



“Transboundary wetlands governance: bridging ecosystems, policies, and communities”
Dr. Zoe H. Rosenblum
University College Dublin, Oregon State University, and the Shared Waters Lab Partnership
rosenblz@oregonstate.edu



Introduction: Transboundary Wetlands

Wetlands, like other ecosystems, transcend country borders. Where this happens, wetlands are subject to often conflicting laws, policies, and priorities of multiple countries. Whereas much transboundary water research has focused on rivers (Fig. 1), and increasingly aquifers (Fig. 2), this research aims to fill knowledge gaps on transboundary wetlands by exploring the following questions:

- 1) What makes a wetland transboundary (e.g., Fig. 3)?
- 2) Where are transboundary wetlands located globally?
- 3) To what extent do international freshwater treaties enable cross-border wetland action?

In addition to filling a gap in the literature, this research is driven by the idea that wetlands can help unite countries in meeting global targets on climate, biodiversity, and water.

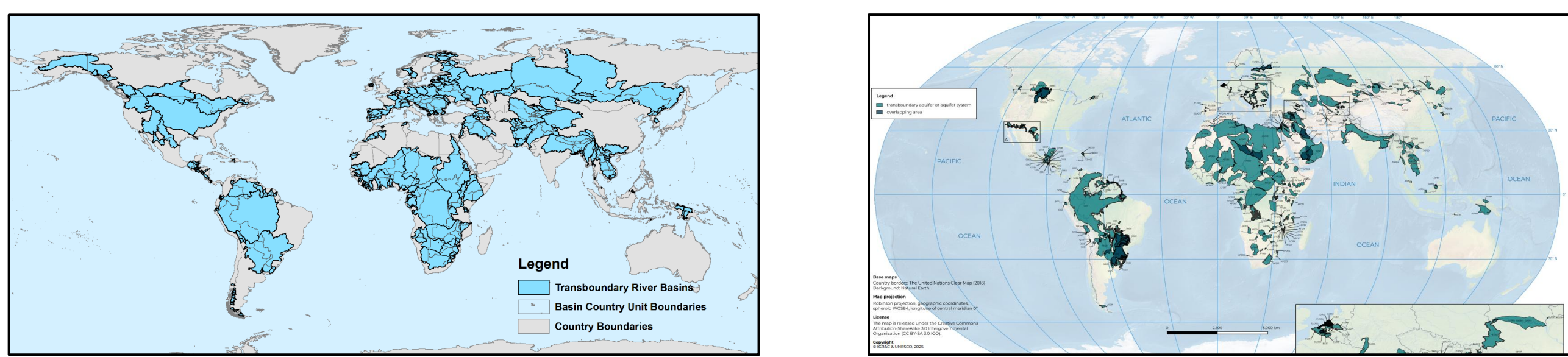


Figure 1. Transboundary river basins of the world (TFDD, 2022). Figure 2. Transboundary aquifers of the world (IGRAC, 2025).

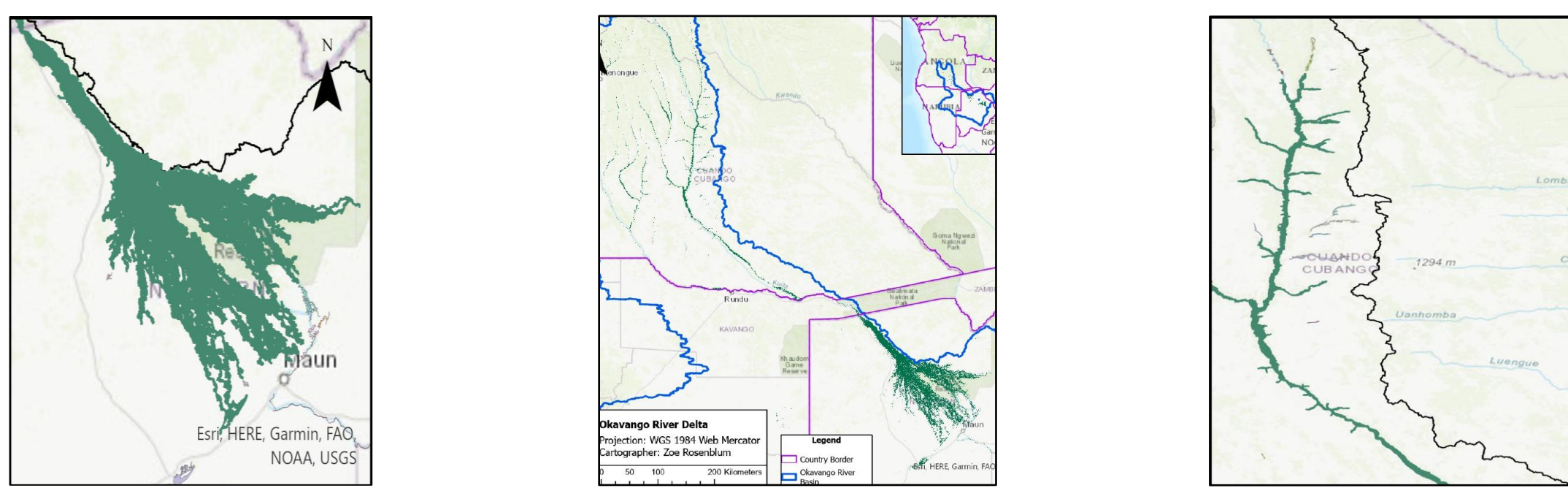


Figure 3. Wetlands in the Okavango River Basin (Angola, Namibia, Botswana) exemplify three ways of crossing borders.

Methods

This research uses geospatial and policy analysis, including qualitative, deductive coding of the world's international freshwater treaties (IFTs).

The **geospatial analysis** involved evaluating existing wetlands maps and selecting one to use for the subsequent analyses. With this map (GWL-FCS30) as a starting point, I used ArcGIS Pro to identify only the wetlands within international river basins (IRBs) as defined by the Transboundary Freshwater Diplomacy Database (TFDD).

The **policy analysis** involved qualitatively coding 882 IFTs to determine to what extent they pertain to wetlands (Fig. 5). I used deductive coding to assess the IFTs (Table 1).

Results

- 1) International wetlands are those located within international river basins, subcategorized into those that cross country borders or are connected to rivers (Figure 4).

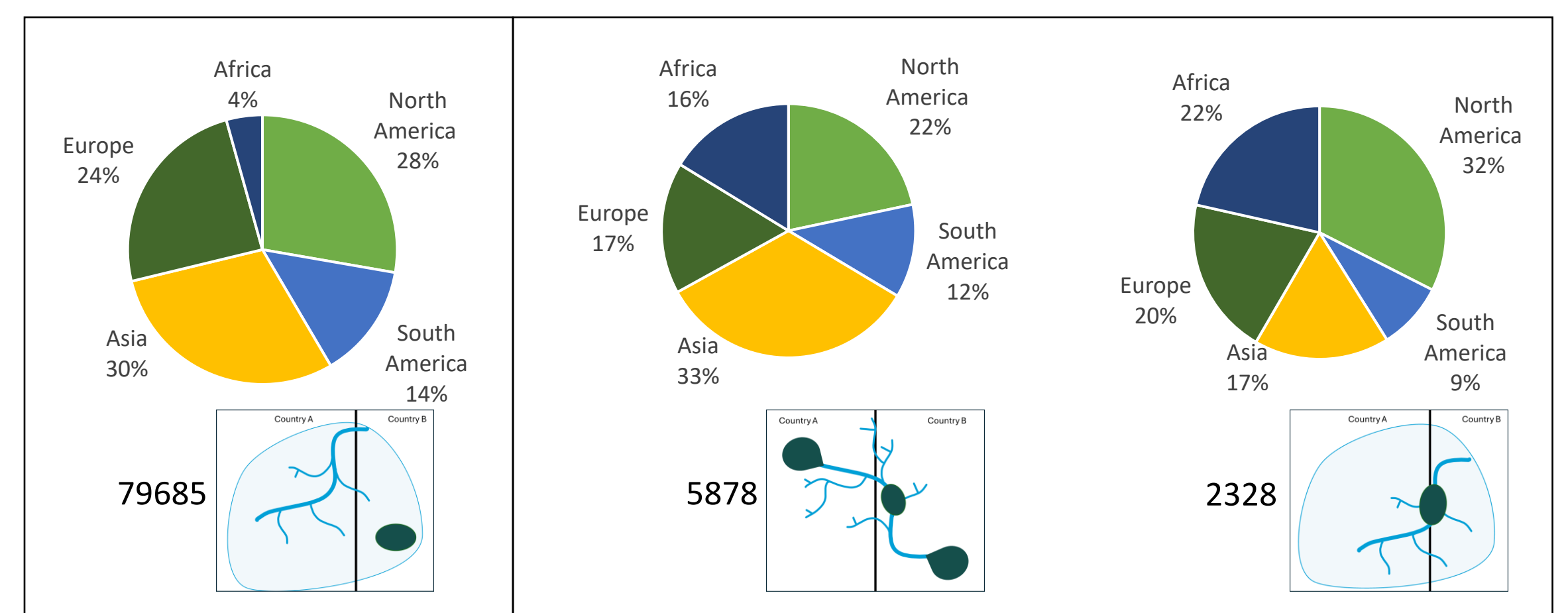


Figure 4: Global distribution of transboundary wetlands within IRBs (~80000), a subset of which are connected to an international river (~6000) and extend across country borders (~2300).

Results (continued)

- 2) Nearly half (43%, 2.7 mil km²) of the world's wetlands are in international settings (Fig. 5).

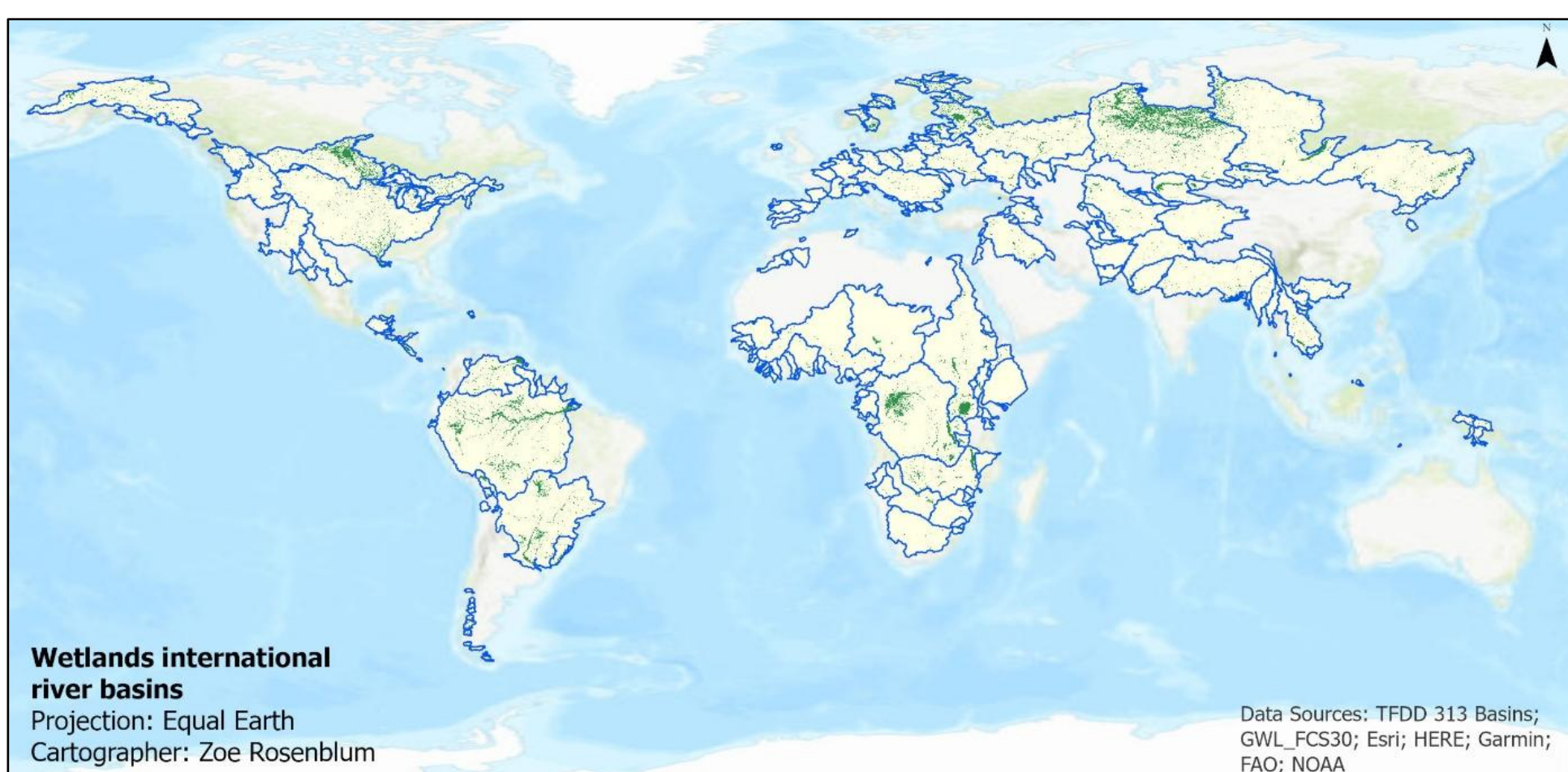


Figure 5: Global distribution of wetlands (green) in international river basins (blue outlines).

- 3) About 40 (13%) of IRBs host treaties that mention wetlands. Most (n=58) of these treaties mention wetlands in a general way (e.g., in a definition); about half (n=50) reference protection or a service that wetlands provide (Fig. 6).

Table 1. Number of IFTs that mention wetlands.

Code	Meaning	Mentions
0	no mention	783
1	general mention	58
2	specific mention	38
3	resource extraction	4
4	ecosystem services	7
5	environmental flows	7
6	protection	35
7	destruction	1

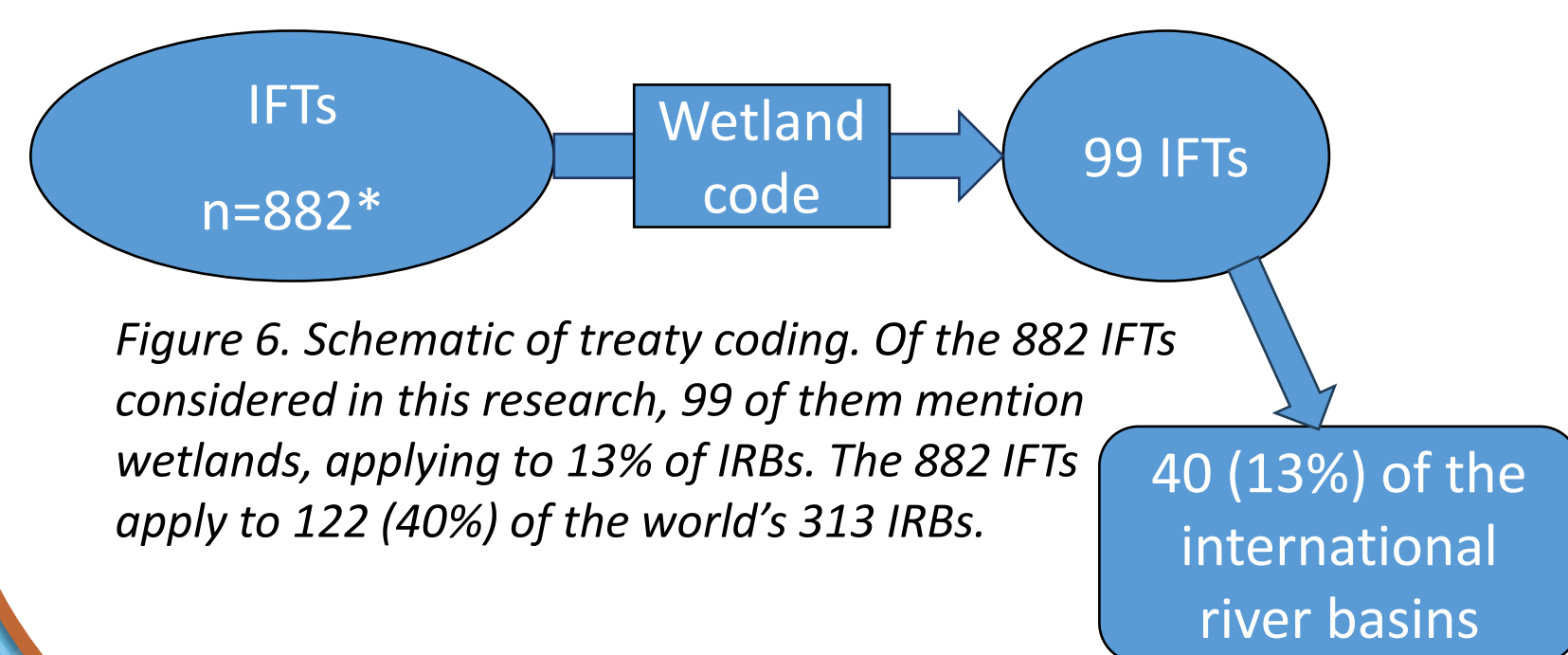
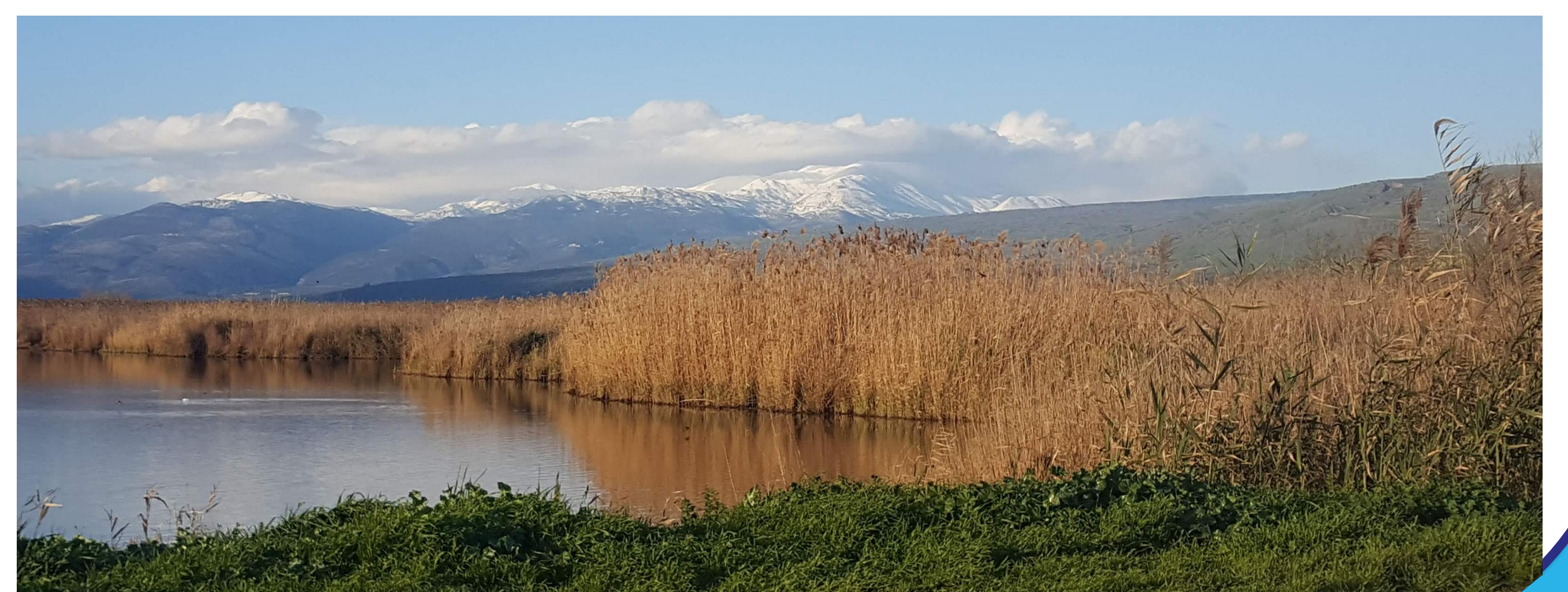


Figure 6. Schematic of treaty coding. Of the 882 IFTs considered in this research, 99 of them mention wetlands, applying to 13% of IRBs. The 882 IFTs apply to 122 (40%) of the world's 313 IRBs.

Conclusions and Recommendations

- 1) Nearly half of the world's wetlands are located in transboundary river basins, highlighting the potential for cross-border governance and cooperation.
- 2) IFTs are an underutilized opportunity to jointly manage transboundary wetlands: less than half of international river basins host agreements that deal with wetlands (not including the Ramsar Convention on Wetlands, to which most countries are party).
- 3) The geography of different continents lend themselves to different categories of international wetlands for ecological or political reasons. There is much heterogeneity in the expression of wetlands across the world.
- 4) Multiple levels of governance facilitate international cooperation on wetlands, but interaction between the levels is limited and many gaps exist.
- 5) Resolving these gaps and improving transboundary cooperation on wetlands contributes to achieving many of the Sustainable Development Goals as well as regional goals on water, climate, and biodiversity.



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