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*

Goals for Presentation

- Brief History of the Effort
- Review of Science Framework & Agenda
- Summary of Planned Near-term Activities and Products

Global Water System Project (GWSP)

--From Planning to Execution--

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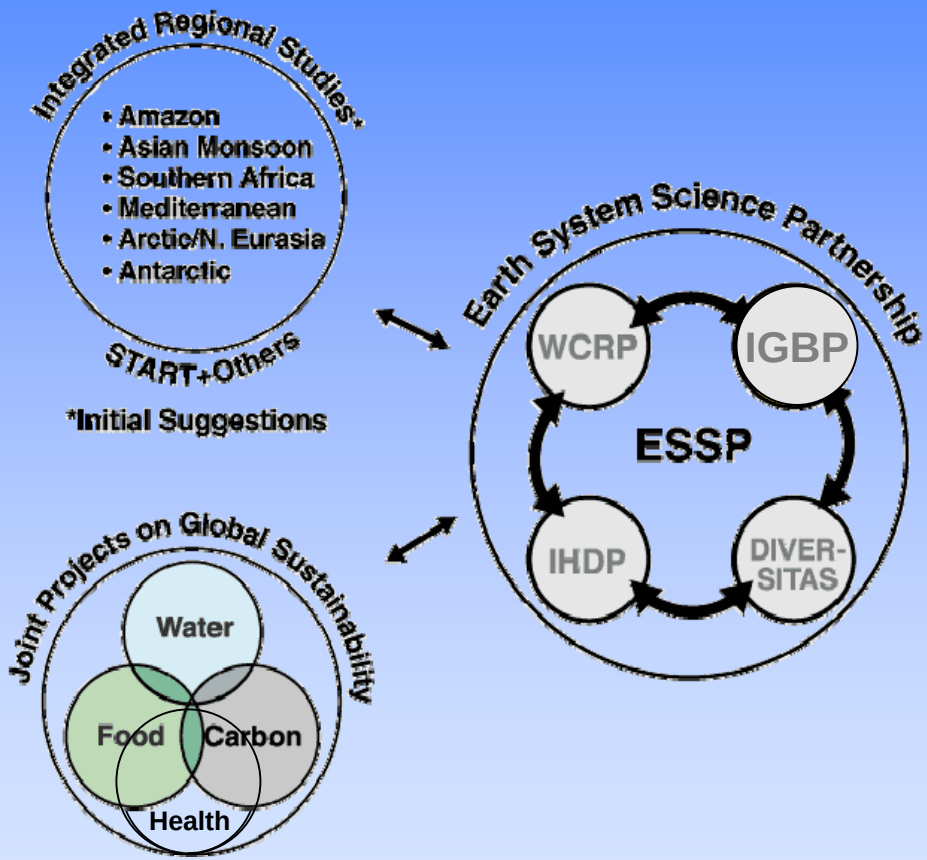

- 4-yr planning effort; ~200 contributors
- GECP consultations, regional planning meetings
- OSC (Portsmouth, NH; Oct. 03) broad agency sponsorship
- IPO Bonn established late '03
- Science Framework approved '04
- SSC constituted late '04
- First SSC meeting February '05

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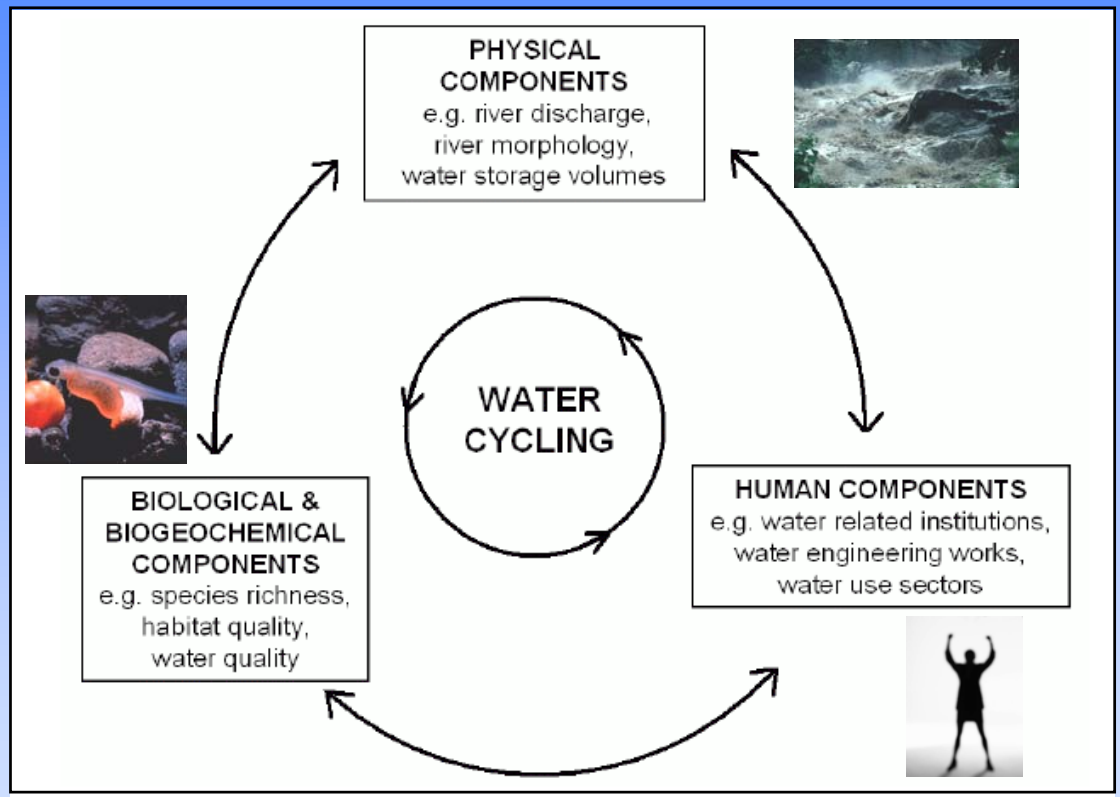
The Notion of a Global Water System

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

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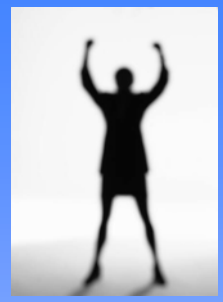

CENTRAL TENET OF THE GWSP

Humans are changing the global water system in a globally-significant way

without…..adequate knowledge of the system and thus its response to change

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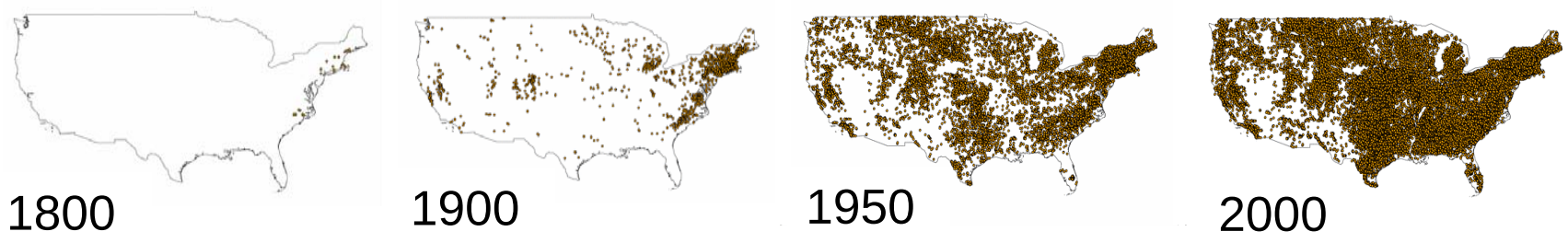
SUPPORTING SCIENCE QUESTIONS

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



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SUPPORTING SCIENCE QUESTIONS

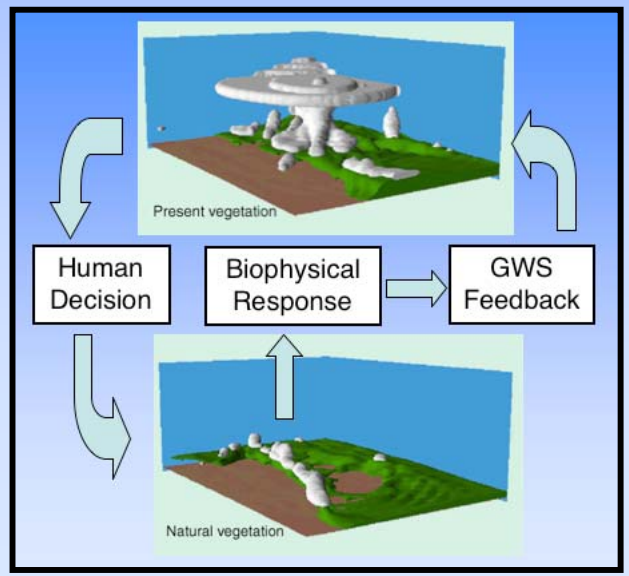
<u>Aim</u>: Gain Holistic Understanding

- **<u>Theme 2</u>:**

  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

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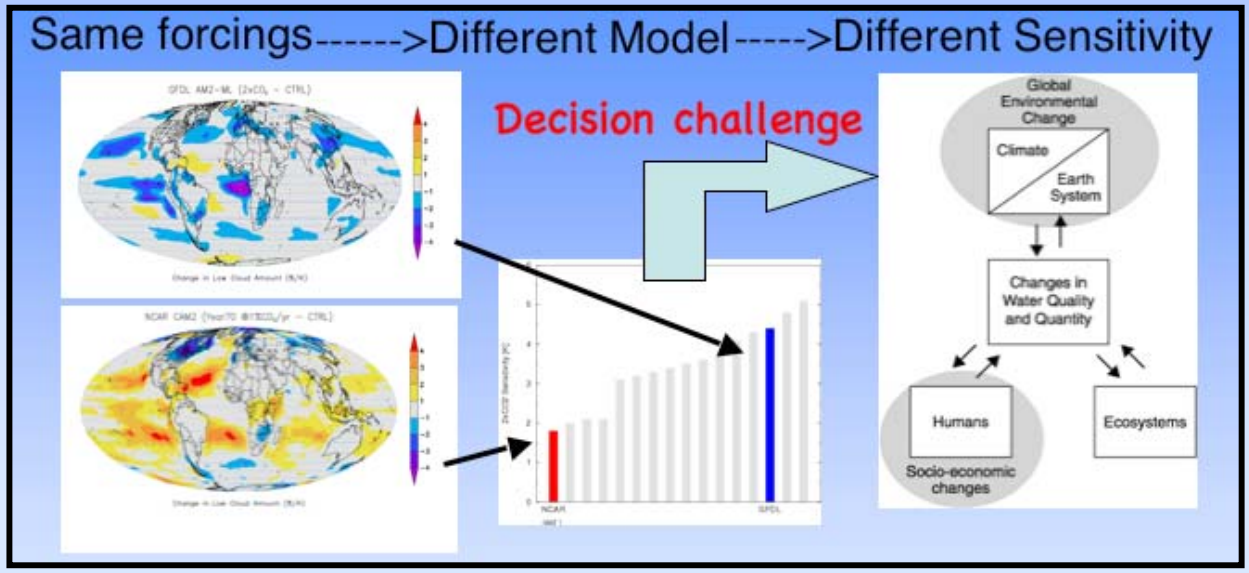
SUPPORTING SCIENCE QUESTIONS

<u>Aim</u>: Understand Implications for Future & Inform Policy

- **<u>Theme 3</u>:**

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



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Fast Track GWSP Activities

How can GWSP contribute to ongoing activities?

Input to International Initiatives

- IGWCO, IGOS-P, Global Earth Observation System of Systems
- Northern Eurasian Earth Science Partnership Initiative (NEESPI)
- U.N. Commission on Sustainable Development
- Global Change, Agriculture and the Food System (GCAFS)

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Fast Track GWSP Activities

What is the State of the Global Water System?

The Digital Water Atlas and World Water Balance

- Digital, harmonized, geographic data for the global water community
- Socio-economic, physical, chemical, & ecological data
- Short term: Archive of existing global data sets and update of world water balances
- Longer term: Harmonized data sets, interactive atlas for planners, policymakers & other stakeholders ♦

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Fast Track GWSP Activities

What are Environmental Flows Around the World?

A Global Study of Environmental Flows

- What are the discharge and water quality requirements for aquatic ecosystems world-wide?
- How can aquatic biodiversity be maintained in the face of competing demands for water?
- Short-term: Review and assessment of case studies and concepts & Co-sponsor workshop on Environmental Flows (with Global River Sustainability Project).
- Longer term: New insights into tradeoffs between water for nature and water for society.

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Fast Track GWSP Activities

How is Water Governed on the Global Scale?

An Assessment of Global Water Governance

- What are the forms of global governance? e.g. International water treaties, international water-related organizations
- How do global arrangements (WTO, GATT) affect local water resources?
- What aspects of water as a resource should be governed at the global scale?
- What are the implications of virtual water trade?
- Short term: Workshop and publication on global water governance
- Longer term: Better understanding of the role of global water governance in the world water system

♦

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Fast Track GWSP Activities

Training the New Generation of Global Water Researchers:

Advanced (Educational) Institute on "Global Environmental Change and Water"

- Co-sponsor with START, Free Uni-Amsterdam, UNESCO-IHE
- Training, research, and mentoring program for top young scientists from developing countries
- Longer term: Comprehensive educational program for young global water researchers.

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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)