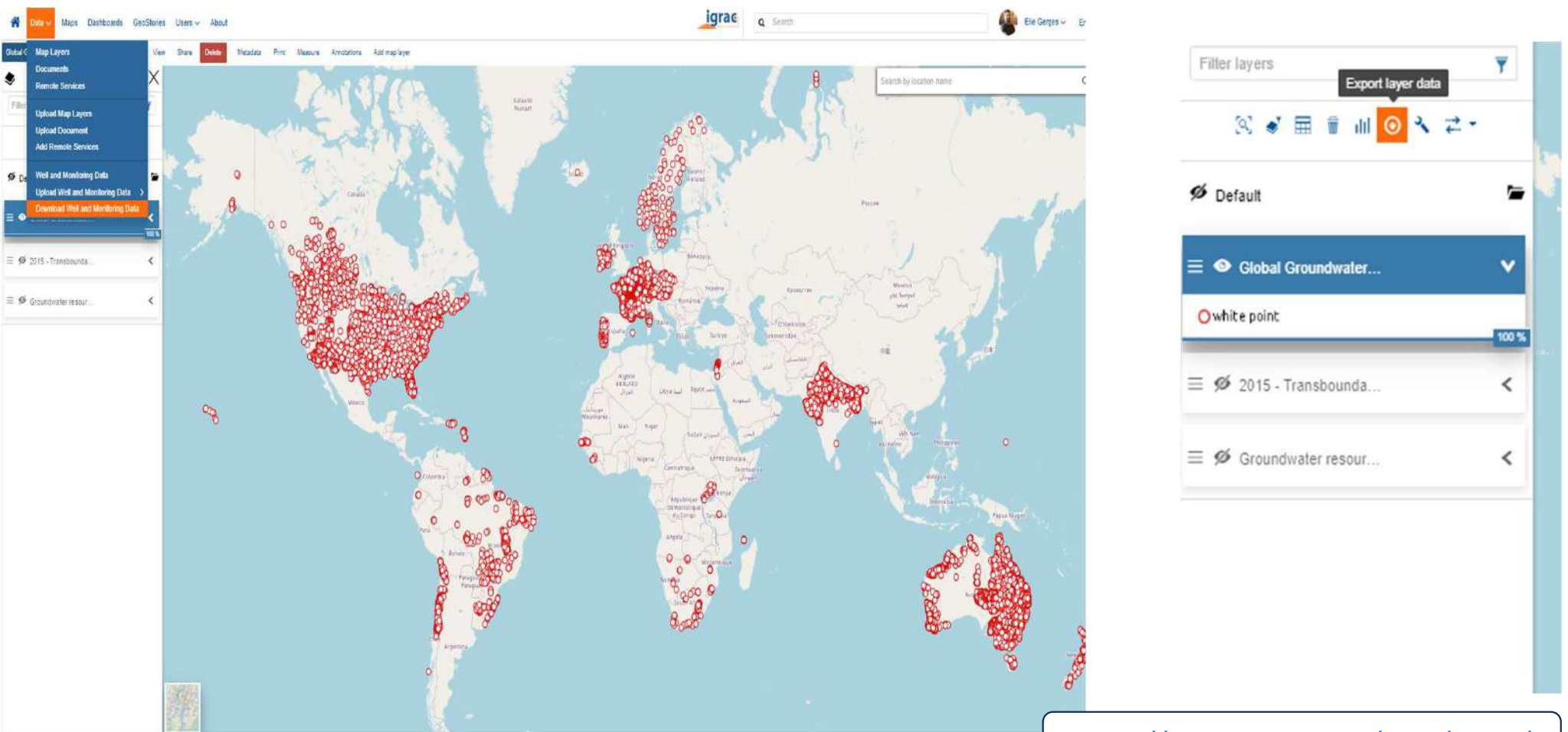
Date and Time	Parameter	Methodology ⓘ	Value	Info ⓘ
2021-02-28 00:00:00	Water depth [from the ground surface]		-0.762 m	ⓘ
2021-01-31 00:00:00	Water depth [from the ground surface]		-0.6389304 m	ⓘ
2020-12-31 00:00:00	Water depth [from the ground surface]		-0.515969032258064 m	ⓘ
2020-11-30 00:00:00	Water depth [from the ground surface]		-0.458216 m	ⓘ
2020-10-31 00:00:00	Water depth [from the ground surface]		-0.2372523870967742 m	ⓘ
2020-09-30 00:00:00	Water depth [from the ground surface]		-0.2060448 m	ⓘ

## Measurement



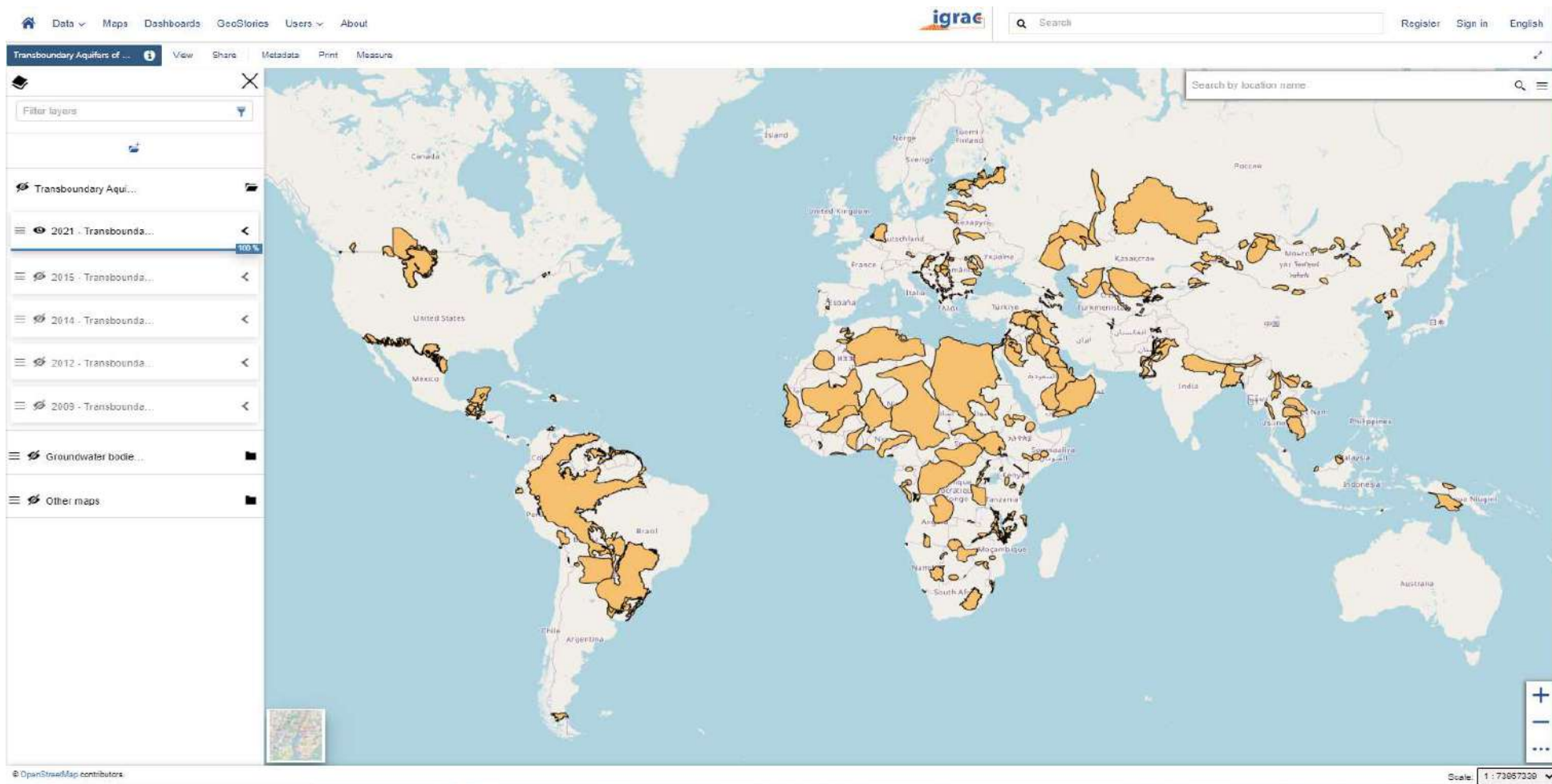


# Global Groundwater Monitoring Network (GGMN)



<https://ggis.un-igrac.org/view/ggm/>

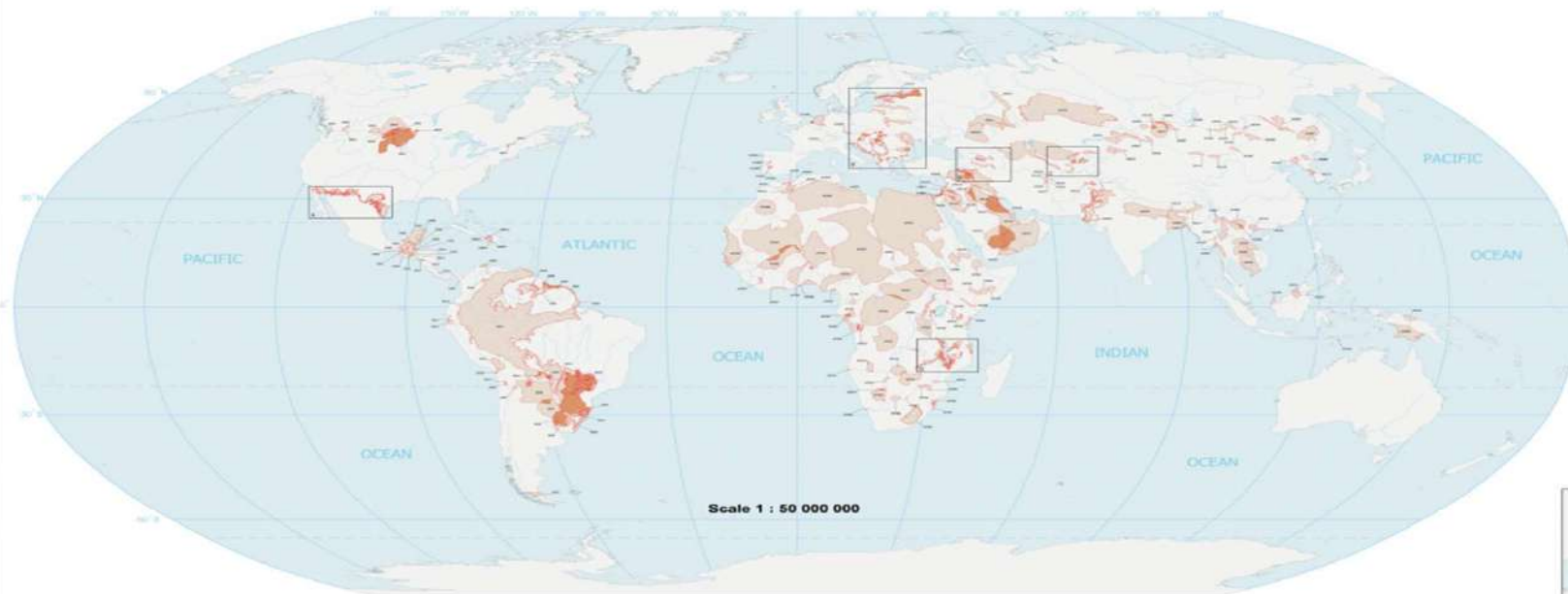
# Transboundary Aquifers



# Transboundary Aquifers

## Transboundary Aquifers of the World

- Update 2021 -



**Legend**

**Occurance and extent**

- aquifer
- overlapping area

**Type of TBA delineation**

- confirmed boundary
- unconfirmed boundary

**Geographic elements**

- rivers
- lakes
- detailed maps

**Prepared by IGRAC**  
**Base maps**  
 Country borders: The United Nations Clear Map (2018)  
 Rivers and lakes: ESR1 (2018)

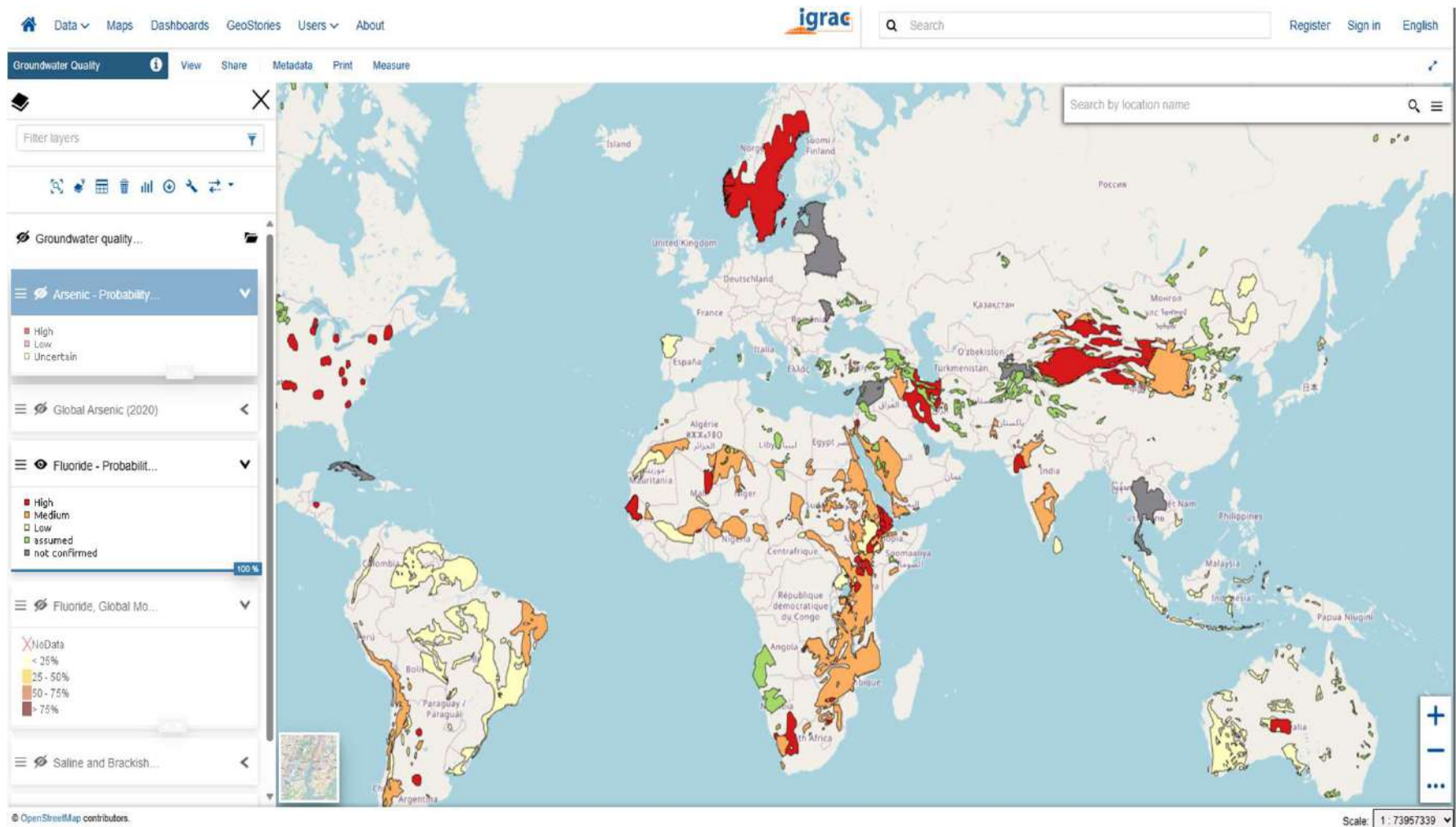
**Map projection**  
 Robinson projection, geographic coordinates, spheroid WGS84, longitude of central meridian 0°  
 © IGRAC, December 2021  
 Released under the Creative Commons licence Attribution Non-Commercial Share Alike.

**Disclaimer**  
 The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. A full disclaimer is available on the back of this map.

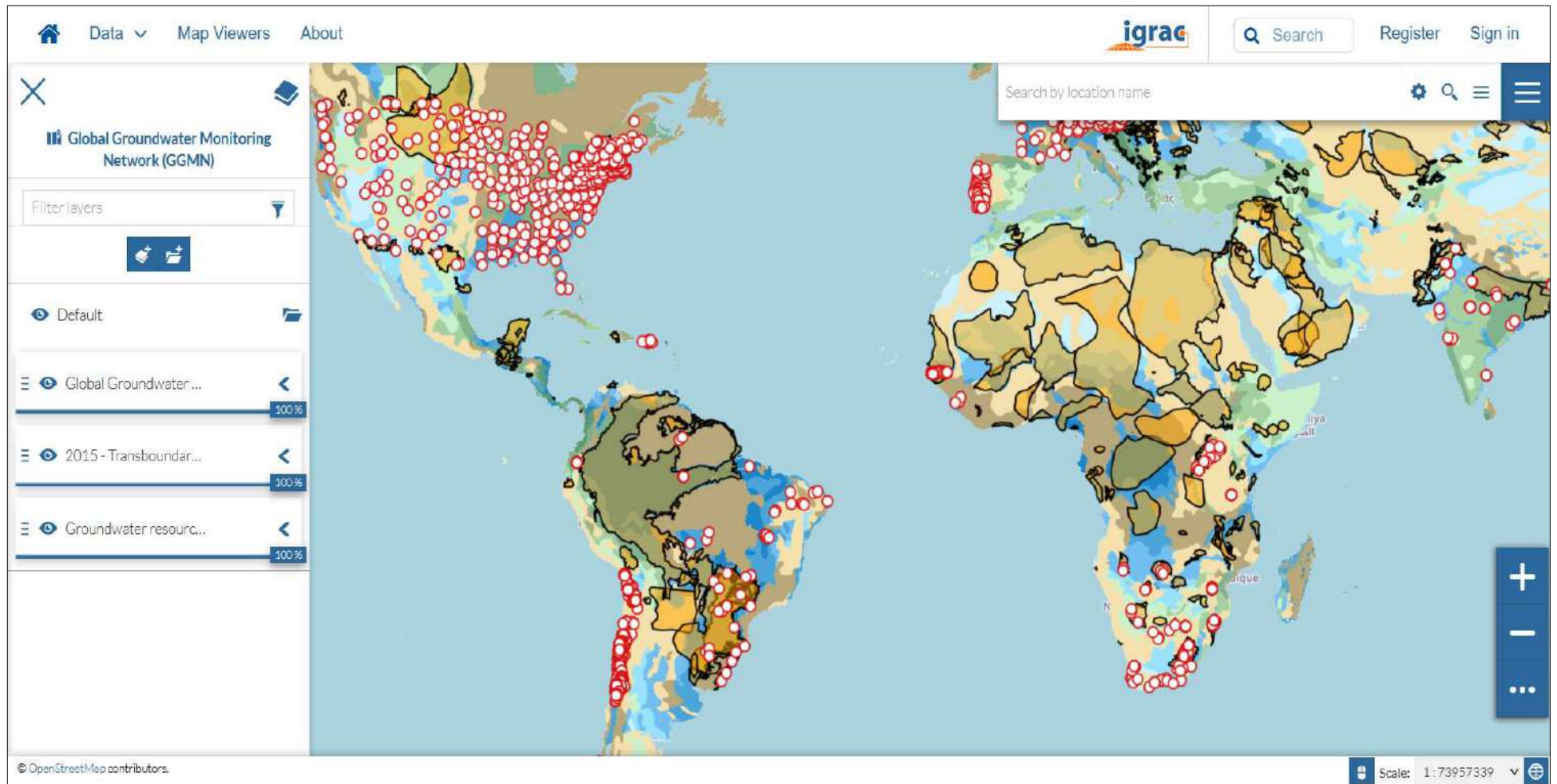


# Groundwater Quality Map

Arsenic  
Fluoride



# The Global Gravity-Based Groundwater Product (G3P) Project



# Global Research and Assessment

From monitoring data to...  
...information for decision-making

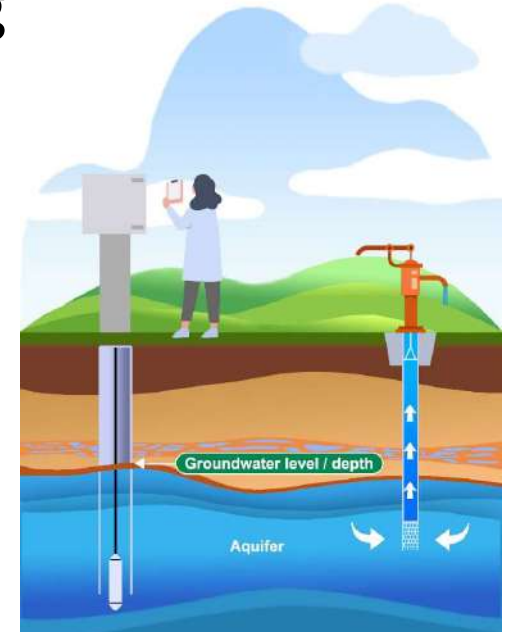
## 1) HydroSOS: Global hydrological status and outlook System

- Groundwater levels at monitoring points
- Compared with historical groundwater levels
- Results: groundwater level status

Based on methodologies already developed by countries

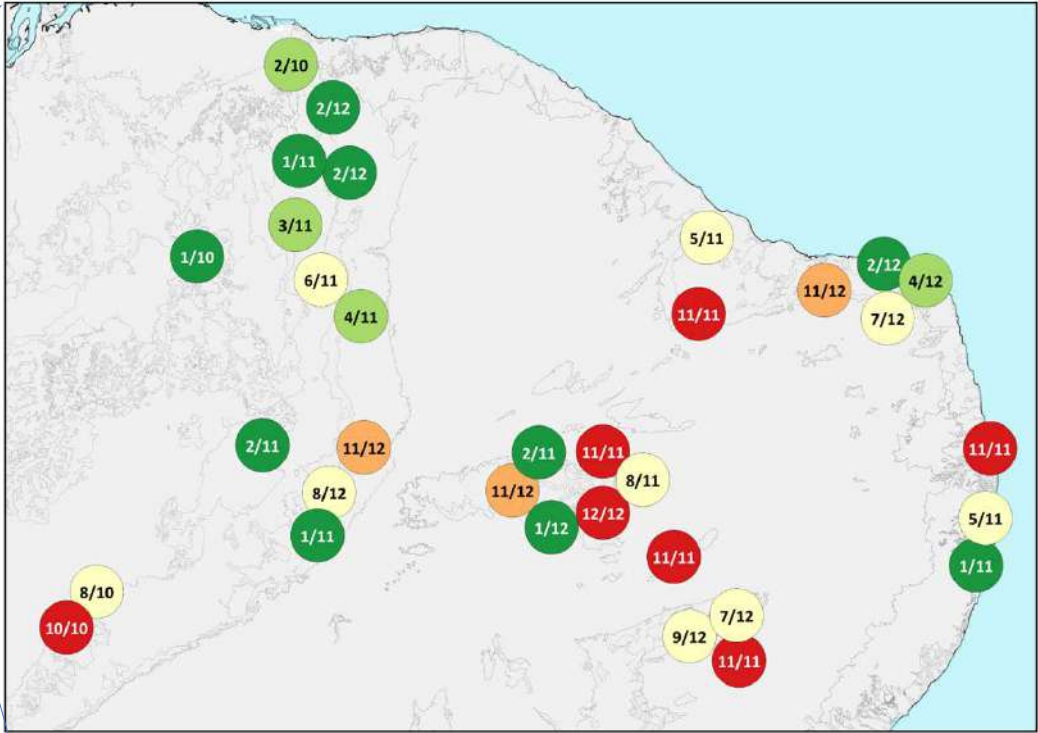
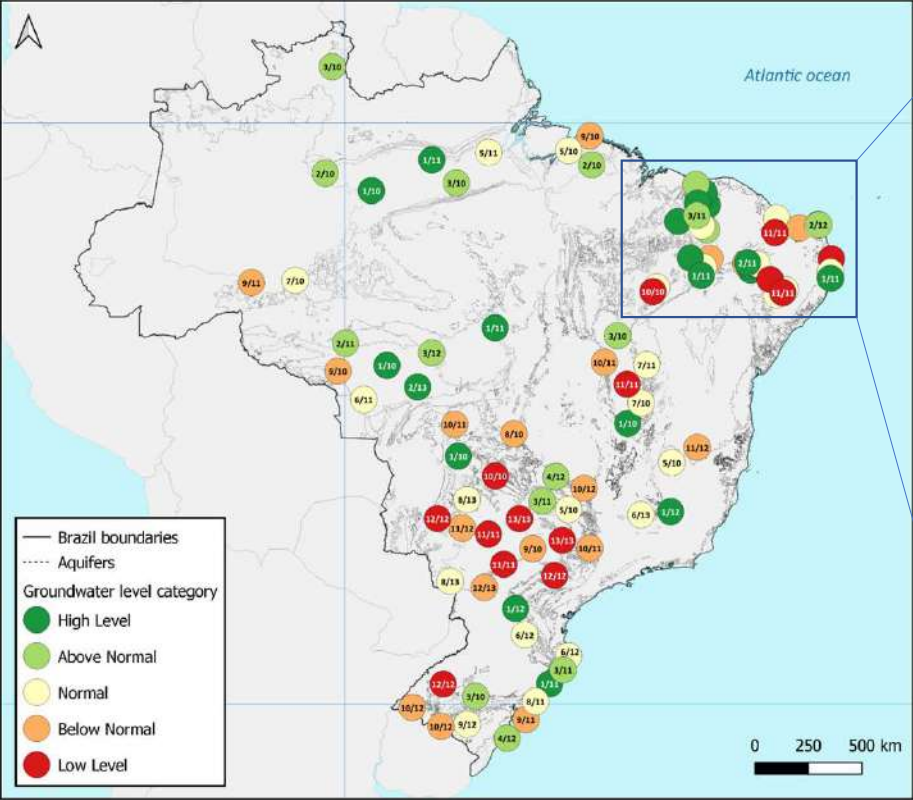
Groundwater level category

- High Level
- Above Normal
- Normal
- Below Normal
- Low Level



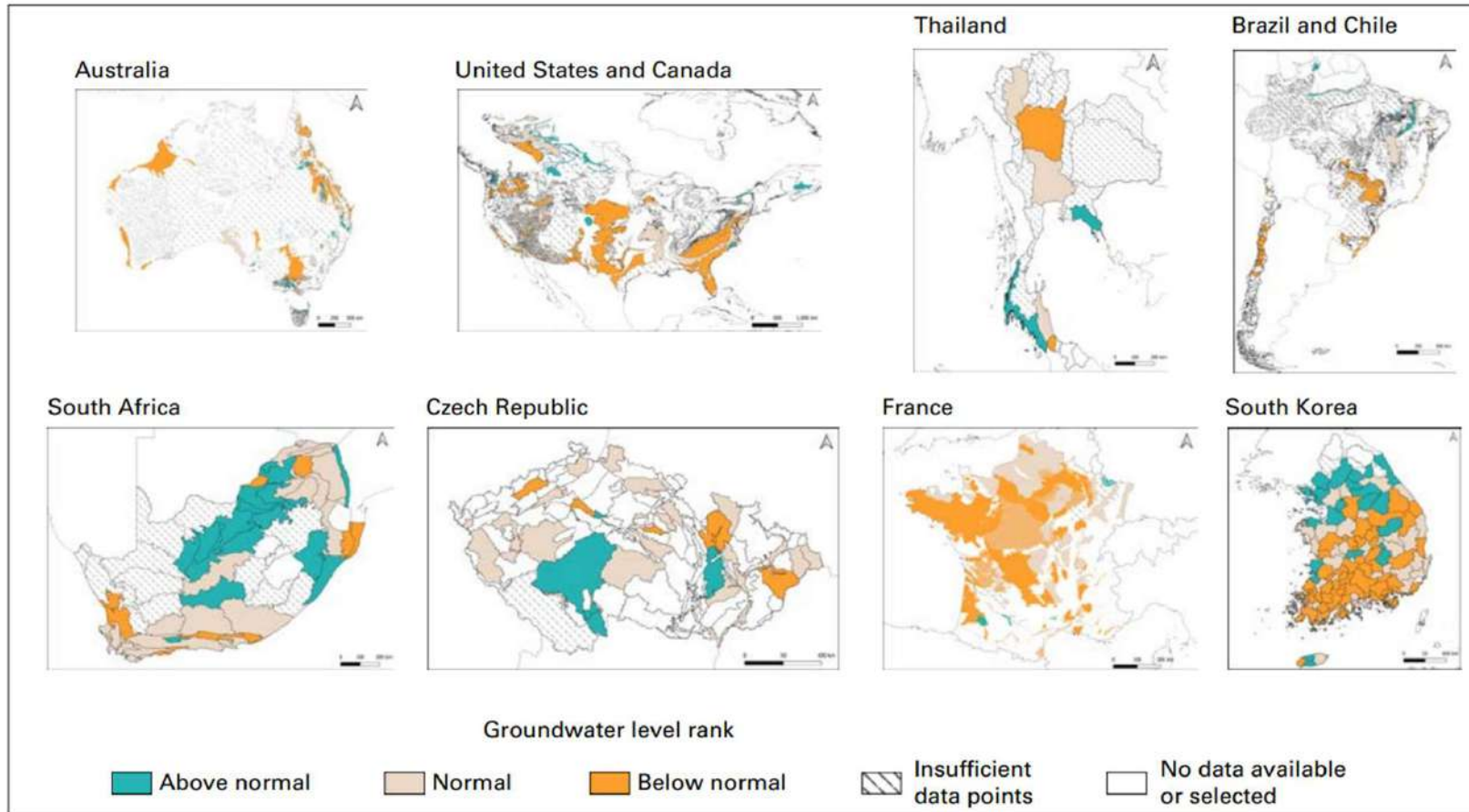
Adapted from [www.ysi.com/parameters/level](http://www.ysi.com/parameters/level)

# HydroSOS



# WMO Report

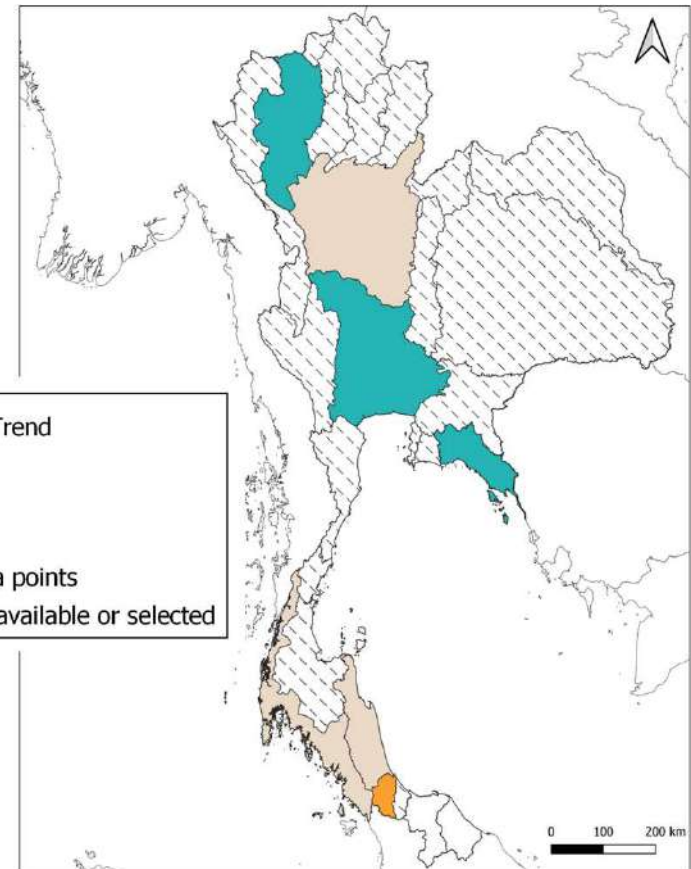
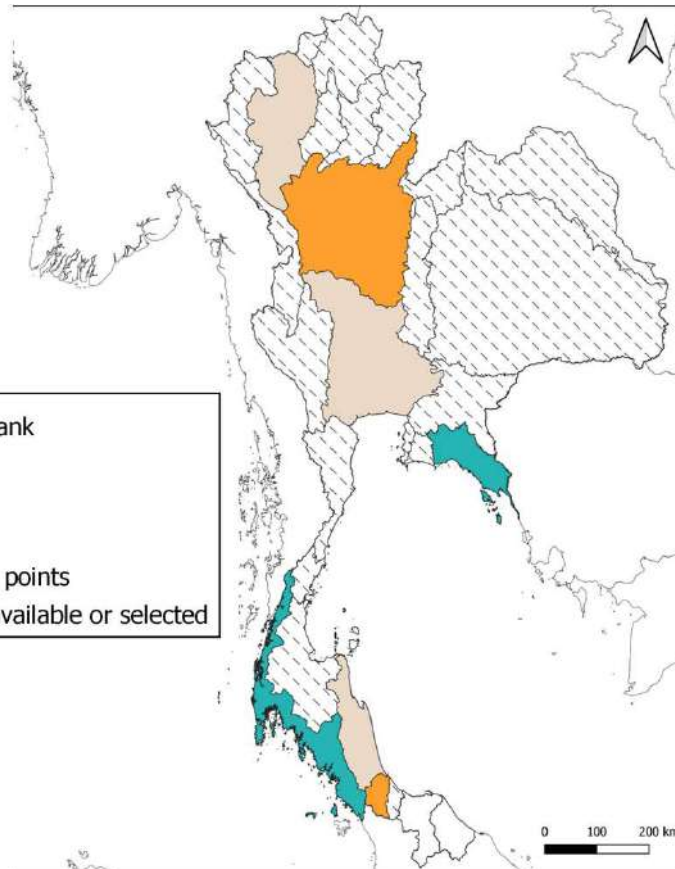
**GROUNDWATER STATUS REPORTING:** [Reporting methodology](#) based on trends and ranks





# WMO Report

**GROUNDWATER STATUS REPORTING:** [Reporting methodology](#) based on trends and ranks



# The Groundwater Geostory

**Springs** **Geysers** **Caves** **Rivers & Lakes** **Ponds & Salars** **Wetlands** **Oasis** **Phreatophytic Vegetation** **Submarine Groundwater Discharge**

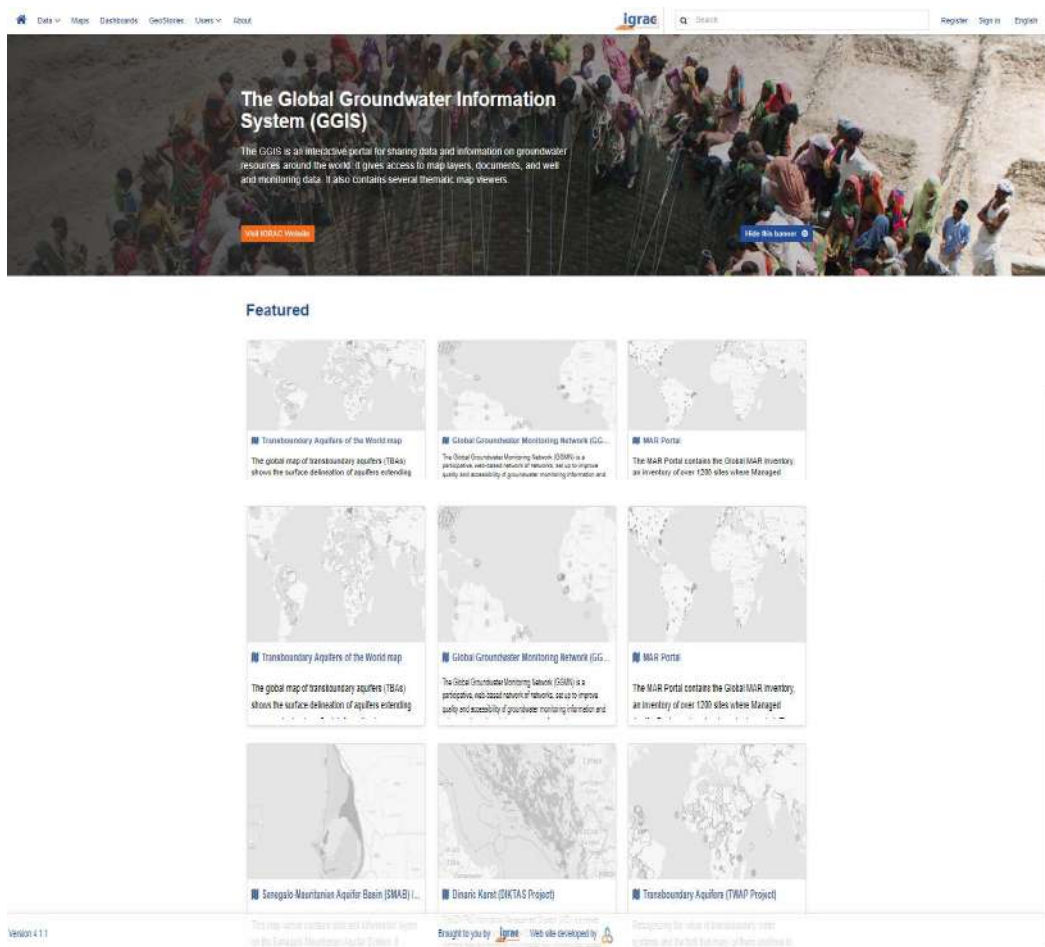
**Jeita Grotto, Lebanon**

The Jeita Grotto consists of two main sections: the upper grotto and the lower grotto. The upper grotto, also known as the "dry grotto," showcases remarkable chambers adorned with beautiful stalactites and stalagmites formed over thousands of years through mineral deposition by water. In contrast, the lower grotto is a mesmerizing underground river system that stretches about 10 kilometers. It is a captivating maze of water-filled passages. The underground river originates from a karstic spring, where groundwater emerges from beneath the Earth's surface.

**1** **2** **3** **4** **5**

[https://www.tripadvisor.com/Attraction\\_Review-g2624572-4318145-Reviews-Jeita\\_Grotto-Mita\\_Mount\\_Lebanon\\_Governorate.html](https://www.tripadvisor.com/Attraction_Review-g2624572-4318145-Reviews-Jeita_Grotto-Mita_Mount_Lebanon_Governorate.html)

# The GGIS & IGRAC's Website



<https://ggis.un-igrac.org/view/ggmn/>



<https://www.un-igrac.org/>



International Groundwater Resources Assessment Centre

*Thank you for your attention*

[info@un-igrac.org](mailto:info@un-igrac.org)

[www.un-igrac.org](http://www.un-igrac.org)

Delft, The Netherlands



Ministerie van Infrastructuur  
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# Hydrograph Example

