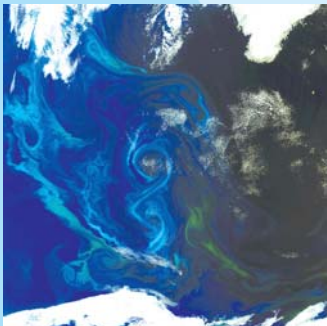




Assessing transboundary aquatic ecosystems globally through the UNEP-GEF Transboundary Waters Assessment Programme (TWAP): Insights for freshwater ecosystems

First International Environment Forum for Basin Organizations
26 November 2014 | Nairobi, Kenya



Why TWAP?

No sustainable governance
without knowledge, data
and information

...No indicator-
based
reference data

Are GEF
investments
improving
aquatic
ecosystems?



...How do we
prioritize
limited IW
funds?



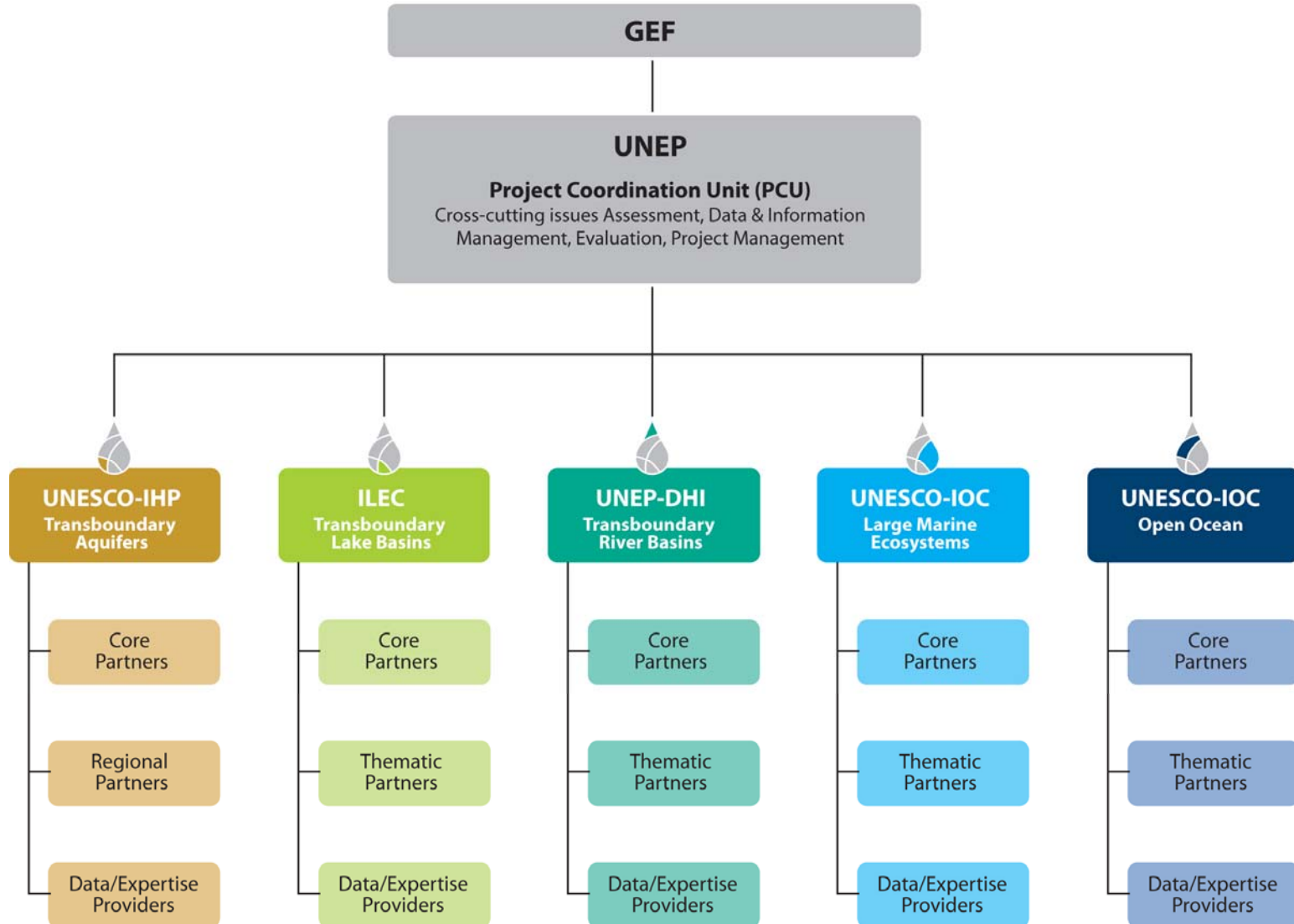
TWAP Full-Sized Project (2013-2015): Global Indicator-Based Assessment






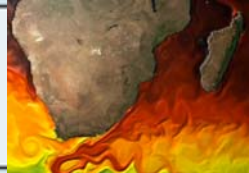
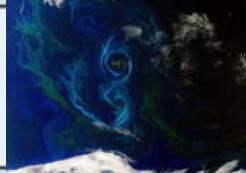
- Conduct **first global assessment** to assist GEF and other donors to indicate funding priorities;
- Formalize **partnerships with key institutions and build sustainable networks**;
- Establish the baseline for **periodic assessments** of transboundary water systems
- In the long-term, promote **transboundary cooperation** for better **ecosystem management** and **governance**



Institutional Partnerships for implementing the GEF TWAP



Overview of five independent water systems assessments

Elements	Comparative within a water system				Thematic
	Transboundary Aquifers:	Transboundary Lakes Basins & Reservoirs	Transboundary River Basins	Large Marine Ecosystems	The Open Ocean
Spatial coverage, 2010, 2030, 2050	166 aquifers 43 groundwater systems in SIDS	206 lakes/ reservoirs	276 river basins	66 LMEs, of which 55 are transboundary	Global Open Ocean
Biophysical indicators					
Socioeconomic Indicators (e.g.)	Water demand by economic sector	GDP Fisheries GDP Tourism	Access to water Access to sanitation	Deaths due to climate related natural disasters	Vulnerability to sea level rise
Governance architecture/ arrangement (e.g.)	For Water Quantity	For Water Distribution	For Habitat Destruction	For Fisheries	For Biodiversity
Data & Information Management					



TWAP Results

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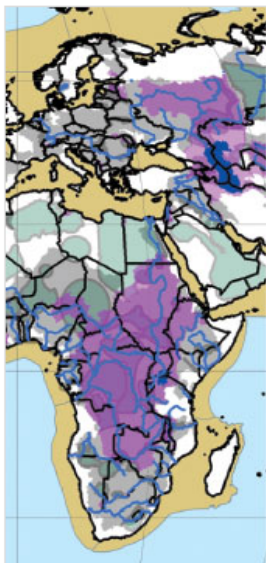
TWAP PROJECT

DATA PORTAL






PROJECT RESULTS
AND REPORTS



Credit: Alto Paraguay River, Brazil
Raymundo José Santos Garrido



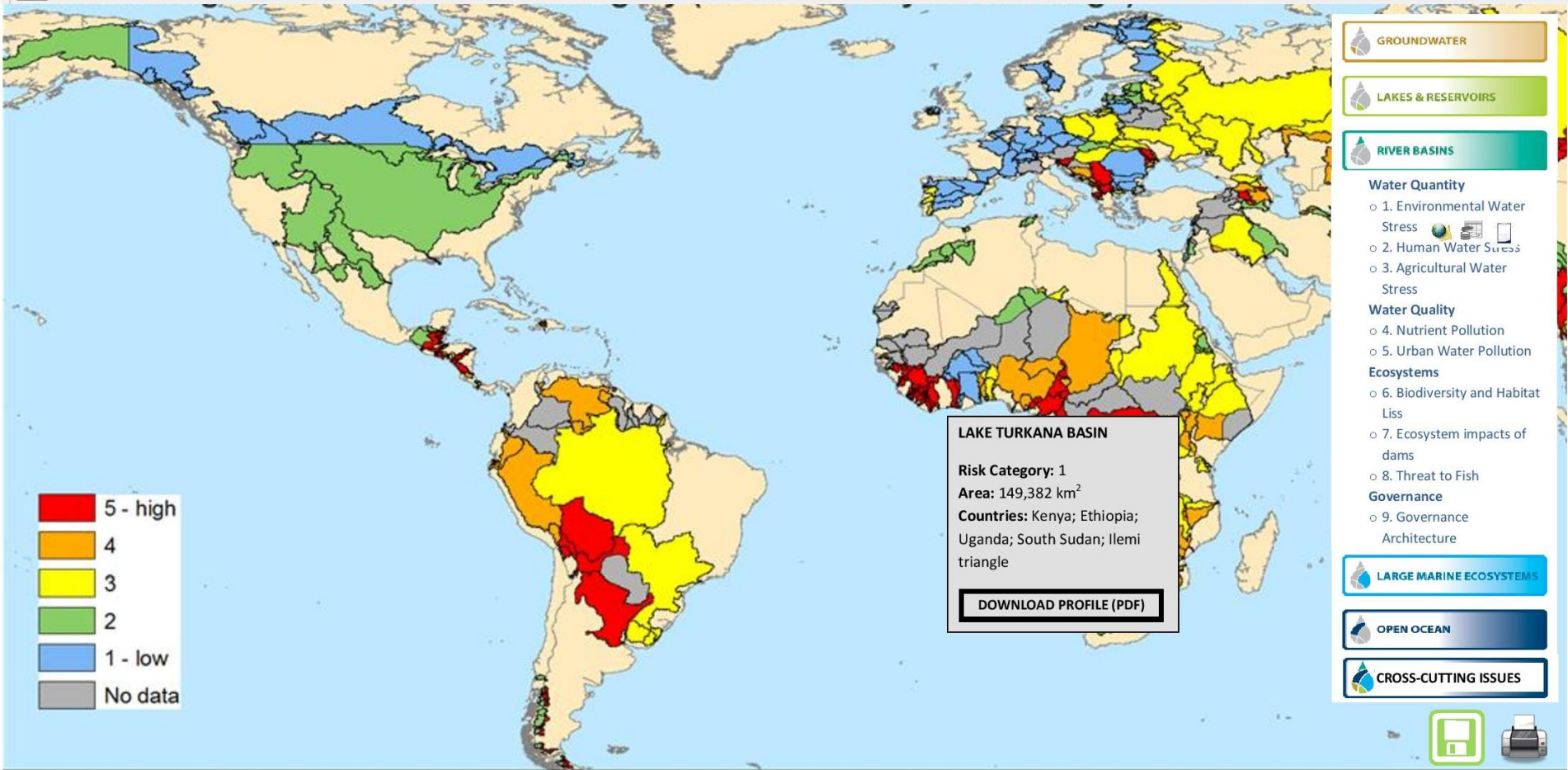
The water systems of the world - aquifers, lakes, rivers, large marine ecosystems, and open ocean - support the socioeconomic development and wellbeing of the world's population. Many of these systems are shared by two or more nations and these transboundary resources are interlinked by a complex web of environmental, political, economic and security interdependencies. The [Global Environment Facility International Waters](#) focal area is enabling the **Transboundary Waters Assessment Programme (GEF TWAP)** to provide the first global-scale assessment and improve knowledge for informed decision-making, raise awareness and foster cooperation among all stakeholders.

-  **GROUNDWATER**
-  **LAKES & RESERVOIRS**
-  **RIVER BASINS**
-  **LARGE MARINE ECOSYSTEMS**
-  **OPEN OCEAN**



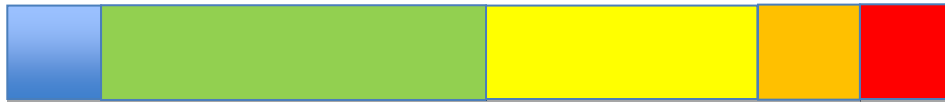
GEF TWAP Project Coordination Unit (PCU)

United Nations Environment Programme (UNEP) | P.O. Box 30552 (00100) | Nairobi, Kenya | E-mail: TWAP.PCU@unep.org



Prioritization across indicators and basins

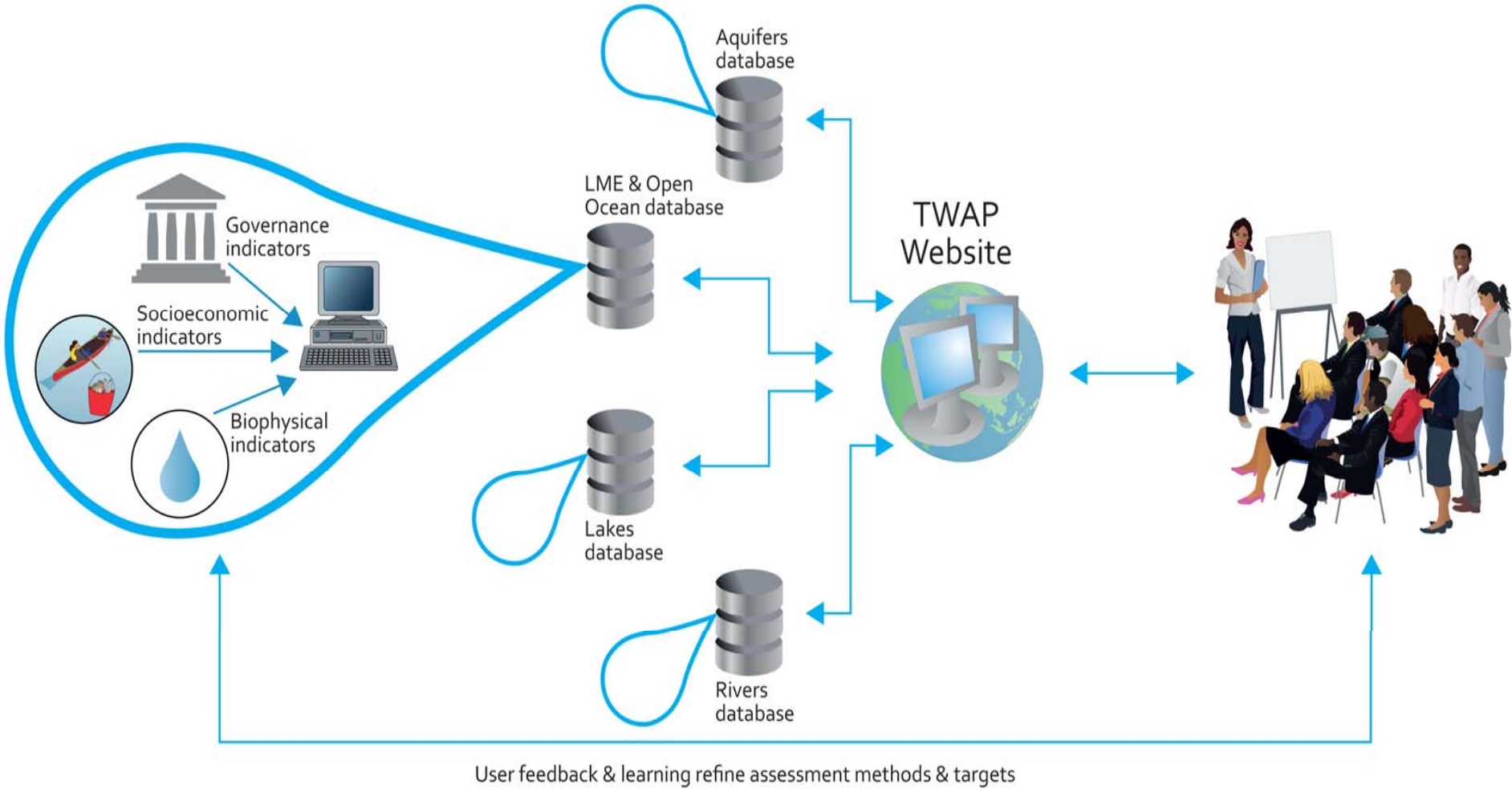
- Raw indicator values ->
- Relative risk categories
- Score card



	Relative risk categories (to humans and/or environment)
1	Very low
2	Low
3	Moderate
4	High
5	Very high

River Basin	Code	Area km ²	Population	Runoff (km ³)	1	2	3	4	5	7	8	10	11	12	13	14	Av
River Basin Name	River Basin Code	Area [km ²]	Population	Runoff [km ³]	Environmental Water Stress	Human Water Stress	Agricultural Water Stress	Nutrient Pollution	Urban Water Pollution	Ecosystem impacts of dams	Threat to Fish	Institutional Resilience	Enabling Environment	Economic Dependency on Water Resources	Societal Well-being	vulnerability to Climate-related Natural Disasters	Unweighted normalised Score
Indus	INDU	11,37,814	270,498,008	270,498,008	1.00	1.00	0.96	0.50	0.69	0.80	0.66	0.41	0.64	0.44	0.08	1.00	0.68
Asi/Orontes	ASIX	37,910	6,289,570	6,289,570	0.63	0.80	0.86	0.75	0.63	0.64	0.69	0.64		0.47	0.56	0.57	0.66
Tagus/Tejo	TAGU	77,619	10,505,570	10,505,570	0.38	0.79	0.72	0.50	0.61	1.00	0.82	0.25	0.26	0.81	0.89	0.49	0.63
Kura-Araks	KURA	193,421	17,148,620	17,148,620	0.50	0.86	0.94	0.50	0.63	0.77	0.66	0.59	0.73	0.23	0.34	0.64	0.62
Vardar	VRDR	32,396	4,126,820	4,126,820	0.38	0.76	0.71	0.50	0.66	0.84	0.59	0.50	0.90	0.49	0.57	0.46	0.61
Medjerda	MDJD	23,149	2,954,230	2,954,230	0.50	0.76	0.85	0.50	0.63	0.83	0.70	0.75	0.36	0.25	0.63	0.58	0.61
Maritsa	MRSA	49,606	3,987,560	3,987,560	0.38	0.80	0.74	0.50	0.63	0.96	0.56	0.53		0.48	0.66	0.50	0.61
Tigris-Euphrates/Shatt al					0.50	0.82	0.87	0.25	0.61	0.87	0.60	0.22		0.41	0.22	0.52	0.61

TWAP Data Management Structure





UNEP-DHI Partnership Centre for Water and Environment



River Basins

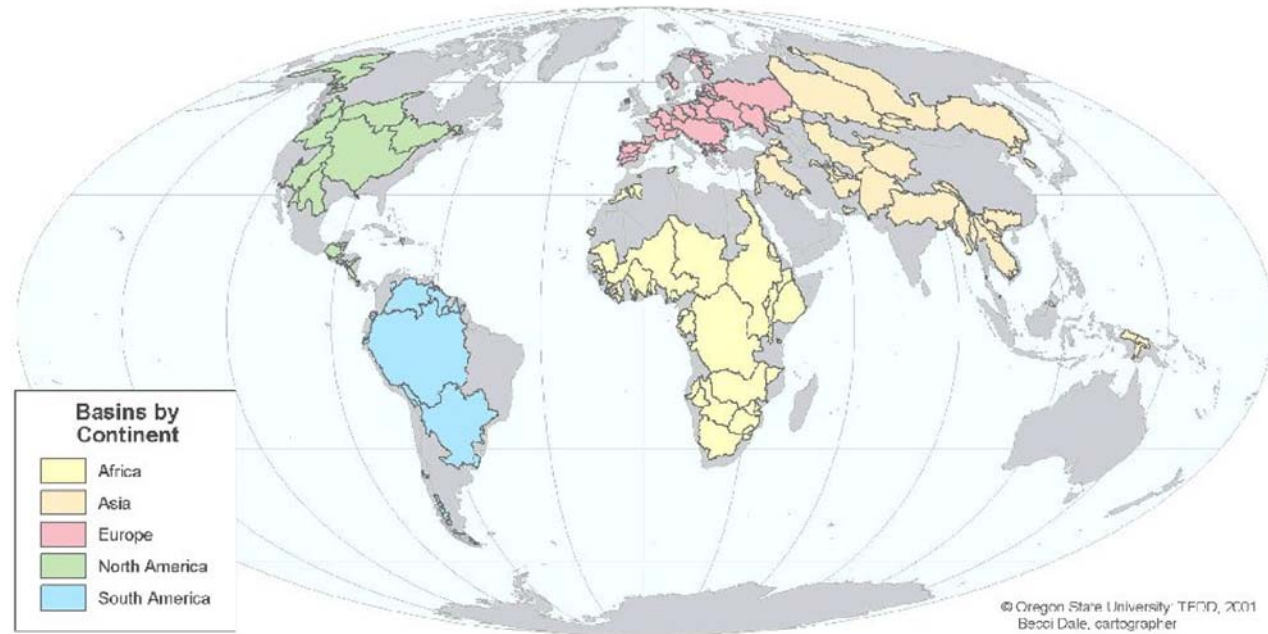
Scope and Activities

Scope:

- Over 280 transboundary basins

Activities:

- Use existing information and modelling
- Data Management System Development
- Use of composite indicators



TWAP River Basin Indicators

Water Quantity

1.

Environmental Stress Induced by Flow Regime Alterations

2. Human Water Stress

3. Agricultural Water Stress

Water Quality

4. Nutrient Pollution

5. Wastewater Pollution

Ecosystems

6. Biodiversity and Habitat Loss

7. Ecosystem Impacts from Dams

8. Threat to Fish

Governance

9. Legal Arrangements

10. Potential Institutional Risk Due to Water Variability

11. Enabling Environment

Socio-economics

12. Economic Dependency

13. Societal Well-being

14. Vulnerability to Climate-related Natural Disasters

Projected transboundary stress 2030 / 2050

Environmental Water Stress

Human Water Stress

Nutrient Pollution

Population Density

Potential hydro-political tensions due to basin development in absence of institutional capacity

Water Systems Interlinkages

Delta Vulnerability Index

Lake Influence Index





UNESCO-IHP

International Hydrological
Programme of UNESCO



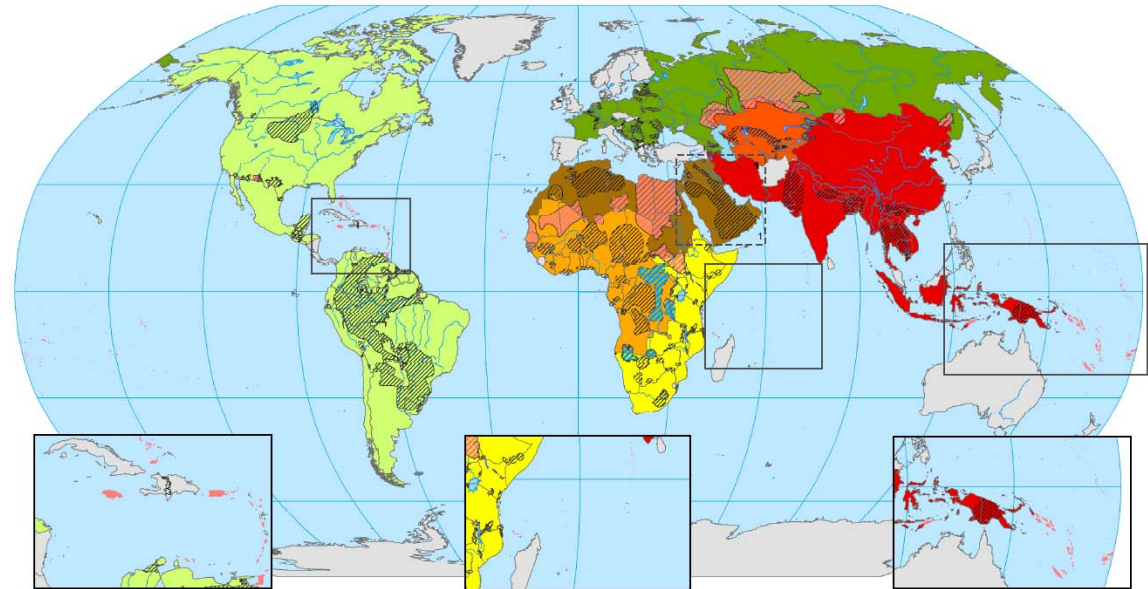
Groundwater

Scope and Activities

Scope

- 166 shared Aquifers
- 43 SIDS
- 526 questionnaires sent to 116 countries
- over 7000 files received

Regions for the TWAP Groundwater component & TBA and SIDS to be assessed



Legend

World Grid	Lakes	approximate boundary	Small Island Developing States (SIDS)	Region Africa (Subregion: Central-Western Africa)
Country borders	TBA and SIDS	confirmed boundary	Regions TWAP TBA	Region Africa (Southern-Eastern Africa)
Countries without TBA in TWAP	TBA within TWAP regions	TBAs (Boundary to be defined)	Region Americas	Region Asia (Subregion: Central Asia)
Rivers	TBA crossing TWAP Regional borders	TBA not selected for TWAP	Region Europe	Region Asia (Subregion: South-Eastern Asia & Pacific)
	TBA crossing TWAP Sub-Regional borders		Region North Africa & Western Asia	

¹ Delineation of Transboundary Aquifers located in the UN-ESCWA (United Nations Economic and Social for Western Asia) will be updated with results from the Inventory of Shared Water Resources in Western Asia, once published jointly by BGR (Federal Institute for Geosciences and Natural Resources) and ESCWA.

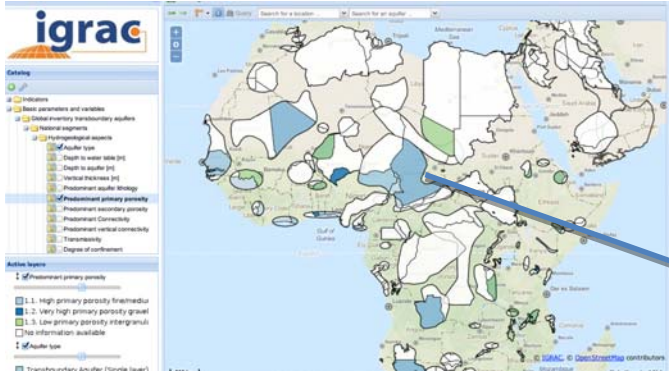
0 1,625 3,250 6,500 Kilometers

Activities:

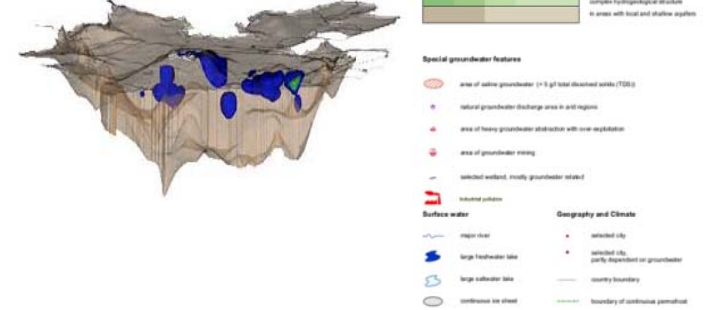
- Collection cross-sections and maps
- National level data gathering through questionnaires
- Literature review
- Regional workshops



Characterizations and indicators



Information Management System



- annual groundwater recharge depth
- annual amount of renewable groundwater resources per capita
- natural background groundwater quality
- human dependency on groundwater
- depletion
- pollution
- population density
- development stress
- management legal frameworks
- management institutional frameworks

TBA Info Sheet

Description

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Issues

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Indicator	Value
Indicator 1	
Indicator 2	
Indicator 3	
Indicator 4	
Indicator 5	
Indicator 6	
Indicator 7	
Indicator 8	
Indicator 9	
Indicator 10	
Indicator 11	
Indicator 12	
Indicator 13	
Indicator 14	
Indicator 15	
Indicator 16	
Indicator 17	
Indicator 18	





ILEC

International Lake
Environment Committee



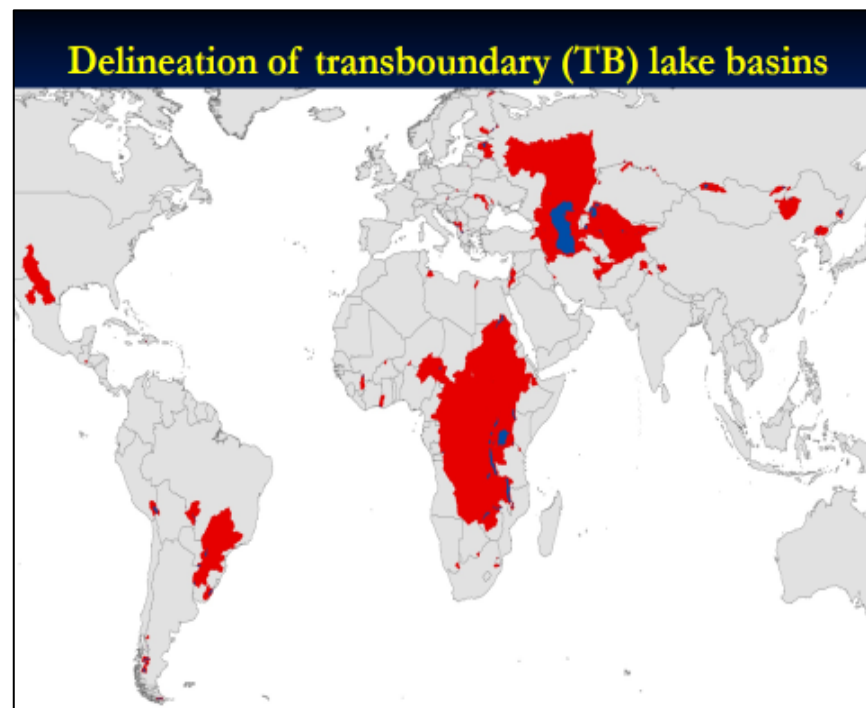
Lake & Reservoir Basins

Scope and Activities

- TWAP TB lakes: 156 transboundary (TB) lake/reservoirs in developing countries; 50 in developed countries;
- Non-TB lakes can have transboundary impacts (e.g., non-TB lakes located in TB river basins);

Activities:

- 1)Producing overlay maps (inter-related systems)
- 2)Organizing Expert Group Meetings
- 3)Data collection through Lake Basin Questionnaires (database supplement): Local input; 'groundtruthing'



Challenges

- Limited or scattered global-scale data
- Quality of data available
- Compatibility issues between different data sources
- Interlinkages between water-system components
- Sustainability of networks
- Regularization of assessments and monitoring of indicators
- Harmonization of data, indicators and classification



Towards a regular assessment

- Support GEF programming
 - prioritization,
 - impact assessment
- Support SDG reporting
 - WASH access - Socioeconomic indicators
 - WRM - Water stress indicators
 - Governance - Governance indicators
 - WW and WQ - WQ indicators
 - Disasters - F&D vulnerability
- Support implementation of the UN-WCC
 - Knowledge platform
 - Basin Profiles/Briefs





Thank you

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