



GWSP and Deltas

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**GWSP/LOICZ/CSDMS Workshop on Dynamics and Vulnerability of River Delta Systems
26-28 September 2007, Boulder, CO, USA**

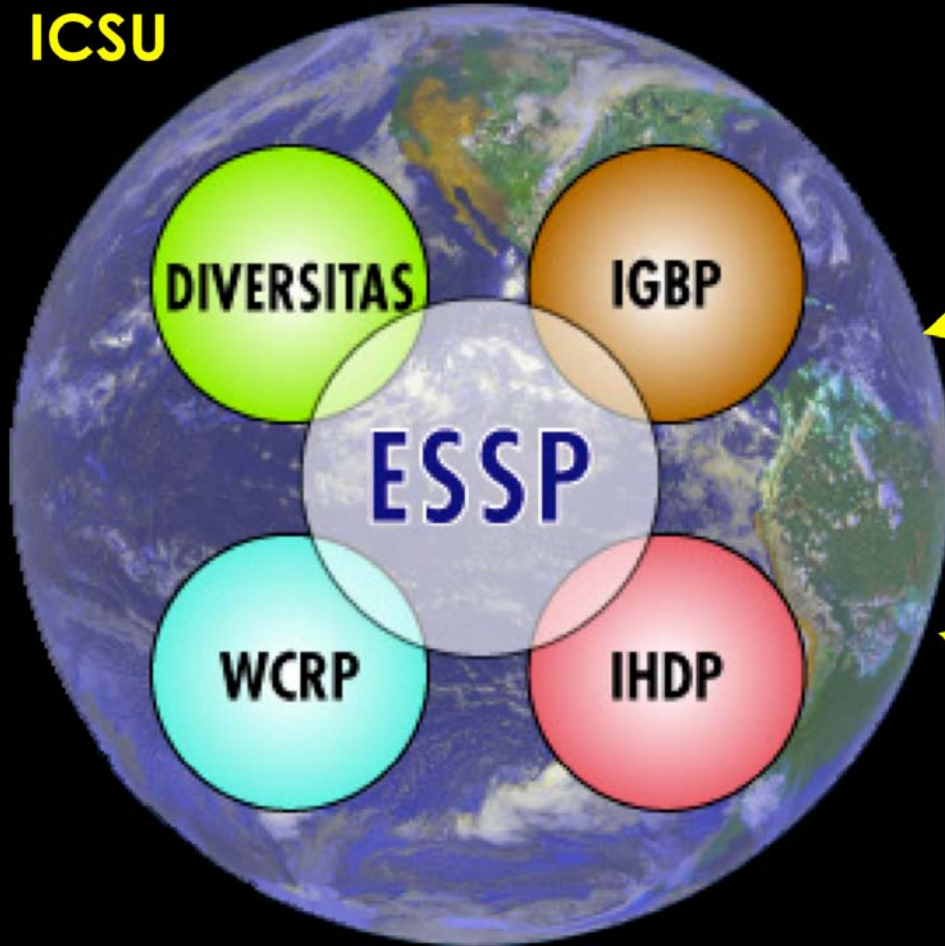
Earth System Science Partnership



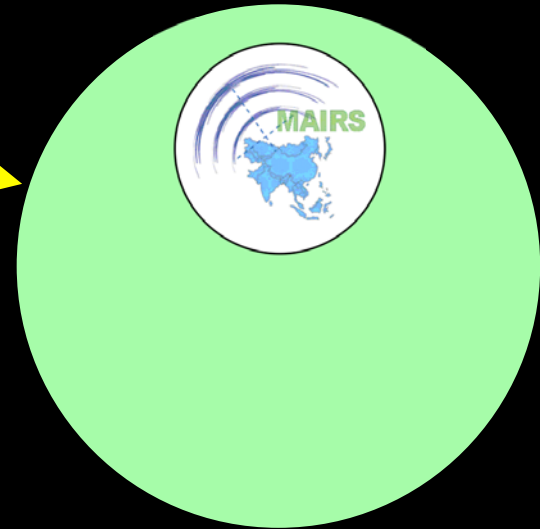
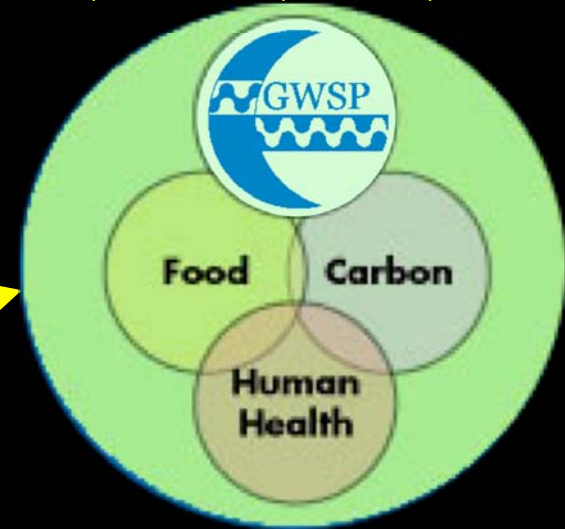
ESSP Joint Projects

GCP, GECAFS, GWSP, Health

ICSU



ESSP Programmes

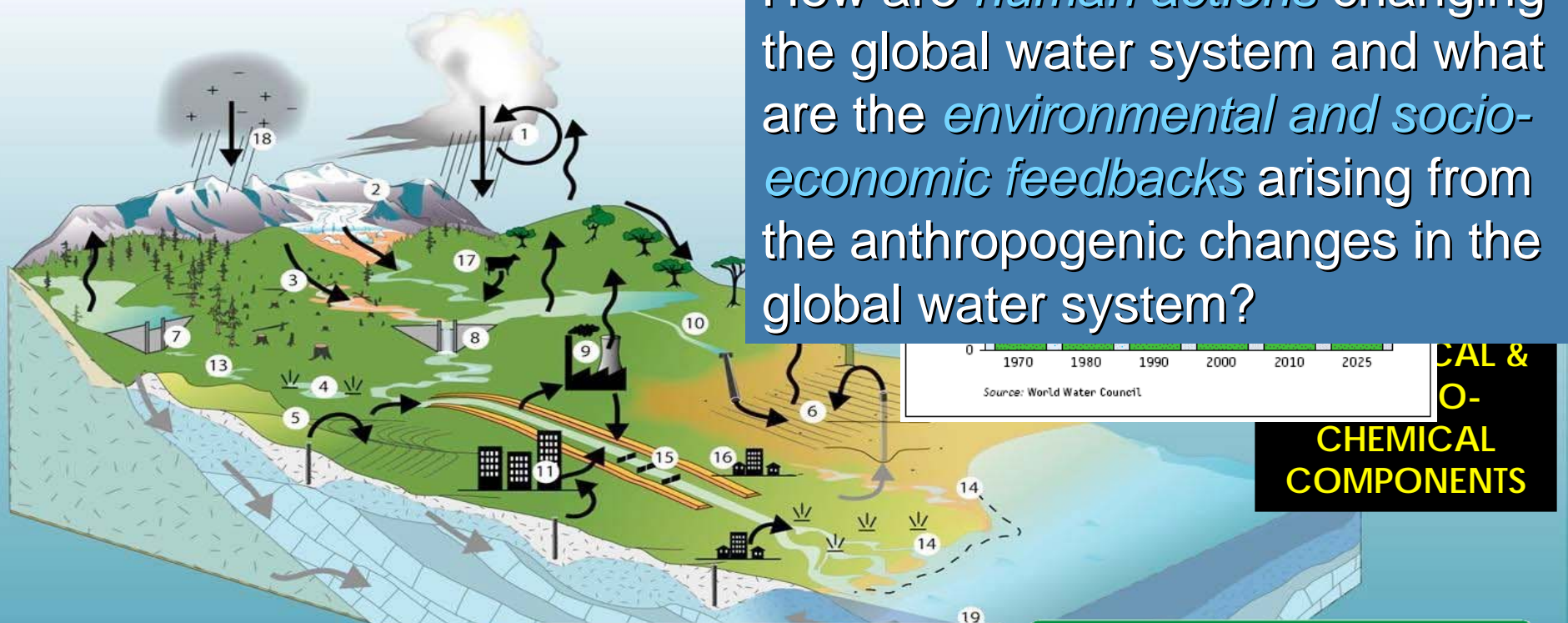


ESSP Integrated Regional Studies

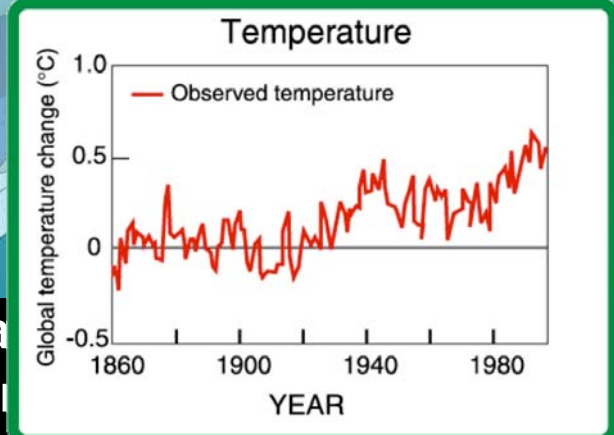
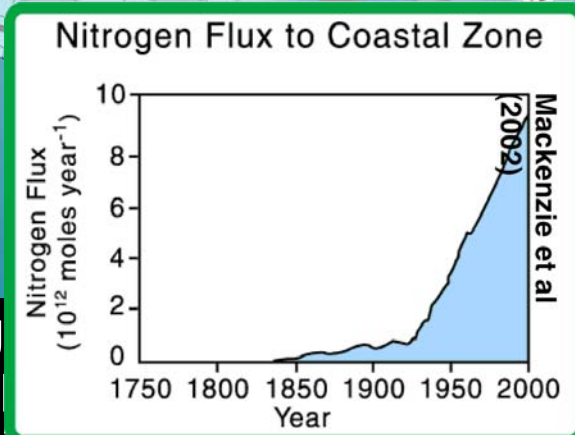
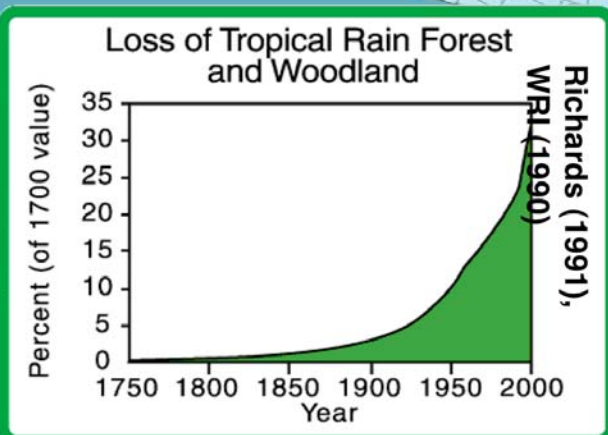
The Global Water System



How are *human actions* changing the global water system and what are the *environmental and socio-economic feedbacks* arising from the anthropogenic changes in the global water system?

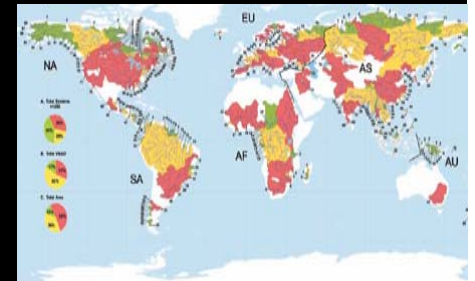


**CAL &
O-
CHEMICAL
COMPONENTS**



Framing Question 1

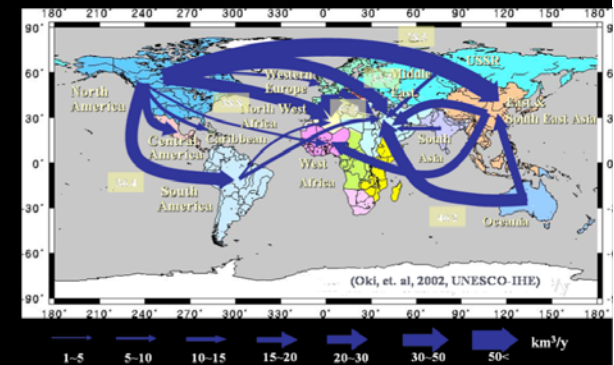
what are the magnitudes of anthropogenic and environmental changes in the gws and what are the key mechanisms by which they are induced?



activity 1.5 – nutrient & sediment transport:
identify key variables & functional relationships
assess & identify global hot spots
assess demographic, cultural & other drivers

Framing Question 2

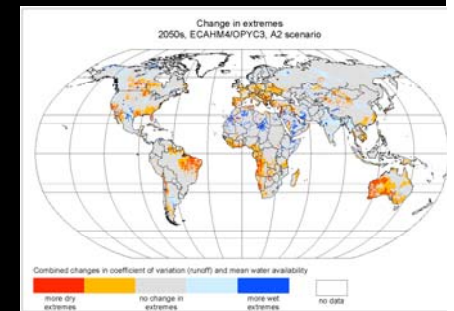
what are the main linkages and feedbacks within the earth system, arising from changes in the gws?



simulation models
 framework for analyzing spatial
 connectivities and long-term effects

Framing Question 3

how resilient and adaptable is the gws to changes, and what are sustainable management strategies?



framework to assess environmental & human water requirements
indicators of adaptive capacity
potential water conflicts
options to alleviate water shortages

Selected Initiatives

digital water atlas

GWSP Digital Atlas - Mozilla Firefox

http://wiki.gwsp.org/atlas/

GWSP Digital Water Atlas

Maps related to 'Population'

Home [Click the map or the map header to enlarge/explore the map or the links on the right-hand side for further information.](#)

Parameter	Unit	Symbol	Parameter	Unit	Symbol	Parameter	Unit	Symbol
Access to Safe Drinking Water	% of Population	D1	Energy - Nuclear	giga watt-hour/yr	D11	Population - Rural	People per km ²	D21
Climate Moisture	Index	D2	Evapotranspiration	mm/yr	D12	Population - Total	People per km ²	D22
Cropland Area	km ²	D3	Infant Mortality	Deaths per 1000	D13	Population - % of Population		D23
Demand/C	km ²	D4	Population - Water Use	km ³ /yr	D14	Survived by Gender	% of Population	D24
Discharge	m ³ /yr	D5	Literacy	%	D15	Water Demand - Domestic	km ³ /yr	D25
Drought	Millions of People	D6	Minerals Application Rate	MT/ha/yr	D16	Water Demand - Industrial	km ³ /yr	D26
Education Expenditure	% of GDP	D7	Minerals Load	MT/ha/yr	D17	Water Demand - Agricultural	km ³ /yr	D27
Elevation	m	D8	Precipitation	mm/yr	D18	Water Demand - Agricultural	km ³ /yr	D28
Energy - Hydro-electric	giga watt-hour/yr	D9	Rainfall	mm/yr	D19			
Energy - Thermal	giga watt-hour/yr	D10	Population - Urban	People per km ²	D20			

Enter equation in the box using selected above parameters. Example: $(D1 - D2) / D3 + \text{sqrt}(D4)$

All arithmetic operators could be used, such as +, -, *, /, **, (), as well as most of commonly used scalar functions (sqrt, abs(), exp(), log(), sinh(), cosh(), etc). Parameters and functions are case sensitive, and spaces are allowed.

Use River Layer Do Calculations Replace Digital Operators with "wordcase" Get Results as Data [Return to Data Explorer](#)

Calculation Results for Selected Area

Frequency Histogram for the Calculated Data

Category:Lexicon Entry - Lexicon Version 1.0 - WaterWiki - Mozilla Firefox

http://wiki.gwsp.org/wiki/index.php/Category:Lexicon_Entry_-_Lexicon_Version_1.0

category discussion edit history watch

Category:Lexicon Entry - Lexicon Version 1.0

Lexicon Terms, Version 1.0

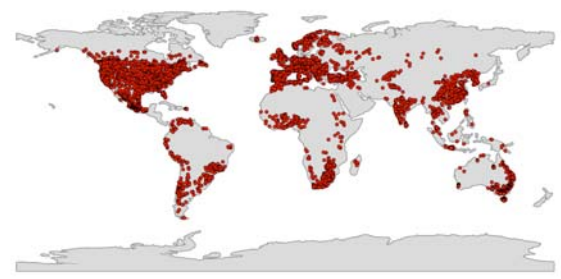
Articles in category "Lexicon Entry - Lexicon Version 1.0"

There are 90 articles in this category.

A	H	V
<ul style="list-style-type: none"> Aquatic ecosystem Aquifer 	<ul style="list-style-type: none"> Habitat fragmentation Human components of the GWSS Hydrologic cycle Hydrosphere 	<ul style="list-style-type: none"> Virtual water Virtual water flow Vulnerability
B	I	W
<ul style="list-style-type: none"> Basin Biodiversity Blue water Book 	<ul style="list-style-type: none"> Institution Integrated water resources management 	<ul style="list-style-type: none"> Water Water abstraction Water availability Water balance Water body Water consumption Water demand Water discharge Water diversion Water governance Water infrastructure Water institutions Water law
C	L	
<ul style="list-style-type: none"> Catchment area Catchment basin Coastal zone Contamination Cryosphere 	<ul style="list-style-type: none"> La Jolla Land cover Land use 	
D	M	
<ul style="list-style-type: none"> Dam Drainage 	<ul style="list-style-type: none"> Monsoon 	
	N	
	<ul style="list-style-type: none"> Nitrification 	

Factors
 Finance
 on geoc & water
 on w/ LOICZ

ity w/ DIV
 ams db.

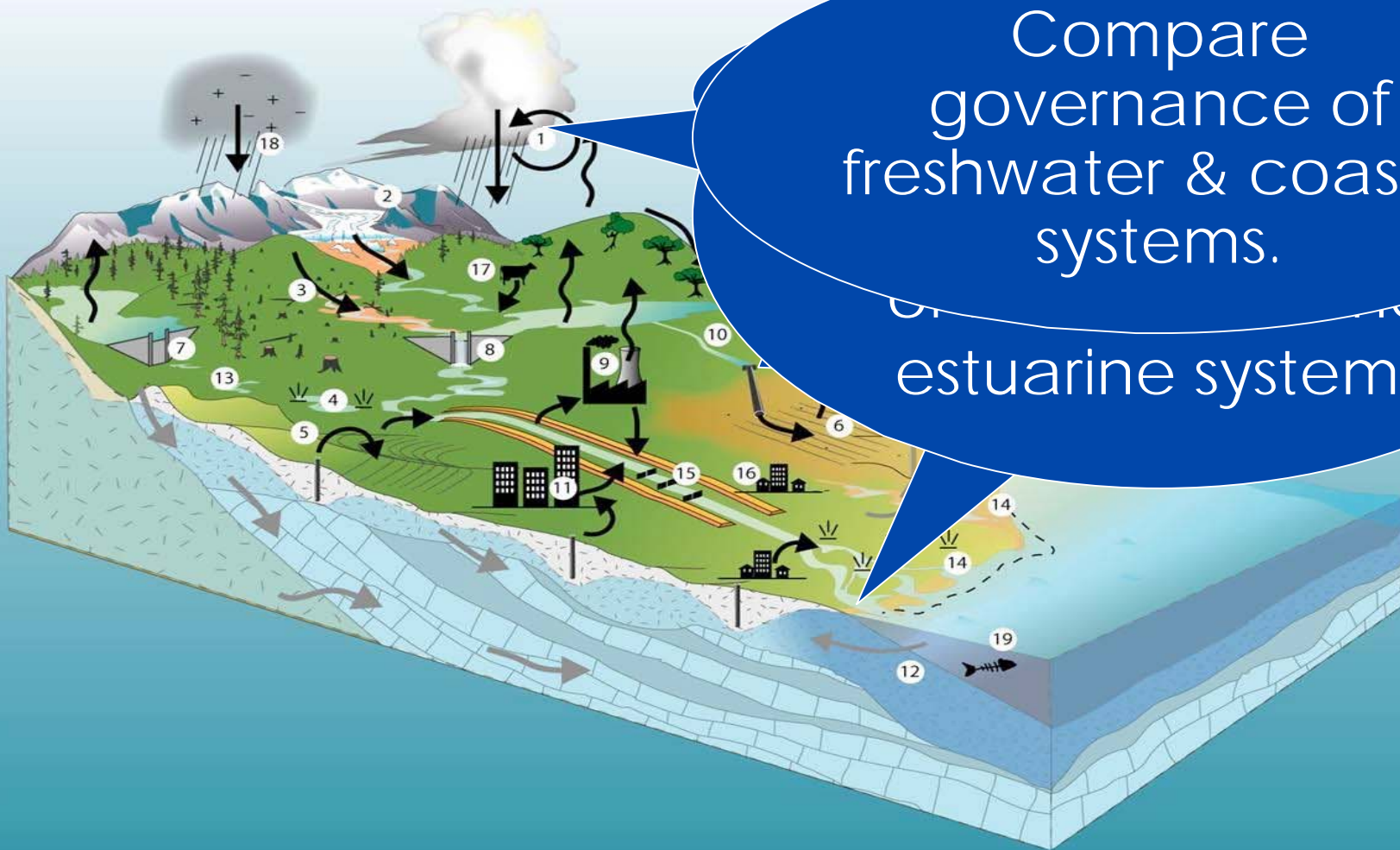


The Global Water System



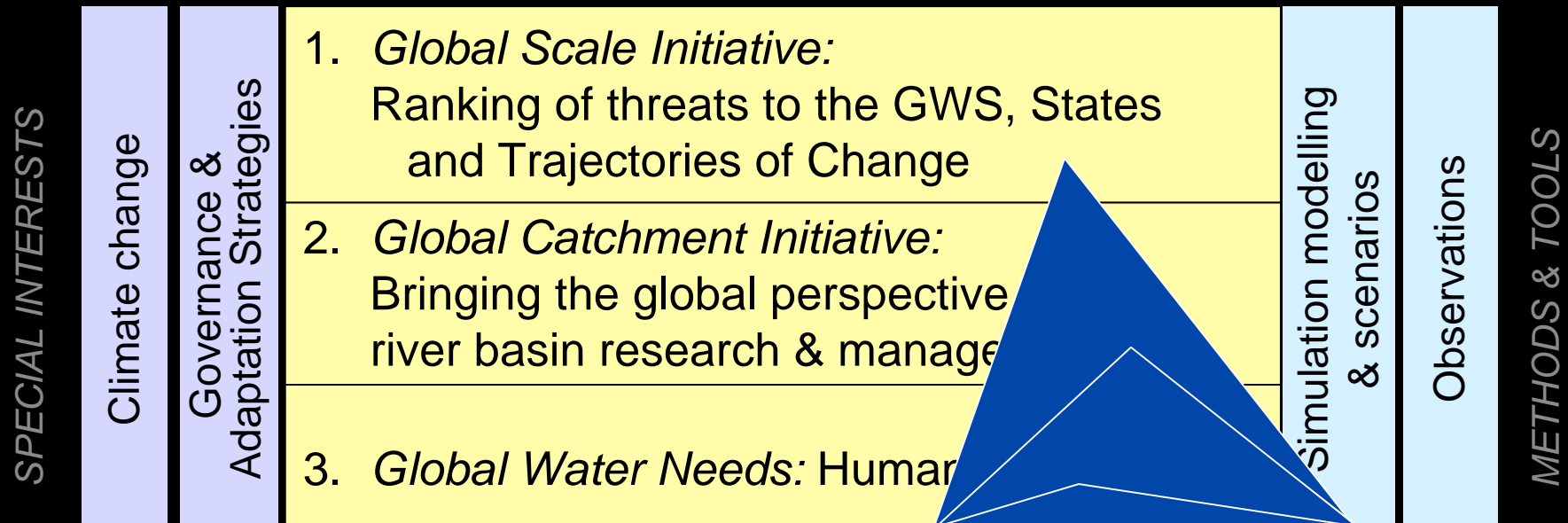
Compare governance of freshwater & coastal systems.

of ... and
estuarine systems



Working definition: The global suite of water-related human, physical, biological, and biogeochemical components and their interactions.

Medium-term Strategy: Global Initiatives



Develop a consensus on env. flow assessments
 Value freshwater ecosystem goods & services
 Devise strategies for harmonising water needs of humans and nature

GWSP & Work on Deltas: Areas of Mutual Interest (1/2)



Digital Water Atlas / Info System

- major deltas/estuaries

- runoff, river discharge

- vulnerability map

- db on dams and Reservoirs

- conceptual framework

Indicator development

- Vulnerability indicators

- Driving forces and impacts

GWSP & Work on Deltas: Areas of Mutual Interest (2/2)



Global Scale Initiative

- global water models + db
- main drivers and impacts

Global Catchment Initiative

- case studies

Global Water Needs: humans & nature

- delta-specific needs

Vulnerability

Vulnerability is a function of the sensitivity or susceptibility of a system (community, house-hold, building, infrastructure, nation etc.).

Determining vulnerability means asking what would happen if certain **event(s)** impacted particular **elements** at risk (e.g. a community).

