



Component 1

Transboundary Aquifers and Groundwater Systems in Small Island Developing States

Lead: UNESCO International Hydrological Programme

Core group: IHP and UNESCO International Groundwater Resources Assessment Centre (IGRAC, Netherlands)

Expertise provided by: Goethe University (Frankfurt, Germany) and Simon Fraser University (Canada)



Overview

1. TWAP Groundwater knowledge products
2. Core indicators for groundwater
3. Groundwater database structure
4. TBA and SIDS information sheets
5. Data analysis
6. Other functions

1. TWAP Groundwater knowledge products

- Information Management System
<http://twapviewer.un-igrac.org>
- TWAP Groundwater Project Website
www.twap.isarm.org
- Aquifer and SIDS Information Sheets
- Methodology for groundwater assessment
- Final Reports (GW Methodology, Status and Trends, SIDS, GW Modelling, etc)

2. Core indicators for groundwater

Thematic cluster	Core Indicators (Projected indicators in bold)
QUANTITY	Groundwater Recharge Groundwater Depletion
QUALITY	Groundwater natural background quality Groundwater pollution
SOCIO-ECONOMIC	Population density Renewable groundwater per capita Human dependence on groundwater Groundwater development stress
GROUNDWATER GOVERNANCE	Transboundary legal framework Transboundary institutional framework

3. Database structure

-  Transboundary aquifers
-  Small Island Developing States

TWAP DATA

-  Boundaries
-  WHYMAP data
-  Other overlays
-  Background maps

OTHER DATA SOURCES

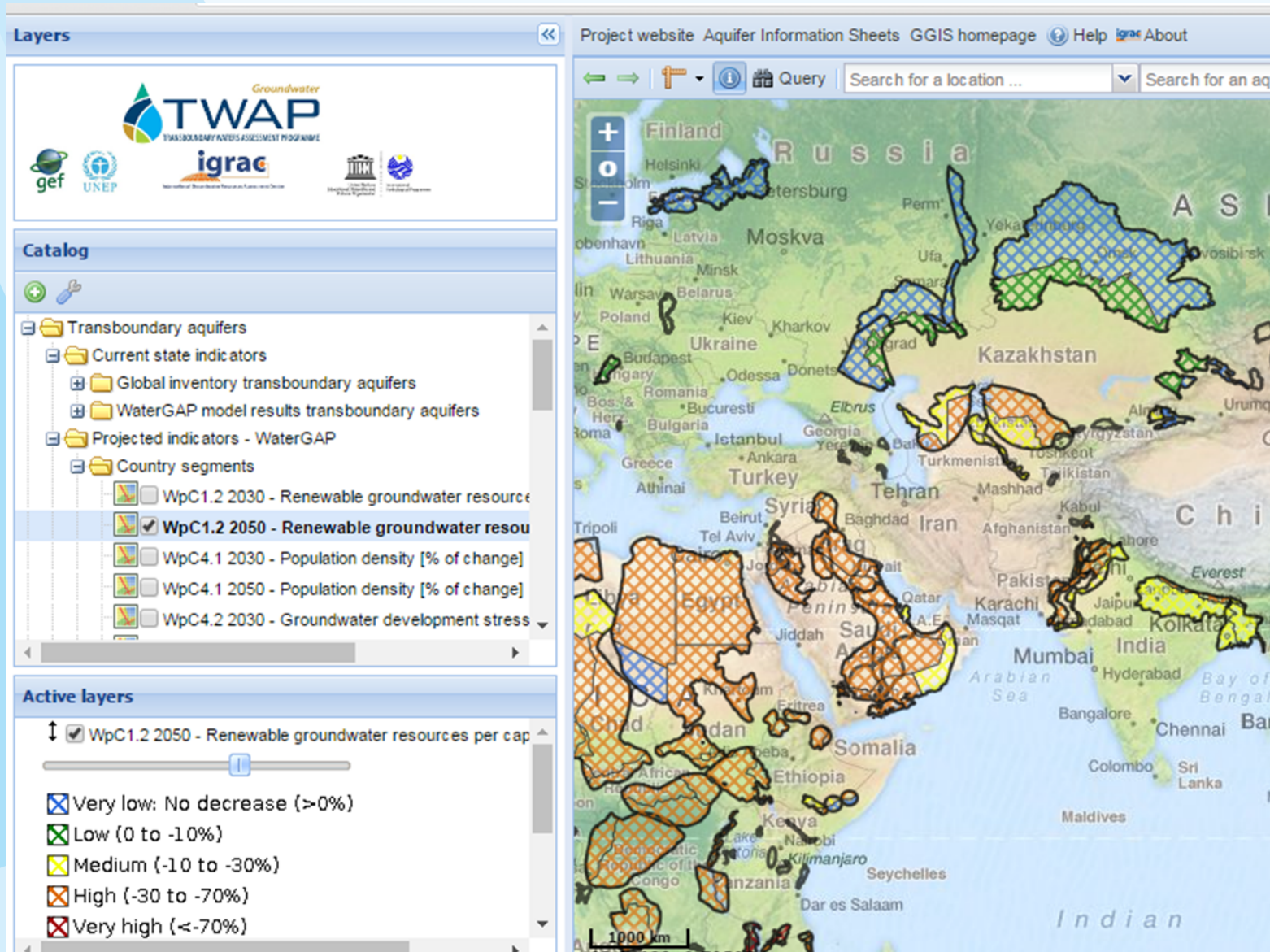
3. Database structure



3. Database structure

- 📁 **Transboundary aquifers**
 - 📁 **Current state indicators**
 - 📁 Global inventory TBAs
(TBA>5,000 km² and other relevant aquifers)
 - 📁 WaterGAP model results (TBA>20,000 km²)
 - 📁 **Projected indicators – WaterGAP**
 - 📁 Country segments
 - 📁 Complete aquifer
 - 📁 Future hotspots on groundwater stress
 - 📁 Basic parameters and variables

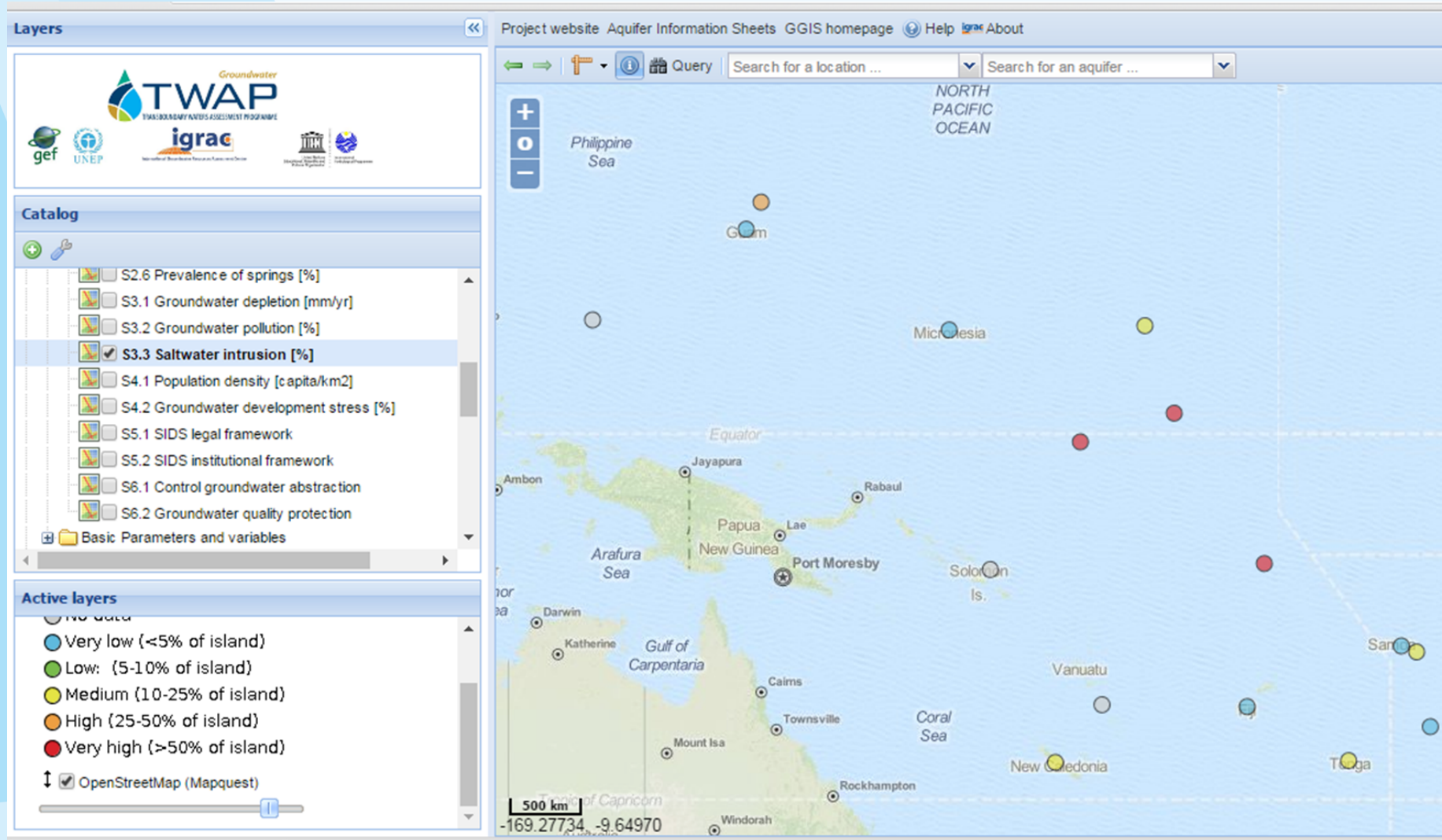
3. Database structure



3. Database structure

-  **Small Island Developing States**
 -  **Current state indicators**
 -  S1.1 Groundwater recharge
 -  S1.2 Renewable groundwater resources
 -  ...
 -  **Basic parameters and variables**

3. Database structure



4. TBA information sheets

- Basic geographical and hydrogeological info
- Location map with delineation
- Cross-section (if available)
- Table with core indicators
- Table with key variables

Transboundary Aquifer Information Sheet



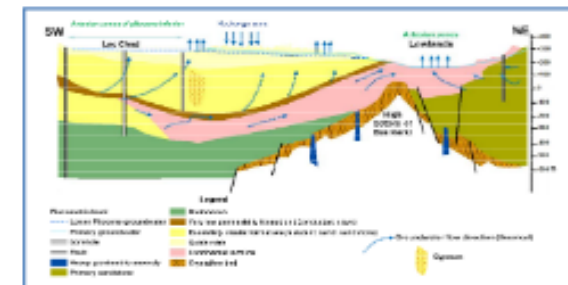
AF52 - Lake Chad Basin

Geography

Total area TBA (km²): 2 000 000
No. countries sharing: 7
Countries sharing: Algeria, Cameroon, Central Africa Republic, Chad, Libya, Niger, Nigeria
Population: 40 000 000
Climate Zone: Arid
Rainfall (mm/yr): 350

Hydrogeology

Aquifer type: Multiple layers hydraulically connected
Degree of confinement: Mostly unconfined but some parts confined
Main lithology: Sediment - Sand and Limestones



Cross section along Maiduguri to the SW and Faya Largeau to the NE of the Lake Chad Basin (after Schneider & Wolff, 1992 modified)

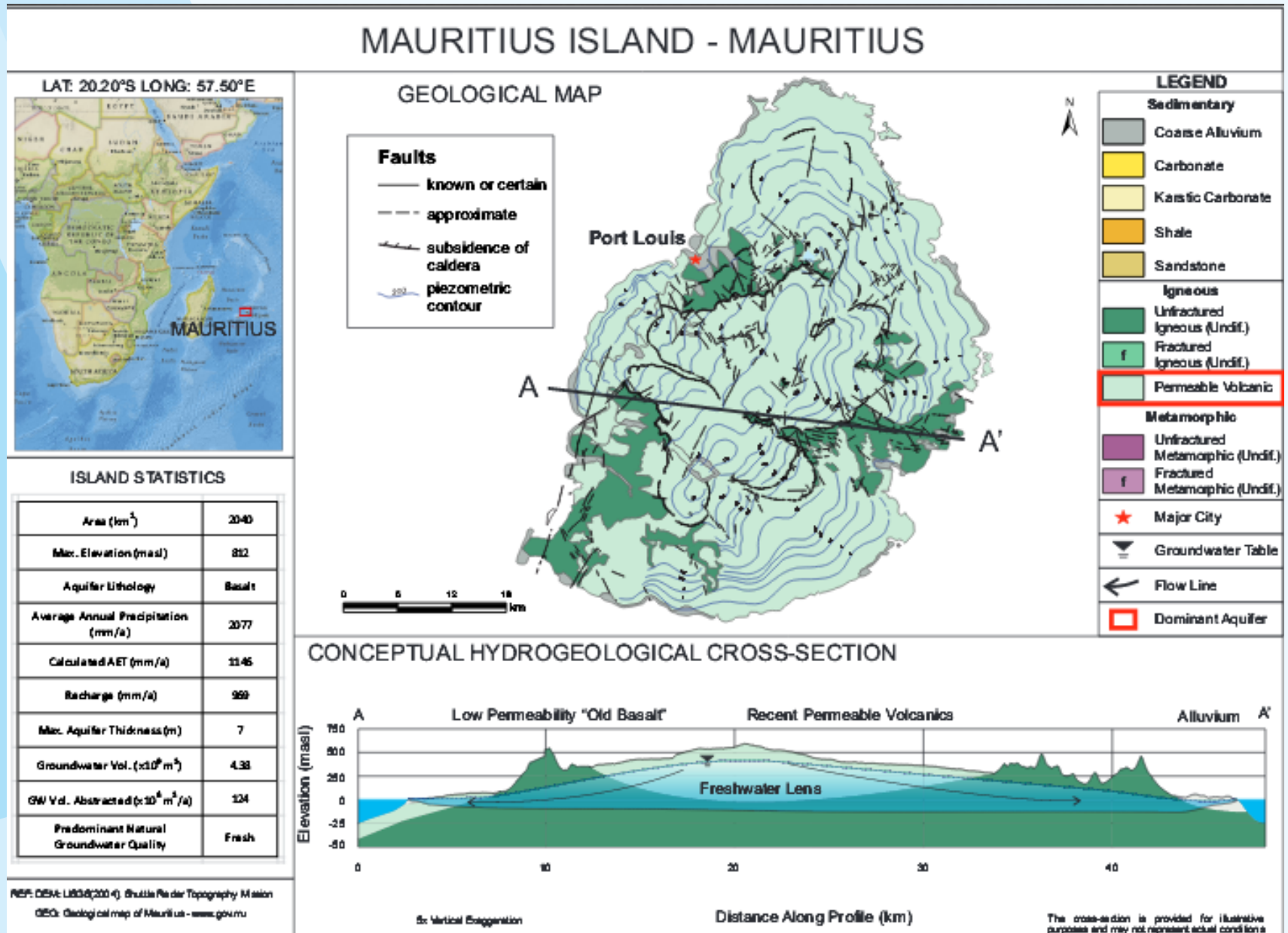
Map and cross-section are only provided for illustrative purposes. Dimensions are only approximate

4. TBA information sheets

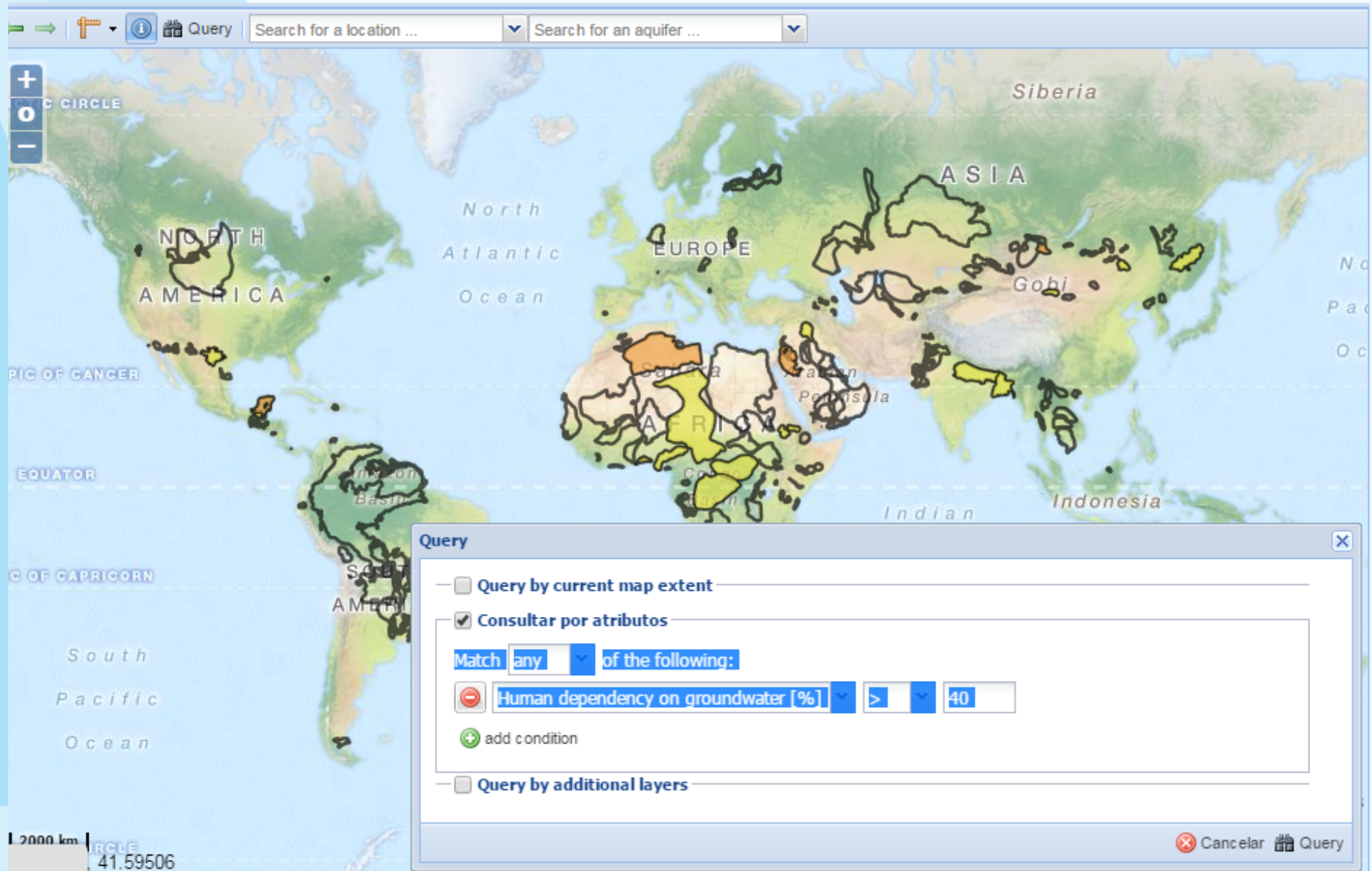
Narratives of:

- ✓ Aquifer geometry
- ✓ Hydrogeological aspects
- ✓ Linkages with other water systems
- ✓ Environmental aspects
- ✓ Socio-economic aspects
- ✓ Legal and Institutional aspects
- ✓ Priority issues and Hotspots

4. SIDS information sheets



5. Global data analysis



5. Global data analysis

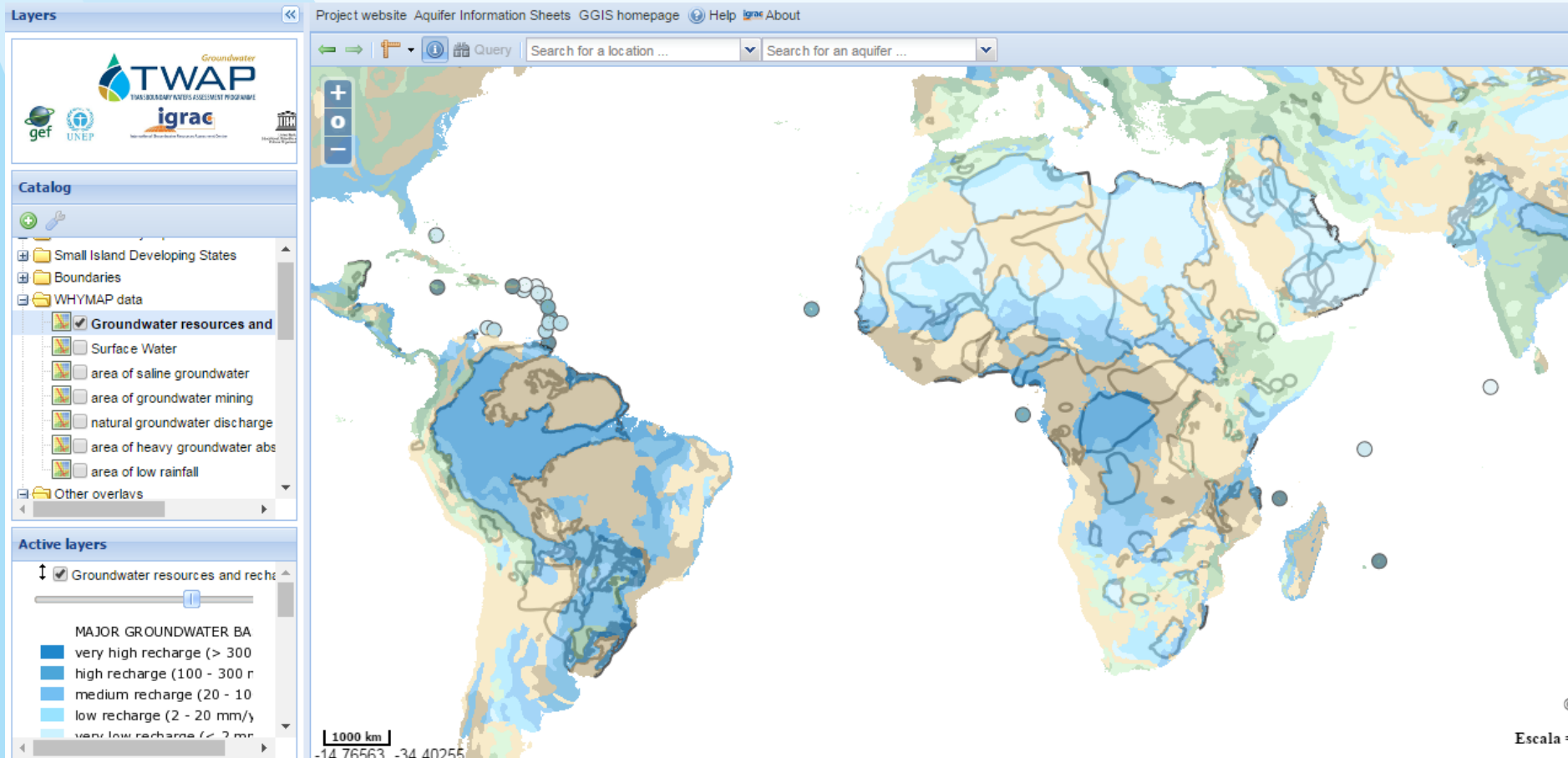
✓ Download indicators as Excel file

	A	B	C	D	E	F	G
1	FID	twap_ind_mod_c	region_code	aq_name	area_sinu	aquifer_code	
2	twap_ind_	65	M26_AS126	Merged: Tawil Quaternary Aquifer Sy	188980.9	M26_AS126	
3	twap_ind_	60	W16N	Edwards-Trinity-El Burro	105928.7	W16N	
4	twap_ind_	47	W5C	Boca del Cerro-San Pedro	21279.05	W5C	
5	twap_ind_	79	W7C	Península de Yucatán-Candelaria-Hc	137394.9	W7C	
6	twap_ind_	43	WAF25	Karoo-Carbonate	544534.4	WAF25	
7	twap_ind_	54	WAF29	Cuvette	791124.3	WAF29	
8	twap_ind_	55	WAF48	Keta / Dahomey / Cotier basin aquife	32601.96	WAF48	
9	twap_ind_	65	WAF5	SE Kalahri Karoo Basin / Stampriet	71968.24	WAF5	
10	twap_ind_	43	WAF51	Aquifer Vallee de la Benoue	197839	WAF51	
11	twap_ind_	48	WAF52	Lake Chad Basin	1983821	WAF52	
12	twap_ind_	41	WAF61	Gedaref	51243.63	WAF61	
13	twap_ind_	64	WAF69	Northwest Sahara Aquifer System (N	1054145	WAF69	
14	twap_ind_	52	WAF73	Mereb	34249.14	WAF73	
15	twap_ind_	44	WAS108	Buir Nuur-Khalkh river Aquifer	25193.09	WAS108	
16	twap_ind_	51	WAS111	Dankhan Khudgiin Sair aquifer	24013.12	WAS111	
17	twap_ind_	52	WAS125	Neogene Aquifer System (North-We	66258.05	WAS125	
18	twap_ind_	44	WAS79	South of outer Himalayas aquifer	311589.5	WAS79	
19	twap_ind_	46	WAS80	East Ganges River Plain Aquifer	180381.9	WAS80	
20	twap_ind_	45	WAS87	Middle Heilongjiang - Amur River Ba	113574.7	WAS87	
21	twap_ind_	66	WAS97	Delger River	22704.9	WAS97	

6. Other functions

- ✓ Search for a country (e.g. a SIDS)
- ✓ Search for an aquifer
- ✓ Connect other data (internal and external) layers to view with TWAP data (e.g. WHYMAP, NASA, GRACE data...)

6. Other functions





TWAP

TRANSBOUNDARY WATERS ASSESSMENT PROGRAMME

Thank you



UNEP-DHI PARTNERSHIP
Centre on Water and Environment



United Nations
Educational, Scientific and
Cultural Organization



International
Hydrological
Programme



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission

