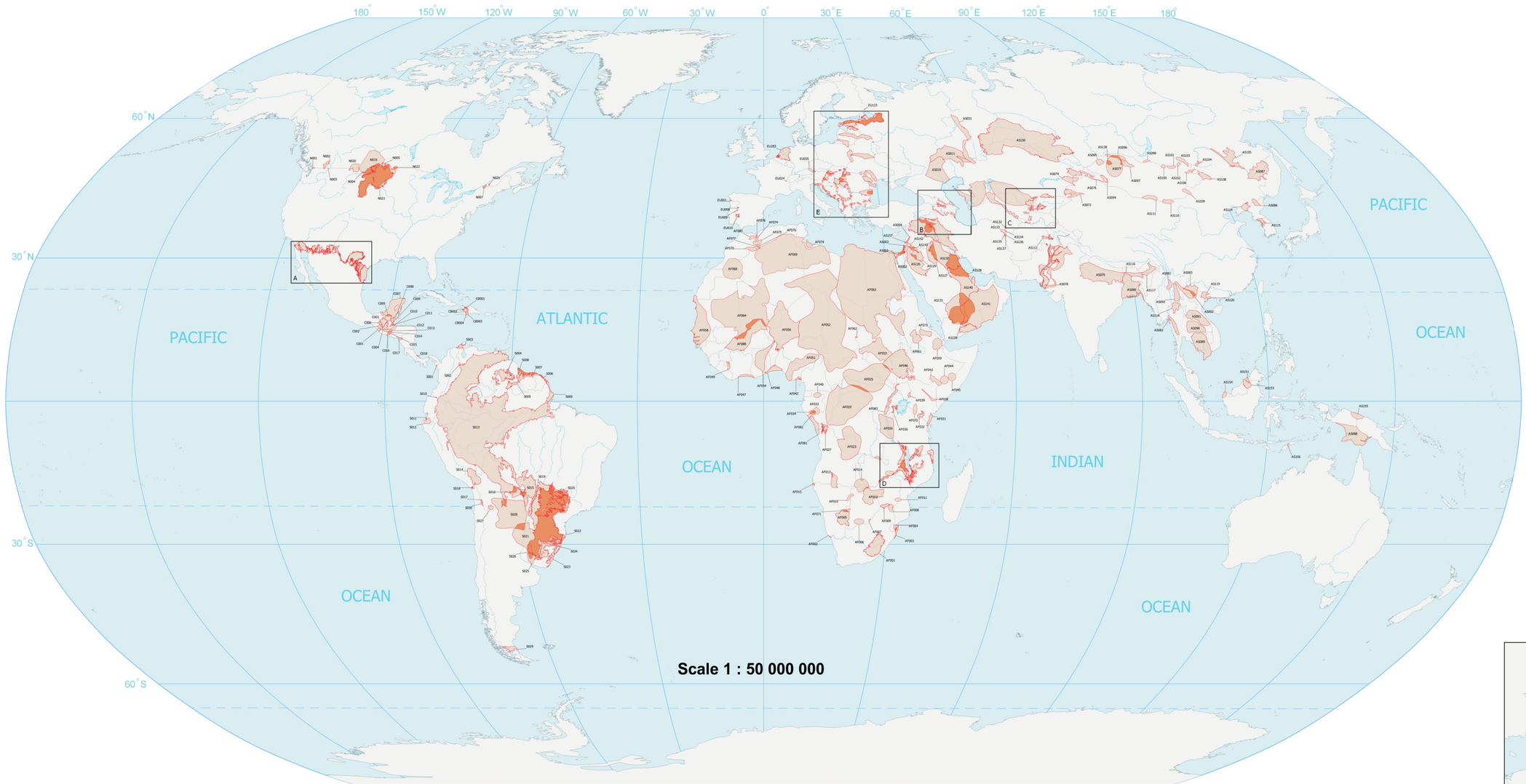
Transboundary Aquifers of the World

- Update 2021 -



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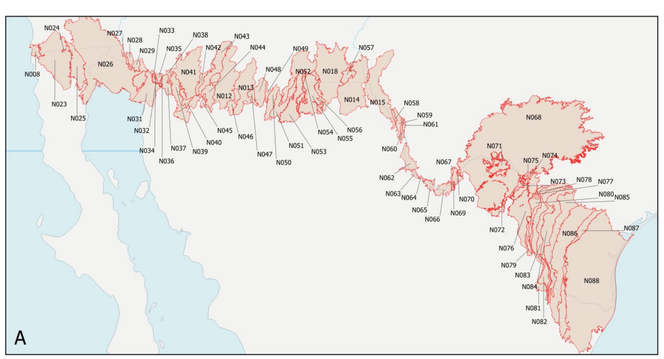

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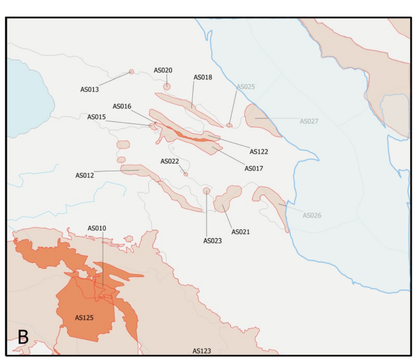

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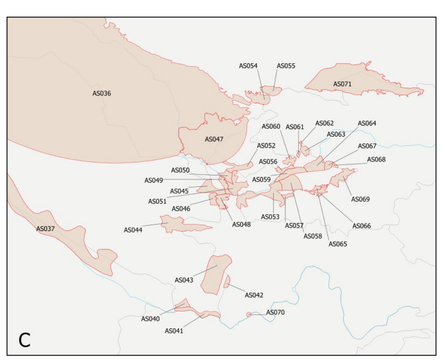

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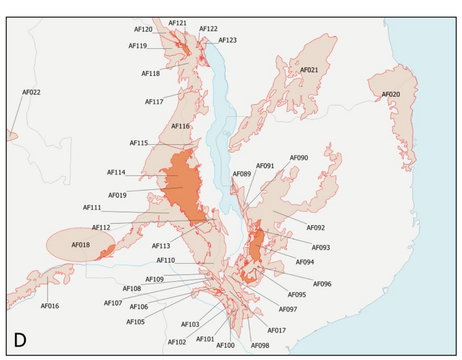

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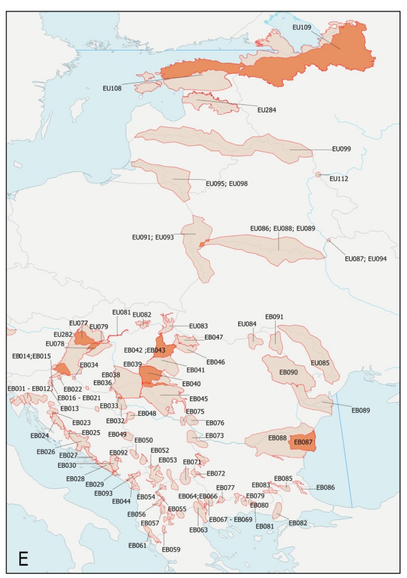


1 : 13 000 000

Legend

Occurance and extent

- aquifer
- overlapping area

Type of TBA delineation

- confirmed boundary
- unconfirmed boundary

Geographic elements

- rivers
- lakes
- detailed maps

SC/HYD/2021/Map-1

Prepared by IGRAC

Base maps

Country borders: The United Nations Clear Map (2018)
Rivers and lakes: ESRI (2018)

Map projection

Robinson projection, geographic coordinates, spheroid WGS84, longitude of central meridian 0º

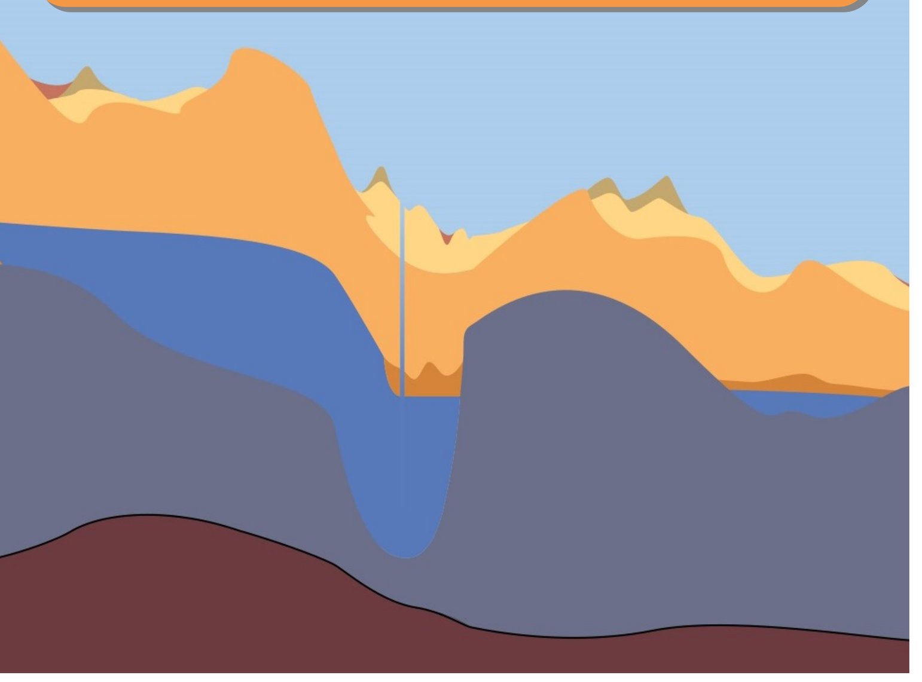
Disclaimer

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.

TRANSBOUNDARY AQUIFERS OF THE WORLD

- UPDATE 2021 -

1 : 50 000 000



THE IMPORTANCE OF GROUNDWATER AND TRANSBOUNDARY AQUIFERS

Groundwater is the most abundant source of freshwater on earth, accounting for approximately 97% of non-frozen fresh water. It is an important natural resource that greatly contributes to human development. Approximately 50% of the world's population drinks groundwater daily. It is often critical for sustaining rural populations that are located away from surface water and piped infrastructure. With respect to food production, groundwater is estimated to contribute to over 40 percent of the world's production of irrigated crops. Groundwater sustains ecosystems, maintains base flow of rivers and stabilizes land in areas with easily compressed soils. Aquifers can also buffer impacts resulting from seasonal variability and climate change. However, groundwater does not stop flowing at political borders and huge resources are stored in transboundary aquifers. Therefore, the identification, mapping, assessment and development of governance mechanisms for transboundary aquifers (TBAs) are important tasks for ensuring the sustainability of these resources and peaceful cooperation between countries. 40% of the worlds available water is transboundary. The assessment of global groundwater resources is one of the core activities of the International Groundwater Resources Assessment Centre (IGRAC). Next to the assessment, IGRAC – as UNESCO/WMO groundwater centre – facilitates and promotes global sharing of information and knowledge. In both activities, transboundary aquifers take a prominent place.

There are now 468 identified transboundary aquifers and aquifer systems identified, underlying almost every nation, increased from 366 in 2015. The United Nations International Law Commission's Draft Articles on the Law of Transboundary Aquifers (Draft Articles) define an aquifer as "a permeable water-bearing geological formation underlain by a less permeable layer and the water contained in the saturated zone of the formation." The Draft Articles further define a transboundary aquifer or a transboundary aquifer system as "an aquifer or aquifer system, parts of which are situated in different States. The number of transboundary aquifers has been increasing steadily since the first 'Transboundary Aquifers of the World Map; was released in 2009. It is likely that new transboundary aquifers will still be identified in the future and that the delineation of existing transboundary aquifers may be refined once further studies are conducted.

For more information on individual transboundary aquifers and the extended view of the small aquifers, please visit IGRAC's Global Groundwater Information System (GGIS) online :

https://ggis.un-igrac.org/view/tba

www.un-igrac

MAP COMPILATION AND LABELLING

This map encapsulates information provided by various organisations and projects dealing with transboundary aquifer assessments and/or management. It is an update of the Transboundary Aquifers of the World Map - Update 2015 (IGRAC and UNESCO-IHP, 2015). IGRAC compiled this map based on information from peer-reviewed literature and information provided by national experts. Specific information sources are given in the reference list. A significant source of information for the 2015 map, and now the 2021 map, was data collected as part of the Global Environment Facility Transboundary Waters Assessment Programme (TWAP). Other significant inputs to the 2021 map include contributions from the Transboundary Aquifer Assessment Program (TAAP) , SADC Groundwater Management Institute (SADC-GMI), the Scottish Government Climate Justice Fund Water Futures Programme (CJF) and the EU:WATERRES Project.

For countries in the EU, Switzerland and Norway, previous editions of the global transboundary aquifer map have also displayed transboundary groundwater bodies as adopted by the EU Water Framework Directive alongside or instead of transboundary aquifers. Transboundary groundwater bodies are not necessarily complete hydrologic units, but rather management units. In many cases, aquifers are subdivided into groundwater bodies while occasionally groundwater bodies may contain multiple aquifers. This causes confusion when describing the number and extent of transboundary aquifers and aquifer systems across Europe. Therefore, IGRAC have decided to remove transboundary groundwater bodies from the 2021 map update in order to more accurately reflect the true number of transboundary aquifers globally. For those interested in the number, extent and location of transboundary groundwater bodies in the EU, Switzerland and Norway, more information can be found in the WISE Water Framework Directive database:

https://www.eea.europa.eu/data-and-maps/data/wise-wfd-4

The guiding principle in compiling the 2021 map was to stay as close to the information provided by the individual sources as possible, while presenting the information in a form that is appropriate for the chosen scale of the map (1:50,000,000).

In the map key, solid dark red borders indicate that the aquifers' delineation is known and confirmed by all sharing countries. There are two situations in which a transboundary aquifer is marked with dashed line, signifying an approximate or unconfirmed boundary:

- There is a transboundary aquifer with very limited hydrogeological information, which is represented by circular or elliptical shape. The size and position of the shape gives a rough indication of size and position of the transboundary aquifer.
- A transboundary aquifer delineated does not have all country's individual map segments confirmed and/or harmonized by sharing countries. For some aquifers, one or more of the country's segments is considered definite, but this distinction is not made of the map for clarity.

Transboundary aquifers that were not assessed as part of TWAP and where different sources provided incongruent delineations, delineations with the highest level of certainty were chosen. The also map contains a number of transboundary aquifers that may not formally be recognised by all countries. Various transboundary aquifers are identified as overlapping or overlaying. For larger transboundary aquifers, orange polygons represent overlapping areas.

Each transboundary aquifer is uniquely labelled with a code. To ensure legibility in areas with a high density of transboundary aquifers, in particular Europe, only large transboundary aquifers are labelled. At present, there is no internationally adopted or consistent system of labelling transboundary aquifers. New labels were adopted specifically for this map. For the aquifers of the Americas, coding is the same as used by the Organization of American States (OAS). For the other regions, the code comprises two letters that identify the continent or region and a number to identify the individual aquifer. For reference purposes, coding of transboundary aquifers in previous versions of the Transboundary Aquifers of the World Map were maintained as much as possible, but some exceptions were made. There are instances where an existing transboundary aquifer is split into two or more new transboundary aquifers, and there are cases where multiple transboundary aquifers have been merged. In those instances the old aquifer code was deleted from the list and the newly delineated transboundary aquifers were added to the bottom of the list, resulting in 'missing aquifer codes.' Newly identified aquifers have also been added to the list sequentially by region.

Mapping of transboundary aquifers is a specific step towards transboundary governance of environmental resources that occurs within a broader, sometimes political, process between countries. However, knowledge about transboundary aquifers is still limited. Therefore, individuals and organisations (national and international, governmental and non-governmental) are invited to provide comments and suggestions to further improve the Transboundary Aquifers of the World map.

YEAR OF GROUNDWATER

ISARM Conference 2021

On 6-8 December 2021, UNESCO will organise the conference ISARM 2021 in Paris, France. This Second International UNESCO Conference on transboundary aquifers ISARM II "Challenges and the way forward"; aims to be an opportunity for showcasing diverse efforts made by UNESCO, the International and Donor community (GEF, the World Bank, the FAO, the Swiss, the German etc.) to streamline groundwater as an enabler for achieving the water-related SDGs. While nations establish their limits by political boundaries, aquifers are delimited by their hydrogeological dynamics; understanding and defining the boundaries of these water bodies is complex, due to both the intricate physicochemical processes to which they are exposed, and the available information by which they are characterized. Understanding transboundary aquifers is further complicated by the socio-political and territorial issues that arise as a result of their existence. There is no doubt that management of transboundary aquifers is a challenge, particularly when addressing governance issues.

Furthermore, in light of Agenda 2030 and the new development framework, there is clear evidence that proves the need for institutional strengthening on transboundary aquifers management and the resulting issues raised. In addition, there is an absence of characterization and legal guidance on this subject with regards existing multilateral environmental, regional, and sub-regional agreements (i.e. Paris Agreement, UN biodiversity convention, the RAMSAR Conventions) as well as transboundary river basin treaties and agreements.

The ISARM 2021 conference will also be a good opportunity to position transboundary as an important resource in the upcoming year of groundwater.

https://isarm2021.org/

World Water Day 2022

In order to increase awareness about groundwater, the international water community decided to dedicate World Water Day in 2022 to this precious resource. Groundwater will also be a topic of a World Water Development Report in the same year. The report will present the state and trends of groundwater resources in order to make their role more understandable and visible. The slogan of the WWD and the WWDR in this Year of Groundwater will be: Groundwater – Making invisible visible. Every year, the World Water Day highlights a specific aspect of freshwater. The theme also sets the focus for the annual World Water Development Report.

The year of groundwater will conclude with The Groundwater Summit (December 2022) is envisaged as a high level platform to bring together scientists, policy makers and practitioners and it will focus on improving a science-policy-practice interface.

ACKNOWLEDGEMENTS

We would like to thank the many organizations and experts that provided the data made available on this map. In particular, we would like to thank the International Association of Hydrogeologists Transboundary Aquifer Commission in their assistance with raising awareness of the update. Furthermore, we would like to express our gratitude to the three organisations supporting IGRAC: UNESCO, WMO and the Government of The Netherlands.

COLOPHON

The mission of the International Groundwater Resources Assessment Centre (IGRAC) is to facilitate and promote global sharing of information and knowledge required for sustainable groundwater resources development and management. As an independent and non-profit centre, IGRAC operates under auspices of United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Meteorological Organisation (WMO). IGRAC is an in-house partner of UNESCO-IHE in Delft, the Netherlands, and receives financial support from the Government of the Netherlands.

DISCLAIMERS

Clear Map

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

IGRAC

Any designation employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of IGRAC, UNESCO, WMO or the Government of the Netherlands concerning the legal status of any country, territory, city or area, nor of its authorities and sovereignty on its territory and natural resources, and delineation of its frontiers or boundaries. Furthermore, the location and boundaries of several transboundary aquifers have not yet been confirmed by representatives of all countries involved. In such cases, an effort was made to indicate on the map the corresponding provisional status.

UNESCO

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Summary of Transboundary Aquifers of the World, 2021 Update

Region	# TBAs	Region Codes
Africa	106	AF
North Africa	--	--
West and Central Africa	--	--
East Africa	--	--
Southern Africa	--	--
Americas	135	N, C, CB & S
Asia and Oceania	130	AS
Caucasus	--	--
Europe	97	EU, EB
World	**468**	--

WORLD MAP

Label	Aquifer name	Sharing countries
AF001	Karoo Sedimentary Aquifer	Lesotho, South Africa
AF002	Coastal Sedimentary Basin V	South Africa, Namibia
AF003	Coastal Sedimentary Basin VI / Coastal Plain Sedimentary	Mozambique, South Africa
AF004	Rhyolite-Breccia Aquifer	South Africa, Swaziland, Mozambique
AF005	Stampriet Aquifer System	Botswana, Namibia, South Africa
AF006	Khakhea/Bray Dolomite	Botswana, South Africa
AF007	Ramotswa /Zeerust / Lobatse Dolomite Basin Aquifer	Botswana , South Africa
AF008	Limpopo Basin	Mozambique, South Africa, Zimbabwe
AF009	Tuli Karoo Sub-Basin	Botswana, South Africa, Zimbabwe
AF010	Northern Kalahari / Karoo Basin / Eiseb Graben Aquifer	Botswana, Namibia
AF011	Save Aluvial	Mozambique, Zimbabwe
AF012	Eastern Kalahari Karoo Basin	Botswana, Zimbabwe
AF013	Cuvelai and Etosha Basin / Ohangwena Aquifer System	Angola, Namibia
AF014	Nata Karoo Sub-basin / Caprivi deep-seated Aquifer	Angola, Botswana, Namibia, Zambia,
AF015	Coastal Sedimentary Basin IV	Angola, Namibia
AF016	Medium Zambesi Aquifer	Zambia, Zimbabwe
AF017	Shire River Basin Aquifer	Malawi, Mozambique
AF018	Arangua Alluvial	Mozambique, Zambia
AF019	Sand and Gravel	Malawi, Zambia
AF020	Coastal Sedimentary Basin III	Mozambique, Tanzania
AF021	Karoo Sandstone Aquifer	Mozambique, Tanzania
AF022	Kalahari/Katangian Basin/Lualaba	Zambia, Democratic Republic of the
AF023	Coango	Democratic Republic of the Congo, Angola
AF025	Karoo-Carbonate	Central African Republic, Congo, South
AF026	Tanganyika	Burundi, Democratic Republic of the
AF027	Dolomitic Basin	Angola, Democratic Republic of the
AF029	Cuvette	Congo, Democratic Republic of the Congo
AF031	Coastal Sedimentary Basin I / Karoo Sedimentary Aquifer	Kenya, Tanzania
AF032	Kilimanjaro Aquifer	Kenya, Tanzania
AF033	AF33	Congo, Gabon
AF034	AF34	Congo, Gabon
AF036	Kagera Aquifer	Tanzania, Rwanda, Uganda
AF038	Merti Aquifer	Kenya, Somalia
AF039	Mount Elgon Aquifer	Uganda, Kenya
AF040	AF40	Congo, Gabon
AF042	Rio DelRey	Nigeria, Cameroon
AF043	Dawa	Ethiopia, Kenya, Somalia
AF044	Jubba	Ethiopia, Somalia
AF045	Shabelle	Ethiopia, Somalia
AF046	Sudd Basin	Ethiopia, Kenya, South Sudan
AF047	Tano Basin	Ghana, Cote d'Ivoire
AF048	Keta / Dahomey / Cotier Basin Aquifer	Ghana, Togo, Benin, Nigeria
AF049	Cestos - Danané Aquifer	Cote d'Ivoire, Guinea, Liberia
AF051	Aquifer Vallee de la Benoue	Nigeria, Cameroon
AF052	Lake Chad Basin	Chad, Niger, Nigeria, Cameroon, Central
AF053	Baggara Basin	Central African Republic, South Sudan,
AF054	Volta Basin	Benin, Burkina Faso, Ghana, Togo, Niger
AF056	Irhazer-Illuemeden Basin	Algeria, Benin, Mali, Niger, Nigeria
AF058	Senegalo-Mauretanian Basin	Gambia, Guinea-Bissau, Mauritania,
AF059	Afar Rift valley / Afar Triangle Aquifer	Djibouti, Ethiopia
AF061	Gedaref	Ethiopia, Sudan
AF062	Disa	Chad, Sudan
AF063	Nubian Sandstone Aquifer System (NSAS)	Chad, Egypt, Libya, Sudan
AF064	Taoudeni Basin	Algeria, Mali, Mauritania
AF068	Système Aquifère de Tindouf	Morocco, Western Sahara, Mauritania,
AF069	Northwest Sahara Aquifer System (NWSAS)	Algeria, Libya
AF070	Système Aquifère d'Errachidia	Morocco, Algeria
AF071	Ncojane Basin	Botswana, Namibia
AF072	Rift Aquifer	Kenya, Tanzania
AF073	Mereb	Ethiopia, Eritrea
AF074	Angad	Morocco, Algeria
AF075	Ain Beni Mathar	Morocco, Algeria
AF076	Chott Tigri-Lahouita	Morocco, Algeria
AF077	Figuig	Morocco, Algeria
AF078	Jbel El Hamra	Morocco, Algeria
AF079	Système Aquifère de la Djeffara	Tunisia, Libya
AF080	Triffa	Morocco, Algeria
AF081	Aquifere Cotier	Angola, Democratic Republic of the
AF082	AF82	Gabon, Congo
AF083	Aquifere du Rift	Democratic Republic of the Congo, South
AF088	Aquifer extension Sud-Est de Taoudeni	Mali, Guinea, Burkina Faso
AF089	AQ01	Malawi, Mozambique
AF090	AQ02	Malawi, Mozambique
AF091	AQ03	Malawi, Mozambique
AF092	AQ04	Malawi, Mozambique
AF093	AQ05	Malawi, Mozambique
AF094	AQ06	Malawi, Mozambique
AF095	AQ07	Malawi, Mozambique
AF096	AQ08	Malawi, Mozambique
AF097	AQ09	Malawi, Mozambique
AF098	AQ10	Malawi, Mozambique
AF099	AQ13	Malawi, Mozambique
AF100	AQ14	Malawi, Mozambique
AF101	AQ15	Malawi, Mozambique
AF102	AQ16	Malawi, Mozambique
AF103	AQ17	Malawi, Mozambique
AF104	AQ18	Malawi, Mozambique
AF105	AQ19	Malawi, Mozambique
AF106	AQ20	Malawi, Mozambique
AF107	AQ21	Malawi, Mozambique
AF108	AQ22	Malawi, Mozambique
AF109	AQ23	Malawi, Mozambique
AF110	AQ24	Malawi, Mozambique
AF111	AQ25	Malawi, Mozambique, Zambia
AF112	AQ26	Malawi, Mozambique
AF113	AQ27	Malawi, Mozambique
AF114	AQ29	Malawi, Zambia
AF115	AQ30	Malawi, Zambia
AF116	AQ31	Malawi, Zambia
AF117	AQ32	Malawi, Zambia
AF118	AQ33	Malawi, Zambia, Tanzania
AF119	AQ34	Malawi, Zambia, Tanzania
AF120	AQ35	Malawi, Zambia, Tanzania
AF121	AQ36	Malawi, Tanzania
AF122	AQ37	Malawi, Tanzania
AF123	AQ38	Malawi, Tanzania
AS001	Western Aquifer Basin	Egypt, Israel, Palestinian Territory
AS002	Coastal Aquifer Basin	Egypt, Israel, Palestinian Territory
AS003	Northeastern Aquifer	Israel, Palestinian Territory
AS004	Anti-Lebanon	Lebanon, Syria
AS008	Psou Aquifer	Georgia, Russia
AS010	Upper Jezira	Iraq, Syria, Turkey
AS011	Syrt	Russia, Kazahstan
AS012	Leninak-Shiraks Aquifer	Azerbaijan, Armenia, Iran, Turkey
AS013	Terek Aquifer	Georgia, Russia
AS015	Debet Aquifer	Azerbaijan, Armenia, Georgia
AS016	Ktsia-Khrami Aquifer	Azerbaijan, Georgia

WORLD MAP

Label	Aquifer name	Sharing countries
AS017	Agstev-Akstafa/Tavush-Tovuz Aquifer	Azerbaijan, Azerbaijan, Armenia
AS018	Alazan-Agrichay Aquifer	Azerbaijan, Georgia
AS019	Pre-Caspien	Russia, Kazakhstan
AS020	Sulak Aquifer	Georgia, Russia
AS021	Nakhichevan/Larijan and Djebrail Aquifer	Azerbaijan, Armenia, Georgia, Iran, Turkey, Russia
AS022	Herher, Malishkin and Jermuk Aquifers	Azerbaijan, Armenia
AS023	Vorotan-Akora Aquifer	Azerbaijan, Armenia
AS024	Nakhichevan/Larijan and Djebrail Aquifer	Azerbaijan, Armenia, Georgia, Iran, Turkey, Russia
AS025	Iori/Gabirri Aquifer	Azerbaijan, Russia
AS026	Lenkoran/Astara	Azerbaijan, Iran
AS027	Samur Aquifer	Azerbaijan, Russia
AS031	South-Pred-Ural Aquifer	Kazakhstan, Russia
AS035	Amu-Darya	Uzbekistan, Kazakhstan, Turkmenistan
AS036	Syr Darya	Kazakhstan, Uzbekistan
AS037	Birata-Urgench	Uzbekistan, Turkmenistan
AS040	Sherabad	Uzbekistan, Turkmenistan
AS041	Amudaryia	Afghanistan, Tajikistan, Uzbekistan
AS042	Kofarnihon Aquifer	Tajikistan, Uzbekistan
AS043	Karatag/North-Surhandarya Aquifer	Tajikistan, Uzbekistan
AS044	Zeravshan Aquifer	Tajikistan, Uzbekistan
AS045	Dustlik	Tajikistan, Uzbekistan, Kazakhstan
AS046	Havost	Tajikistan, Uzbekistan
AS047	Pretashkent Aquifer	Kazakhstan, Uzbekistan
AS048	Zafarobod Aquifer	Tajikistan, Uzbekistan
AS049	Syr-Darya 3	Tajikistan, Uzbekistan
AS050	Kokaral	Tajikistan, Uzbekistan
AS051	Dalverzin Aquifer	Tajikistan, Uzbekistan
AS052	Ahangaran	Tajikistan, Uzbekistan
AS053	Sulyukta-Batken-Nau-Isfara Aquifer	Tajikistan, Uzbekistan
AS054	South Talas Aquifer	Kazakhstan, Kyrgyzstan
AS055	North Talas Aquifer	Kazakhstan, Kyrgyzstan
AS056	Chust-Pap Aquifer	Tajikistan, Uzbekistan
AS057	Shorsu Aquifer	Tajikistan, Kyrgyzstan, Uzbekistan
AS058	Sokh Aquifer	Kyrgyzstan, Uzbekistan
AS059	Syr-Darya 2	Tajikistan, Uzbekistan
AS060	Almos-Vorzik Aquifer	Kyrgyzstan, Uzbekistan
AS061	Kasansay Aquifer	Kyrgyzstan, Uzbekistan
AS062	Nanay	Kyrgyzstan, Uzbekistan
AS063	Iskovat-Pishkaran Aquifer	Kyrgyzstan, Uzbekistan
AS064	Naryn Aquifer	Kyrgyzstan, Uzbekistan
AS065	Yarmazar	Kyrgyzstan, Uzbekistan
AS066	Chimion-Aval	Kyrgyzstan, Uzbekistan
AS067	Maylusu Aquifer	Kyrgyzstan, Uzbekistan
AS068	Karaungur	Kyrgyzstan, Uzbekistan
AS069	Osh-Aravan Aquifer	Kyrgyzstan, Uzbekistan
AS070	Vakhsh Aquifer	Afghanistan, Tajikistan
AS071	Chu Basin	Kyrgyzstan, Kazakhstan
AS072	Illi River	Kazakhstan, China
AS074	Tacheng Basin / Alakol	Kazakhstan, China
AS076	Ertix River	Kazakhstan, China
AS077	Yenisei Upstream	Mongolia, Russia
AS078	Indus River Plain Aquifer	Pakistan, India
AS079	South of outer Himalayas Aquifer	India, Nepal
AS080	East Ganges River Plain Aquifer	Bangladesh, India
AS081	Nu River Valley Aquifer	Burma, China
AS082	Salween River Aquifer	Myanmar, Thailand
AS083	Upriver of Zuo River	China, Vietnam
AS086	Yalu River Valley	China, Democratic People's Republic of Korea
AS087	Middle Heilongjiang - Amur River Basin	China, Russia
AS088	Merauke - Ketu Basin Aquifer	Indonesia, Papua New Guinea
AS089	Cambodia Mekong River Delta Aquifer	Cambodia, Vietnam
AS090	Khorat Plateau Aquifer	Laos, Thailand
AS091	Lower Mekong River 2 Aquifer	Thailand, Laos, Vietnam
AS092	Hong River Basin	China, Vietnam
AS093	Downstream of Lancang River	China, Myanmar
AS094	Bulgan River	Mongolia, China
AS095	Uureg Aquifer	Mongolia, Russia
AS096	Shishhid River Aquifer	Mongolia, Russia
AS097	Delger River	Russia, Mongolia
AS098	Zelter Basin	Mongolia, Russia
AS100	Minj River Basin	Mongolia, Russia
AS101	Balj River Basin	Mongolia, Russia
AS102	Onon River Basin	Mongolia, Russia
AS103	Ulz River Basin	Mongolia, Russia
AS104	Ercguna River	China, Russia
AS105	Zeya River Basin	China, Russia
AS106	Herlen River Basin	Mongolia, China
AS108	Buir Nuur-Khalkha river Aquifer	Mongolia, China
AS109	Zamiin-Uud Basin	Mongolia, China
AS110	Onch Kharikhanii Sair Aquifer	Mongolia, China
AS111	Dankhan Khudgiin Sair Aquifer	Mongolia, China
AS113	Kabul River Aquifer	Pakistan, Afghanistan
AS114	Yalu River Basin	China, Democratic People's Republic of Korea
AS115	Middle of Korea Peninsula	Democratic People's Republic of Korea, Republic of Korea
AS116	Southern of Himalaya Mountains	India, Bhutan
AS117	Mid of Brahmaputra River	India, China
AS118	Lower Mekong River 1 Aquifer	Myanmar, Thailand, Laos
AS119	Karst Aquifer of Upper Zuojiang Valley	China, Vietnam
AS120	Beilun River Basin	China, Vietnam
AS122	Kura River Valley Aquifer	Azerbaijan, Georgia
AS123	Taurus-Zagros	Iran, Iraq, Turkey
AS124	Jezira Tertiary Limestone Aquifer System	Syria, Turkey
AS125	Neogene Aquifer System (North-West): Upper and Lower Fars	Syrian Arab Republic, Iraq
AS126	Saq-Ram Aquifer System (West)	Jordan, Saudi Arabia
AS127	Wasia-Biyadh-Aruma Aquifer System (North): Sakaka-Rutba	Saudi Arabia, Iraq
AS128	Neogene Aquifer System (South-East): Dibdibba-Kuwait Group	Iraq, Kuwait, Saudi Arabia
AS129	Tawil Quaternary Aquifer System: Wadi Sirhan Basin	Jordan, Saudi Arabia
AS130	Umm er Radhuma-Dammam Aquifer System (North): Widyan-Salman	Iraq, Kuwait, Saudi Arabia
AS131	Wajid Aquifer System	Saudi Arabia, Yemen
AS132	Sarakhs	Turkmenistan, Iran
AS133	Agh Darband	Afghanistan, Iran
AS134	Janat Abad-Saleh Abad	Afghanistan, Turkmenistan, Iran
AS135	Fariman-Torbatjam	Afghanistan, Iran
AS136	Taybad	Afghanistan, Iran
AS137	Karet	Afghanistan, Iran
AS138	Tes River Basin	Mongolia, Russia
AS139	Wasia-Biyadh-Aruma Aquifer System (South): Tawila-Mahra/ Cretaceous Sands	Saudi Arabia, Yemen
AS140	Umm er Radhuma-Dammam Aquifer System (Centre): Gulf	Saudi Arabia, United Arab Emirates, Bahrain, Qatar
AS141	Umm er Radhuma-Dammam Aquifer System (South): Rub' al Khali	Oman, Saudi Arabia, United Arab Emirates, Yemen
AS142	Basalt Aquifer System (West): Yarmouk Basin	Jordan, Syria
AS143	Basalt Aquifer System (South): Azraq-Dhuleil Basin	Jordan, Syria
AS150	Irtysh-Obsky	Russia, Kazakhstan
AS151	Limbang Aquifer	Malaysia, Brunei Darussalam
AS152	Golok Aquifer	Thailand, Malaysia
AS153	Baram Aquifer	Malaysia, Indonesia, Brunei Darussalam
AS154	Palah Basin Aquifer	Malaysia, Indonesia
AS155	Jayapura Basin Aquifer	Indonesia, Papua New Guinea

WORLD MAP

Label	Aquifer name	Sharing countries
AS156	Besikama Basin Aquifer	Indonesia, Timor - Leste
AS157	Ecocene Aquifer	Lebanon, Palestinian Territory
C001	Soconusco-Suchiate/Coatán	Guatemala, Mexico
C002	Chicomuselo-Cuilco/Selegua	Guatemala, Mexico
C003	Ocosingo-Usumacinta-Pocóm-Ixcán	Guatemala, Mexico
C004	Márquez de Comillas-Chixoy/Xaclbal	Guatemala, Mexico
C005	Boca del Cerro-San Pedro	Guatemala, Mexico
C006	Trinitaria-Nentón	Guatemala, Mexico
C007	Península de Yucatán-Candelaria-Hondo	Belize, Guatemala, Mexico
C008	Mopán-Belice	Guatemala, Belize
C009	Pusila-Moho	Guatemala, Belize
C010	Sarstún	Guatemala, Belize
C011	Temash	Guatemala, Belize
C012	Delta del Río Motagua	Guatemala, Honduras
C013	Chiquimula - Copán Ruinas	Guatemala, Honduras
C014	Ocotepeque-Citala	Honduras, El Salvador
C015	Ostua-Metapán	Guatemala, El Salvador
C016	Río Paz	Guatemala, El Salvador
C017	Estero Real-Río Negro	Nicaragua, Honduras
C018	Sixaola / Salinas Aquifer	Costa Rica, Panama
CB001	Masacre	Dominican Republic, Haiti
CB002	Artibonito	Dominican Republic, Haiti
CB003	Los Lagos	Dominican Republic, Haiti
CB004	Pedernales	Dominican Republic, Haiti
EB001	Secovlje-Dragonja/Istra Aquifer	Croatia, Slovenia
EB002 - EB004	Mirna/Istra Aquifer, Mirna Aquifer, Obmocje izvira Rižane Aquifer	Croatia, Slovenia
EB005 - EB006	Opatija/Istra Aquifer; Notranjska Reka Aquifer	Croatia, Slovenia
EB008 - EB009	Rijecina-Zvir Aquifer; Novokracine Aquifer	Croatia, Slovenia
EB010 - EB012	Cerknica/ Kupa, Kocevje Goteniška, RadovicaMetlika/ Zumberak Aquifers	Croatia, Slovenia
EB013	Ormoz-Sredisce ob Drava/Drava-Varazdin Aquifer	Croatia, Slovenia
EB014 - EB015	Bregana Aquifer; Bregana-Obrezje/Sava- Samobor	Croatia, Slovenia
EB016; EB021	Bizeljsko/ Sutla, Boc, Rogaška, Atomske toplice, Bohor, Orlica Aquifers	Croatia, Slovenia
EB022	Dolinsko-Ravensko/ Mura Aquifer	Croatia, Slovenia
EB023	Kupa Aquifer	Bosnia and Herzegovina, Croatia
EB024	Una	Bosnia and Herzegovina, Croatia
EB025	Krka	Bosnia and Herzegovina, Croatia
EB026	Cetina	Bosnia and Herzegovina, Croatia
EB027	Neretva	Bosnia and Herzegovina, Croatia
EB028	Trebišnjica	Bosnia and Herzegovina, Croatia
EB029	Dinaric Littoral (West Coast aquifer)	Bosnia and Herzegovina, Croatia, Montenegro
EB030	Bilecko Lake	Bosnia and Herzegovina, Montenegro
EB031	Posavina I/Sava Aquifer	Bosnia and Herzegovina, Croatia
EB032	Srem-West Srem/Sava Aquifer	Croatia, Serbia
EB033	South Western Backa/Dunav Aquifer	Croatia, Serbia
EB034	Mura Aquifer	Croatia, Hungary
EB035	Drava/ Drava West Aquifer	Croatia, Hungary
EB036	Northeast Backa/Danube -Tisza Interfluve or Backa/Danube-Tisza Interfluve Aquifer	Croatia, Hungary
EB038	Northeast Backa/Danube -Tisza Interfluve Aquifer	Croatia, Hungary, Romania, Serbia
EB039	Upper Pleistocenesomes alluvial fan	Hungary; Romania; Serbia
EB040	Pleistocene-Holocene Mures/Maros alluvial fan aquifer	Hungary; Romania
EB041	Körös-valley, Sárrét, shallow/Crisuri aquifer	Hungary; Romania
EB042; EB043	Körös – Crisuri holocene, pleistocene transboundary aquifer; Hortobágy-Nagykunság Bihar Northern Part	Hungary; Romania
EB044	Skadar/Shkoder Lake, Dinaric East Coast Aquifer	Albania, Montenegro
EB045	North and South Banat or North and Mid Banat Aquifer	Hungary, Romania, Serbia
EB046	Nyírség, keleti rész/Nyírség, east margin aquifer	Hungary; Romania
EB047	Somes/Szamos alluvial fan aquifer	Hungary; Romania; Ukraine
EB048	Macva-Semberija Aquifer	Bosnia and Herzegovina, Serbia
EB049	Tara Massif	Bosnia and Herzegovina, Serbia
EB050	Lim Aquifer	Montenegro, Serbia
EB051	Pester Aquifer	Montenegro, Serbia
EB052	Metohija Aquifer	Montenegro, Serbia
EB053	Beli Drim/Drini Bardhe Aquifer	Albania, Serbia
EB054	Tetovo-Gostivar	Macedonia, Serbia
EB055	Korab/Bistra-Stogovo Aquifer	Albania, Macedonia
EB056	Jablanica/Golobordo Aquifer	Albania, Macedonia
EB057	Prespa and Ohrid Lake Aquifer	Albania, Greece, Macedonia
EB059	Mourgana Mountain/ Mali Gjere Aquifer	Albania, Greece
EB061	Nemechka/Vjosa-Pogoni Aquifer	Albania, Greece
EB062	Pelagonia- Florina/Bitolsko Aquifer	Greece, Macedonia
EB063	Axiou System	Greece, Macedonia
EB064; EB066	Systima Doiranis	Greece; The former Yugoslav Republic of Macedonia
EB067 - EB069	Sandansky-Petrich Aquifer ; Sandansky Valley Aquifer ; Petrich Valley Aquifer	Bulgaria, Greece, Macedonia
EB070	FYROM-Central Serbia	Macedonia, Serbia
EB071	FYROM-SW Serbia	Macedonia, Serbia
EB072	Zemen	Bulgaria, Serbia
EB073	Stara Planina/ Salasha Montana Aquifer	Bulgaria, Serbia
EB075	Miroc & Golubac	Romania, Serbia
EB076	Dacian Basin	Romania, Serbia
EB077	Orvilos-Agistros/Gotze Delchev aquifer	Bulgaria; Greece
EB078	Nastan-Trigrad	Bulgaria; Greece
EB079	Smolyan	Bulgaria; Greece
EB080	Rudozem	Bulgaria; Greece
EB081	Erma Reka	Bulgaria; Greece
EB082	Evros/Meric	Greece, Turkey
EB083	Orestiadas System	Bulgaria; Greece; Turkey
EB085	Topolovgrad Massif Aquifer	Bulgaria, Turkey
EB086	Malko Tarnovo Kasrt Waterbearing Massif	Bulgaria, Turkey
EB087	Dobrudja/Dobrogea Neogene – Sarmatian aquifer	Bulgaria; Romania
EB088	Dobrudja/Dobrogea Upper Jurassic - Lower Cretaceous Aquifer	Bulgaria; Romania
EB089	Danube-Prut	Romania, Moldova, Ukraine
EB090	Middle Sarmantian Pontian Aquifer	Romania, Moldova, Ukraine
EB091	Prut	Romania, Moldova
EB092	Piva	Montenegro, Bosnia and Herzegovina
EB093	Cijevna	Montenegro, Albania
EU001	LOW MIÑO	Portugal; Spain
EU008	CIUDAD RODRIGO	Portugal; Spain
EU009	Moraleja aquifer	Portugal; Spain
EU010	Detrital Aquifer of the Guadiana Middle Basin	Portugal, Spain
EU024	Genevese aquifer	France; Switzerland
EU035	Deep groundwater body – thermal water	Austria; Germany
EU073	Goricko, Mura - Zala basin/Radgona -Vaš aquifer, Kot aquifer	Austria, Croatia, Hungary, Slovenia
EU077	Szigetköz, Hanság-Rábca/Podunajska basin, Zitny Ostrov	Austria; Hungary; Slovakia
EU078	Dunántúli középhegység északi rész/Komarnanska Vysoka Kryha	Hungary; Slovakia
EU079	Komarnanska Vysoka Kryha / Dunántúli – középhegység északi rész	Hungary; Slovakia
EU081	Ipoly völgy/ Alúvium Ipla aquifer	Hungary; Slovakia
EU082	Slovensky kras/Aggtelek aquifer	Hungary; Slovakia
EU083	Bodrog aquifer	Hungary; Slovakia; Ukraine
EU084	Siret	Romania; Ukraine
EU085	Dniester	Moldova, Ukraine
EU086; EU088; EU089	Cenomanian terringeous Aquifer; Upper Proterozoic terringenous Aquifer; Pripyat	Belarus, Ukraine
EU087; EU094	Paleogene-Neogene terringenous Aquifer; Cenomanian carbonate-terrigenous Aquifer	Belarus, Ukraine
EU091 - EU093	Alluvial/Paleogene-Neogene and Oxfordian - Cenomanien aquifers	Poland, Belarus, Ukraine
EU095 - EU098	Aquifers in Quaternary deposits; Oxfordian-Cenomanian Carbonate-Terrigenous Aquifer; Mazursko-Podlashi Aquifer; Upper Cretaceous Aquifer	Belarus, Lithuania, Poland, Russia
EU099	Daugava	Latvia, Belarus, Lithuania, Russia
EU108	Ordivician - Cambrian Groundwater Body	Estonia, Russia
EU109	Cambrian - Vendian - Voronka Groundwater Body / Lomonosovsky Aquifer	Estonia, Russia
EU112	Upper Devonian terrigenous-Carbonate Aquifer	Belarus, Russia

WORLD MAP

Label	Aquifer name	Sharing countries
EU123	Kanunkankaat Aquifer	Finland, Russia
EU282	Upper Pannonian Thermal Aquifer	Slovakia, Austria, Hungary, Slovenia
EU283	Belgian - Dutch - German Lowland Aquifer System	Belgium, Netherlands, Germany
EU284	Quaternary aquifer; Middle-Upper Devonian aquifer	Estonia; Latvia
N001	Abbotsford-Sumas	Canada, United States of America
N002	Okanagan-Osoyoos	Canada, United States of America
N003	Grand Forks	Canada, United States of America
N004	Poplar	Canada, United States of America
N005	Estevan	Canada, United States of America
N007	Châteauguay	Canada, United States of America
N008	Tijuana - San Diego Aq.	Mexico, United States of America
N012	Nogales-Rio Santa Cruz Aq./Upper Santa Cruz Basin	Mexico, United States of America
N013	Rio Sand Pedro Aq./Upper San Pedro Basin	Mexico, United States of America
N014	Conejos Medanos Aq./Mesilla Bolson	Mexico, United States of America
N015	Valle de Juarez Bolson/Hueco-Tularose Bolson	Mexico, United States of America
N018	Las Palmas Aq./Mimbres Basin	Mexico, United States of America
N019	Judith River	Canada, United States of America
N020	Milk River	Canada, United States of America
N021	Richelieu/Lake Champlain	Canada, United States of America
N021	Lower Tertiary Aquifer System	Canada, United States of America
N022	Upper Cretaceous Aquifer System	Canada, United States of America
N023	Tecate Aq./Potrero Valley	Mexico, United States of America
N024	La Rumorosa - Tecate Aq./Jacumba Valley	Mexico, United States of America
N025	Laguna Salada Aq./Coyote Wells Valley	Mexico, United States of America
N026	Valle de Mexicali - San Luis Rio Colorado Aq./Yu,a - Imperial Valley	Mexico, United States of America
N027	Tinajas Atlas Mountains	Mexico, United States of America
N028	Puente Cuates Valley/Lechuguilla Desert	Mexico, United States of America
N029	Cabeza Prieta Mountains	Mexico, United States of America
N030	Los Vidrios Aq.	Mexico, United States of America
N031	Sonoyta-Puerto Penasco Aq.	Mexico, United States of America
N032	Agua Dulce Mountains	Mexico, United States of America
N033	Cerro Colorado Numero 3 Valley	Mexico, United States of America
N034	Quitobaquito Hills	Mexico, United States of America
N035	La Abra Plain	Mexico, United States of America
N036	Senita Basin	Mexico, United States of America
N037	Lukeville - Sonoyta Valley	Mexico, United States of America
N038	Sierra de Santa Rosa - La Nariz	Mexico, United States of America
N039	The Great Plain	Mexico, United States of America
N040	Los Chirriones Aq.	Mexico, United States of America
N041	San Simon Wash	Mexico, United States of America
N042	Baboquivari Mountains	Mexico, United States of America
N043	Arroyo Seco Aq.	Mexico, United States of America
N044	Pajarito Mountains	Mexico, United States of America
N045	Rio Altar Aq.	Mexico, United States of America
N046	Elenita-Huachuca Basin	Mexico, United States of America
N047	Mule Mountains	Mexico, United States of America
N048	Rio Agua Prieta Aq./Douglas Basin	Mexico, United States of America
N049	Perilla Mountains	Mexico, United States of America
N050	Arroyo San Bernardino Aq./San Bernardino Valley	Mexico, United States of America
N051	Guadalupe Mountains	Mexico, United States of America
N052	Animas Basin	Mexico, United States of America
N053	Janos Aq./Playas Basin	Mexico, United States of America
N054	Alamo Hueco Mountains	Mexico, United States of America
N055	Ascension Aq./Hachita Moscos Basin	Mexico, United States of America
N056	Josefa Ortiz de Dominguez Aq.	Mexico, United States of America
N057	Potrillo Mountains	Mexico, United States of America
N058	Quitman Mountains	Mexico, United States of America
N059	Red Light Draw Bolson	Mexico, United States of America
N060	Eagle Mountains	Mexico, United States of America
N061	Green River Valley Bolson	Mexico, United States of America
N062	Presidio Bolson	Mexico, United States of America
N063	Redford Bolson	Mexico, United States of America
N064	Tertiary Igneous Rocks	Mexico, United States of America
N065	Cretaceous-Terlingua Aq.	Mexico, United States of America
N066	Mariscal	Mexico, United States of America
N067	Boquillas Fm/Boquillas Fm	Mexico, United States of America
N068	Edwards Aq.	Mexico, United States of America
N069	Santa De del Pino Aq.	Mexico, United States of America
N070	Serrania del Burro Aq.	Mexico, United States of America
N071	Austin Fm/Austin Chalk	Mexico, United States of America
N072	Kiamichi Fm	Mexico, United States of America
N073	Buda-Del Rio Fm/Buda Limestone-Del Rio Clay	Mexico, United States of America
N074	Eagle Ford Fm/Eagle Ford Group	Mexico, United States of America
N075	Presa La Amistad Aq.	Mexico, United States of America
N076	Allende-Piedras Negras Aq.	Mexico, United States of America
N077	Upson Fm/Upson Clay	Mexico, United States of America
N078	San Miguel Fm	Mexico, United States of America
N079	Olmos Fm	Mexico, United States of America
N080	Escondido Fm	Mexico, United States of America
N081	Midway Fm/Kincaid Fm	Mexico, United States of America
N082	Carrizo-Wilcox Aq.	Mexico, United States of America
N083	Bigford Fm	Mexico, United States of America
N084	El Pico Clay Fm	Mexico, United States of America
N085	Palma Real-Guayabal Fm/Laredo Fm	Mexico, United States of America
N086	Yegua-Jackson Aq.	Mexico, United States of America
N087	Calahoula Confining System	Mexico, United States of America
N088	BRB/Gulf Coast Aq.	Mexico, United States of America
S001	Choco-Darién	Panama, Colombia
S002	Táchira Pamplonita	Colombia, Venezuela
S003	La Guajira	Colombia, Venezuela
S004	Grupo Roraima	Brazil, Guyana, Venezuela
S005	Boa Vista-Serra do Tucano-North Savanna	Brazil, Guyana
S006	Zanderij	French Guiana, Guyana, Suriname
S007	Coesewijne	Guyana, Suriname
S008	A-Sand/B-Sand	Guyana, Suriname
S009	Costeiro	Brazil, French Guiana
S010	Tulcán-Ipiales	Colombia, Ecuador
S011	Zarumilla	Ecuador, Peru
S012	Puyango-Tumbes-Catamayo-Chira	Ecuador, Peru
S013	Amazonas	Bolivia, Brazil, Colombia, Ecuador, Peru,
S014	Titicaca	Bolivia, Chile, Peru
S015	Pantanal	Bolivia, Brazil, Paraguay
S016	Agua Dulce	Bolivia, Paraguay
S017	Ollagüe-Pastos Grandes	Bolivia,Chile
S018	Concordia-Escritos-Caplina	Peru, Chile
S019	Aquidauana-Aquidabán	Brazil, Paraguay
S020	Caiua-Bauru-Acaray Aquifer	Brazil, Paraguay
S021	Sistema Aquífero Guaraní	Argentina, Brazil, Paraguay, Uruguay
S022	Serra Geral	Argentina, Brazil, Paraguay, Uruguay
S023	Litoráneo-Chuy	Brazil, Uruguay
S024	Permo-Carbonífero	Brazil, Uruguay
S025	Litoral-Cretácico	Argentina, Uruguay
S026	Salto-Salto Chico	Argentina, Uruguay
S027	Puneños	Argentina, Bolivia
S028	Yrendá-Toba-Tarijeño	Argentina, Bolivia, Paraguay
S029	El Cóndor-Cañadón del Cóndor	Argentina, Chile
S030	Ascotán	Bolivia,Chile