TWAP

TRANSBOUNDARY WATERS ASSESSMENT PROGRAMME

Transboundary River Basins Assessment

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UNEP

gef

UNEP-DHI PARTNERSHIP
Centre on Water and Environment

UNESCO
United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

UNESCO
United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

ILEC

River Basin Assessment Partners

Center for International Earth Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY

OSU
Oregon State
UNIVERSITY

CUNY The City University of New York

DeltAlliance

GLOBAL CHANGE
IGBP International Geosphere-Biosphere Programme

CESR Center for Environmental Systems Research

River Basin Assessment Approach

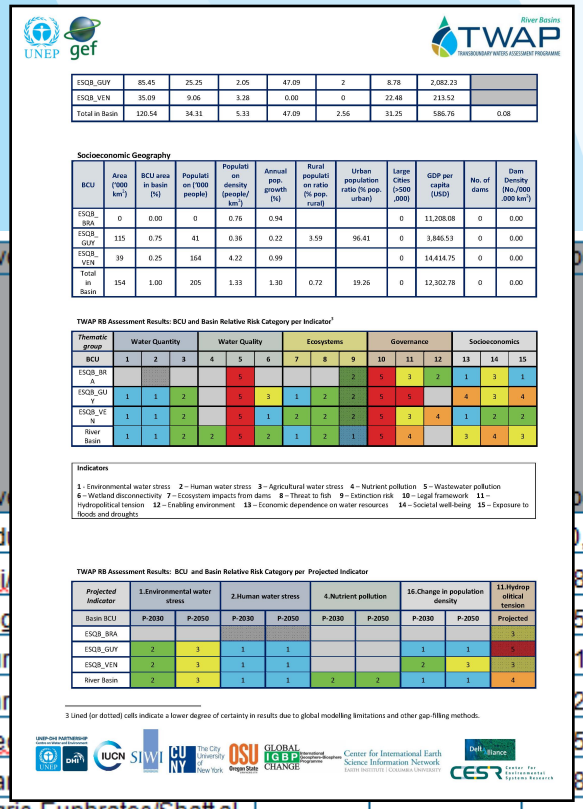
- **Need to assess all 280+ transboundary basins**
- **Develop a simple, scalable methodology**
- **Use existing information and modelling**
- **Use of composite indicators**
- **Short-listing criteria:**
  - **A**vailability (i.e. cost efficiency in acquisition)
  - **A**cceptability (i.e. ownership to information among stakeholders)
  - **A**pplicability (i.e. relevance to transboundary issues)
  - **A**ggregation at river basin level and comparability between basins

Relative Risk Categories

Raw indicator values -> Relative risk categories

- Global comparative assessment
- Comparability across indicators
- Scorecards for individual basins (Factsheets)

Relative Risk Category
1 Very low
2 Low
3 Moderate
4 High
5 Very high



ESQB_GUY	85.45	25.25	2.05	47.09	2	8.78	2,082.23	
ESQB_VEN	35.09	9.06	3.28	0.00	0	22.48	213.52	
Total in Basin	120.54	34.31	5.33	47.09	2.56	31.25	586.76	0.08

Socioeconomic Geography

BCU	Area ('000 km²)	BCU area in basin (%)	Population ('000 people)	Population density (people/km²)	Annual pop. growth (%)	Rural population ratio (% pop. rural)	Urban population ratio (% pop. urban)	Large Cities (>500,000)	GDP per capita (USD)	No. of dams	Dam Density (No./000,000 km²)
ESQB_BRA	0	0.00	0	0.76	0.94			0	11,208.08	0	0.00
ESQB_GUY	115	0.75	41	0.36	0.22	3.59	96.41	0	3,846.53	0	0.00
ESQB_VEN	39	0.25	164	4.22	0.99			0	14,414.75	0	0.00
Total in Basin	154	1.00	205	1.33	1.30	0.72	19.26	0	12,302.78	0	0.00

TWAP RB Assessment Results: BCU and Basin Relative Risk Category per Indicator[3]

Thematic group	Water Quantity			Water Quality			Ecosystems			Governance			Socioeconomics		
BCU	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ESQB_BRA					5				2	5	3	2	1	3	1
ESQB_GUY	1	1	2		5	3	1	2	2	5	5		4	3	4
ESQB_VEN	1	1	2		5	1	2	2	2	5	3	4	1	2	2
River Basin	1	1	2	2	5	2	1	2	1	5	4		3	4	3

Indicators

1 – Environmental water stress 2 – Human water stress 3 – Agricultural water stress 4 – Nutrient pollution 5 – Wastewater pollution 6 – Wetland disconnectivity 7 – Ecosystem impacts from dams 8 – Threat to fish 9 – Extinction risk 10 – Legal framework 11 – Hydropolitical tension 12 – Enabling environment 13 – Economic dependence on water resources 14 – Societal well-being 15 – Exposure to floods and droughts

TWAP RB Assessment Results: BCU and Basin Relative Risk Category per Projected Indicator

Projected Indicator	1.Environmental water stress		2.Human water stress		4.Nutrient pollution		16.Change in population density		11.Hydropolitical tension
Basin BCU	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	Projected
ESQB_BRA									3
ESQB_GUY	2	3	1	1			1	1	5
ESQB_VEN	2	3	1	1			2	3	3
River Basin	2	3	1	1	2	2	1	1	4

3 Lined (or dotted) cells indicate a lower degree of certainty in results due to global modelling limitations and other gap-filling methods.

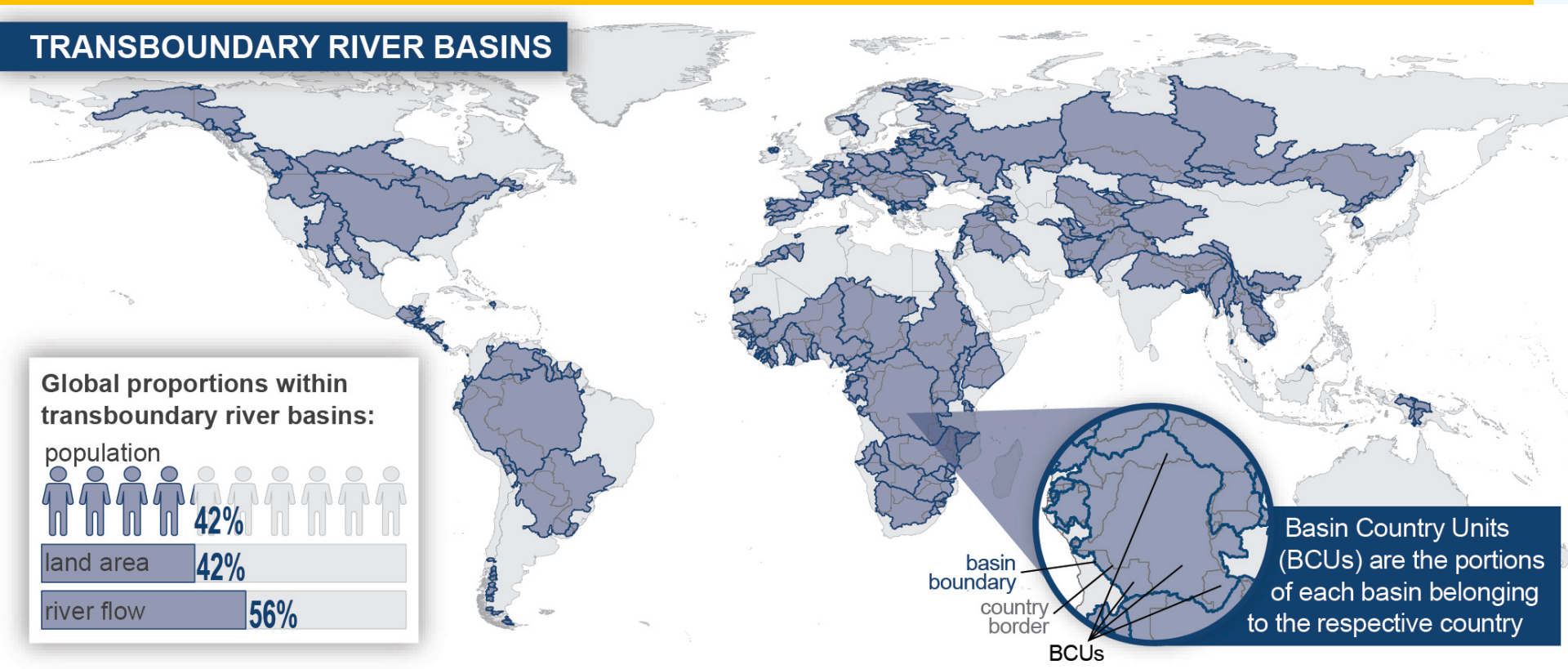
Riv	...ulation	Runoff (km³)	1	2	3	4	5	7	8	10	11	12	13	14	Av
Riv	...ulation	Runoff [km³]	Environmental Water Stress	Human Water Stress	Agricultural Water Stress	Nutrient Pollution	Urban Water Pollution	Ecosystem impacts of dams	Threat to Fish	Institutional Resilience	Enabling Environment	Economic Dependency on Water Resources	Societal Well-being	vulnerability to Climate-related Natural Disasters	Unweighted normalised Score
Indu	...,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	...89,570	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
Tag	...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
Kur	...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
Var	...26,820	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
Me	...54,230	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
Ma	...87,560	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	0.93	0.87	0.25	0.61	0.87	0.69	0.33		0.91	0.22	0.53	0.61

Transboundary River Basin Indicators

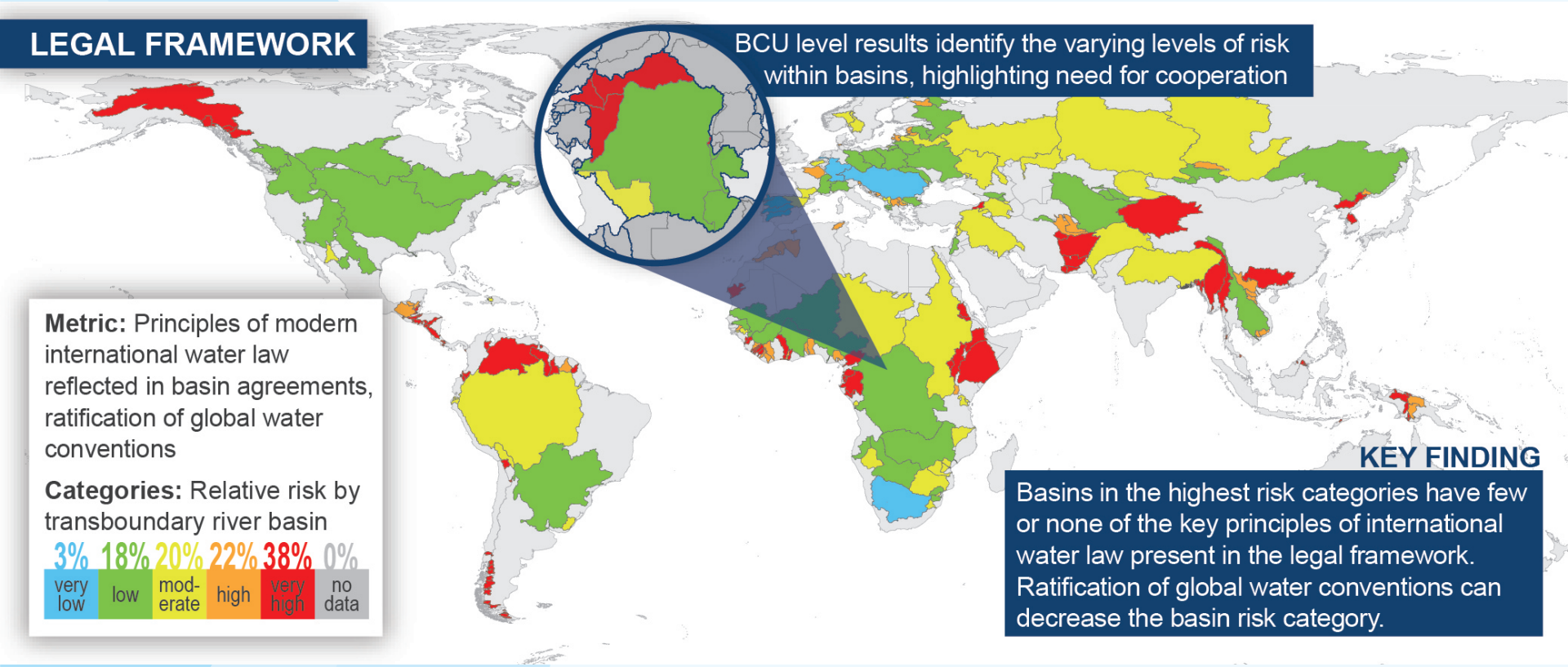
THEMATIC GROUP	INDICATOR	
Baseline Transboundary Status (2010)		**Projected Transboundary Stress (2030/2050)**
Water Quantity	1. Environmental water stress 2. Human water stress 3. Agricultural water stress	1. Environmental water stress 2. Human water stress
Water Quality	4. Nutrient pollution 5. Wastewater pollution	3. Nutrient pollution
Ecosystems	6. Wetland disconnectivity 7. Ecosystem impacts from dams 8. Threat to fish 9. Extinction risk	[Environmental water stress]
Governance	10. Legal framework 11. Hydropolitical tension 12. Enabling environment	4. Exacerbating factors to hydropolitical tension
Socioeconomics	13. Economic dependence on water resources 14. Societal wellbeing 15. Exposure to floods and droughts	5. Change in population density
Water Systems Links		
Lakes	1. Lake influence	
Coastal areas	2. Delta vulnerability (sea level rise, wetlands, population and governance)	

Assessment Scope

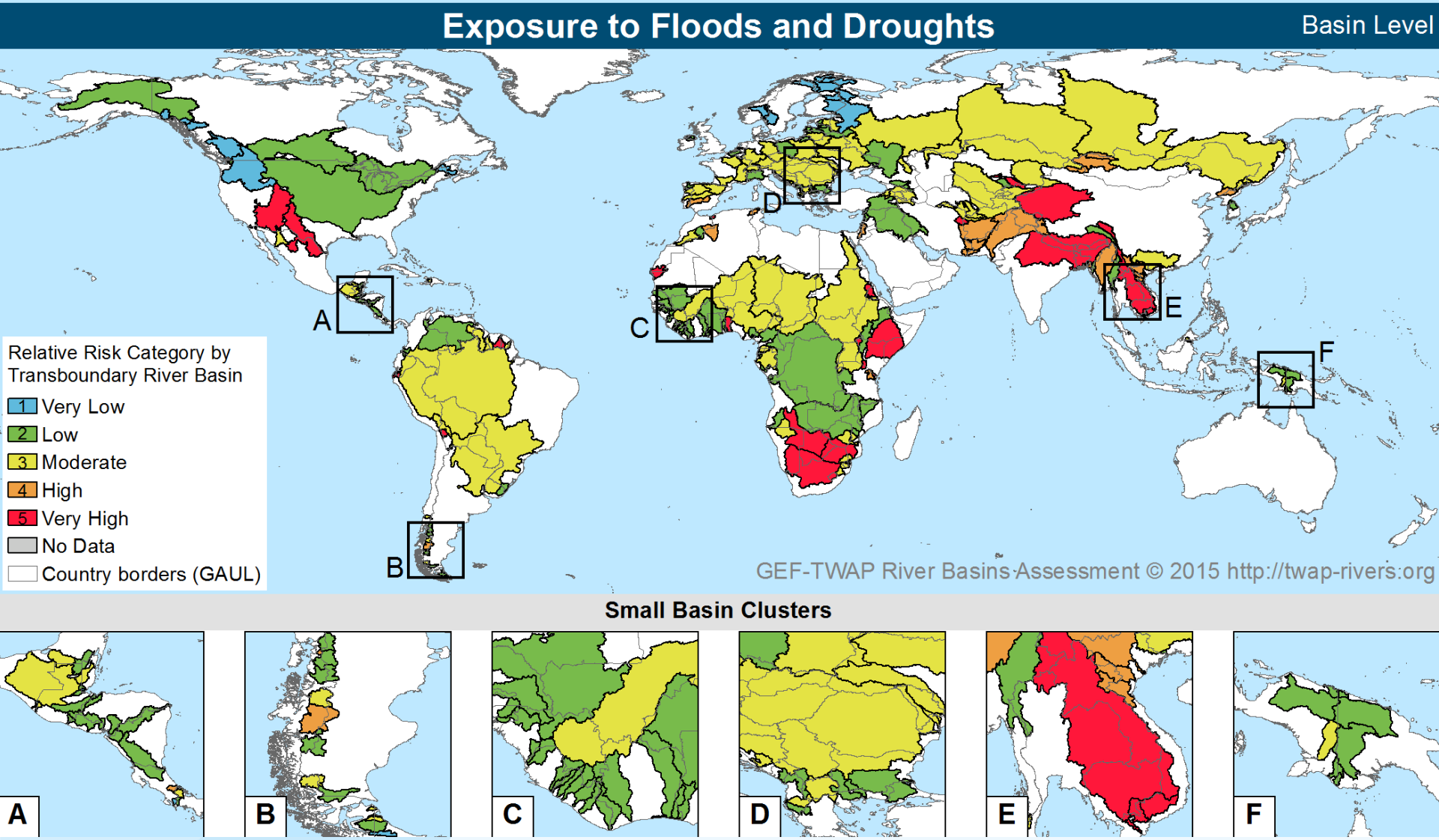
286 Transboundary River Basins – 796 Basin Country Units (BCUs)
/+26 selected deltas/



Basin & Basin Country Units (BCUs) results

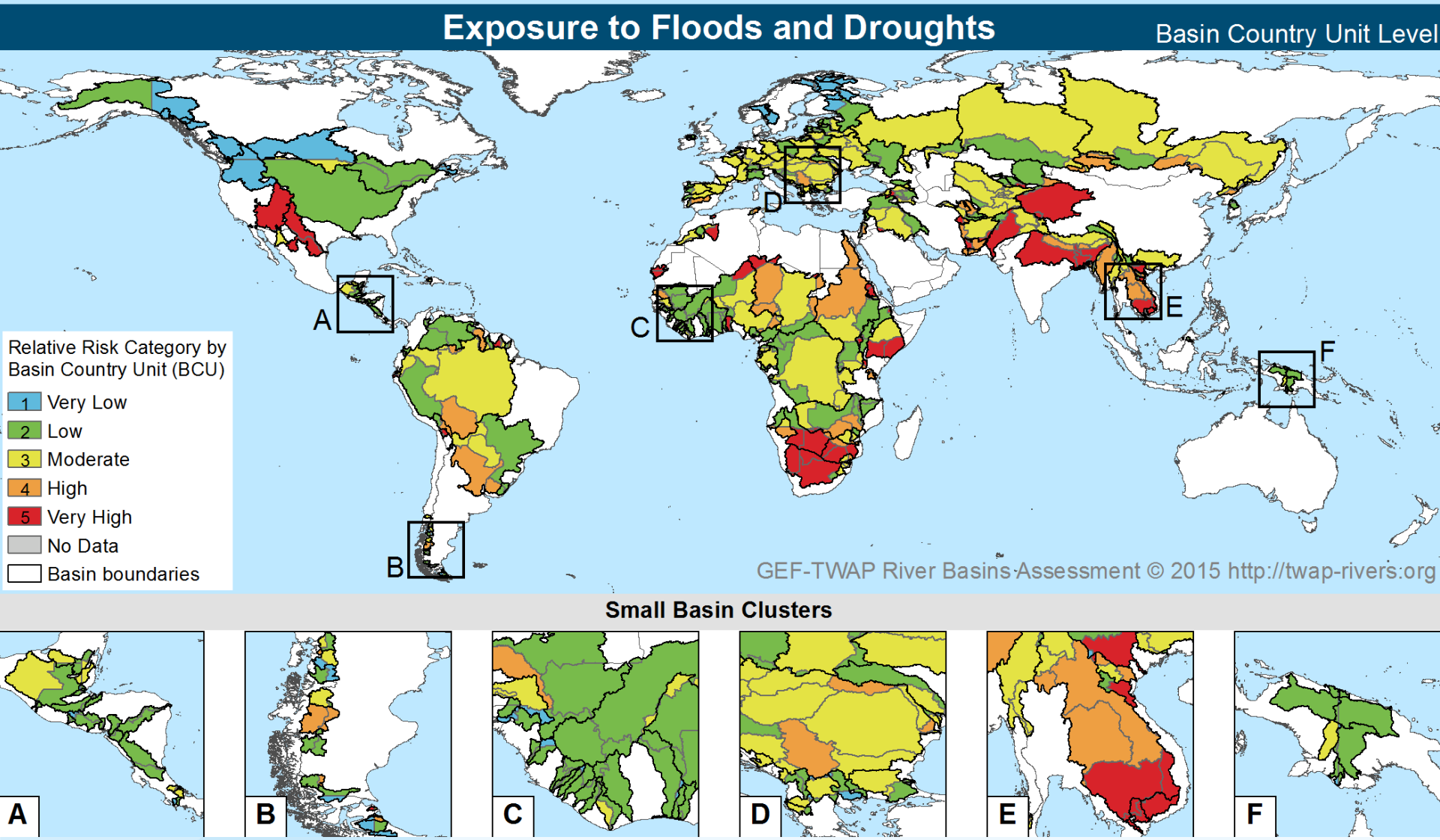


Example: Basin level

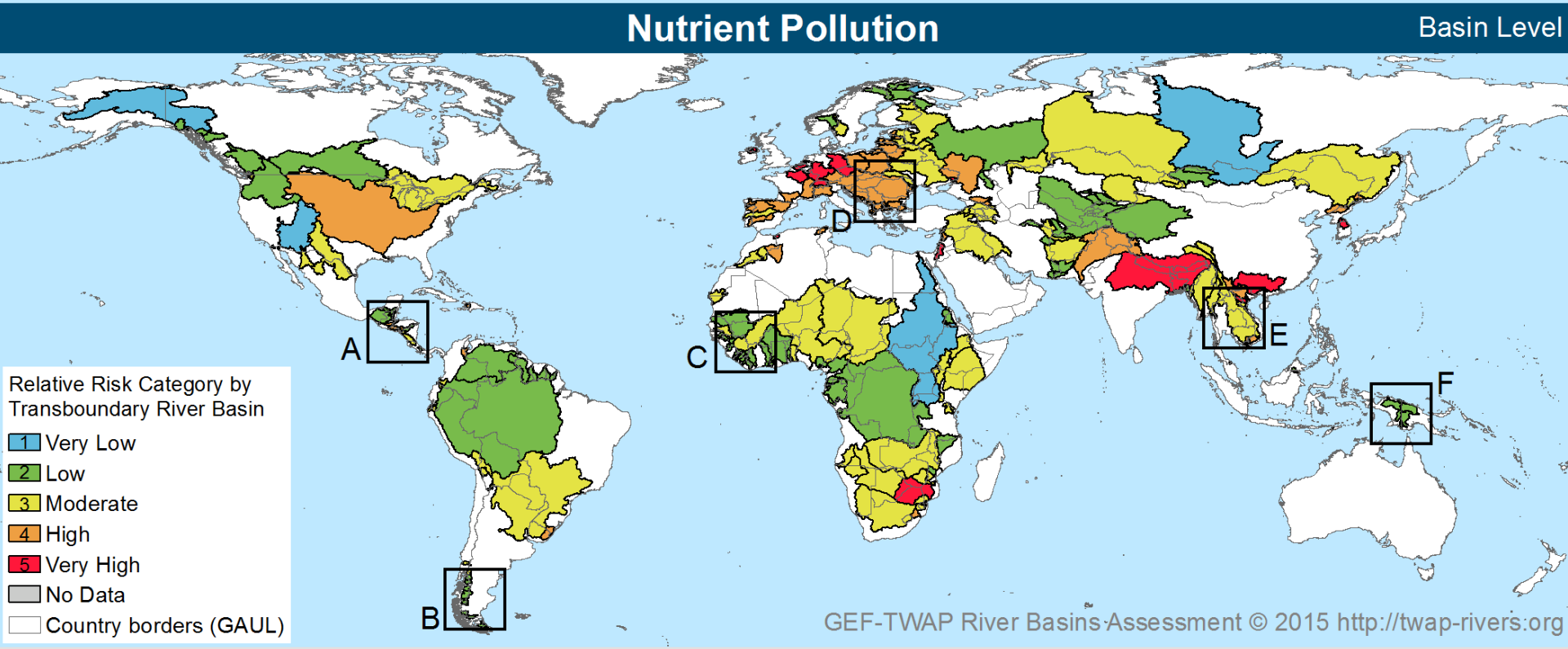


Small Basin Clusters

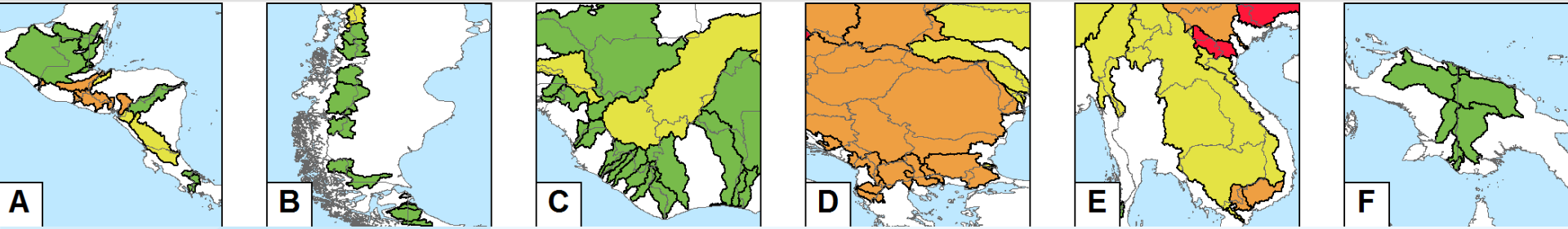
Example: BCU level



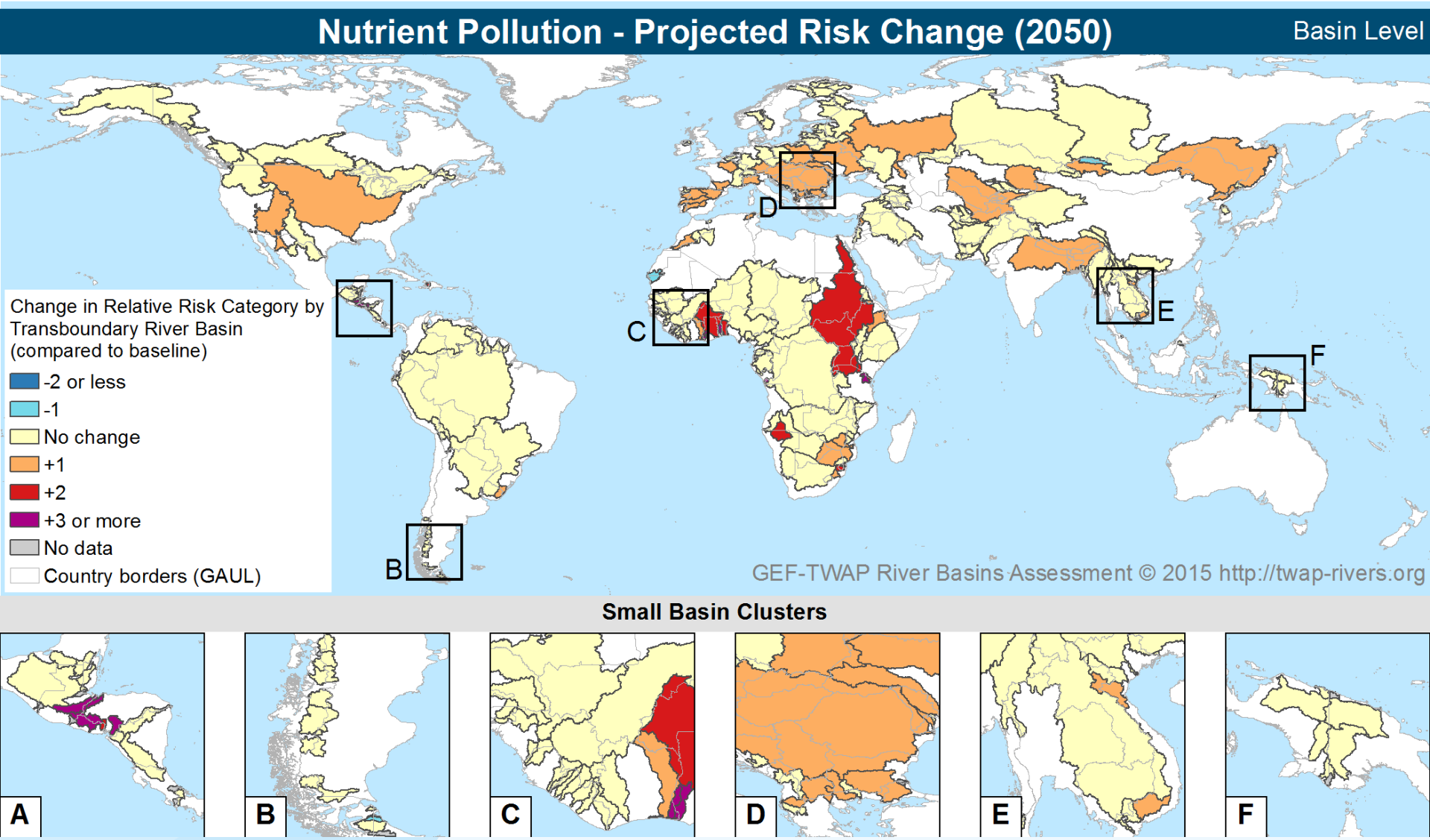
Example: Baseline



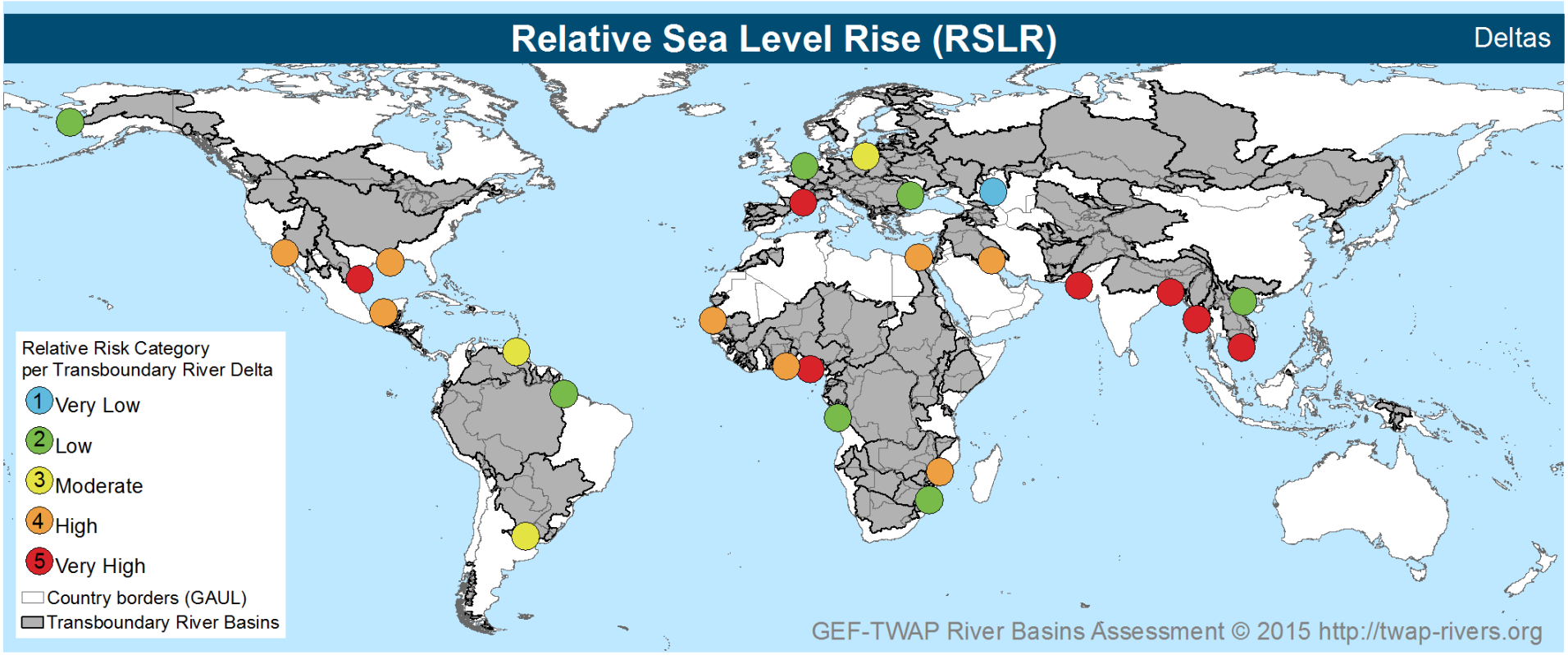
Small Basin Clusters



Example: Projected change



Example: Deltas



Transboundary River Basins Website

TWAP RB Assessment Report: Status and Trends

The final technical report of the TWAP RB assessment (March 2016). Contains results and results maps for all assessment indicators, as well as integrated analysis accross indicators. The technical report is accompanied by Summary for Policy Makers.

DOWNLOADS

TWAP RB Technical Assessment Report:

- **Full Technical Report** (high-res 205 MB)
- **Full Technical Report** (low-res 27.5 MB)
- **Technical Report without Annexes** (high-res166 MB)
- **Technical Report without Annexes** (low-res 22.7 MB)
- **Annexes** (high-res 39.8 MB)
- **Annexes** (low-res 5.11 MB)

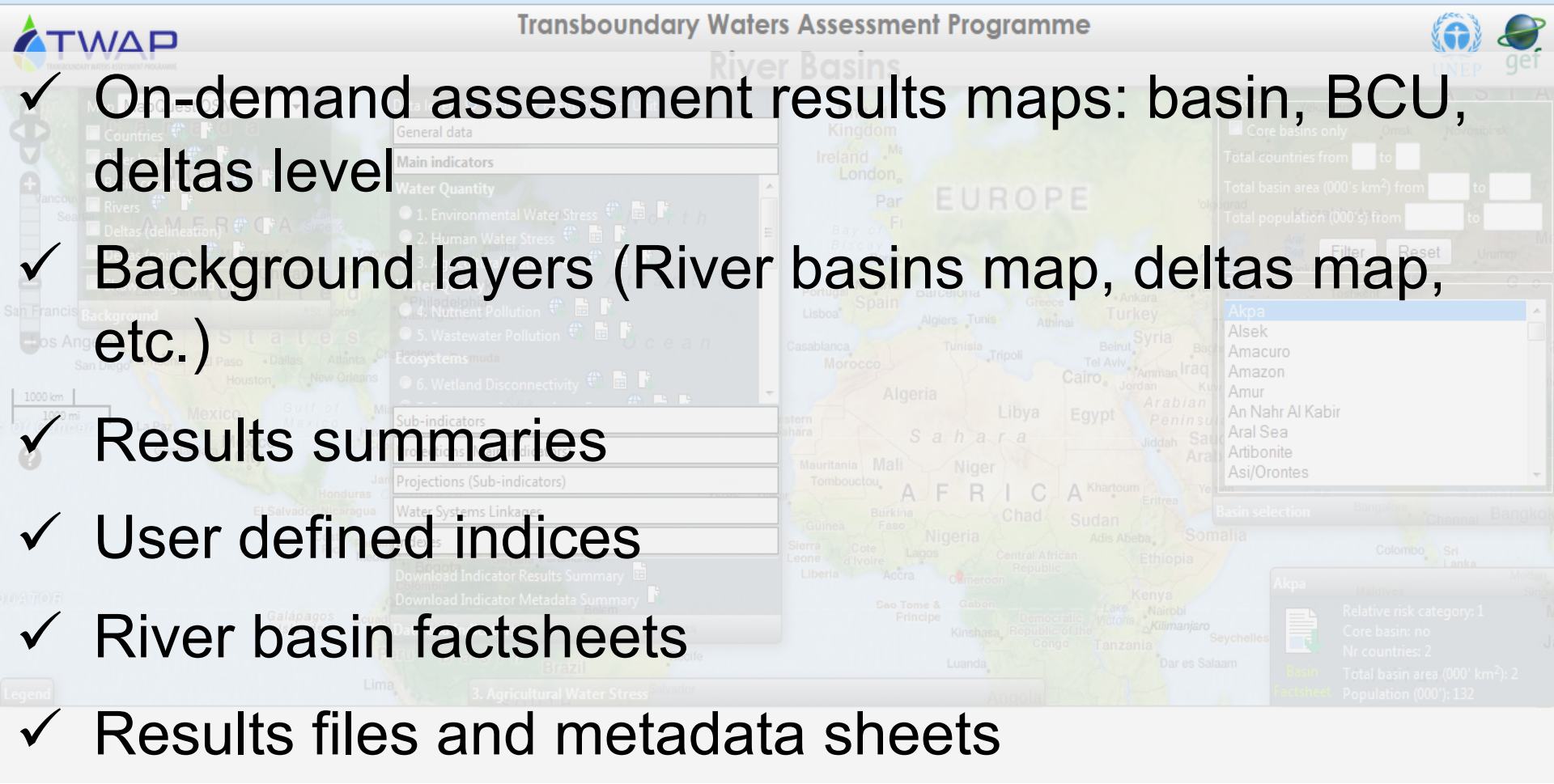
Summary for Policy Makers:

- **Summary for Policy Makers** (high-res 14 MB)
- **Summary for Policy Makers** (low-res 2.5MB)

Chapter downloads:

Table of Contents (high-res 3.9MB) (low-res 1.1MB)

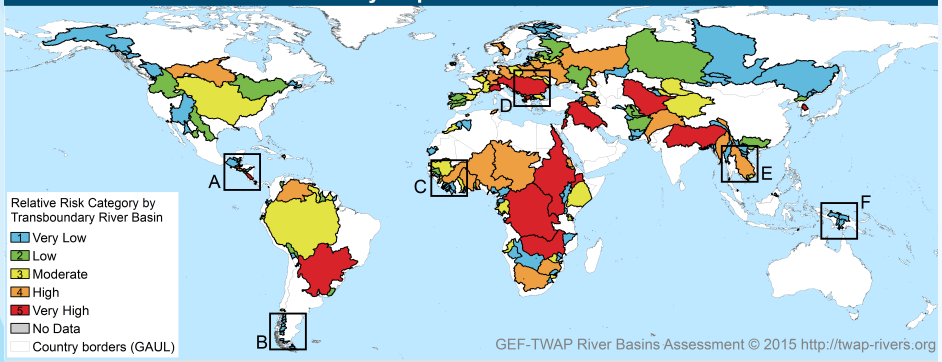
Interactive results & data portal



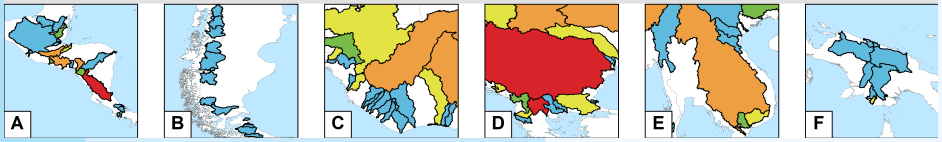
- ✓ On-demand assessment results maps: basin, BCU, deltas level
- ✓ Background layers (River basins map, deltas map, etc.)
- ✓ Results summaries
- ✓ User defined indices
- ✓ River basin factsheets
- ✓ Results files and metadata sheets

Hydropolitical Tension

Basin Level

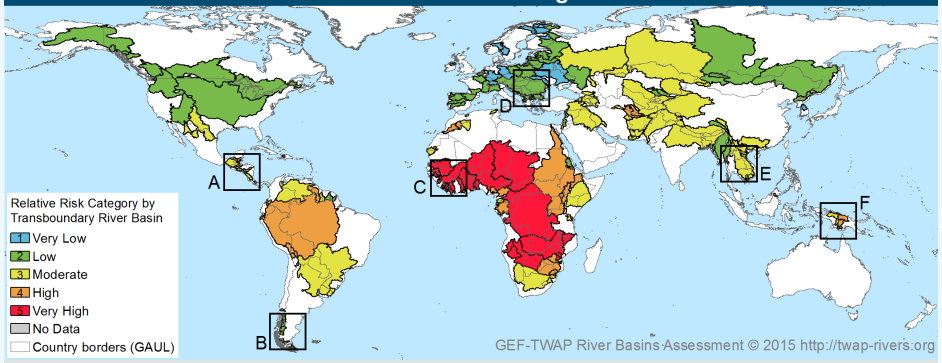


Small Basin Clusters



Societal Wellbeing

Basin Level



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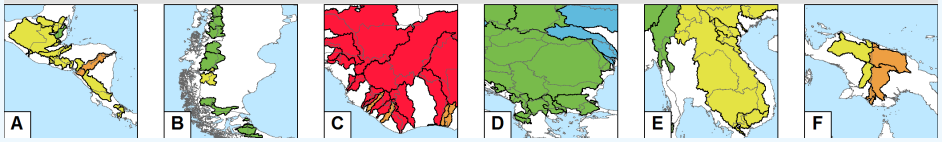
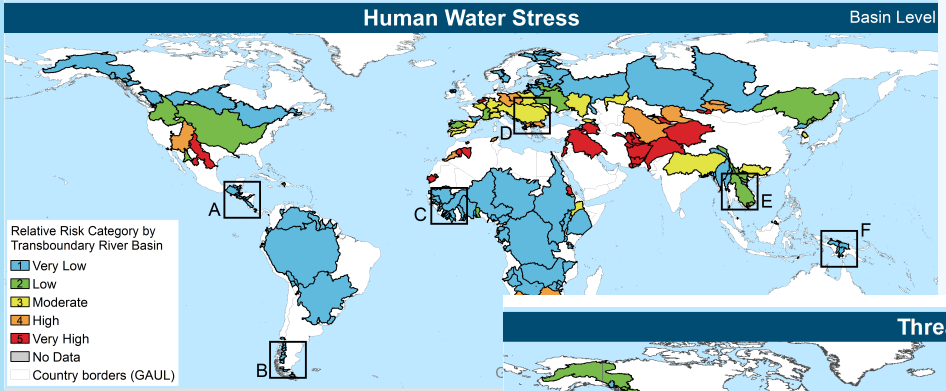


Human Water Stress

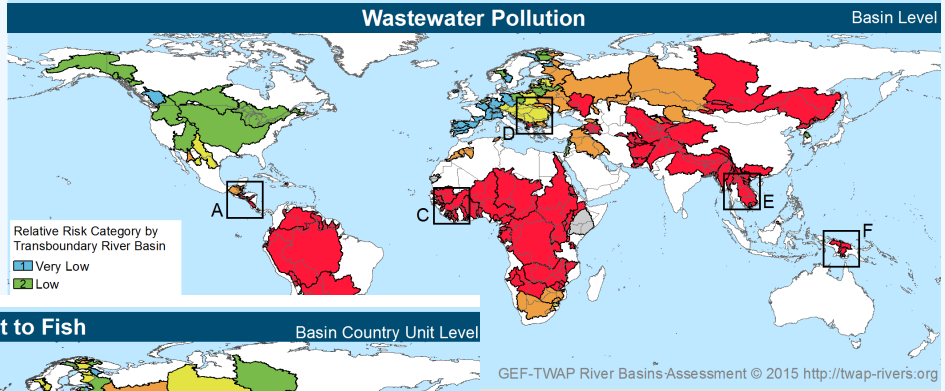
Basin Level



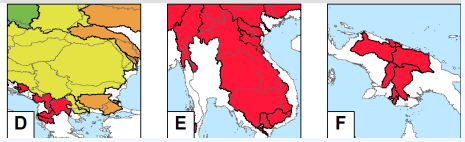
Small Basin Cl

Wastewater Pollution

Basin Level

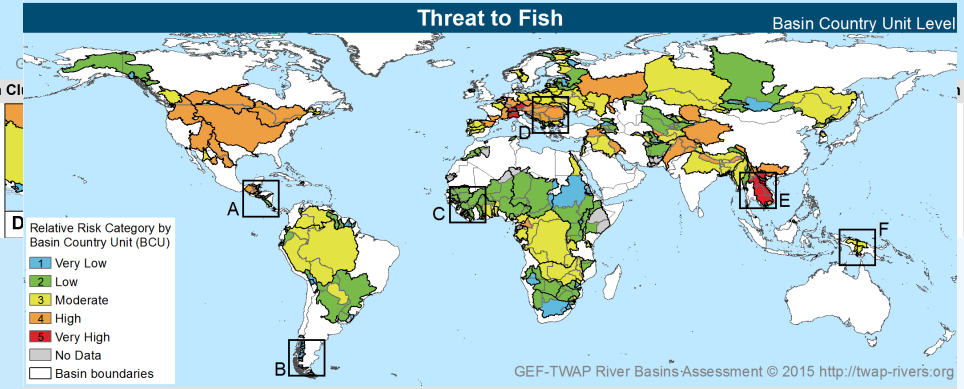


Clusters

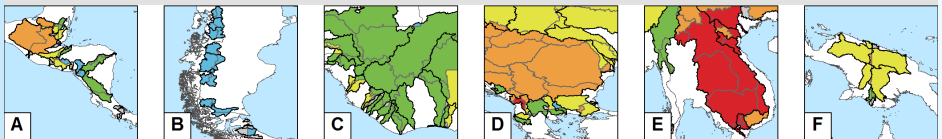


Threat to Fish

Basin Country Unit Level

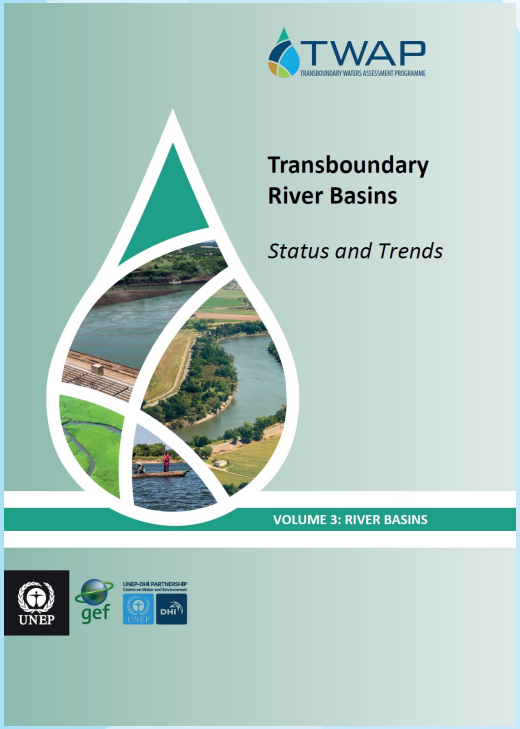


Small Basin Clusters



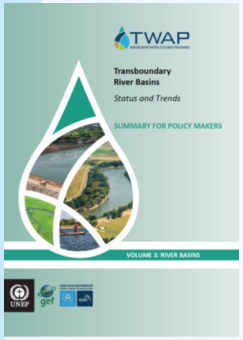
TWAP

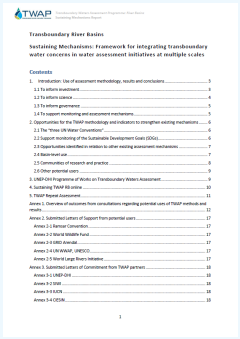
TRANSBOUNDARY WATERS ASSESSMENT PROGRAMME

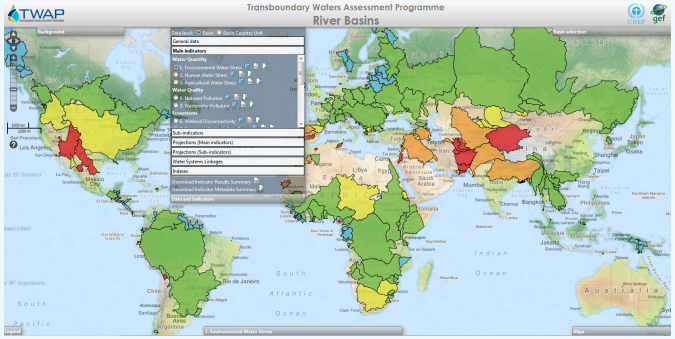


Thank you

Maija Bertule, mabe@dhigroup.com







http://twap-rivers.org/