



Global Water System Project

Integrated Studies of the Water Cycle



GWSP: A New Earth System Science Partnership Project

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A Collaboration of the *Global Environmental Change Programmes*



A joint project w/ financial support from:

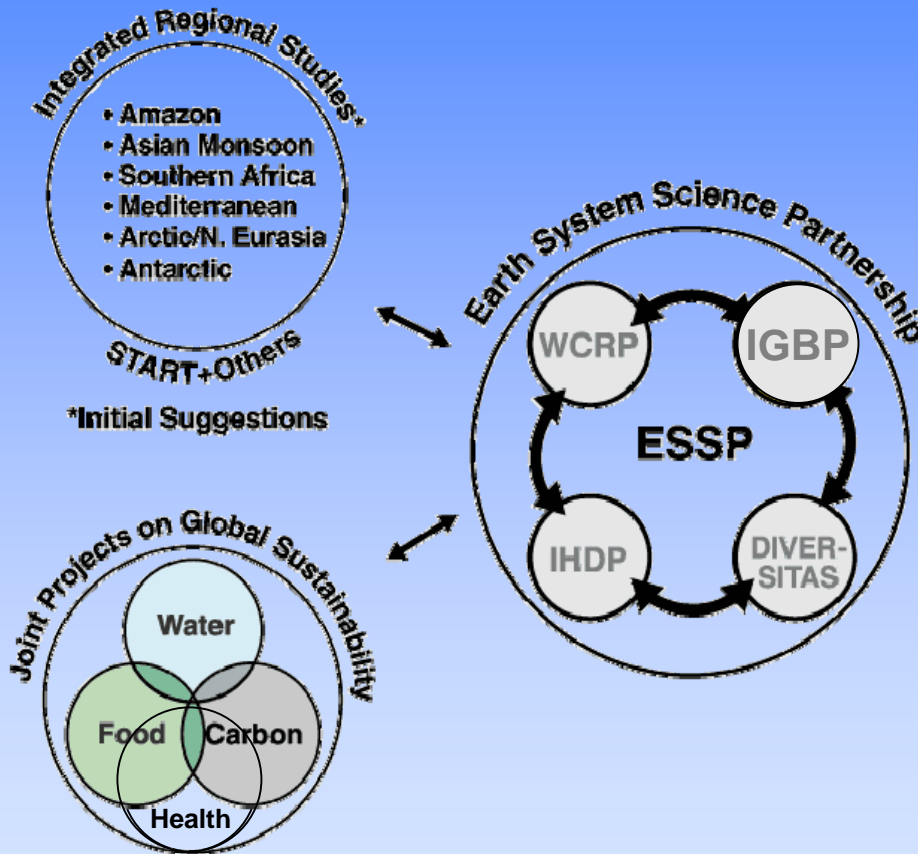




Earth System
Science Partnership

Global Water System Project (GWSP)

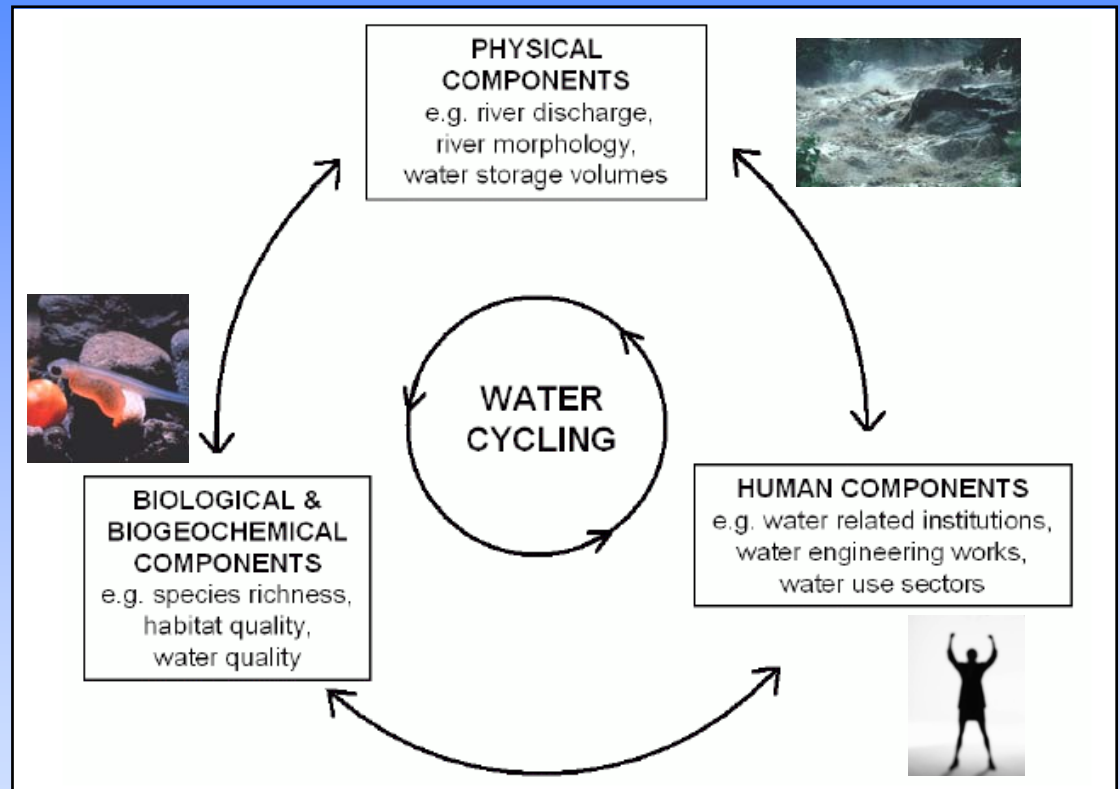
--From Planning to Execution--



- 4-yr planning effort; ~200 contributors
- GECP consultations, regional planning meetings
- OSC (Portsmouth, NH; Oct. 03) broad agency sponsorship
- IPO Bonn established late '03
- Science Framework approved '04
- SSC constituted late '04
- First SSC meeting February '05
- GWSP/GLOWA/UNESCO Int'l Conference on Integrated Assessment of Water Resources & Global Change (Bonn; February '05)

The Notion of a Global Water System

We are moving rapidly toward a fully global-scale picture of a changing hydrosphere, the anthropogenic contributions to this change, and its consequences



Integration across elements is a central GWSP Focus



CENTRAL TENET OF THE GWSP

Humans are changing the global water system in a globally-significant way, but without.....adequate knowledge of the system and thus its response to change

GWSP is Science-Driven but Policy-Informing and organized around 3 science themes:

1. Quantify change and its sources
2. Uncover feedbacks in the global water system
3. Assess system adaptation and resilience

SUPPORTING SCIENCE QUESTIONS

Aim: Documentation & Attribution

• Theme 1:

What are the magnitudes of anthropogenic and environmental changes in the Global Water System and what are the key mechanisms by which they are induced?

History of US Dam & Reservoir Construction



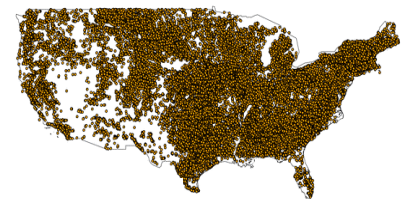
1800



1900



1950



2000



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SUPPORTING SCIENCE QUESTIONS

Aim: Gain Holistic Understanding

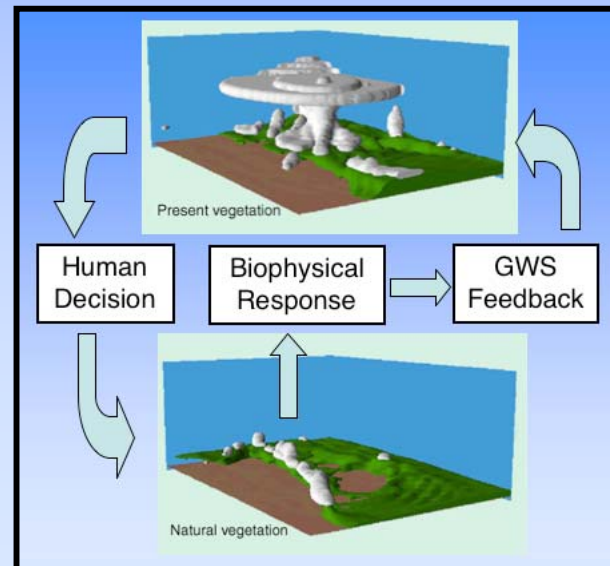
- Theme 2:

What are the main linkages and feedbacks within the Earth system arising from a changing Global Water System?

Example:

Land Use-
Atmosphere
Interactions

Pielke et al. 2001



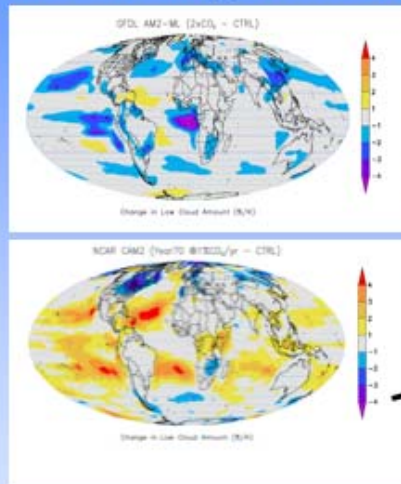
SUPPORTING SCIENCE QUESTIONS

Aim: Understand Implications for Future & Inform Policy

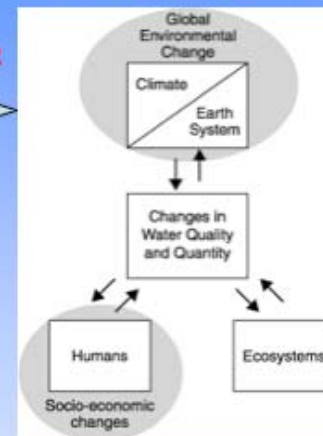
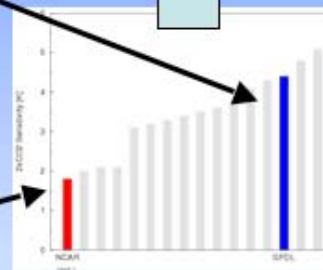
- **Theme 3:**

How resilient and adaptable is the Global Water System to change, and what are sustainable management strategies?

Same forcings----->Different Model----->Different Sensitivity



Decision challenge



Fast Track GWSP Activities

- **Initial Targetted Interntional Partnerships**
 - IGWCO/GEOSS
 - Northern Eurasian Earth Science Partnership Initiative (NEESPI)
 - U.N. Commission on Sustainable Development
 - Global Change, Agriculture and the Food System (GCAFS)



Initial “Fast-Track“ GWSP Activities

(Contributions to/interactions with IGWCO/GEOSS)

- **The Digital Water Atlas and World Water Balance** (indicators; harmonized data across physical, biological, biogeochemical, social dimensions; population / poverty / water vulnerability mapping; documenting water engineering impacts; integrated information platform for stakeholders / policy makers)
- **A Global Study of Environmental Flows** (existing rules inventory; use of high resolution hydromet data for global mapping and benchmarking of contemporary situation; water quality impacts included)
- **An Assessment of Global Water Governance** (quantifying role of management / laws / enforcement / economics in the water system; globalization impacts)
- **Advanced (Educational) Institute on “Global Environmental Change and Water”** (capacity building; new users of water information)