Outline

- Refinement and expansion of the TFDD
- Preliminary findings on treaty content and distribution
- International treaties and climate change risk

Geographic Coverage





Temporal Evolution



Depth of Content

Example: Conflict Resolution

100%

90%

80%

70%

60%

50% 40% 30% 20% 10% 0%

1900101910

1910101920

1970101930

Proportion of instruments signed with each element





40%

60%

80%

20%

one treaty

100%

Africa

0%

Overall Treaty Distributions



Basin-Scale Management



Treaties and Climate Change

 What is the global distribution of climate-resilient institutional mechanisms?

• What basins may merit further study and capacity-building?

Approach

Vulnerability (Treaties and RBOs)

Hazard (Variability or variability change)

+

Potential Risk

 \rightarrow

Risk	Vulnerability Level - Treaty/RBO Groups		
Hazard Level - Hydrological Classes present(future)	High (0, 1)	Medium (2, 3)	Low (4, 5)
High(High)	Decreasing Risk		-
Medium(Moderate)			
Low(Low/None)	ļ		

Several Ways of Rating Hazard

1. High present year-to-year variability (World Bank)

2. Large future variability increase (World Bank)

3. The combination: high present variability or medium present variability coupled with a large increase in the future (Forthcoming in Journal of Peace Research)



Projected Change in Runoff Variability Regime



Potential Risk #1: Present Variability



Potential Risk #2: Future Change



Potential Risk #3: Present + Future



Basin	Riparian countries identified in filtering	Present Hazard level	Treaty-RBO scores and disparity		Basin Population ^a	Area	Additional riparians	
			Disparity	(Low/high)	(count)	(km^2)		
Asi/Orontes	Turkey	Medium	2	(0/2)	5,607,300	37,900	Lebanon, Syria	
Catatumbo	Colombia	Medium	0	(0/0)	1,255,700	30,900		
	Venezuela	Medium						
Chiro	Ecuador	High	0	(1/1)	747 400	15 600		
Chila	Peru	High	0	(1/1)	747,400	15,000		
Congo/Zaire	Uganda	High	4	(0/4)	81,395,000	3,674,800	Angola, Burundi, Central African Republic, Cameroon, Republic of the Congo, Gabon, Malawi, Rwanda, Sudan, Tanzania, Democratic Republic of Congo, Zambia	
Gash	Ethiopia	High	2	(0/2)	3,687,500	39,900	Eritria, Sudan	
Kura-Araks	Georgia	Medium	3	(0/3)	13,047,100	193,400	Armenia, Azerbaijan, Iran	
	Turkey	Medium						
Lake Chad	Algeria	High	3	(0/3)	41,249,100	2,380,500	Central African Republic, Cameroon, Chad, Niger, Nigeria	
	Libya	High						
	Sudan	High					Nigel, Nigella	
Lotagipi	Ethiopia	High			328,500	38,700		
	Sudan	High		(0/0)			Kenya	
Swamp	Uganda	High	0					
Neman	Poland	Medium	1	(1/2)	4,722,200	90,700	Belarus, Latvia, Lithuania, Russia	
Nestos	Greece	Medium	0	(0/0)	301,000	10,200	Bulgaria	
Niger	Algeria	Migh	4	(0/4)	88,602,400	2,105,200	Benin, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Guinea, Mali, Niger, Nigeria	
Oued Bon	Algeria	High	0	(0/0)	79,300	500		
Naima	Morocco	High	0					
Sarata	Moldova	Medium	0	(0/0)	98,300	1,800		
	Ukraine	Medium						
Zapaleri	Argentina Bolivia	High High	0	(0/0)	200	2,600	Chile	

Note: Discharge and irrigated area included, but not shown here

Basins of interest in the future



Implications

- New dimensions of treaty data
- Disparities in resilience within basins



• New distributions of risk