



United Nations
Educational, Scientific and
Cultural Organization



International
Hydrological
Programme



**Sustainable
Development
Goals**

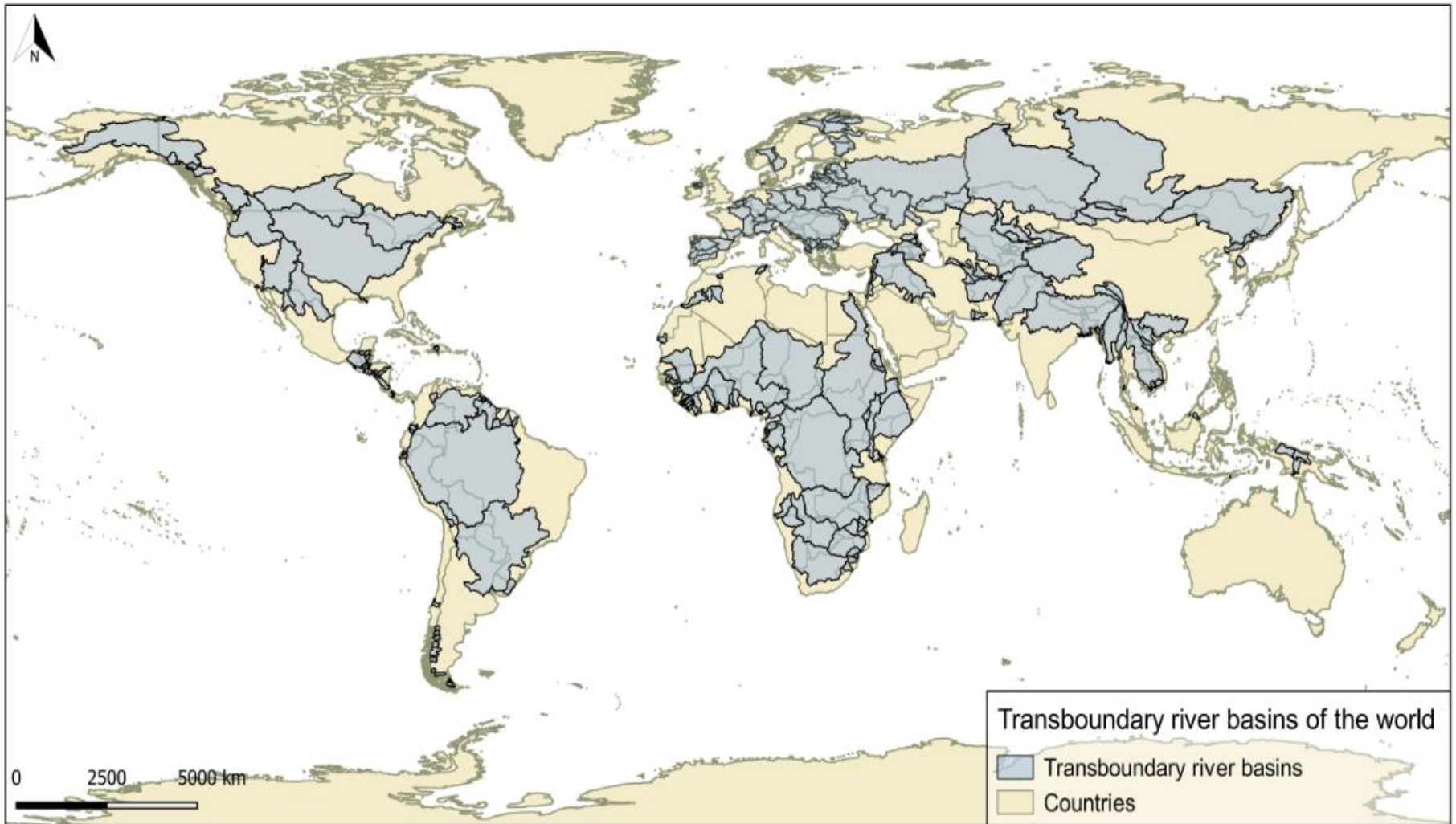
GROUNDWATER MANAGEMENT IN TRANSBOUNDARY RIVER BASIN ORGANIZATIONS

**14th International Conference "Europe-INBO 2016"
on implementation of the European Water Directives
Lourdes, 20 October 2016**

Tales Carvalho Resende
UNESCO International Hydrological Programme (IHP)

Transboundary River Basins

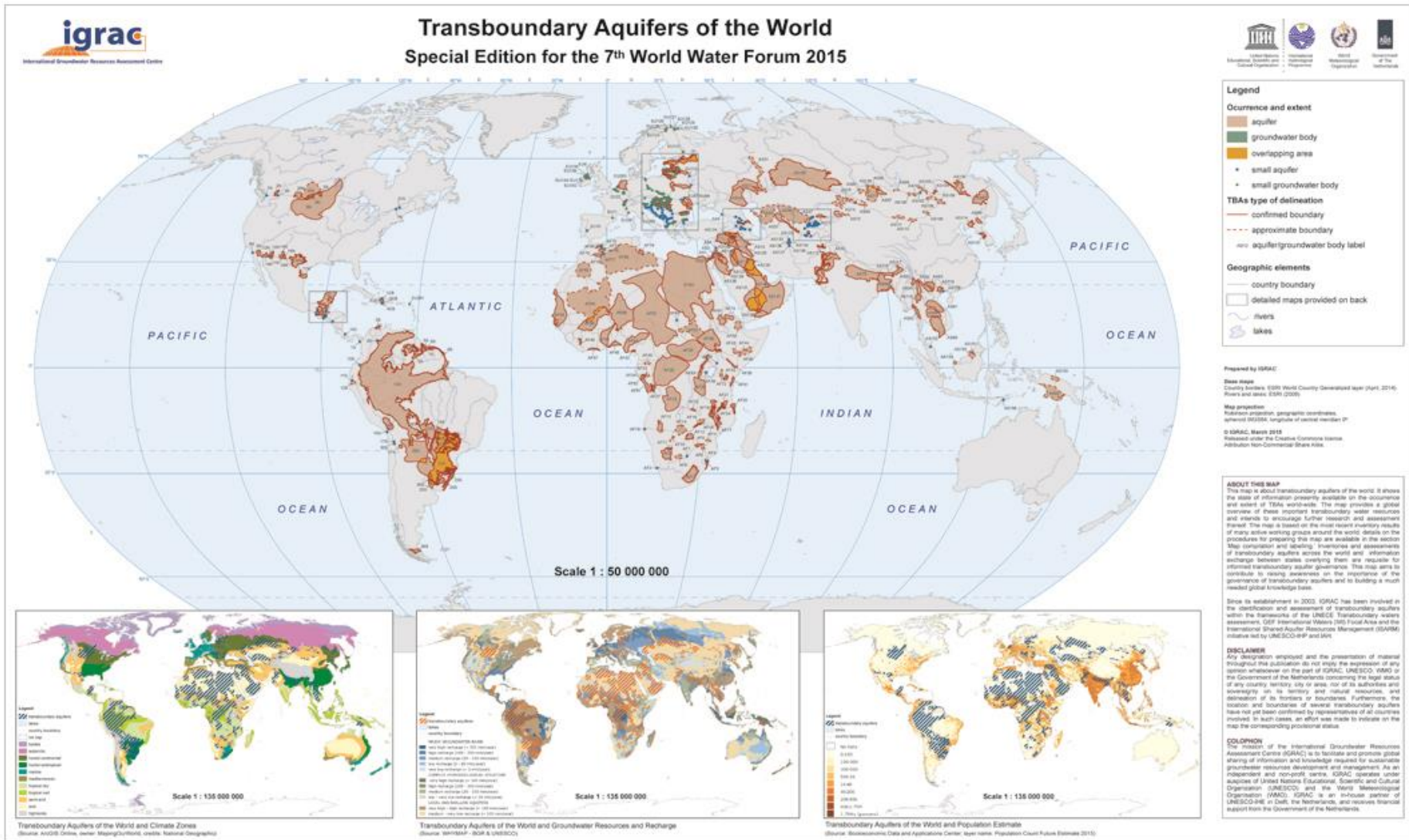
Source: Transboundary Freshwater Dispute Database – Oregon State University



276 transboundary river basins (TBRBs) have been identified.

Transboundary Aquifers

Source: UNESCO-IGRAC – 2015 Map of Transboundary Aquifers



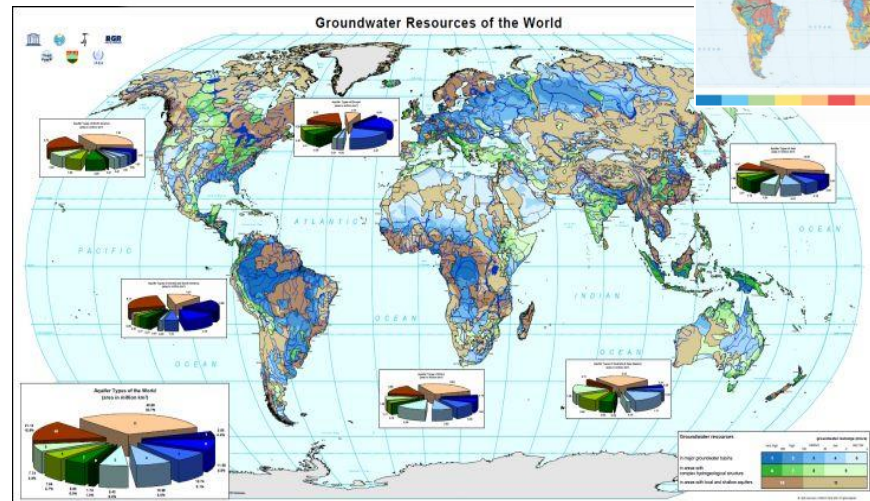
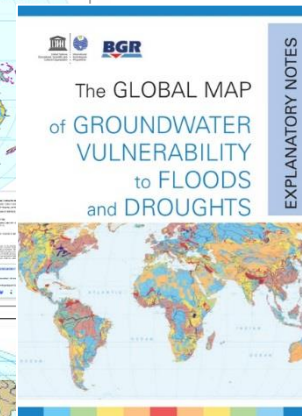
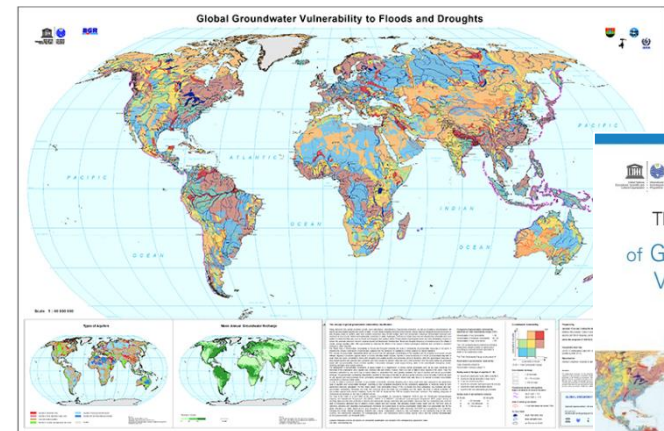
592 transboundary aquifers (TBAs) have been identified by UNESCO-IGRAC.

Groundwater at UNESCO-IHP

- UNESCO International Hydrological Programme (IHP):
 - Only intergovernmental programme of the UN system devoted to help improve understanding of water resources and foster effective water management
- More than 50 years of hydrogeological mapping activities



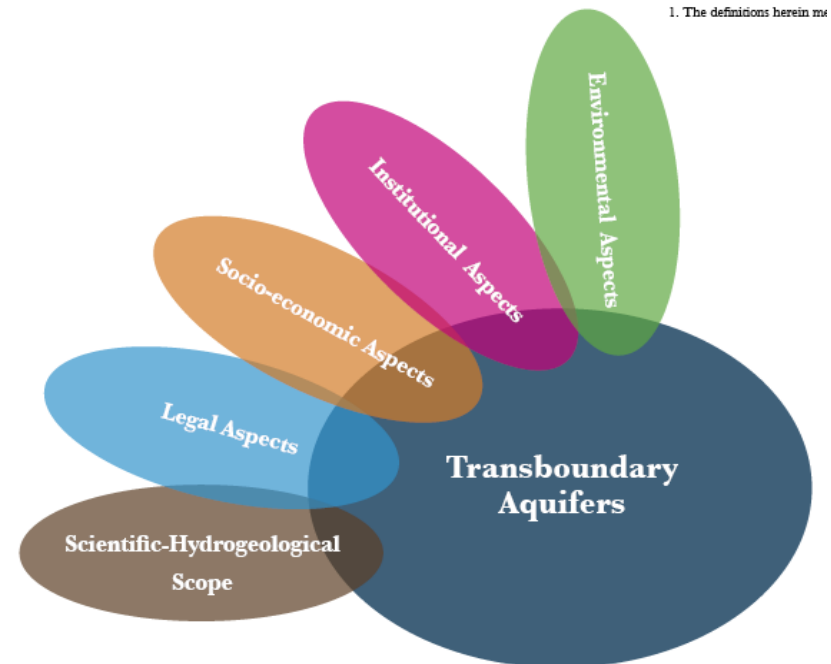
50 Years of
Hydro(geo)logical
Mapping Activities



International Shared Aquifer Resources Management (ISARM) Programme



UNESCO-IHP launched the ISARM initiative in the year 2000 aiming at undertaking the inventory of transboundary aquifers and develop recommendations for improving their management and governance considering scientific, socio-economic, legal, institutional and environmental components

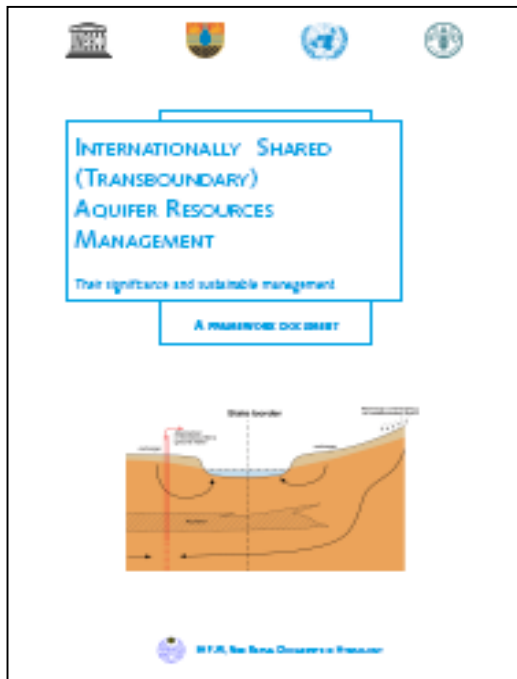


International Shared Aquifer Resources Management (ISARM) Programme

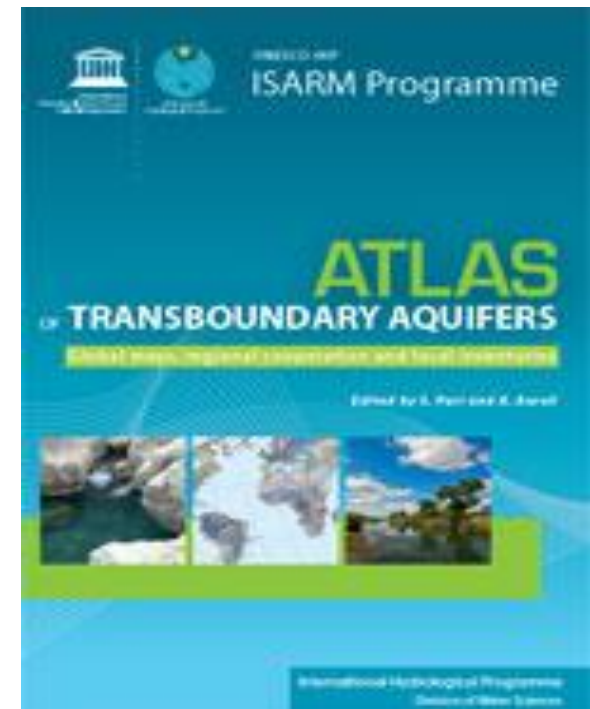


2000: Starting of the first Worldwide Inventory of Transboundary Aquifers (UNESCO-IHP Resolution XIV-12 - 2000)

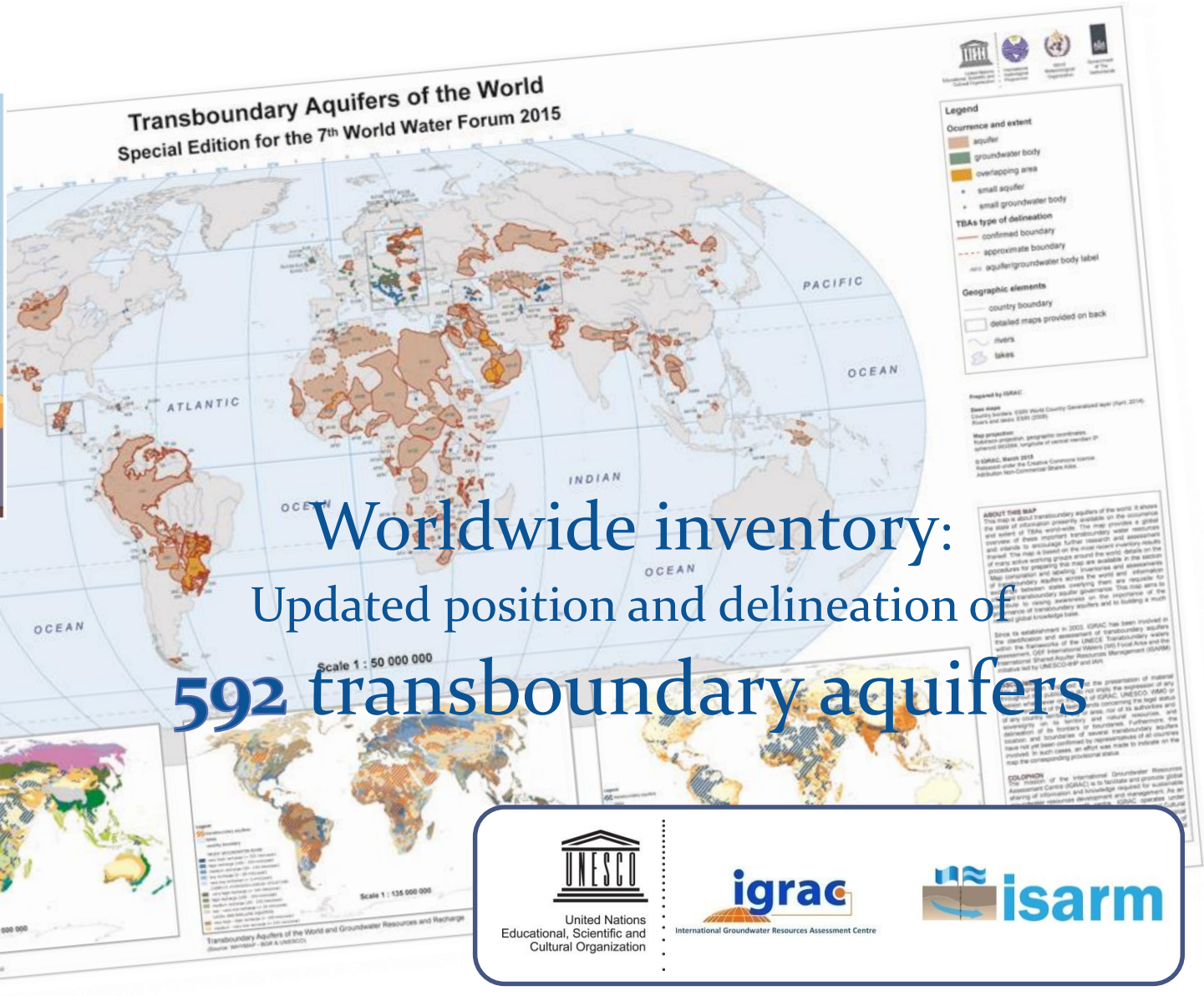
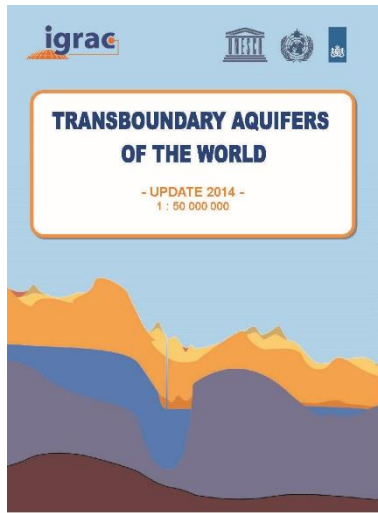
2000: Framework document



2008: First TBAs Map



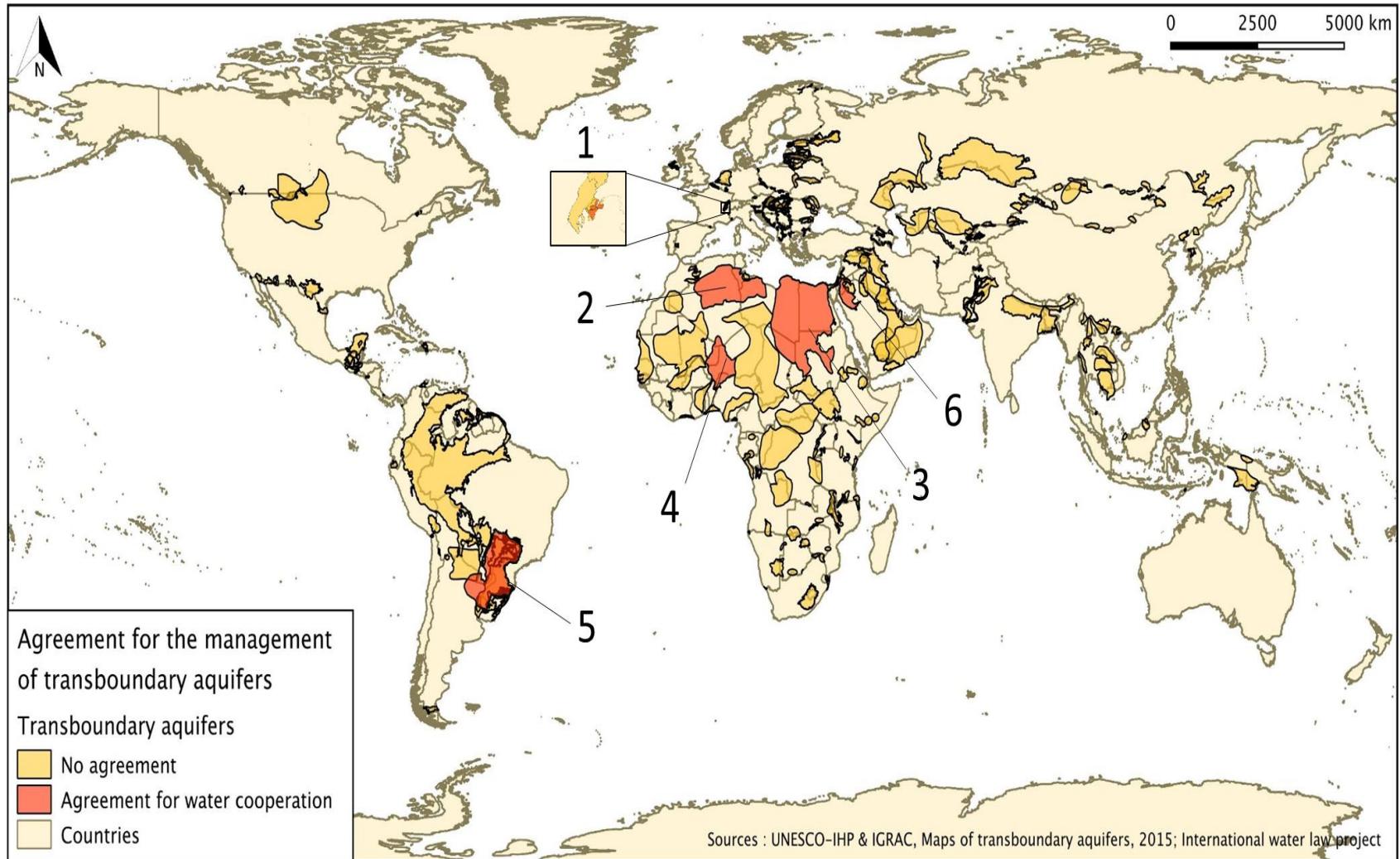
Transboundary Aquifers of the World



Worldwide inventory:
Updated position and delineation of
592 transboundary aquifers



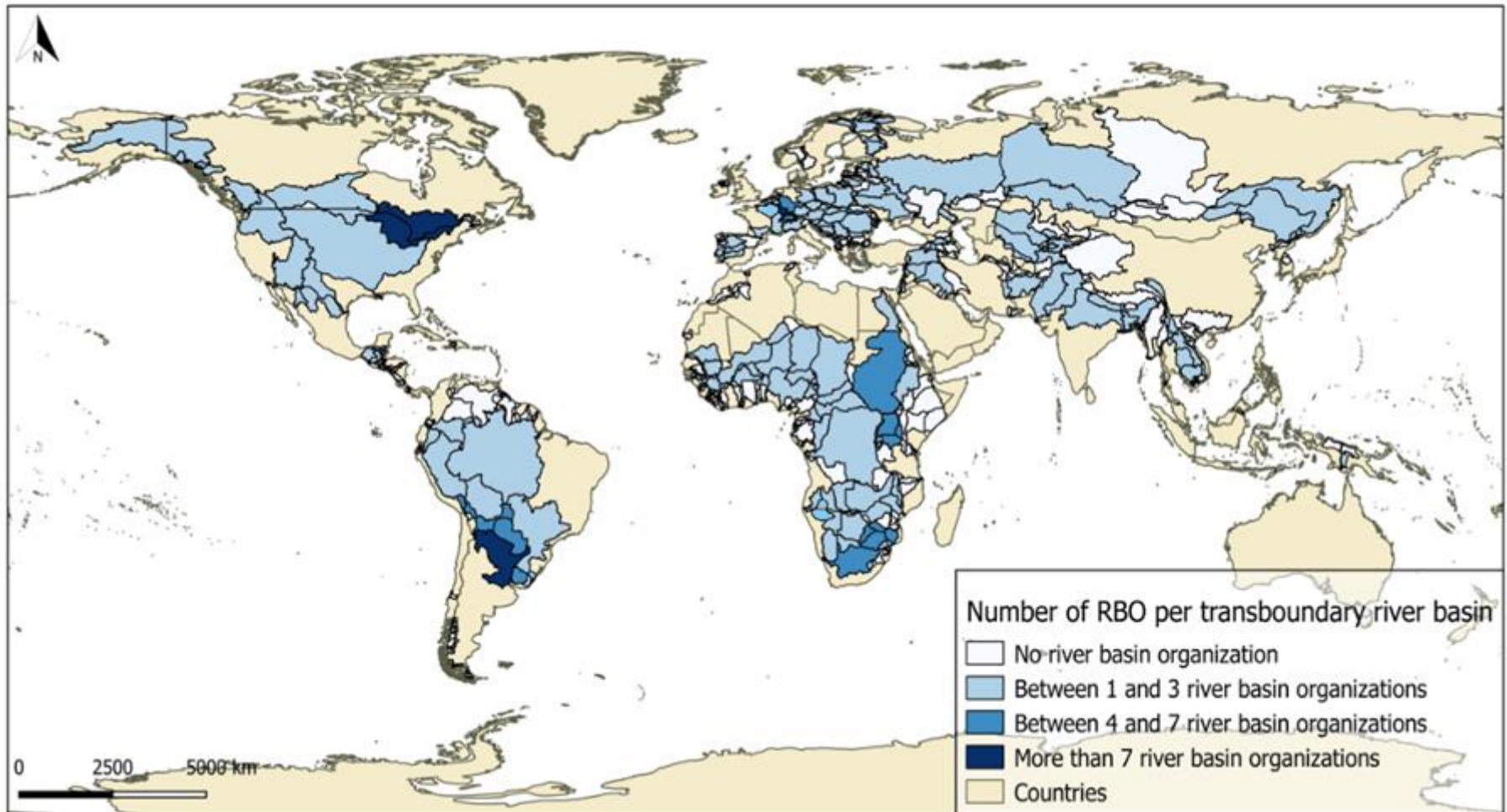
Governance of Transboundary Aquifers



Only 6 TBAs are subjected to an arrangement for water cooperation

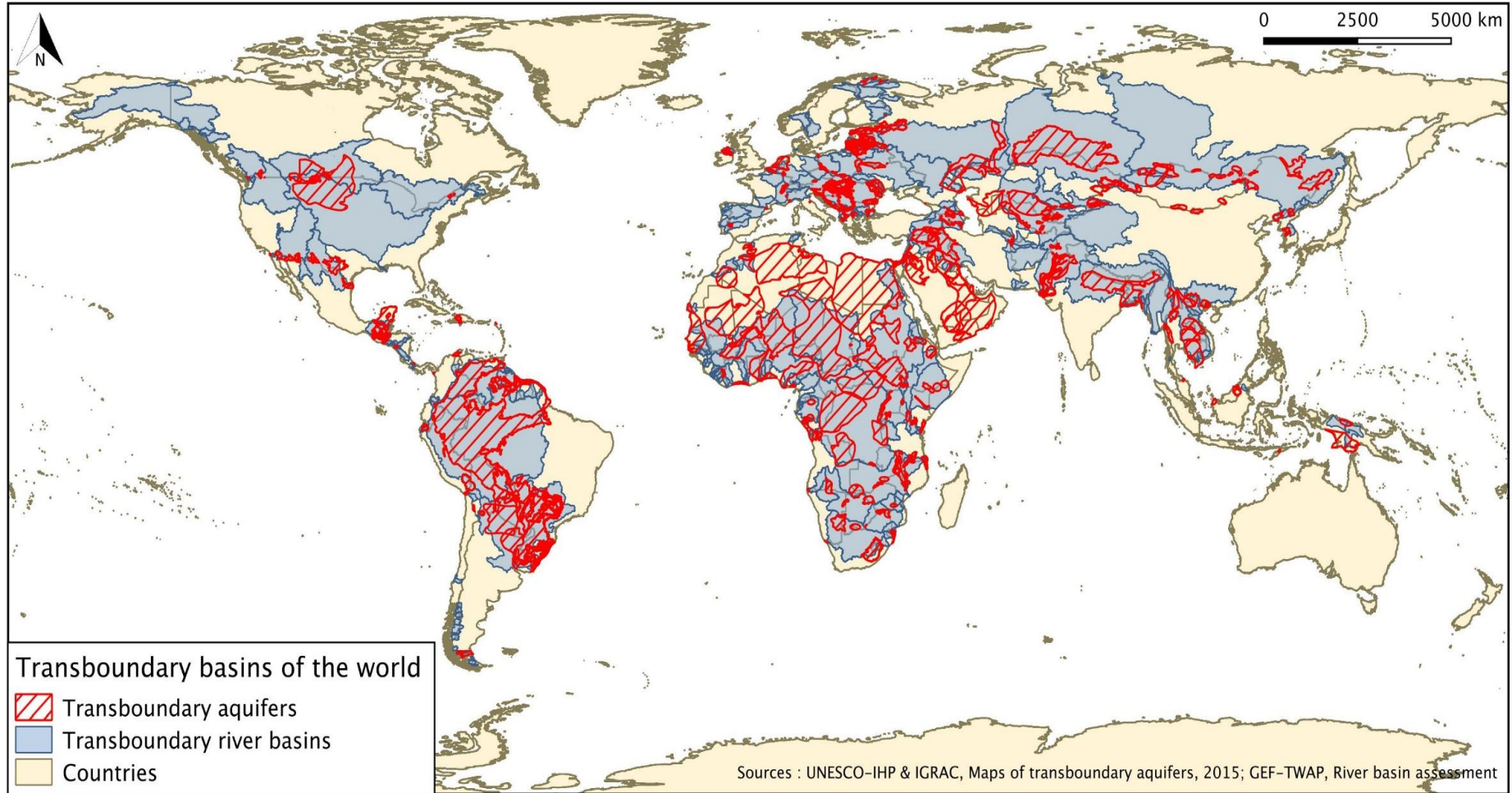
Governance of Transboundary River Basins

Source: Transboundary Freshwater Dispute Database – Oregon State University



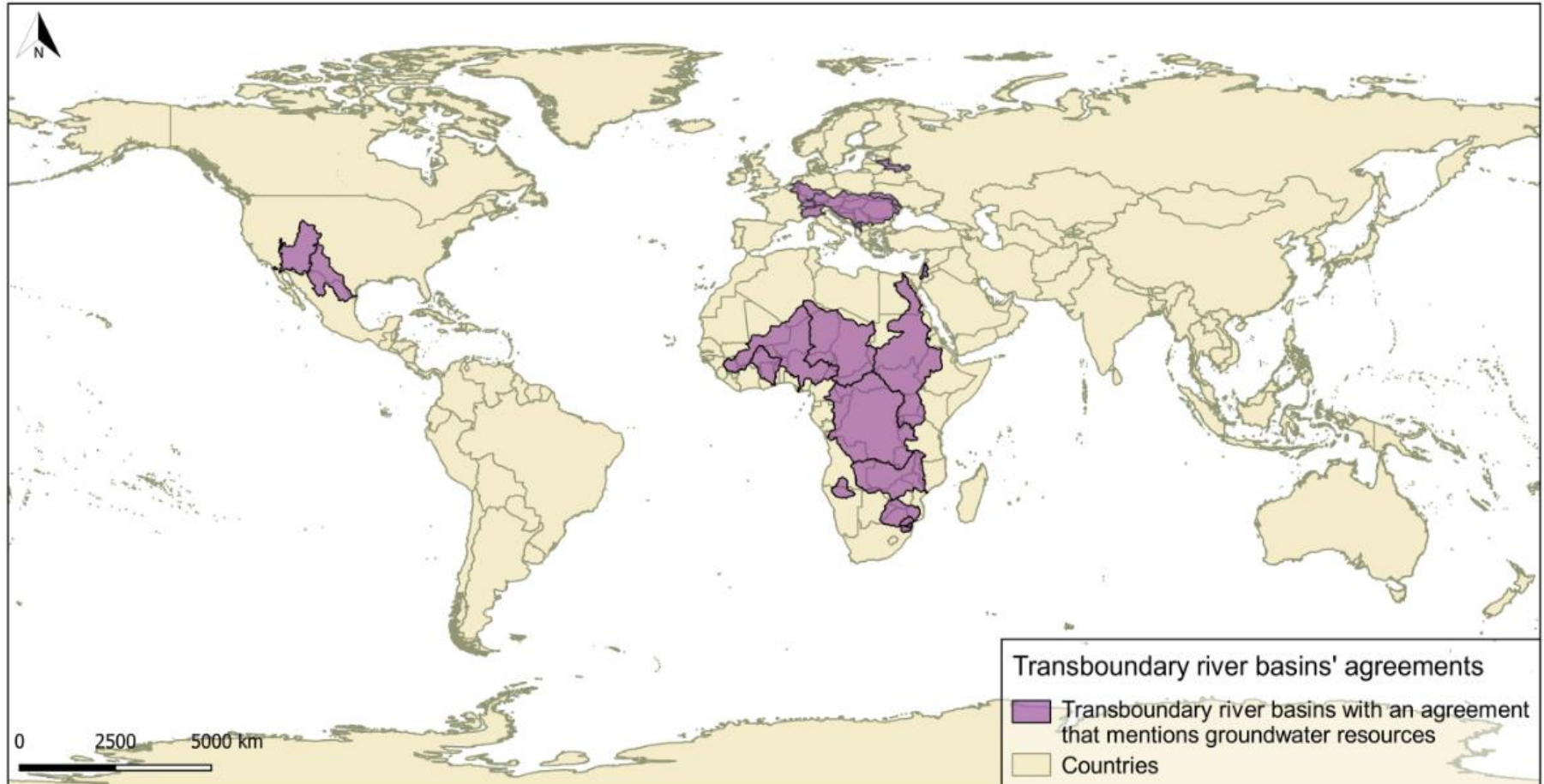
- Around 30% of TBRBs have a transboundary river basin organization (TBRBO) or joint body in charge of managing the entire basin that includes all countries sharing the basin.
- Around 70% of TBRBs (usually small TBRBs) do not have any domestic or transboundary RBO.

Transboundary River Basins vs Aquifers



RBOs can play an important role in promoting cooperation over transboundary aquifers

Groundwater in transboundary river basins



Out of the existing TBRBOs worldwide, less than 10% have a mandate that covers groundwater

The potential role of RBOs in promoting cooperation over transboundary aquifers

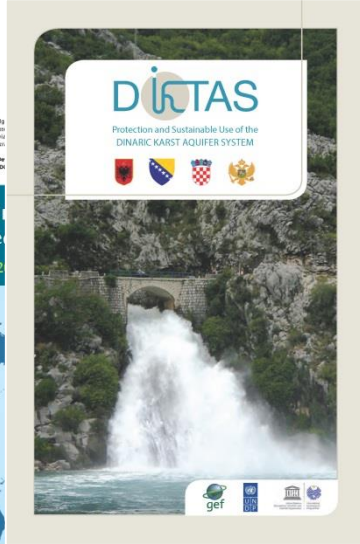
- Managing and governing a TBA has to start at the domestic level. A solid legal and institutional foundation at domestic level will trigger TBA cooperation frameworks.
- Domestic groundwater governance frameworks usually need either reviewing and upgrading water laws or completing water law with regulations.
- Existing TBRBOs whose mandate covers groundwater could host dedicated attention to transboundary aquifers.
- However, a critical issue for sound governance and management of transboundary aquifers within TBRBOs is that TBAs can be partly or fully inside one or several TBRBs. Hence, the importance of domestic RBOs.

Key messages:

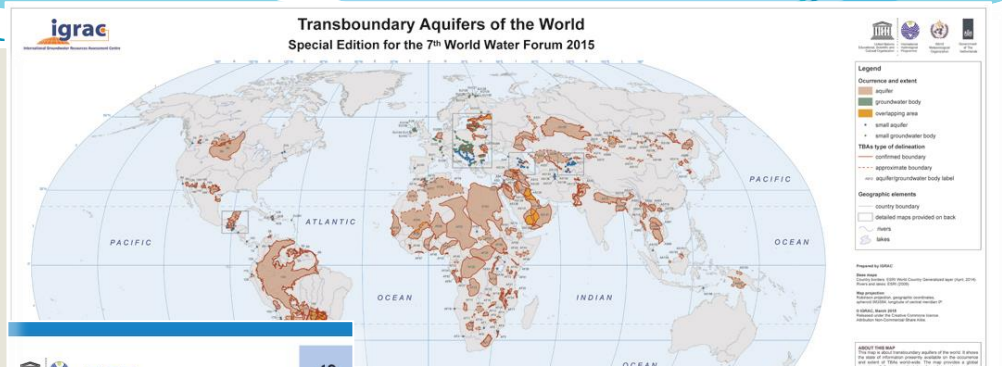
- How to promote cooperation over TBAs?
 - ✓ *Building upon national government capacities and institutions, and seeking to synergize them towards cooperative mechanisms or,*
 - ✓ *Tapping into the regional existing institutions (e.g. TBRBOs) whose mandates cover groundwater resources.*
- Strengthening groundwater capacities in implementation and enforcement both at domestic level and in TBRBOs is then necessary to support cooperation.



Governance of Groundwater Resources in Transboundary Aquifers (GGRETA) project
OVERVIEW AND RESULTS OF THE ASSESSMENT PHASE (2013–2015)

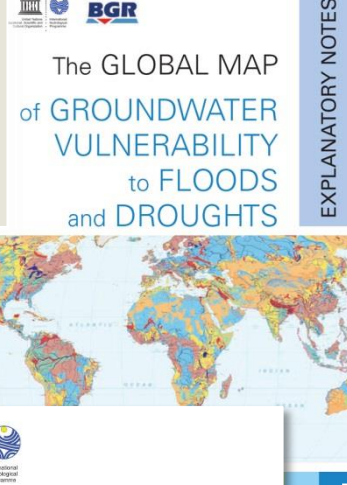


DISTAS
Protection and Sustainable Use of the
DINARIC KARST AQUIFER SYSTEM



igac
International Groundwater Assessment Centre

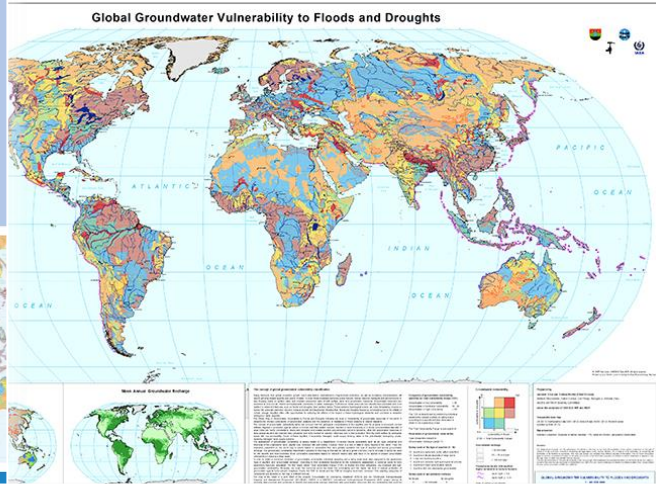
Transboundary Aquifers of the World
Special Edition for the 7th World Water Forum 2015



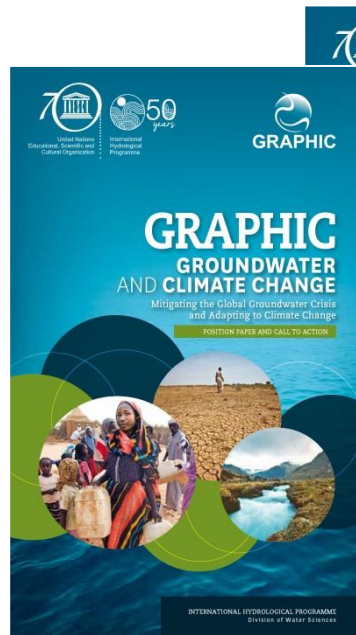
BGR

The GLOBAL MAP
of GROUNDWATER
VULNERABILITY
to FLOODS
and DROUGHTS

EXPLANATORY NOTES



Global Groundwater Vulnerability to Floods and Droughts



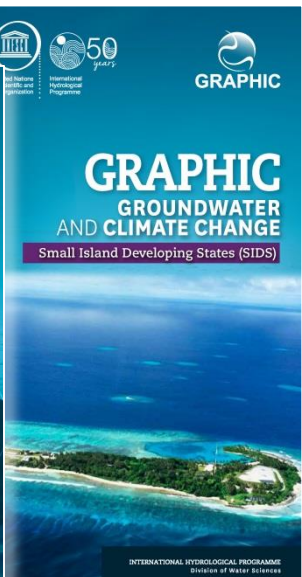
70 years
United Nations
Educational, Scientific and
Cultural Organization

50 years
International
Hydrological
Programme

GRAPHIC

GRAPHIC
GROUNDWATER
AND CLIMATE CHANGE
Mitigating the Global Groundwater Crisis
and Adapting to Climate Change
POSITION PAPER AND CALL TO ACTION

INTERNATIONAL HYDROLOGICAL PROGRAMME
Division of Water Sciences



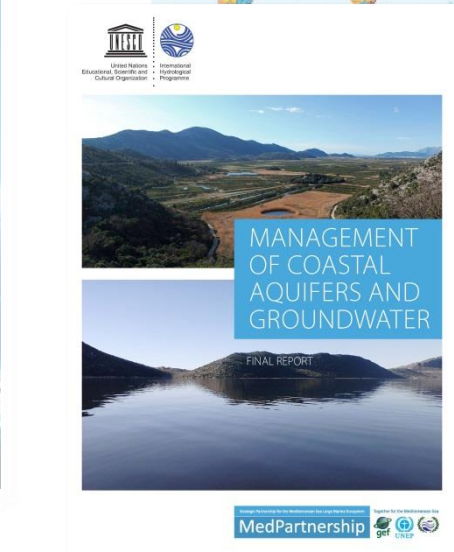
70 years
United Nations
Educational, Scientific and
Cultural Organization

50 years
International
Hydrological
Programme

GRAPHIC

GRAPHIC
GROUNDWATER
AND CLIMATE CHANGE
Small Island Developing States (SIDS)

INTERNATIONAL HYDROLOGICAL PROGRAMME
Division of Water Sciences



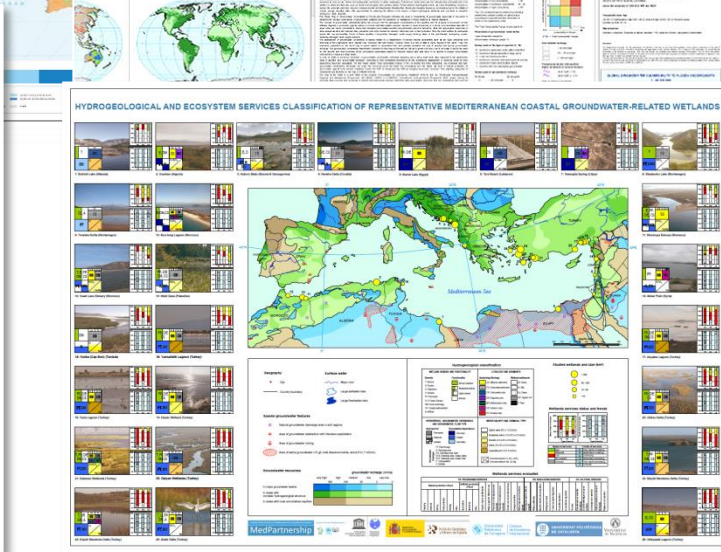
United Nations
Educational, Scientific and
Cultural Organization

International
Hydrological
Programme

**MANAGEMENT OF COASTAL
AQUIFERS AND
GROUNDWATER**

FINAL REPORT

MedPartnership



HYDROGEOLOGICAL AND ECOSYSTEM SERVICES CLASSIFICATION OF REPRESENTATIVE MEDITERRANEAN COASTAL GROUNDWATER-RELATED WETLANDS

MedPartnership

Thank you!

t.carvalho-resende@unesco.org



Organisation
des Nations Unies
pour l'éducation,
la science et la culture



Programme
Hydrologique
International