SHARED WATERS: CONFLICT AND COOPERATION

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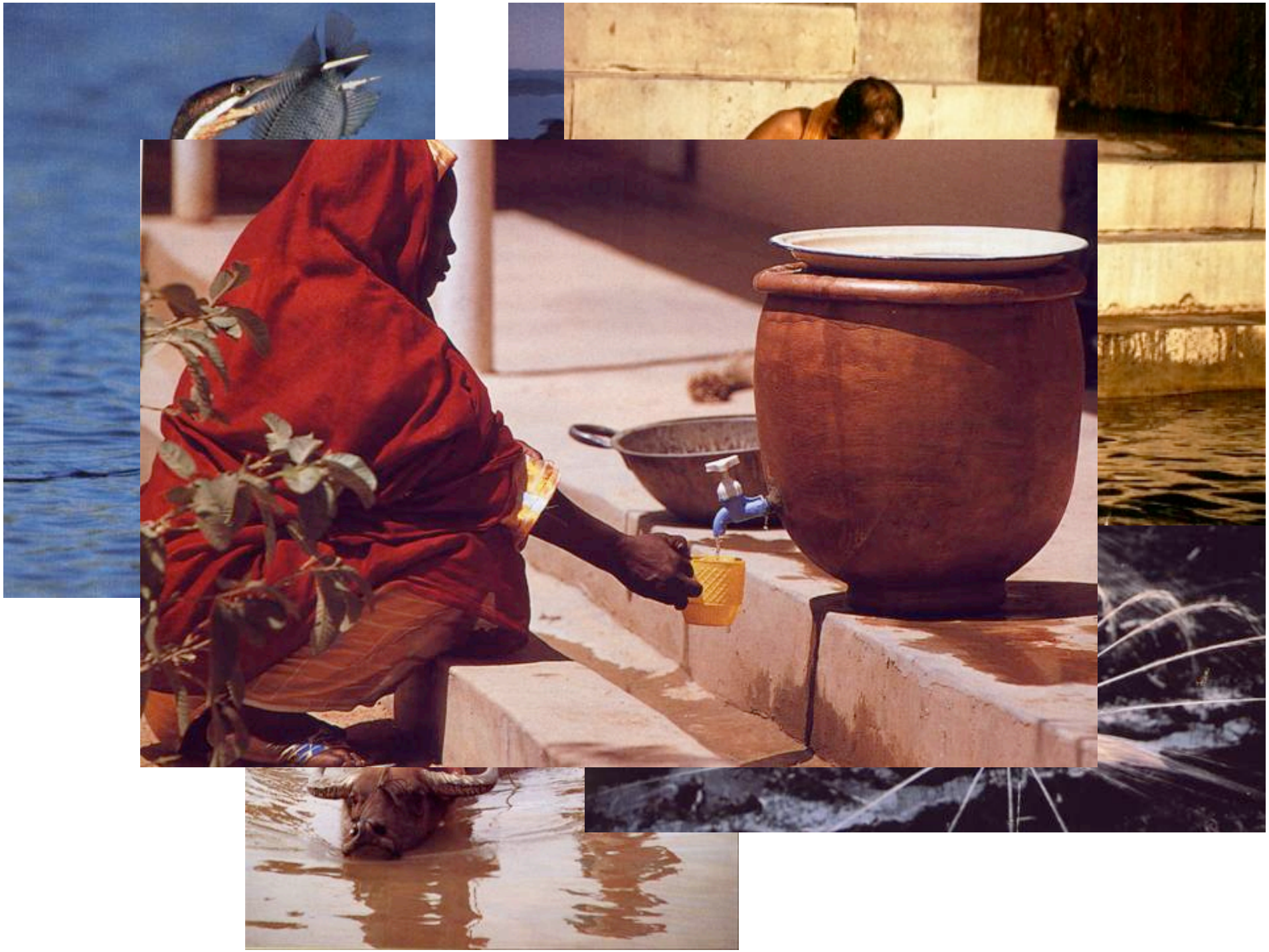
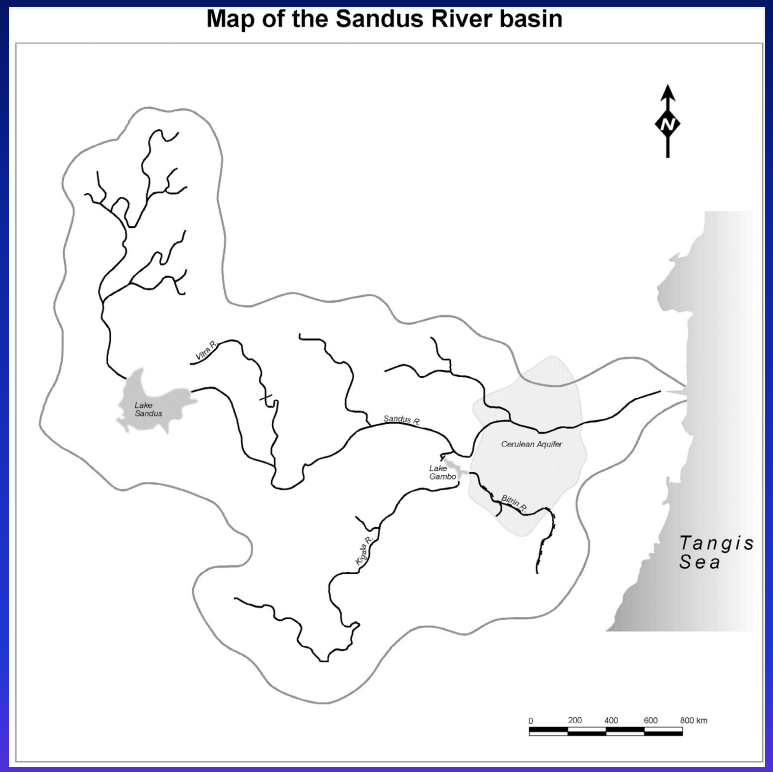
Global Water Crisis

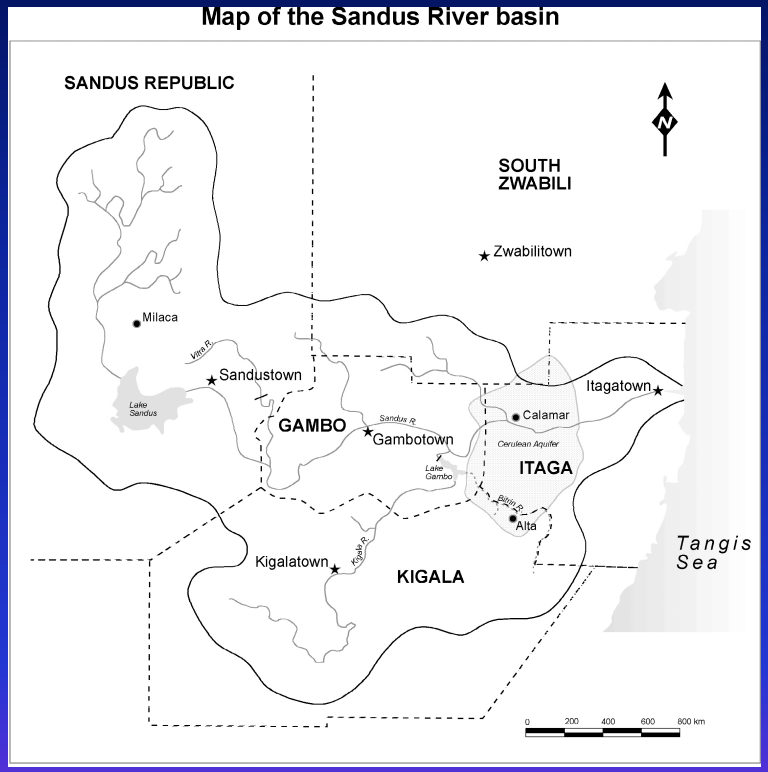
- 2.4 billion people lack access to adequate sanitation
- >1 billion people lack access to safe drinking water
- At least 250 million illnesses result
- 2.2 to 5 million deaths
- 20% of irrigated lands are salt-laden

- Water-related disease costs US$125 billion/yr.
- Would "only" cost US$7-50 billion/yr. to resolve



What *is* Water Conflict Management & Transformation??





What changes when a border is present?

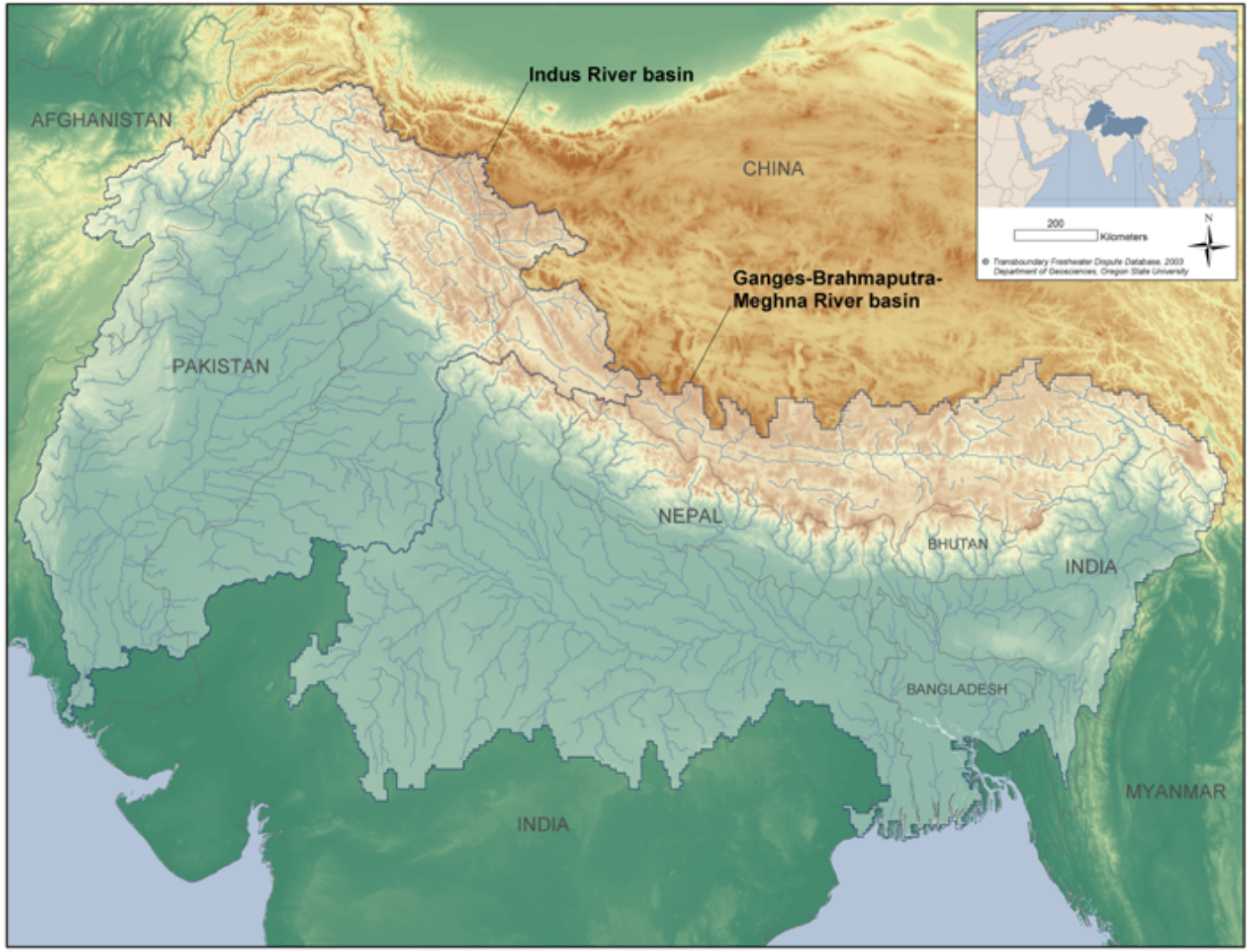
What capacity do we need to address the change?

What *is* Water Conflict Management & Transformation??

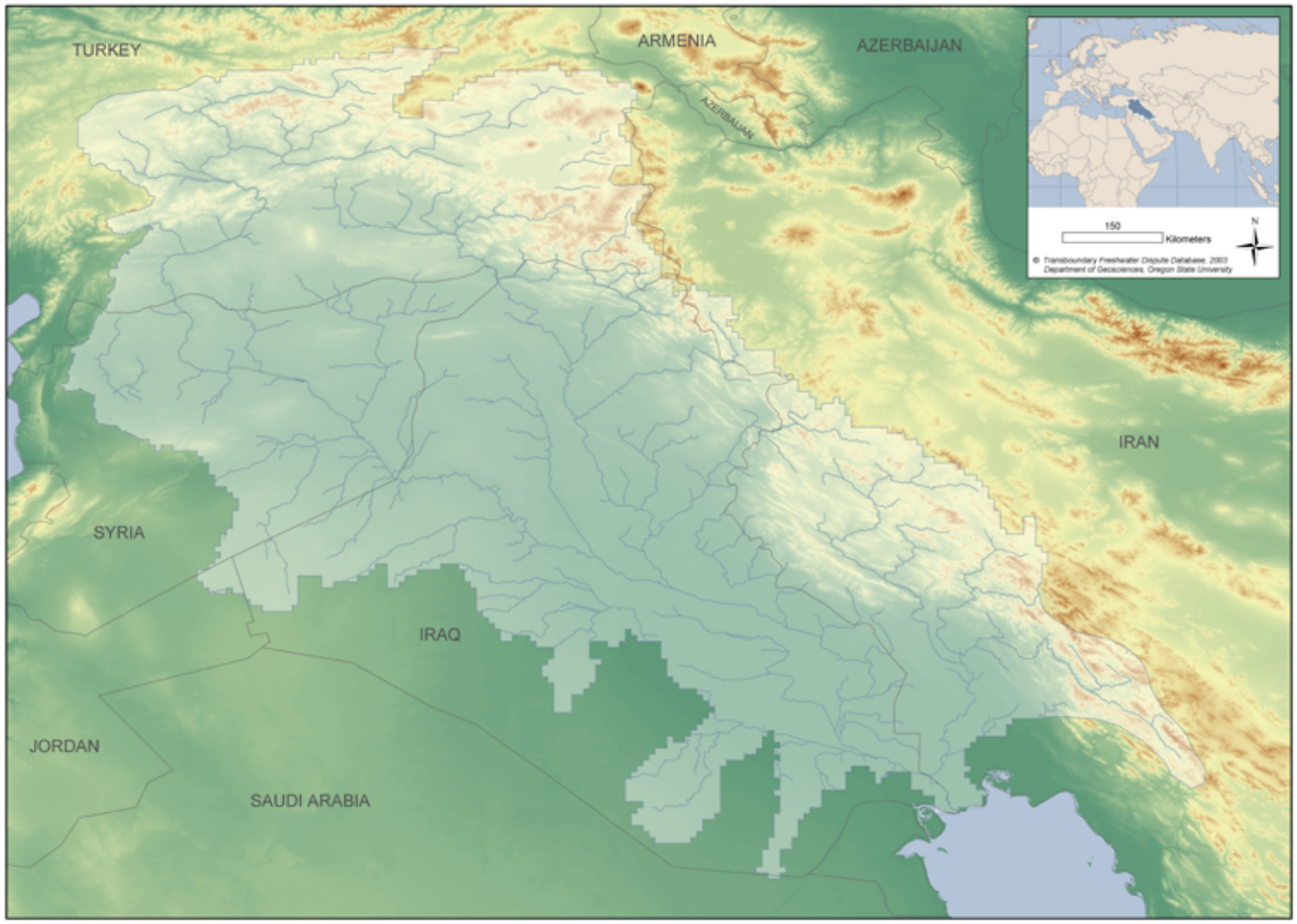
A process which allows for sustainable, equitable and efficient water resources management, while incorporating the political realities of political borders

(IWRM vs. Sovereignty)

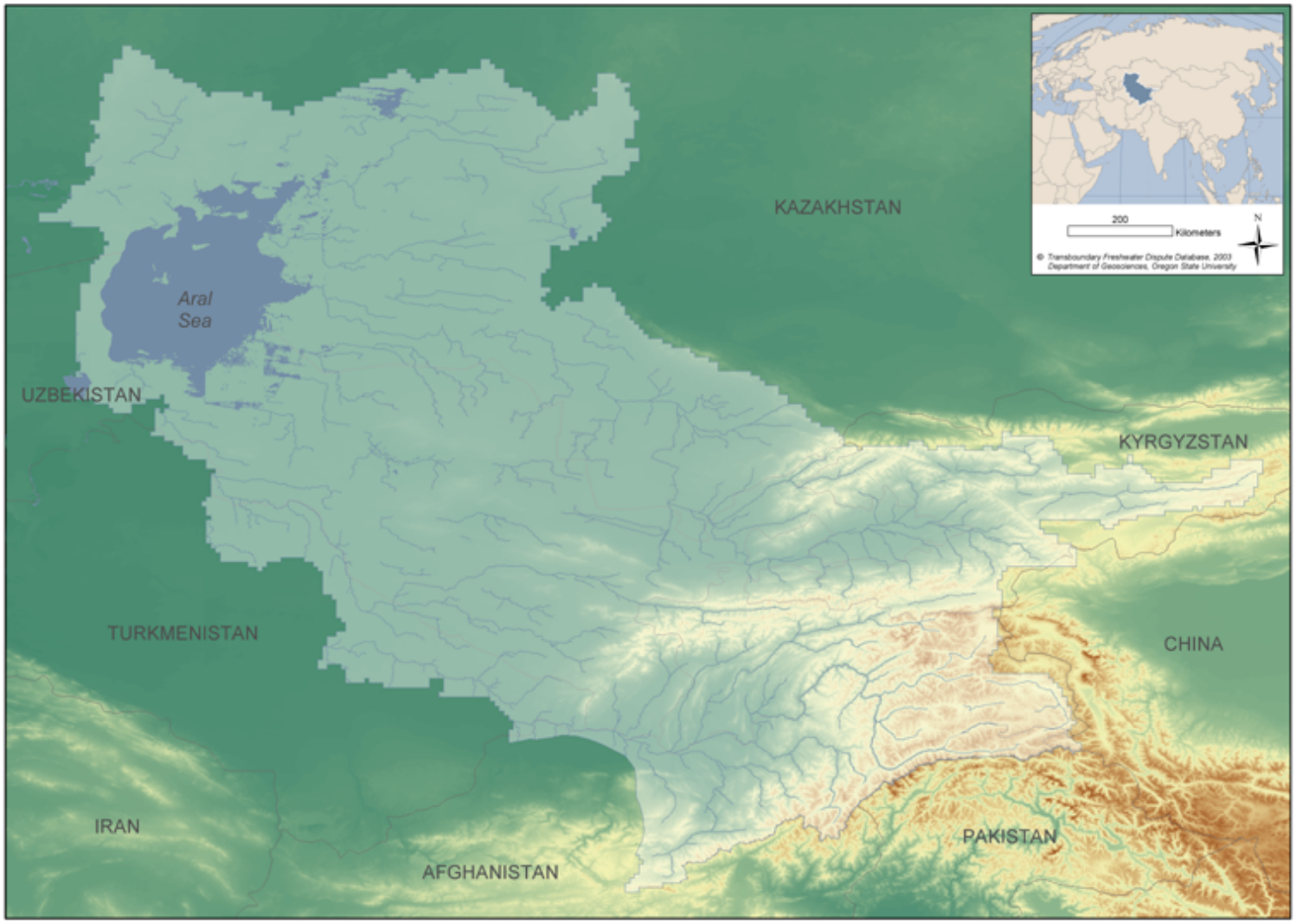
The Indus River and Ganges-Brahmaputra-Meghna River basins



The Tigris-Euphrates River basin

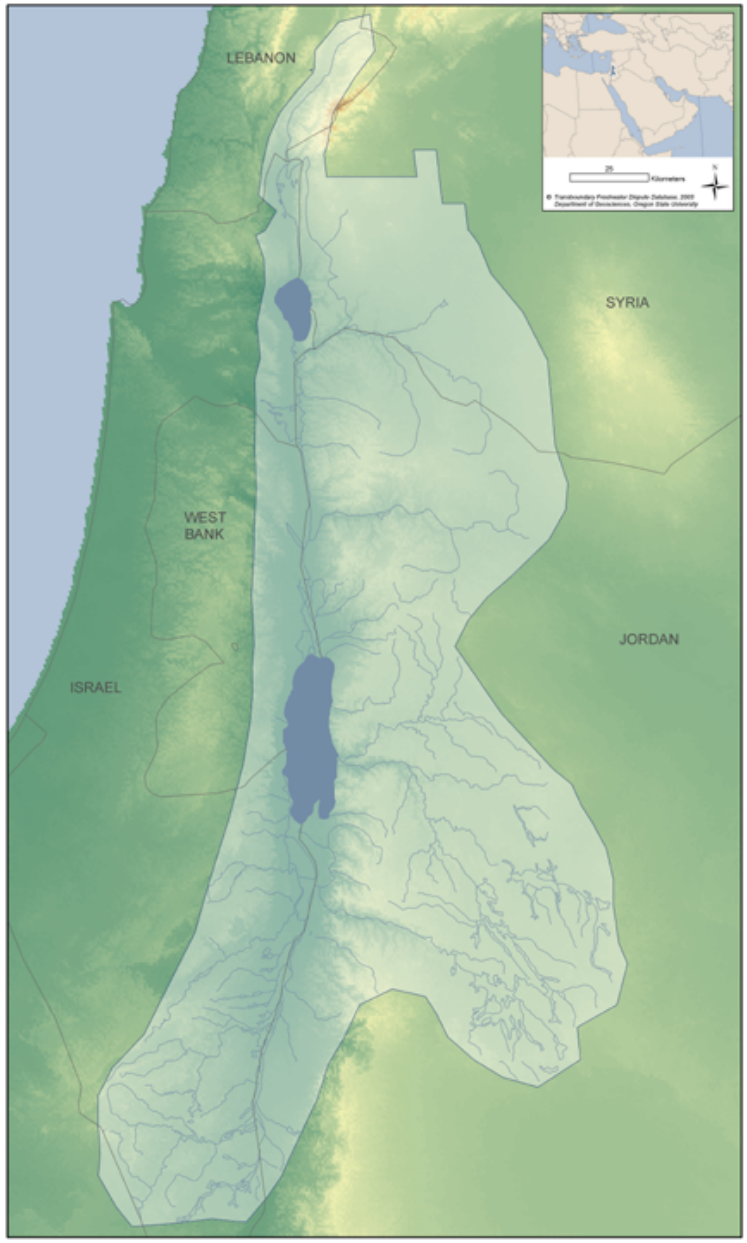


The Aral Sea basin



The Nile River basin

The Jordan River basin



Water and Conflict

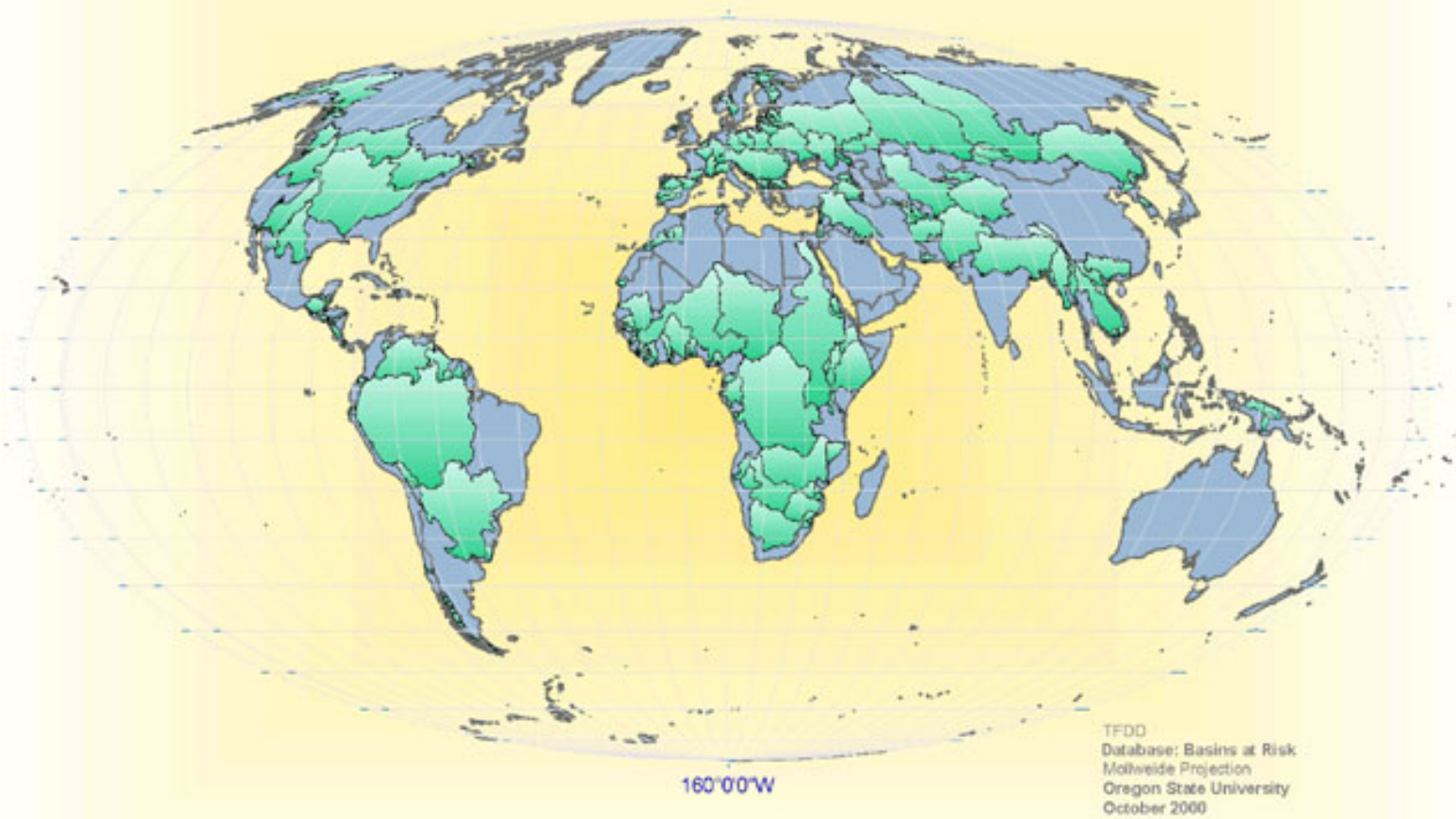
"Fierce competition for fresh water may well become a source of conflict and wars in the future."

- Kofi Annan, March 2001

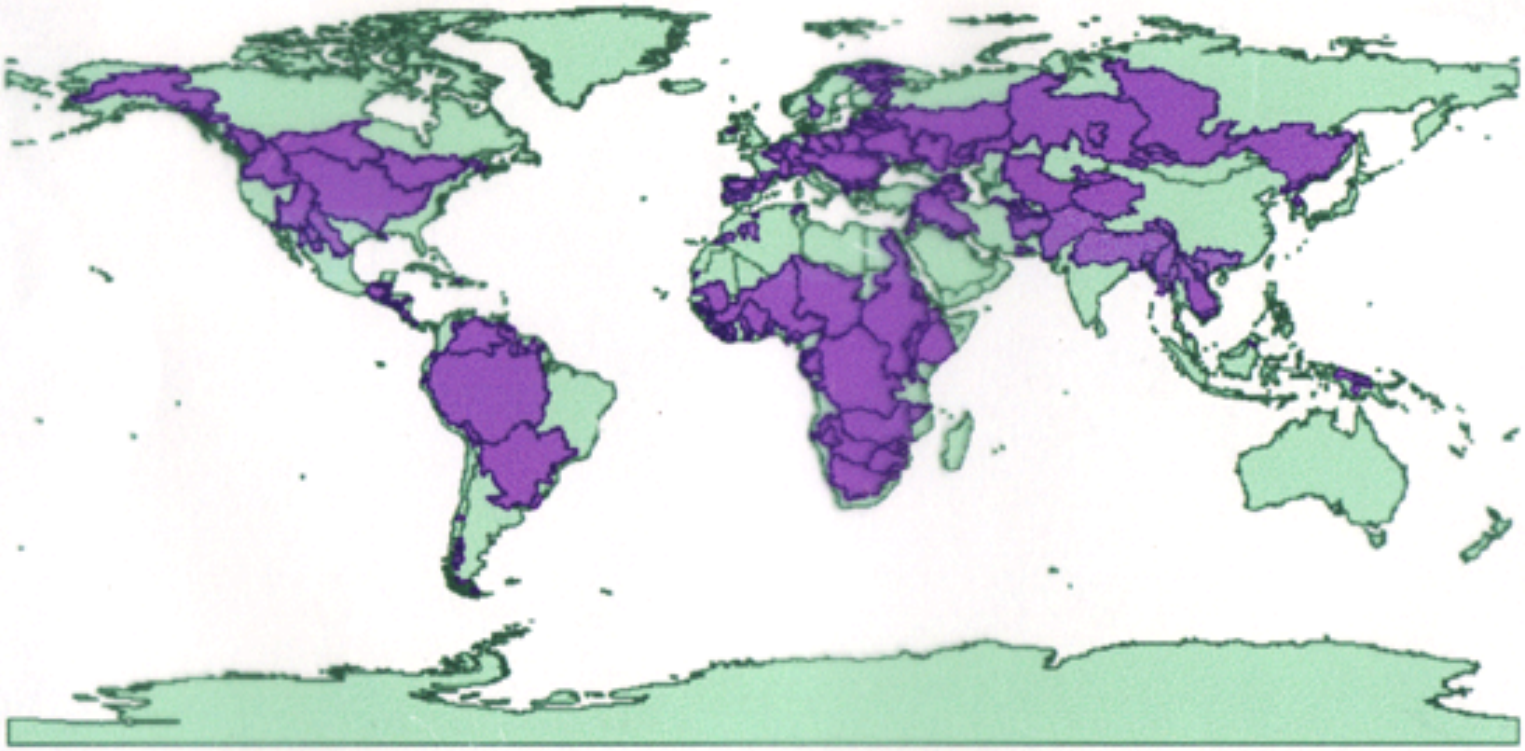
Water Myths and Water Facts

Myth 1:
Water Wars are Prevalent and Inevitable

International Basins of the World



Scale of Conflict



The Transboundary Freshwater Dispute Database

A Project of Oregon State University Department of Geosciences and the Northwest Alliance for Computational Science

- Reference to 3,600 water-related treaties (805-1997)
- Full-text of 400 treaties and 40 US compacts, entered in computer database
- Detailed negotiating notes (primary or secondary) from fourteen case-studies of water conflict resolution
- Annotated bibliography of "State of the Art" of water dispute resolution literature
- News files on cases of acute water-related disputes
- Indigenous methods of water dispute resolution

Interactive Search Interface

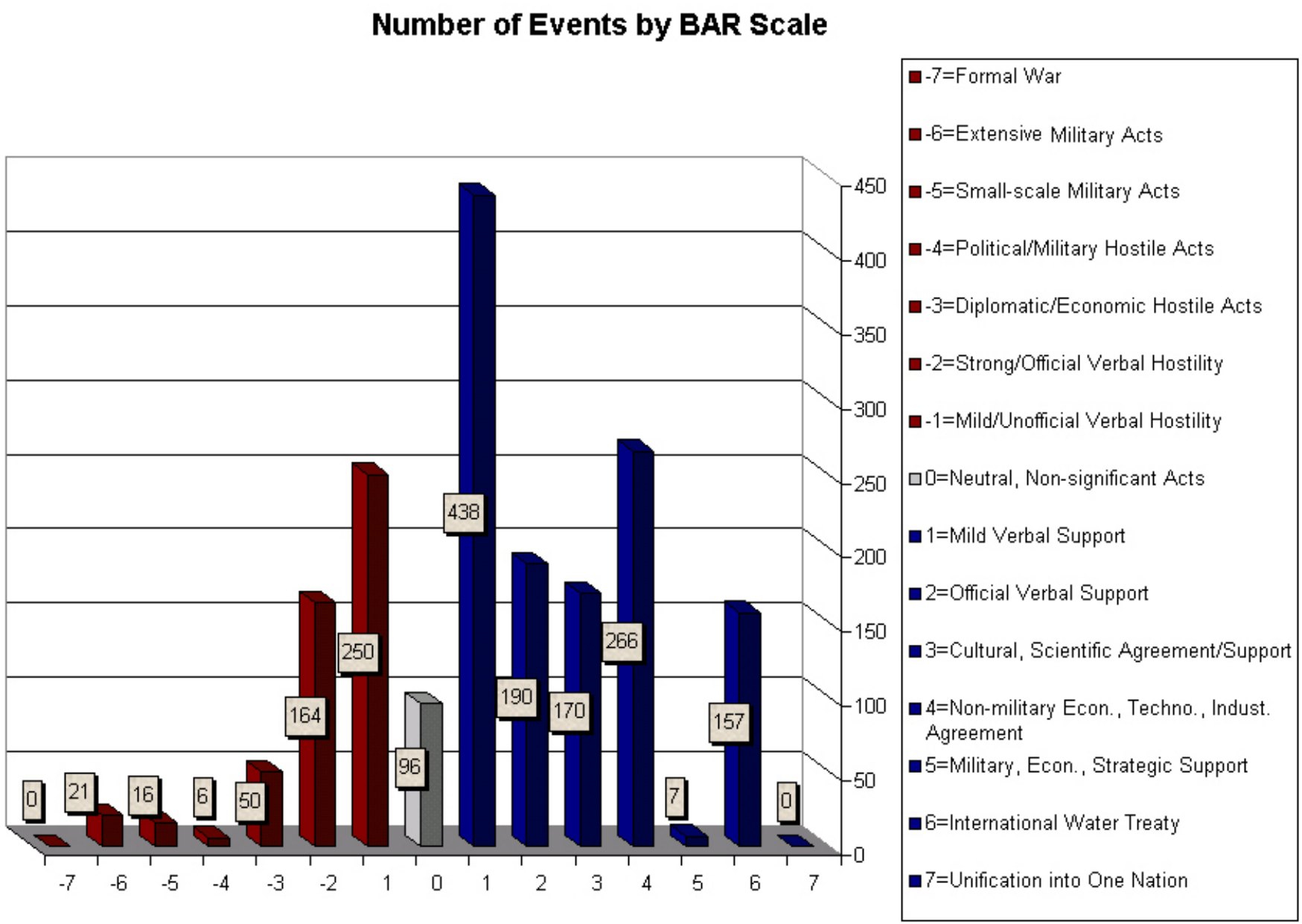
Bibliography

Treaties

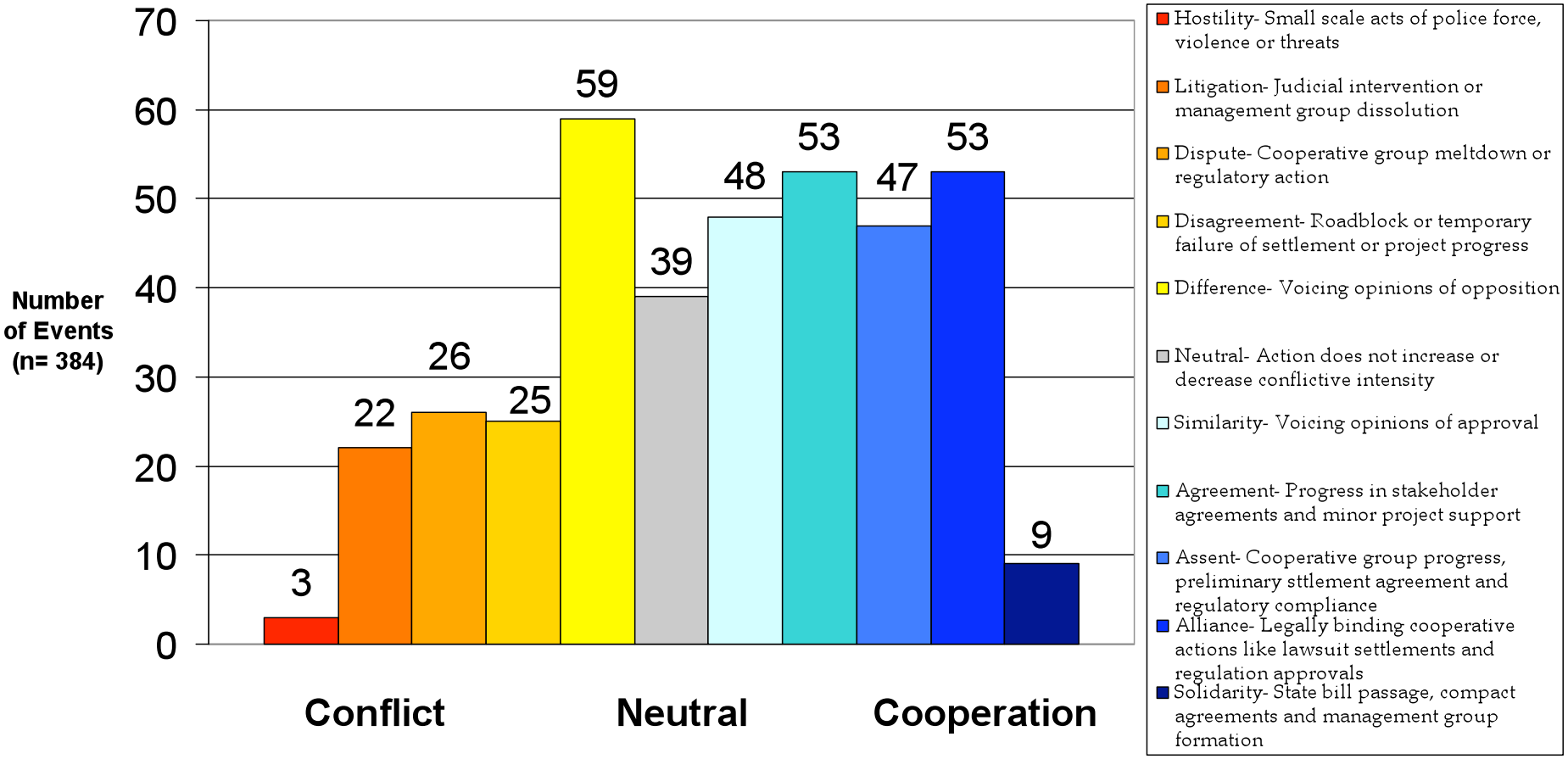
www.transboundarywaters.orst.edu

DATE	BASIN	COUNTRIES	BAR SCALE	EVENT SUMMARY	ISSUE TYPE
12/5/73	La Plata	Argentina--Paraguay	4	PRY AND ARG AGREE TO BUILD 1B DAM, HYDROELECTRIC PROJECT	Infrastructure
1/1/76	Ganges	Bangladesh--India--United Nations	-2	Bangladesh lodges a formal protest against India with the United Nations, which adopts a consensus statement encouraging the parties to meet urgently, at the level of minister, to arrive at a settlement.	Quantity
7/3/78	Amazon	Bolivia--Brazil--Colombia--Ecuador--Guyana--Peru--Suriname--Venezuela	6	Treaty for Amazonian Cooperation	Economic Development
4/7/95	Jordan	Israel--Jordan	4	Pipeline from Israel storage at Beit Zera to Abdullah Canal (East Ghor Canal) begins delivering water stipulated in Treaty (20 MCM summer, 10 MCM winter). The 10 mcm replaces the 10 mcm of desalinated water stipulated Annex II, Article 2d until desalinization plant completed	Quantity
6/1/99	Senegal	Mali--Mauritania	-3	13 people died in communal clashes in 6/99 along border between Maur. & Mali; conflict started when herdsmen in Missira-Samoura village in w. Mali, refused to allow Maur. horseman to use watering hole; horseman returned w/ some of his clansmen, attacking village on 6/20/99, causing 2 deaths; in retaliation that followed, 11 more died.	Quantity

Events Database, Example

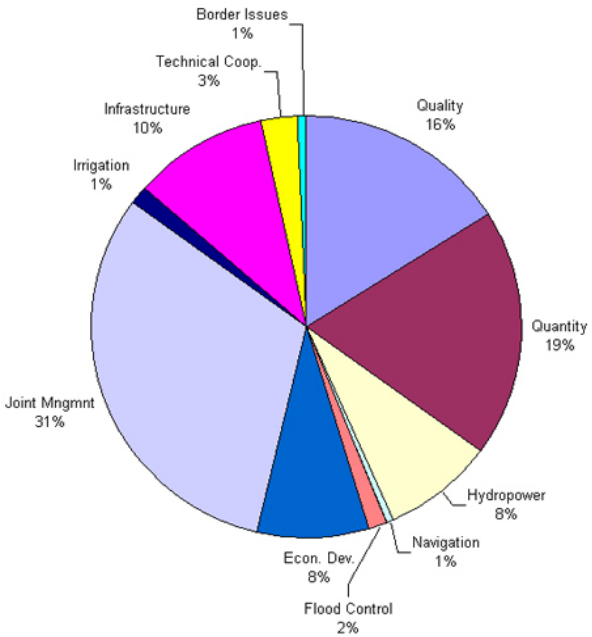

Number of Events by BAR Scale
-7=Formal War
-6=Extensive Military Acts
-5=Small-scale Military Acts
-4=Political/Military Hostile Acts
-3=Diplomatic/Economic Hostile Acts
-2=Strong/Official Verbal Hostility
-1=Mild/Unofficial Verbal Hostility
0=Neutral, Non-significant Acts
1=Mild Verbal Support
2=Official Verbal Support
3=Cultural, Scientific Agreement/Support
4=Non-military Econ., Techno., Indust. Agreement
5=Military, Econ., Strategic Support
6=International Water Treaty
7=Unification into One Nation
0
21
16
6
50
164
250
96
438
190
170
266
7
157
0
450
400
350
300
250
200
150
100
50
0
-7
-6
-5
-4
-3
-2
1
0
1
2
3
4
5
6
7

Number of Media Reported Events in Oregon along a Cooperation- Conflict Spectrum from 1990 to 2004

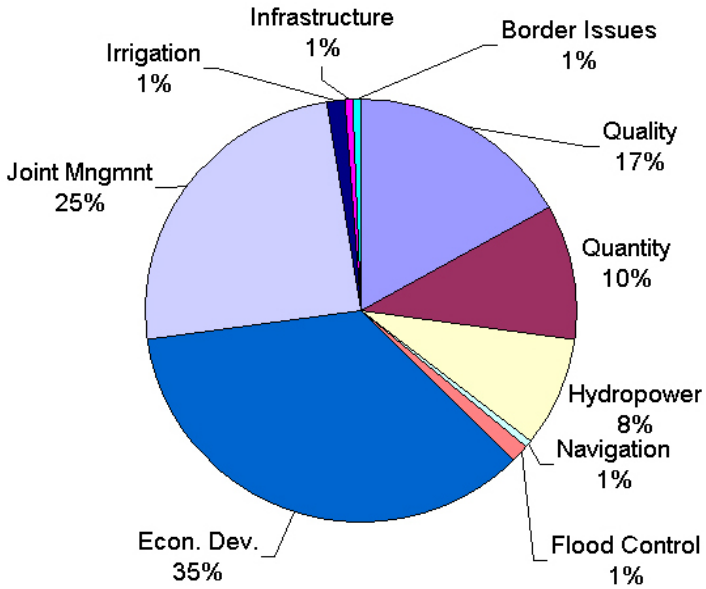


Source: Fesler, K. (2006) [Analysis of social interactions concerning Oregon's water resources between 1990 and 2004.] Unpublished Data.

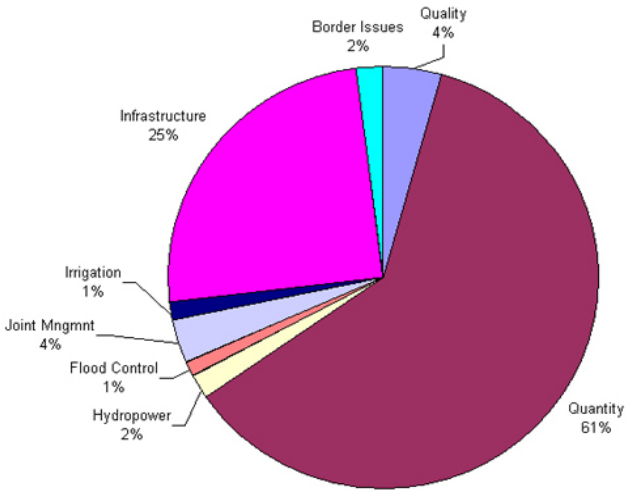
Distribution of Total Cooperative Events by Issue Area



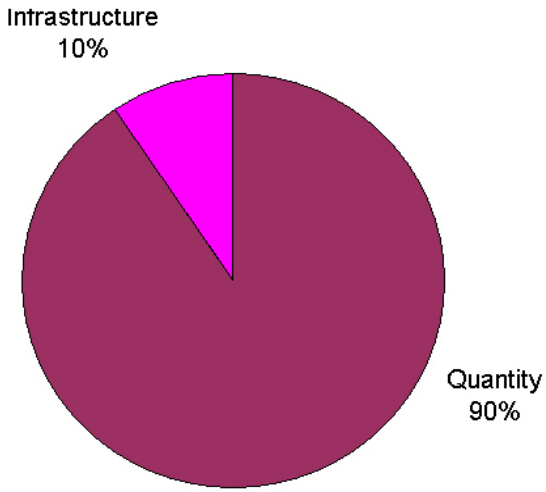
Country-Pair Interactions By Issue Type Extreme (BAR Scale 6) Cooperation



Distribution of Total Conflictive Events by Issue Area



Country-Pair Interactions by Issue Type
Extreme (BAR Scale -6) Conflict



Institutional Resiliency Argument

Transboundary water institutions are resilient over time, even between hostile riparians, even as conflict is waged over other issues:

- **Picnic Table Talks**
- **Mekong Committee**
- **Indus River Commission**
- **Caucasus**
- **SADC Region**

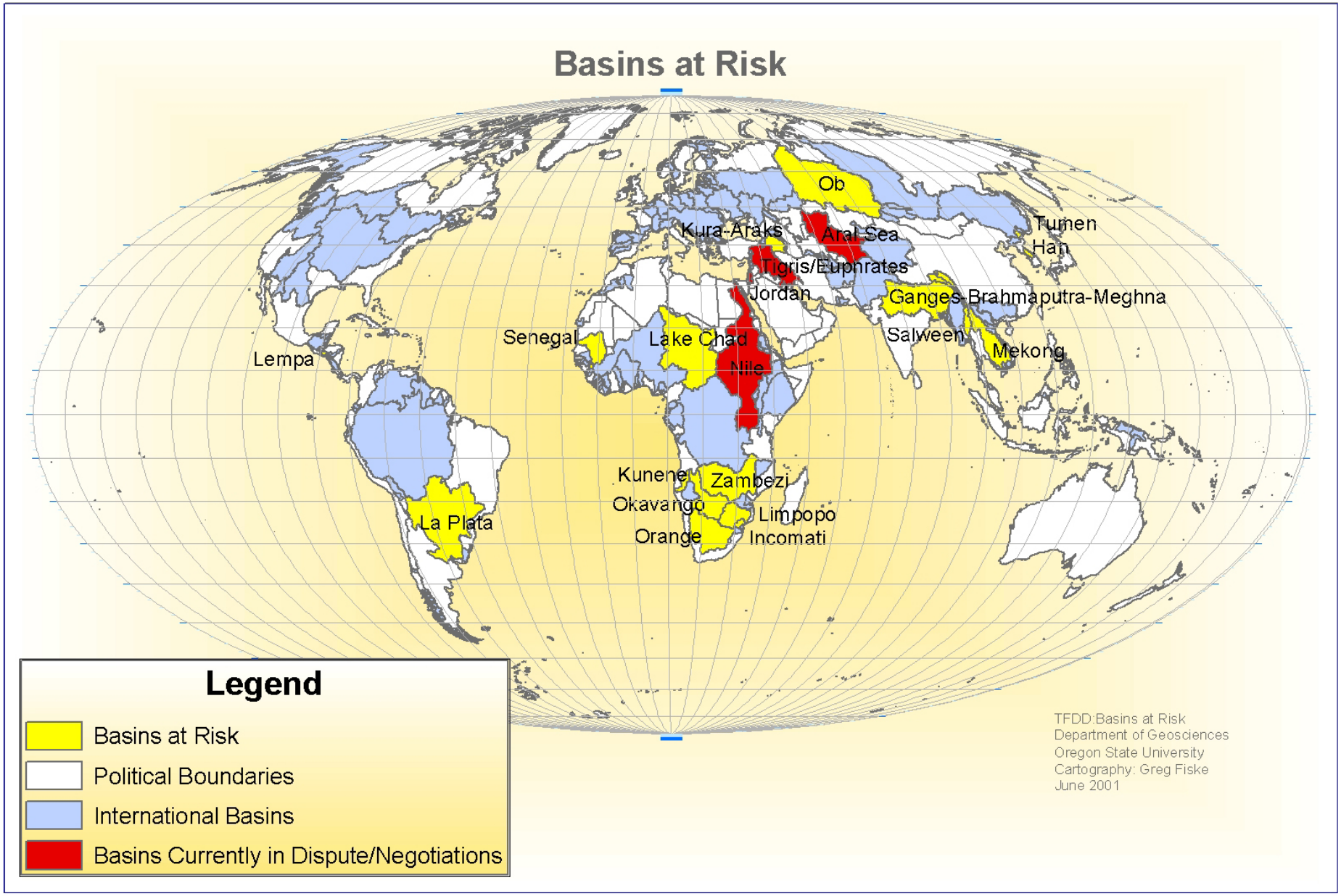
BASINS AT RISK: Working Hypothesis

"The likelihood of conflict rises as the rate of change within the basin exceeds the institutional capacity to absorb that change."

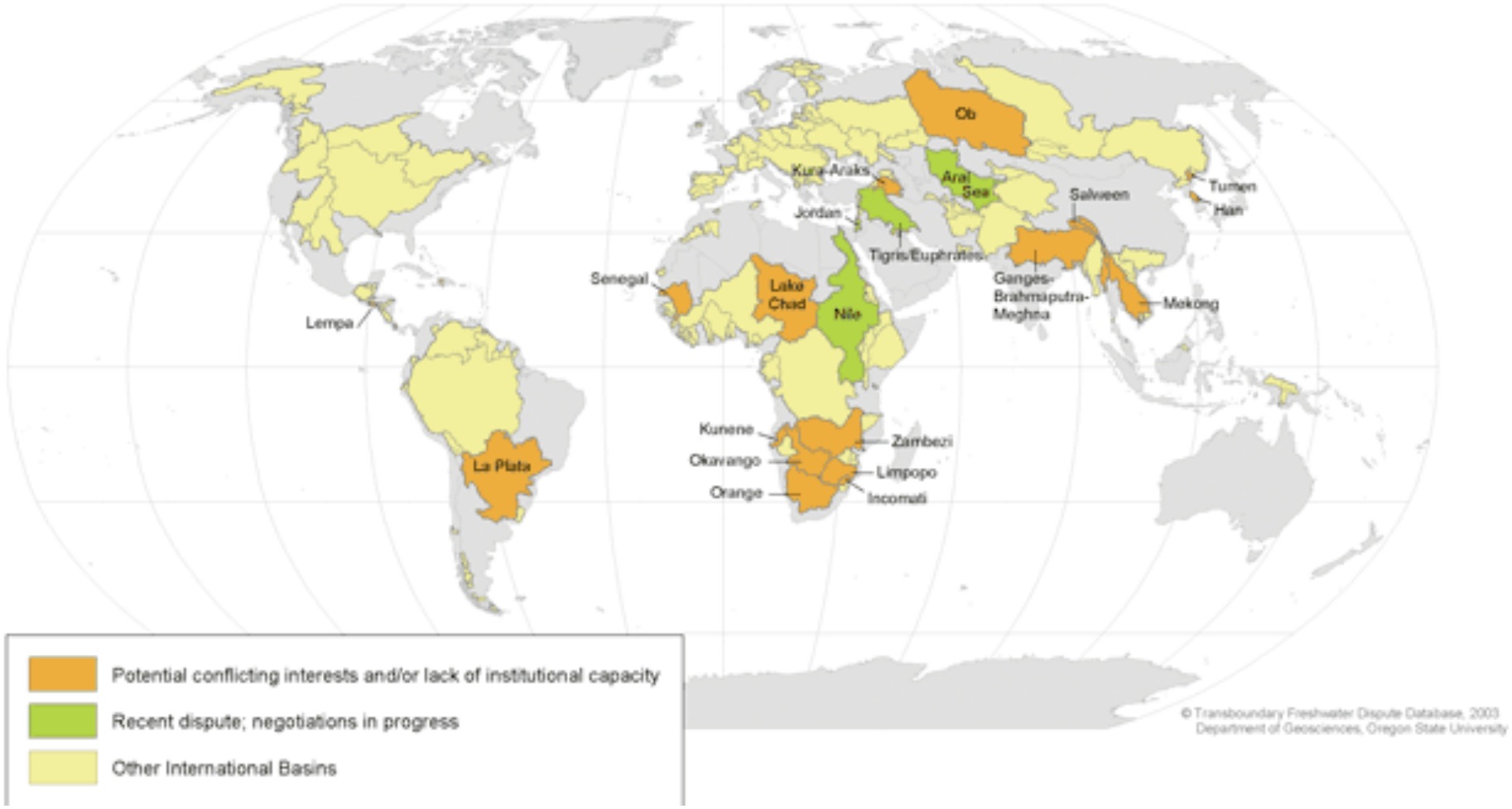
What *are* indicators*?*

Sudden physical changes or lower institutional capacity are more conducive to disputes:

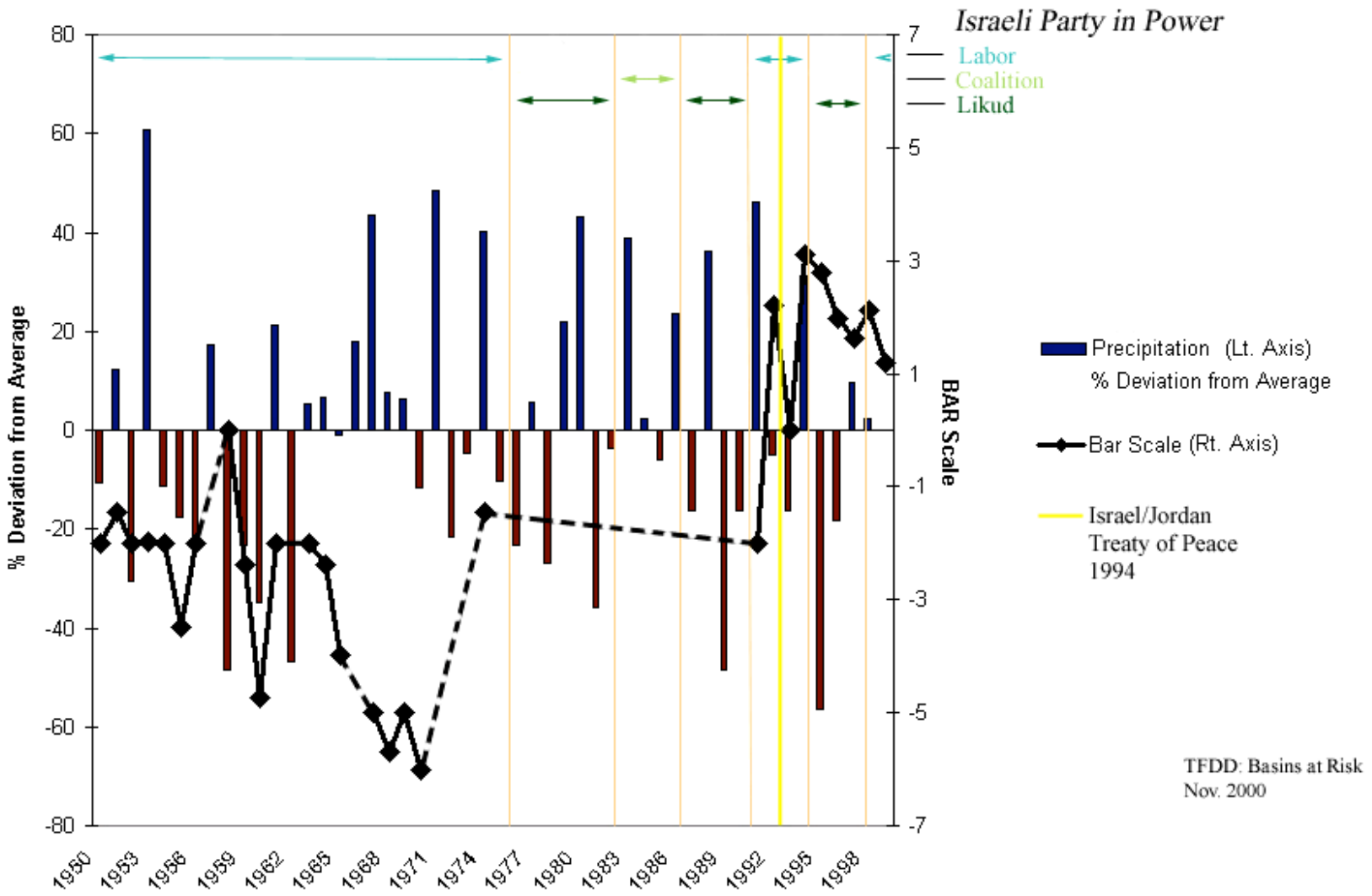
1) Uncoordinated development: a major project *in the absence* of a treaty or commission
2) "Internationalized basins"
3) General animosity


Basins at Risk
Ob
Kura-Araks
Aral Sea
Tumen
Han
Tigris/Euphrates
Jordan
Ganges-Brahmaputra-Meghna
Senegal
Lake Chad
Salween
Mekong
Lempa
Nile
Kunene
Zambezi
Okavango
Limpopo
La Plata
Orange
Incomati
Legend
Basins at Risk
Political Boundaries
International Basins
Basins Currently in Dispute/Negotiations
TFDD:Basins at Risk
Department of Geosciences
Oregon State University
Cartography: Greg Fiske
June 2001

Basins Under Observation



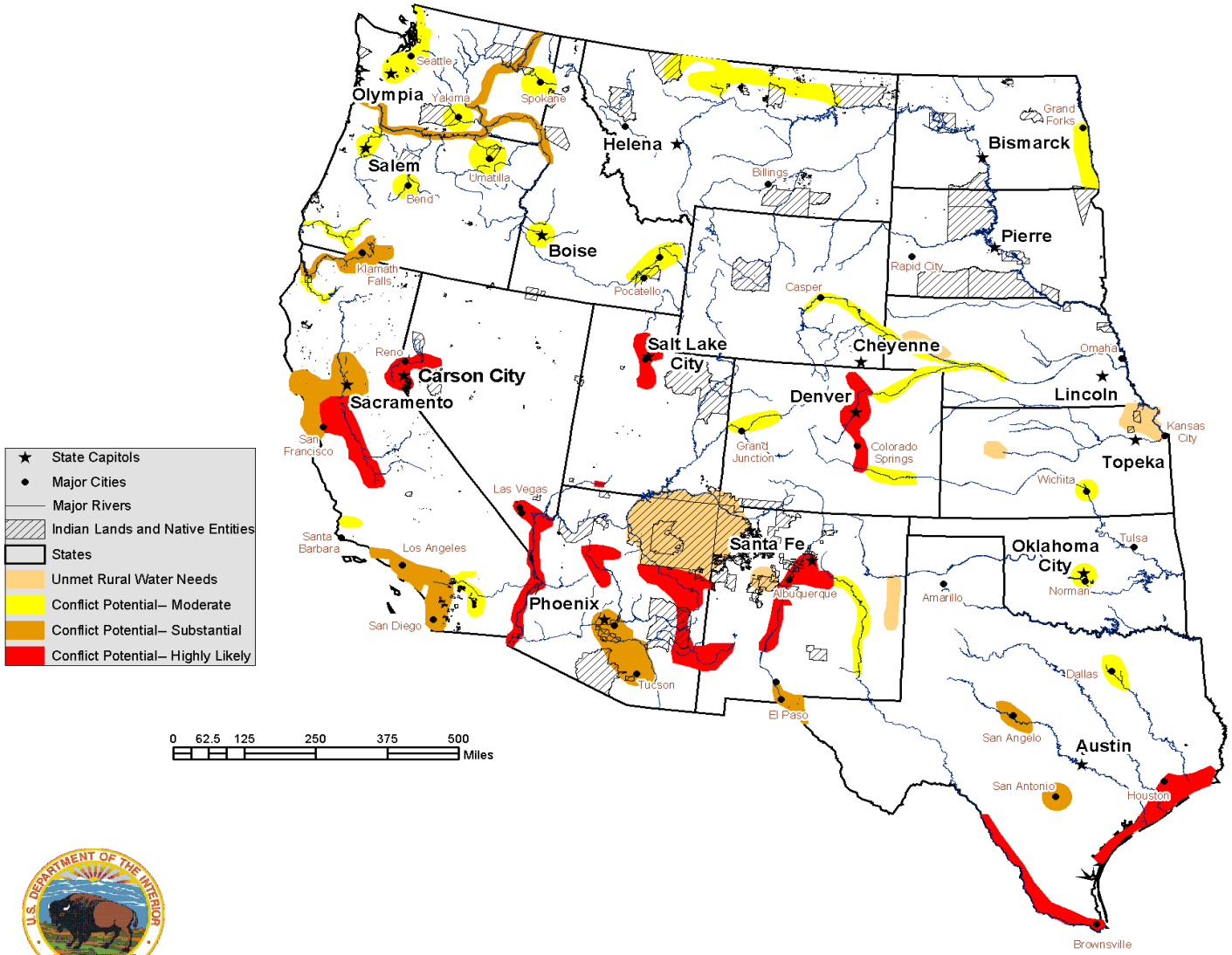
Jordan River Timeline



TFDD: Basins at Risk
Nov. 2000

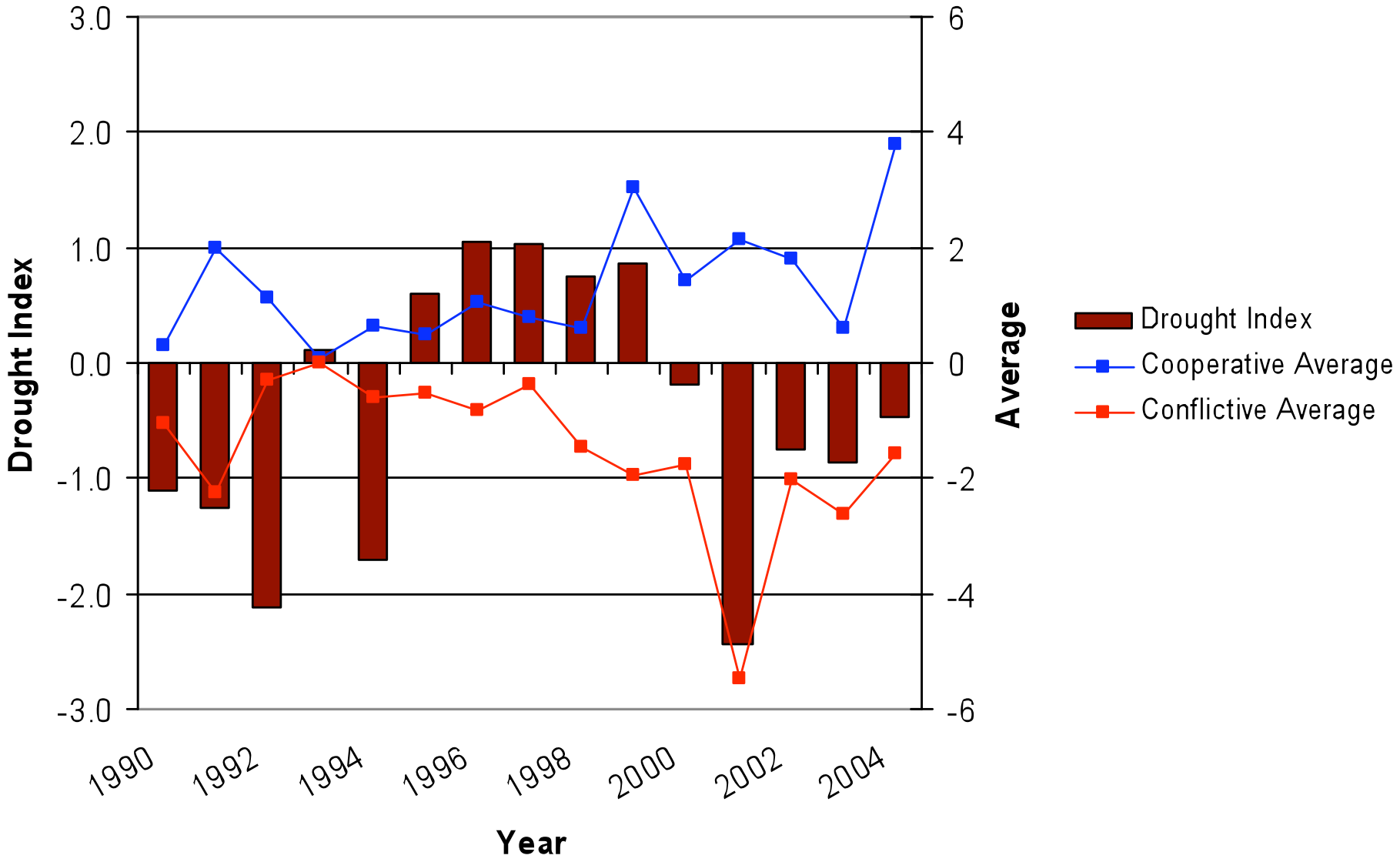
Potential Water Supply Crises by 2025

(Areas where existing supplies are not adequate to meet water demands for people, for farms, and for the environment)



May 2003

Oregon Timeline



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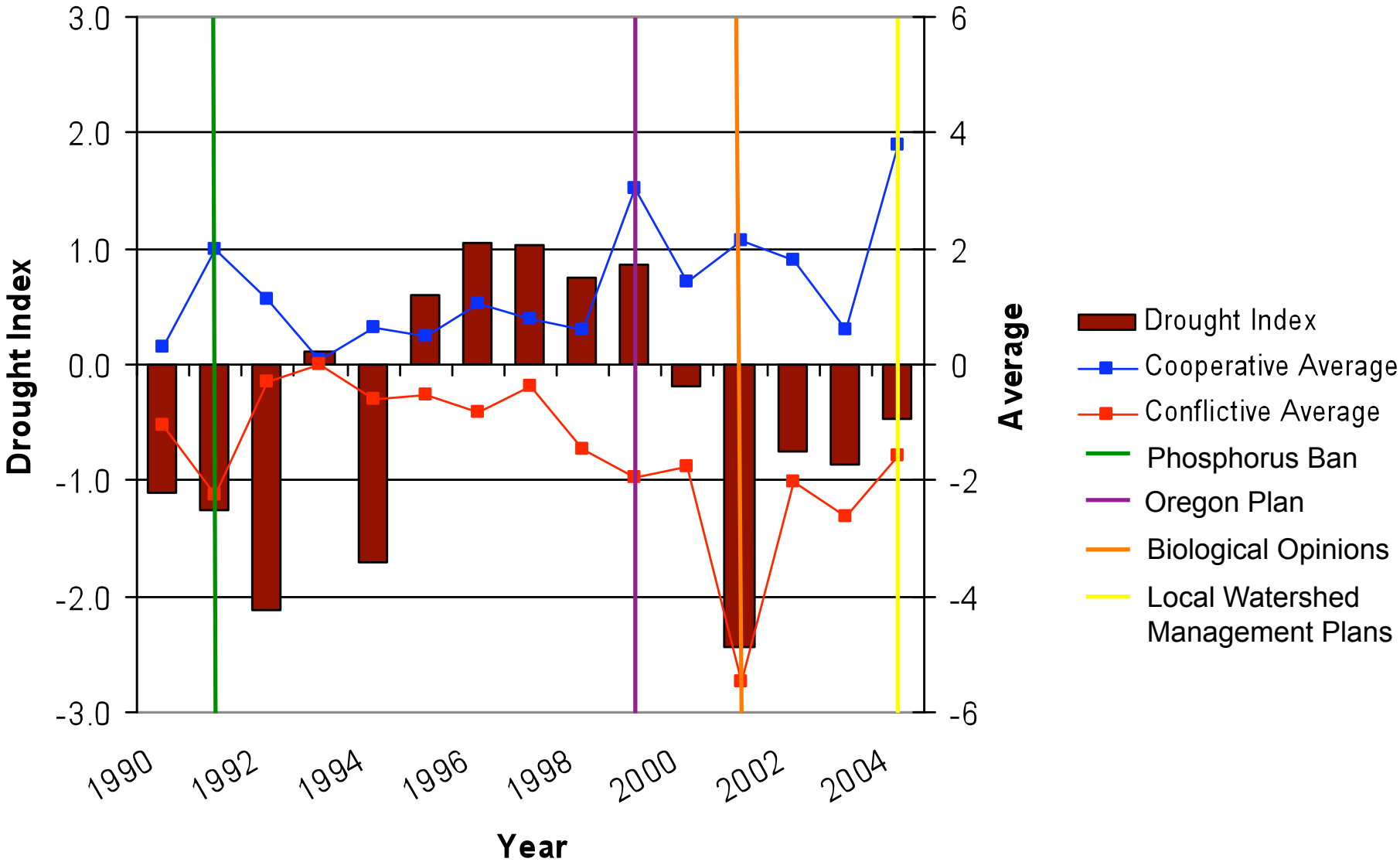
Oregon Timeline



Source: Fesler, K. (2006) [Analysis of social interactions concerning Oregon's water resources between 1990 and 2004.] Unpublished Data.


Great Lakes
Merrimack
Yellowstone
Connecticut
Flint
Thames
Snake
Belle Fourche
Niobrara
Klamath
Bear
Delaware
Susquehanna
South Platte
Wabash
Republican
Potomac
Ohio
Animas La Plata
Costilla Creek
Colorado
Arkansas
Tallapoosa/Coosa
Canadian
Red
Caddo Lake
Chattahoochee
Rio Grande
Apalachicola
Alabama
Pecos
Sabine

ARIA:
Four Paths in Negotiations

- **Adversarial** -- each side defines its positions, or *rights* (win-lose, zero-sum, distributive).
- **Reflexive** -- the *needs* of each side bringing them to their positions is addressed.
- **Integrative** -- negotiators brainstorm together to address each side's underlying *interests* (win-win, positive sum).
- **Action** -- negotiators work on implementation and re-entry.

- Source: Rothman, J. 1991. Negotiation as Consolidation. Journal of International Relations. 13 (1).

Criteria for Water Allocations

Initial Positions:

- Rights-based: Geography vs. Chronology

Interim Positions:

- Needs-based plus recognition of historic use

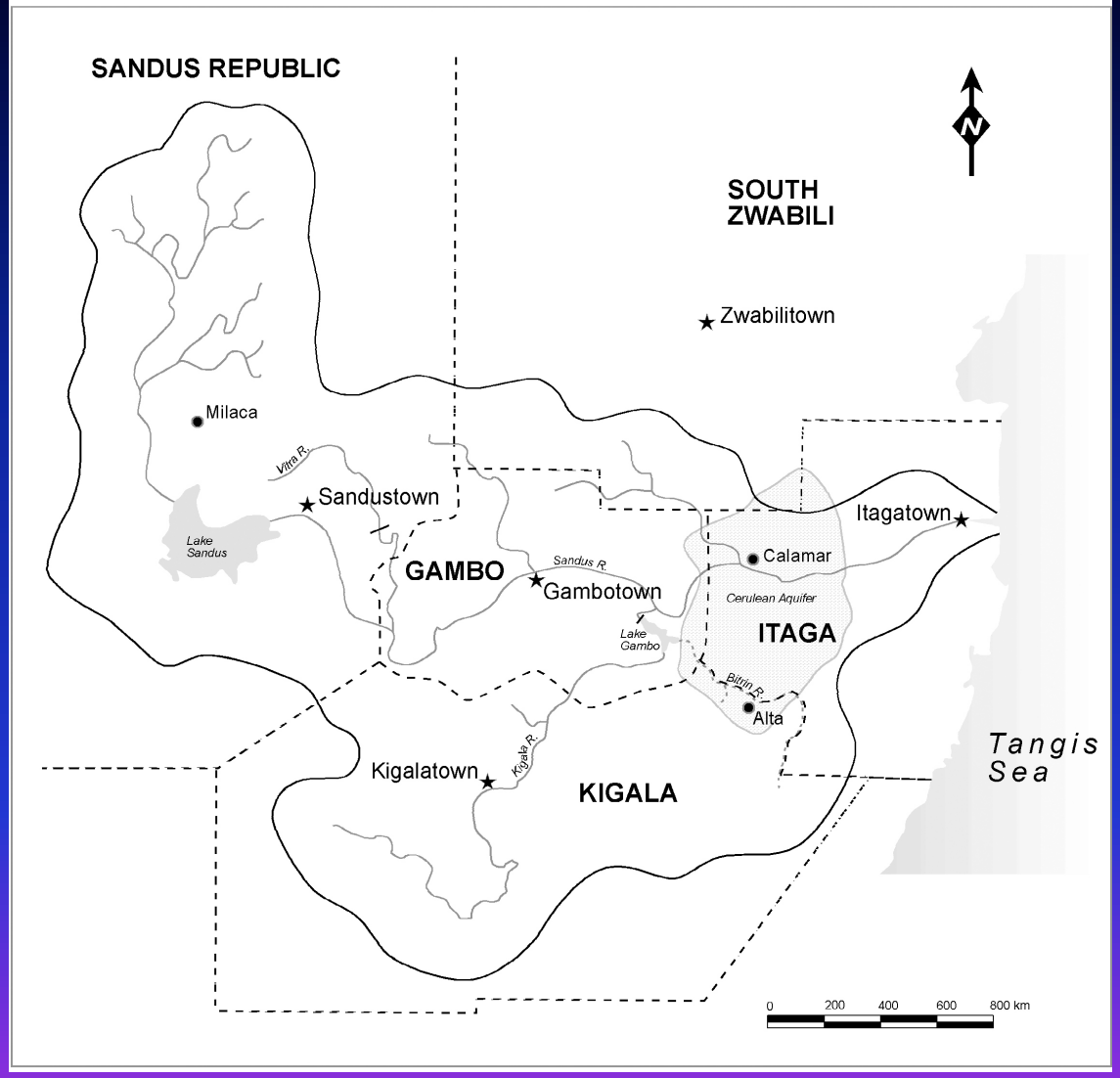
Final Agreement:

- Interest-based: Identification and assessment of “baskets” of benefits (perhaps beyond water)

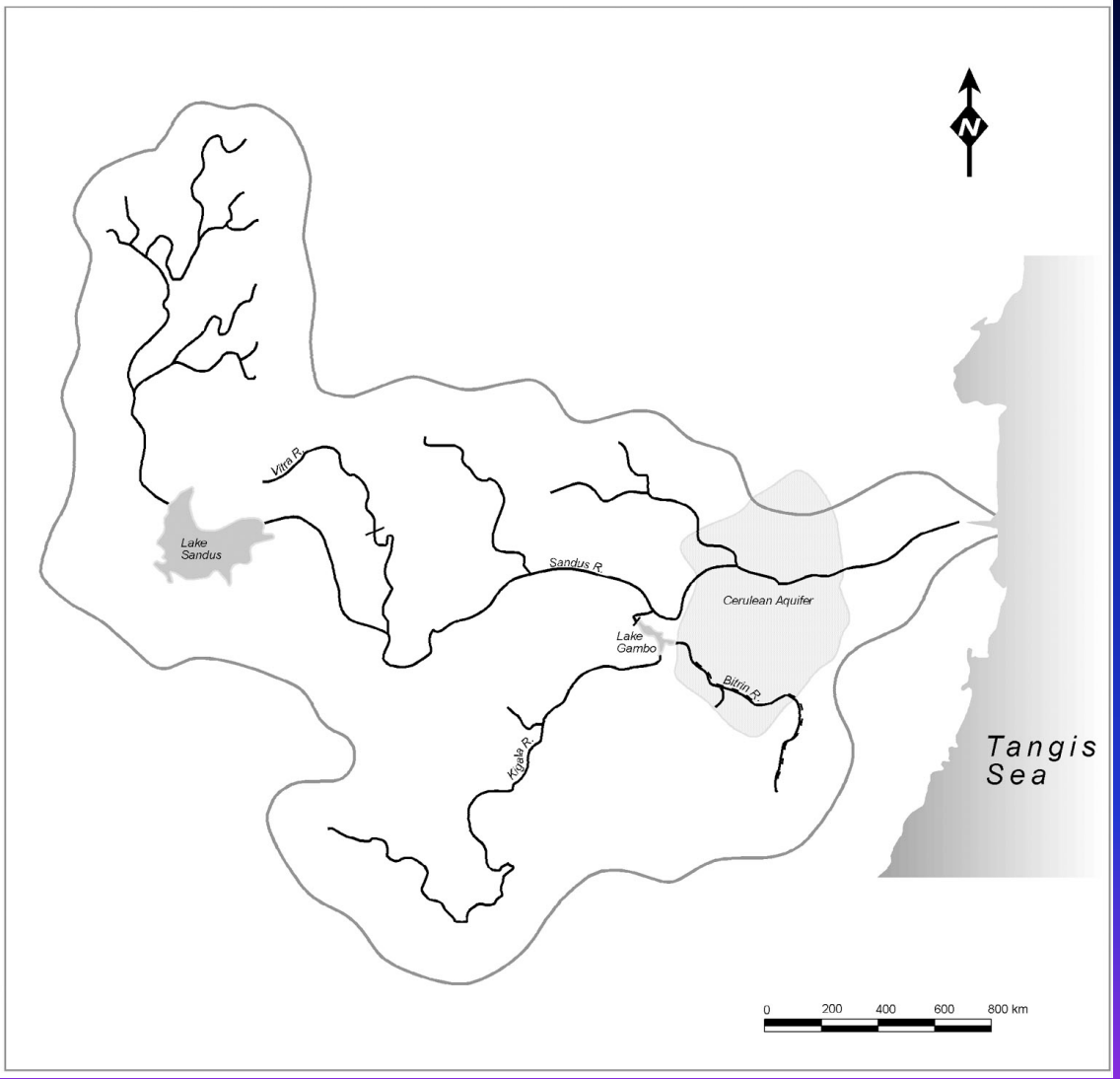
Implementation:

- Equitable distribution of benefits

Map of the Sandus River basin



Map of the Sandus River basin



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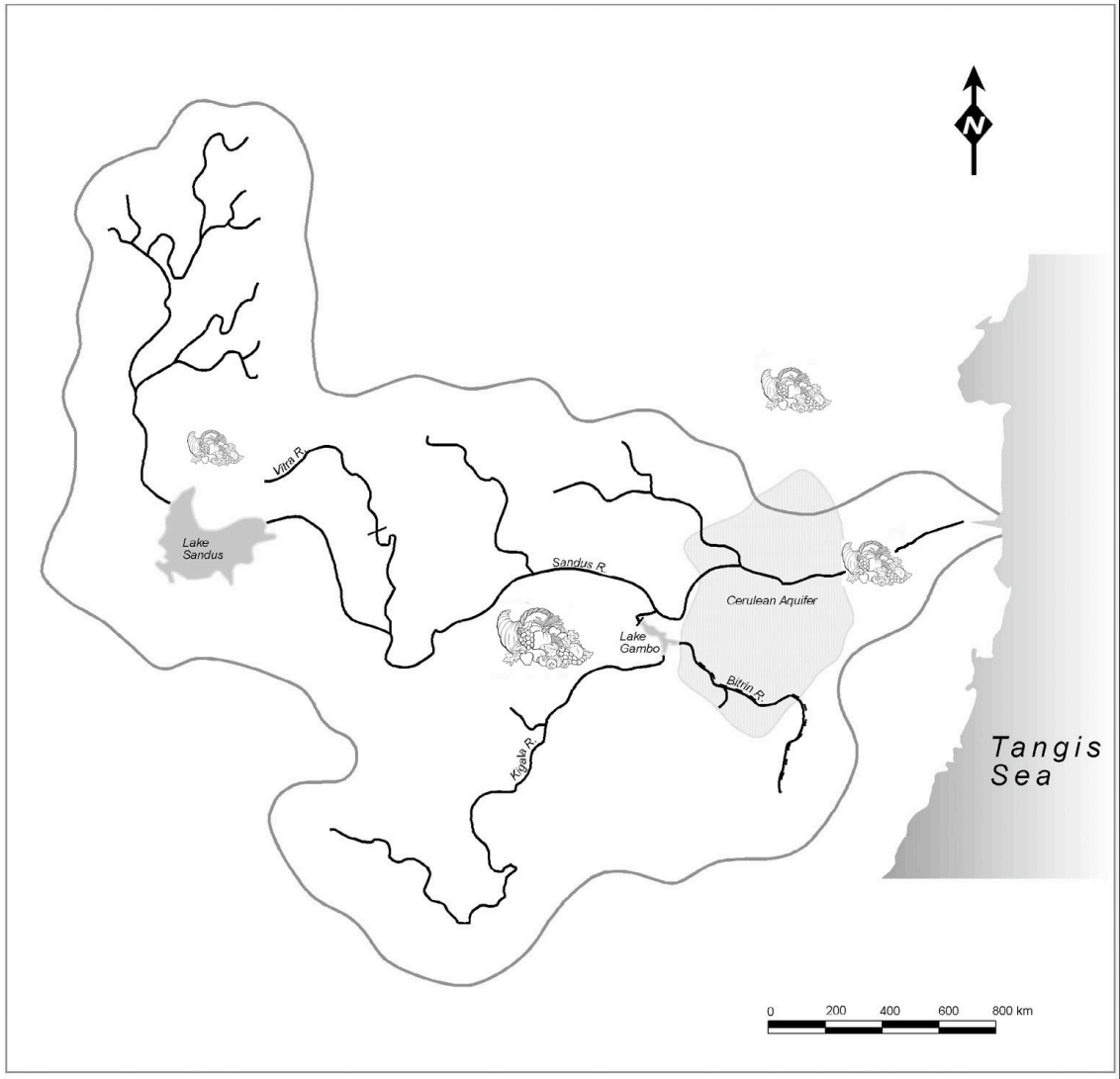
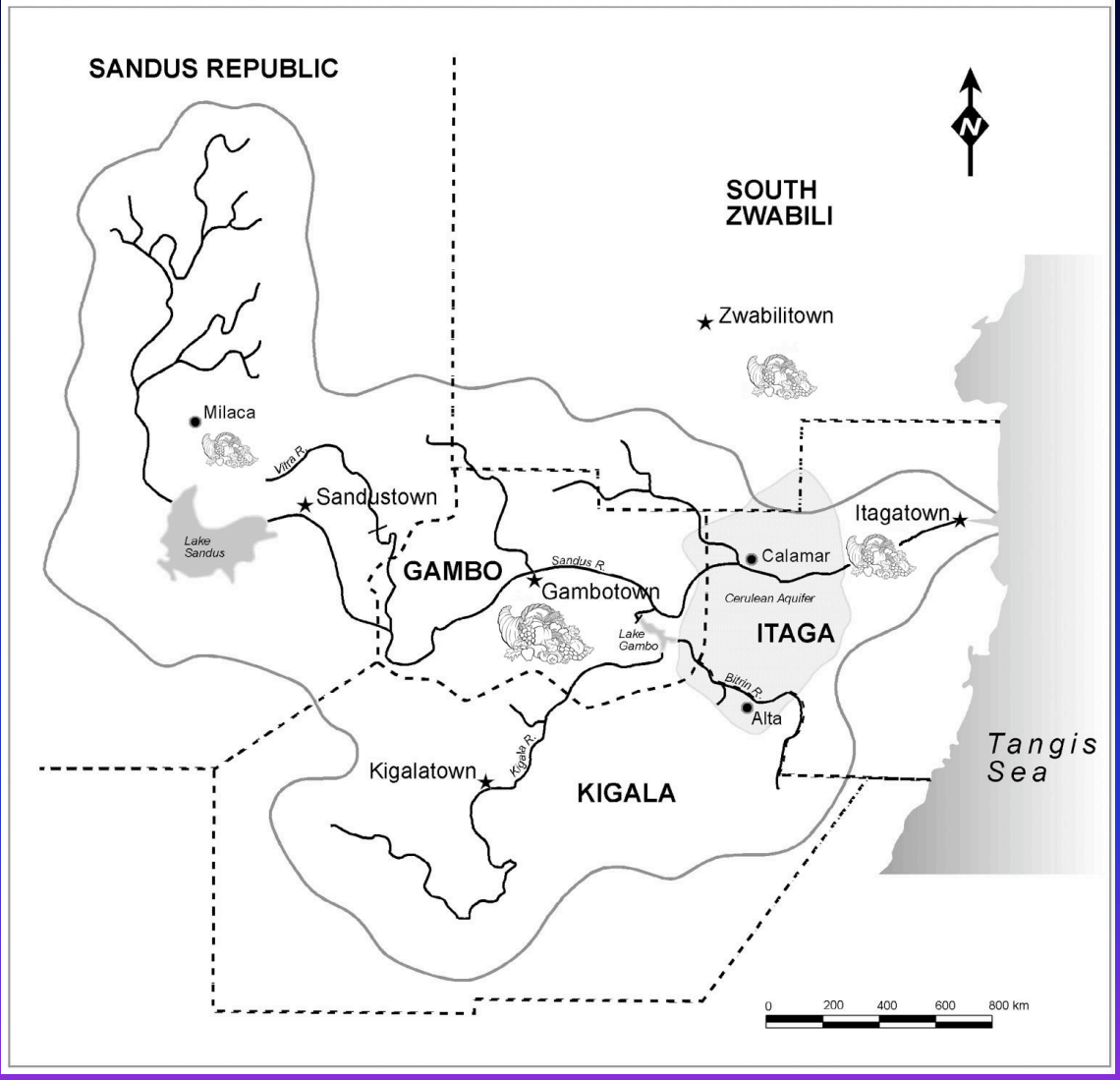
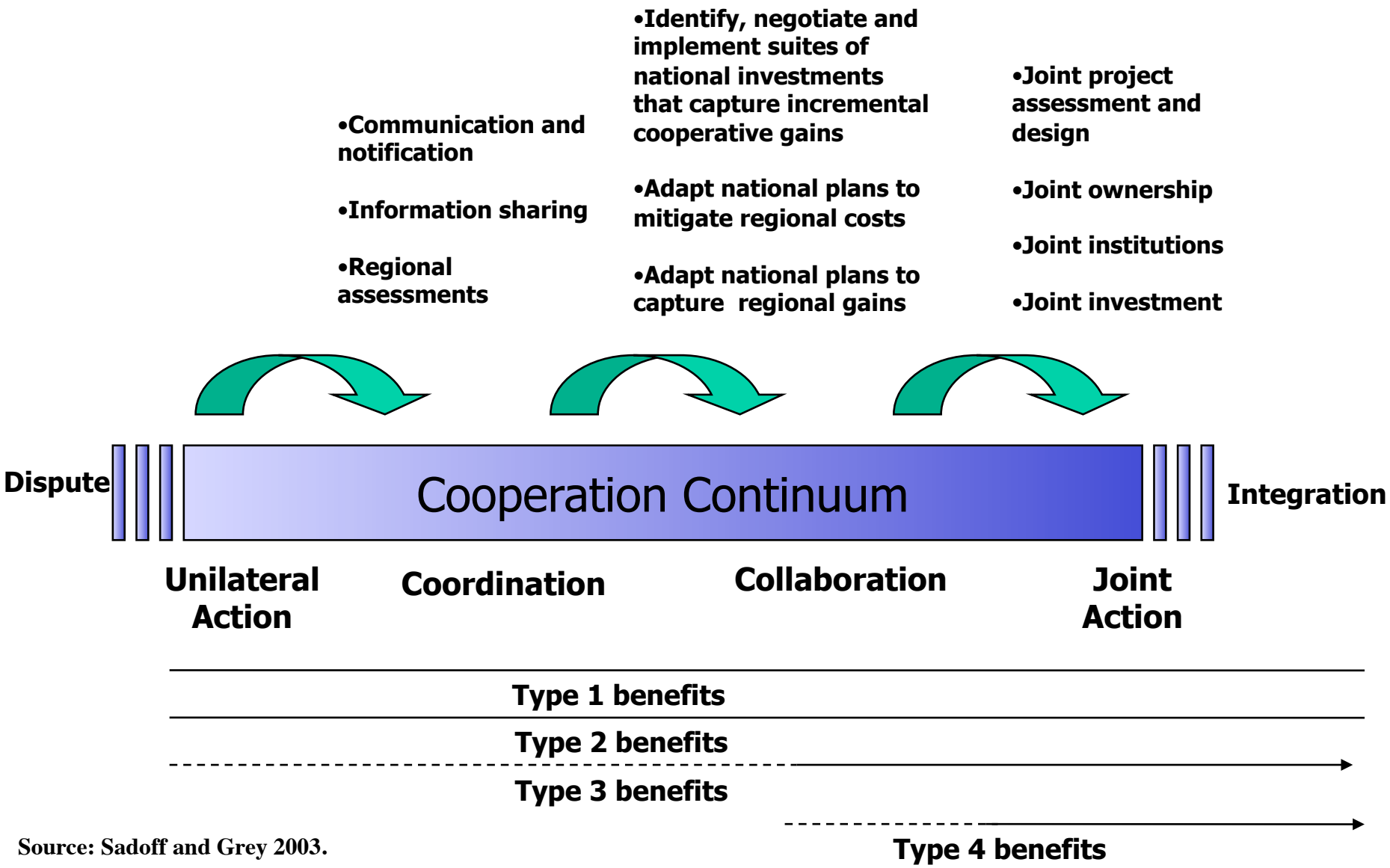


Map of the Sandus River basin



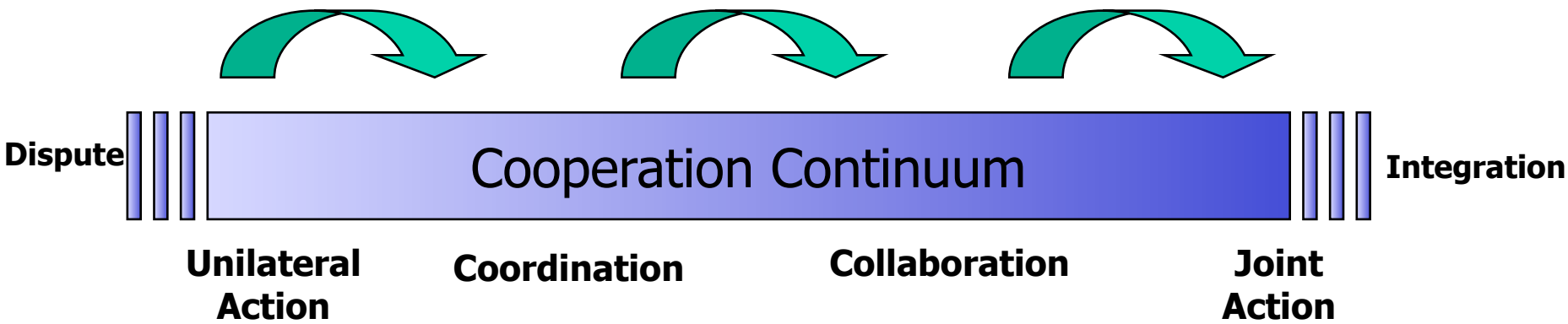
Types of Cooperation – a Cooperation Continuum



Source: Sadoff and Grey 2003.

Types of Cooperation – some examples

Indus	Jordan	Rhine	Orange	Senegal	River
commun-ication	info sharing, assessments	convergent national agendas	joint prep and investment	joint equity ownership	type of cooperation
1-3	1-4	1,3	2,3	1-4	type of benefit
	cost sharing	cost sharing	purchase agreement, financing	joint ownership	type of benefit sharing



Source: Sadoff and Grey 2003.

RESILIENT TRANSBOUNDARY WATER INSTITUTIONS

- Adaptable Management Structure
  -- public input
  -- changing basin priorities
  -- new information/monitoring abilities
- Clear and Flexible Allocation
  -- rights to needs to interests
  -- hydrologic extremes
  -- new knowledge
  -- changing societal values
- Equitable Distribution of (Baskets of) Benefits, Not Water
- Detailed Conflict Resolution Mechanism
- Sustainable Institution and Financing

Water and Cooperation

"But the water problems of our world need not be only a cause of tension;
they can also be a catalyst for cooperation

….If we work together, a secure
and sustainable water future can be ours."

- Kofi Annan, February 2002