The State-of-the-Global Water System:

Moving toward an Operational View of World Water Resources

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Spring AGU: Union Session U44A
Ft. Lauderdale, FL *28 May 2008*

the City College of New York
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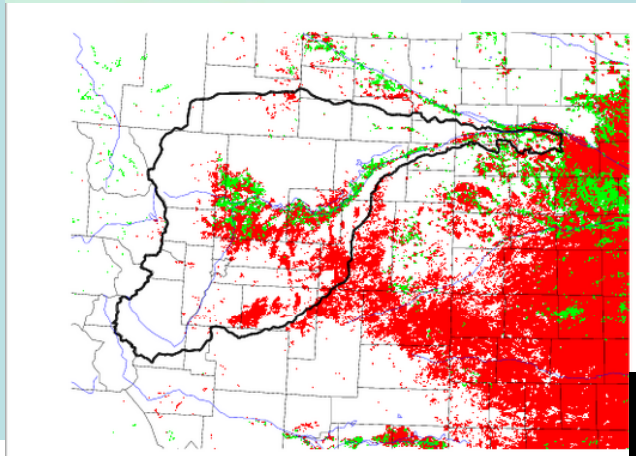
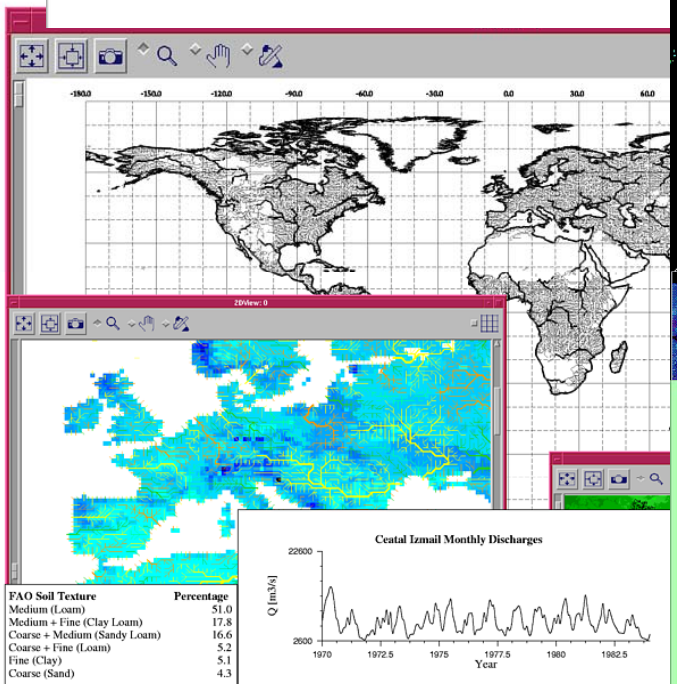
Contributions from Earth System Science

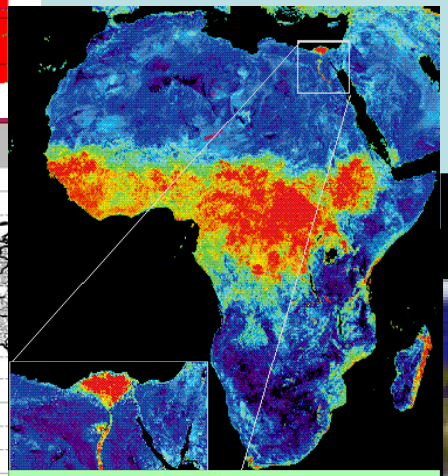
- *In situ* networks
- Operational satellite-based monitoring of the hydrosphere
- Simulation models and data analysis tools (NWP-4DDA, GCMs, RCMs, ESMs)

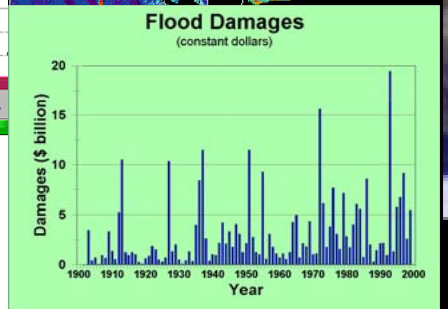
…creating new opportunities to view the "global water crisis"

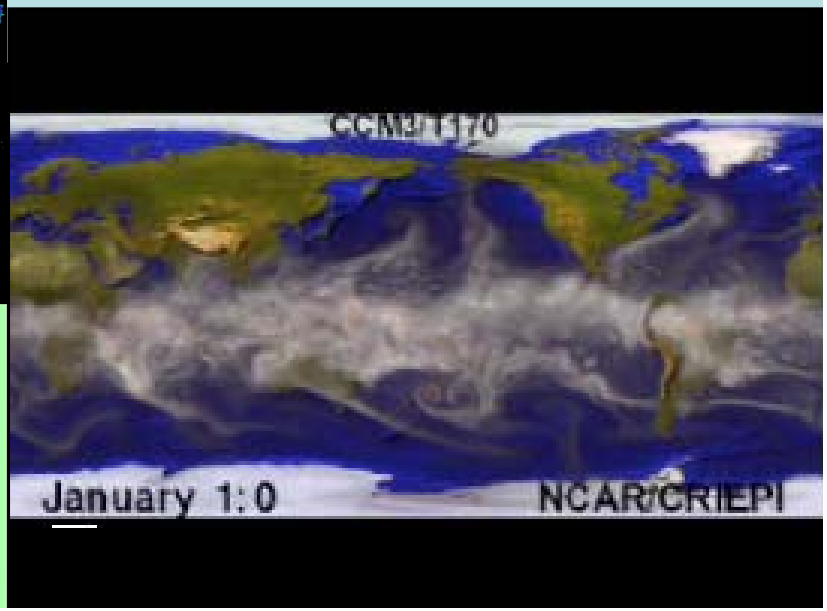
…to inform policy and improve management





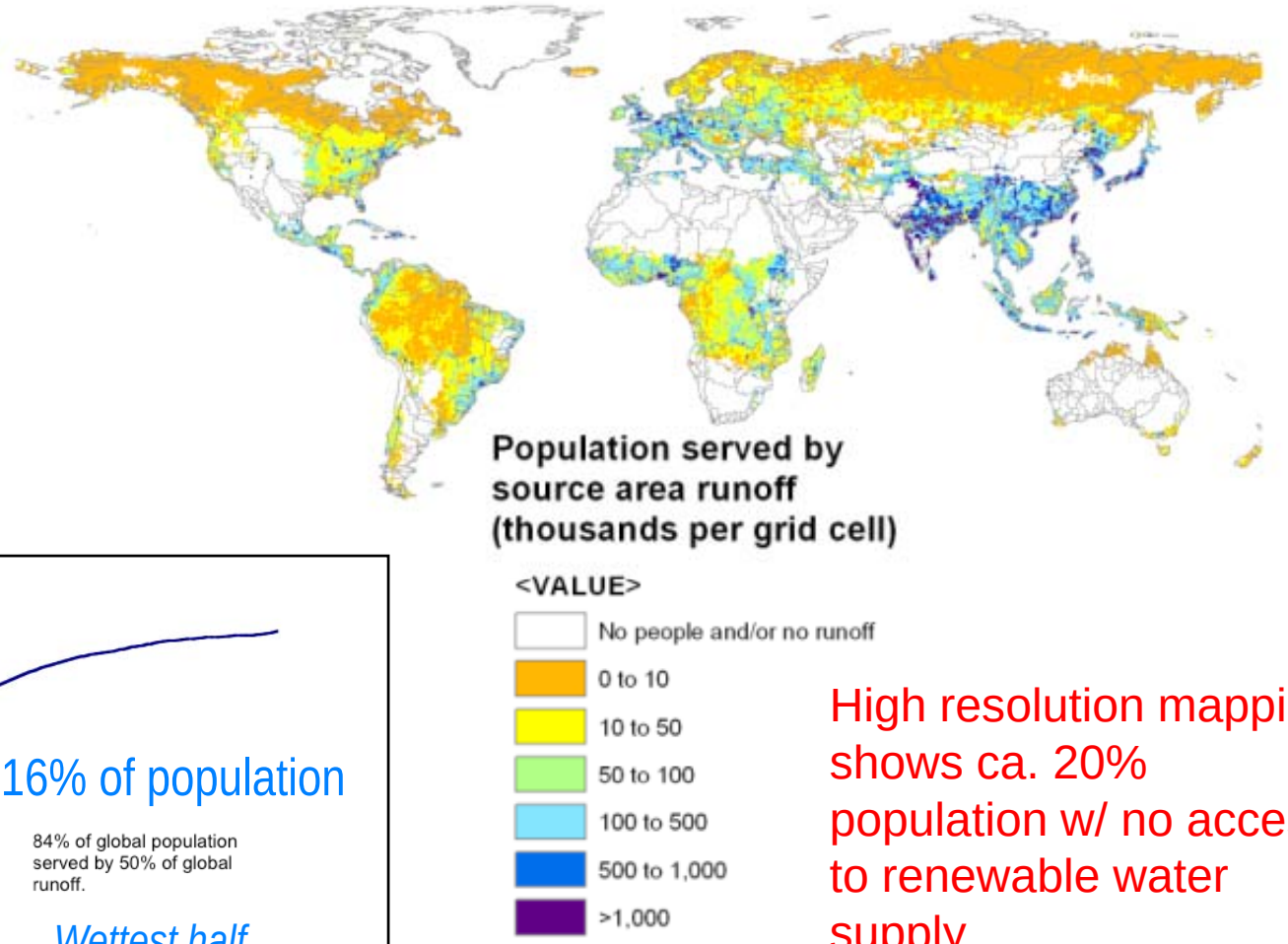


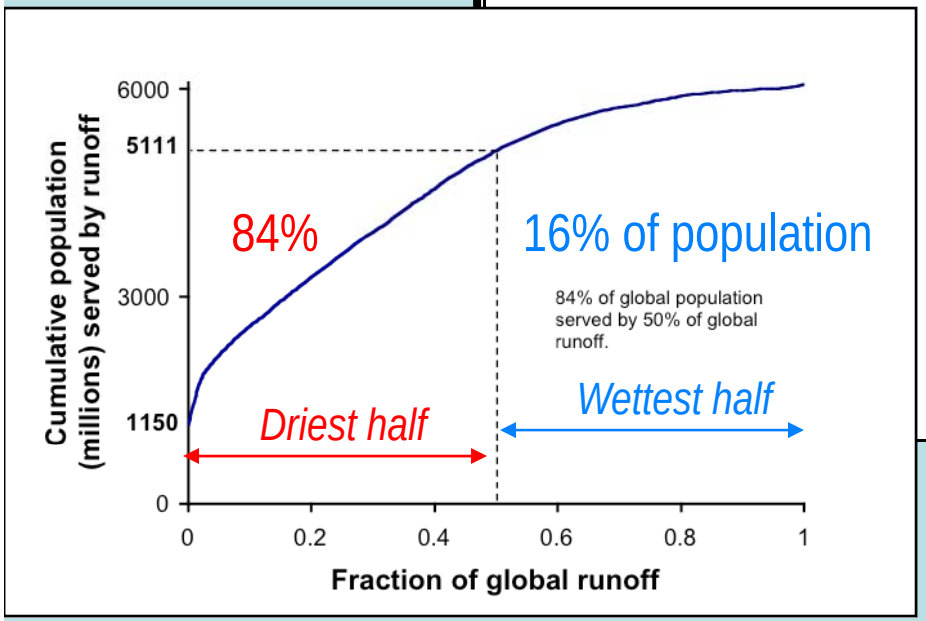




Humans Interacting w/ the Global Water Cycle--

The Picture Today





High resolution mapping shows ca. 20% population w/ no access to renewable water supply

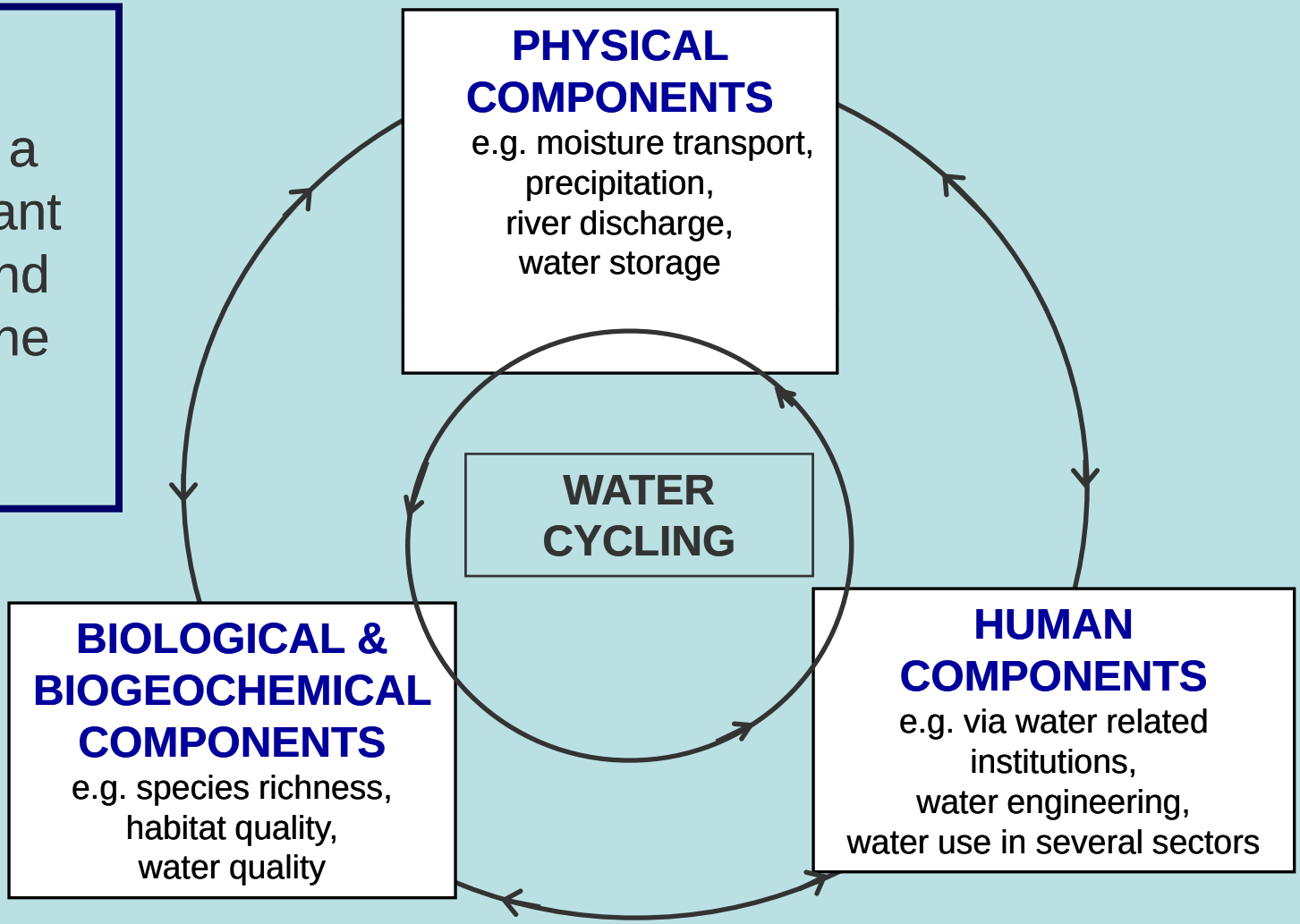
- Importance of upstream source areas: note Amazon/S. Asian contrast
- Notion of tradeoffs w/in basin

Vörösmarty et al. (2005), Millennium Assessment, Conditions & TrendsWorking Group

The Global Water System: Inter-Disciplinary Perspectives are Essential

<u>Central tenet</u>

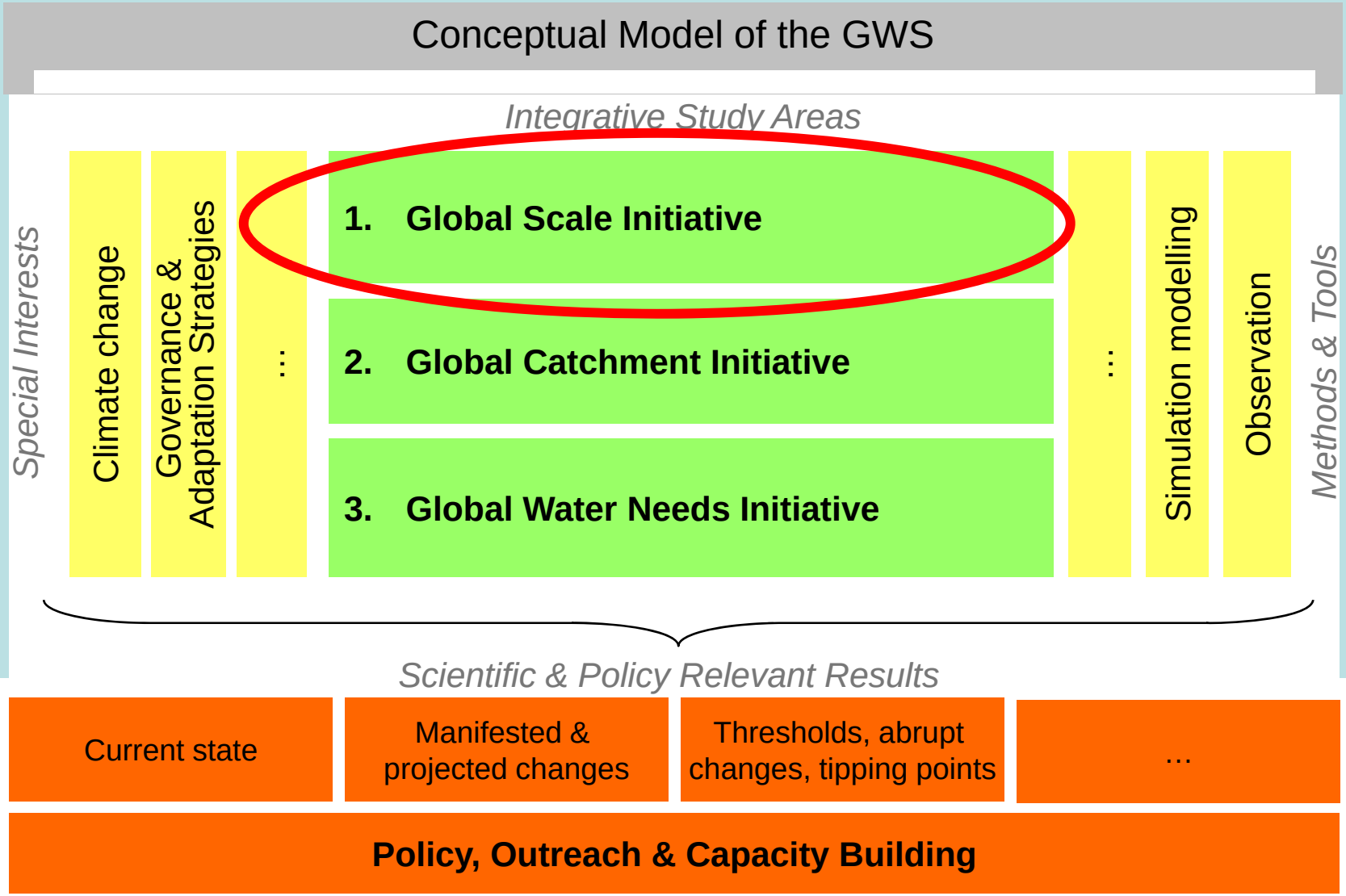
Humans now a key determinant of the state and trajectory of the global water cycle



GWSP Global Water System Project

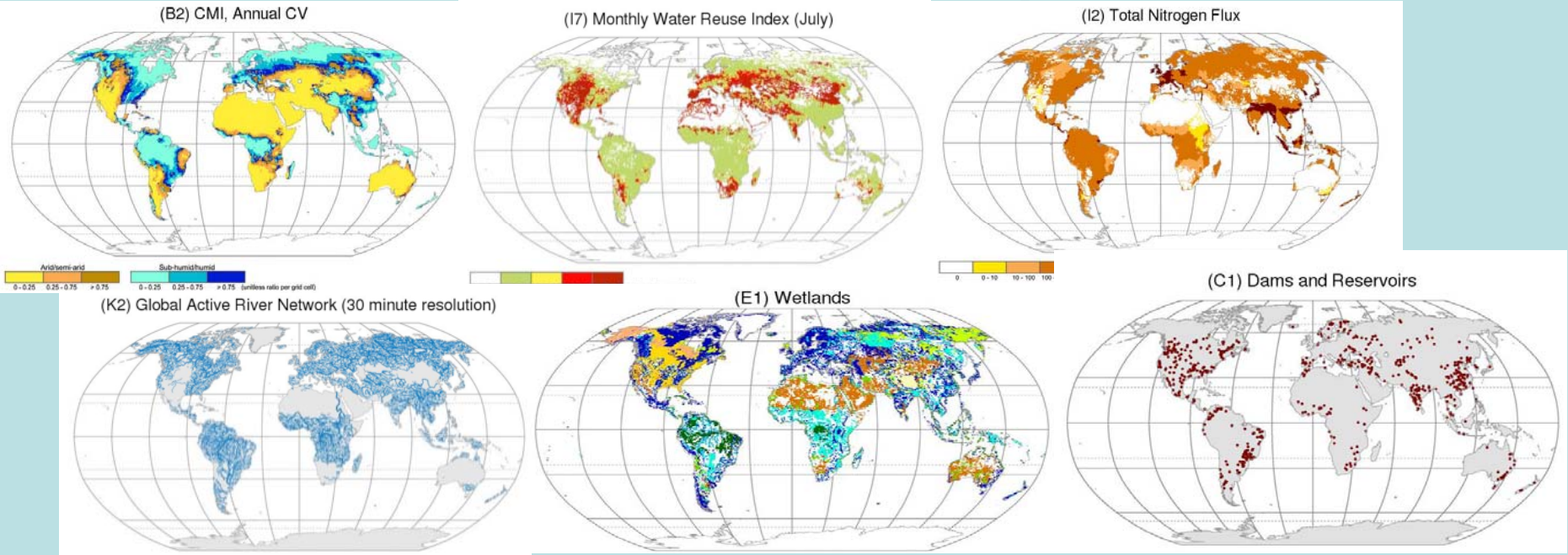
ESSP

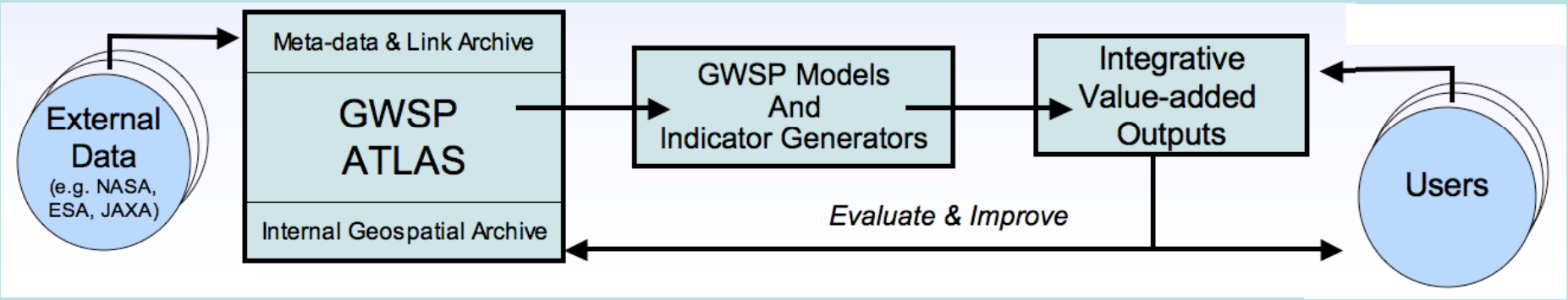
Mid-Phase Strategy
Expert Groups for the GWSP Integrative Study Areas



Integrated Approaches to Global Water Resource Assessment and Global Change Studies

Links Geophysics of Water, Governance, Vulnerability, Supply Limitations Imposed by Pollution & Ecosystem Flow Requirements





THE OVERARCHING GOAL OF GSI:
"*State-of-the-Global Water System*"

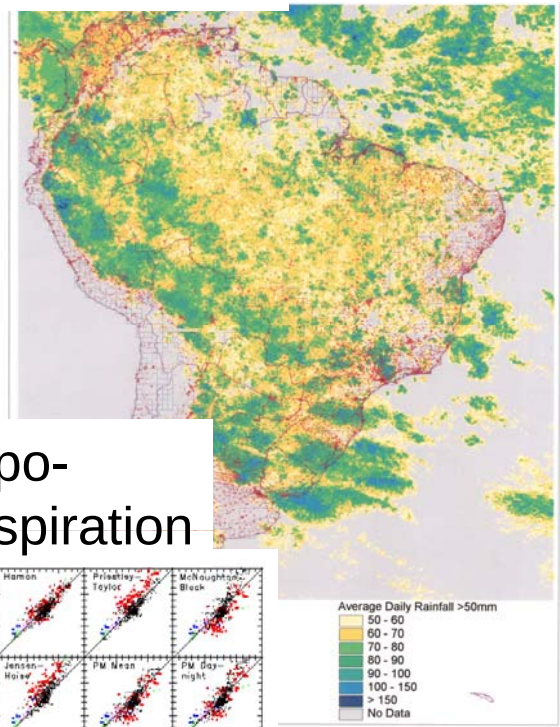
Application 1:
The Definitive
ESS-based Global
Water Resource
Assessment

Application 2: GWS
Change and Its
Significance

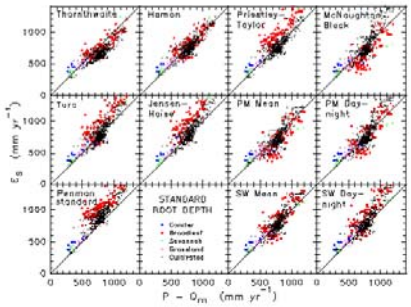
Powered by GWSP Data Sets, Models, Thematic Activities
Outside Affiliates and "Demands" of the Users

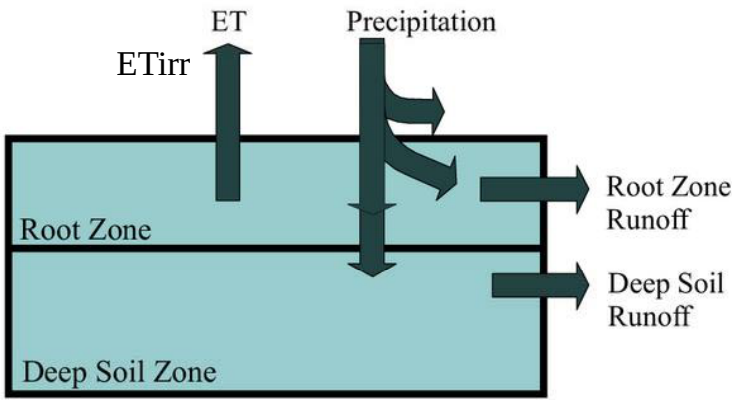
WATER RESOURCE MODULE

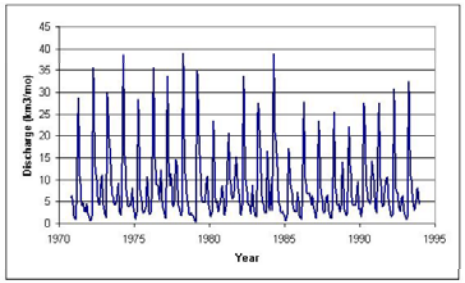
Precipitation



Evapo-transpiration





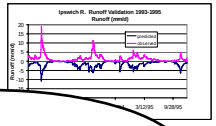


Discharge=
Basin & Inter-basin Resource

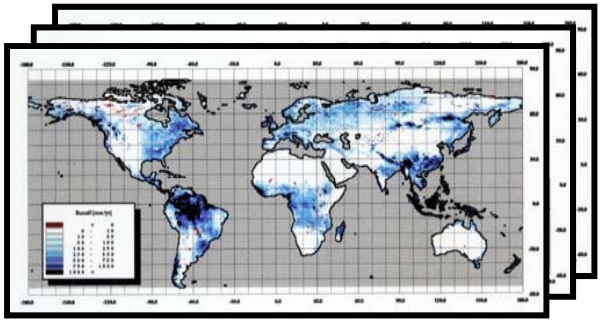
Lateral Transport

Digital River Networks

Cal/Val

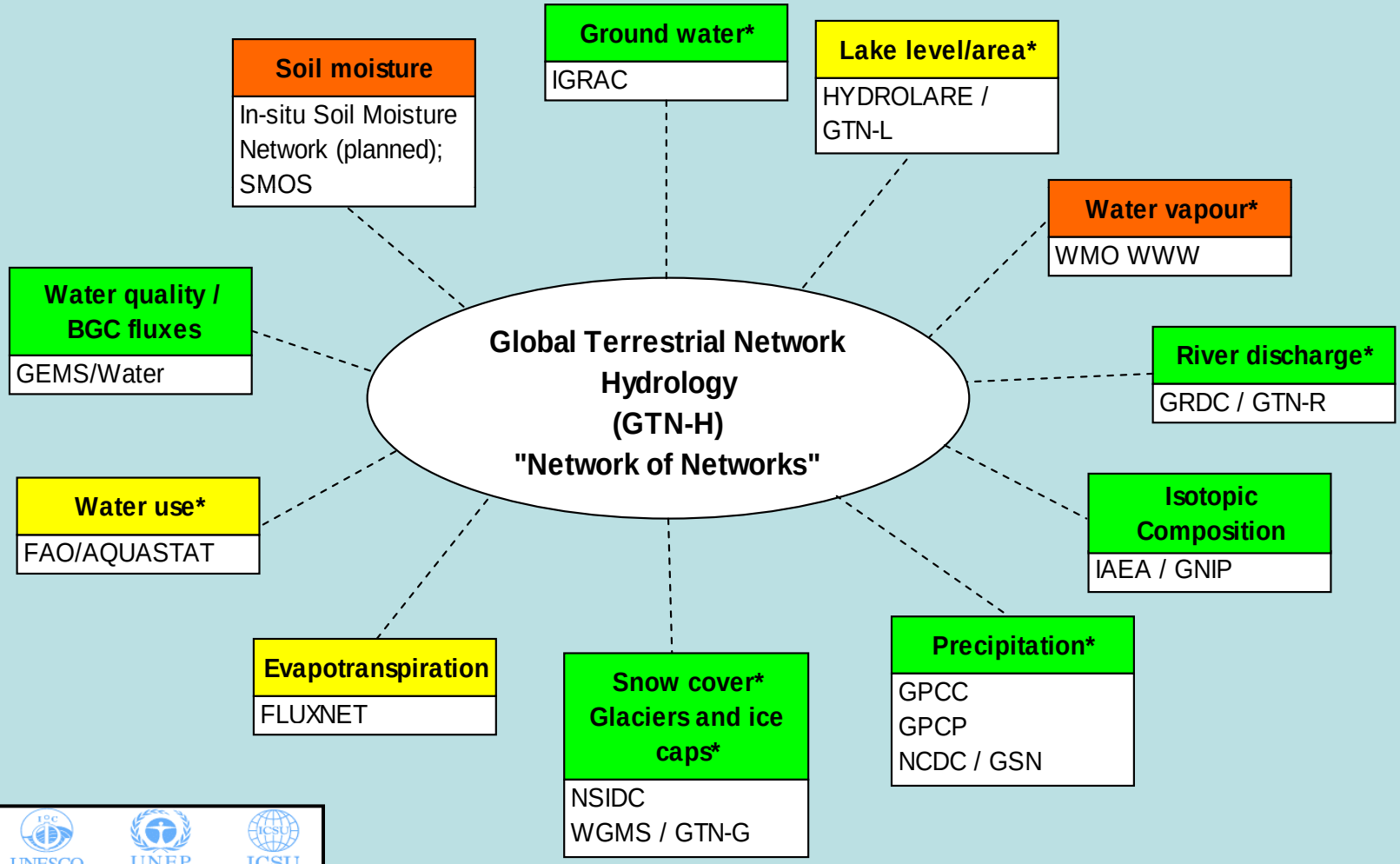


Managed Water



Runoff= Local Water Resource

GTN-H Provides Rich Set of Information Streams for Many Applications

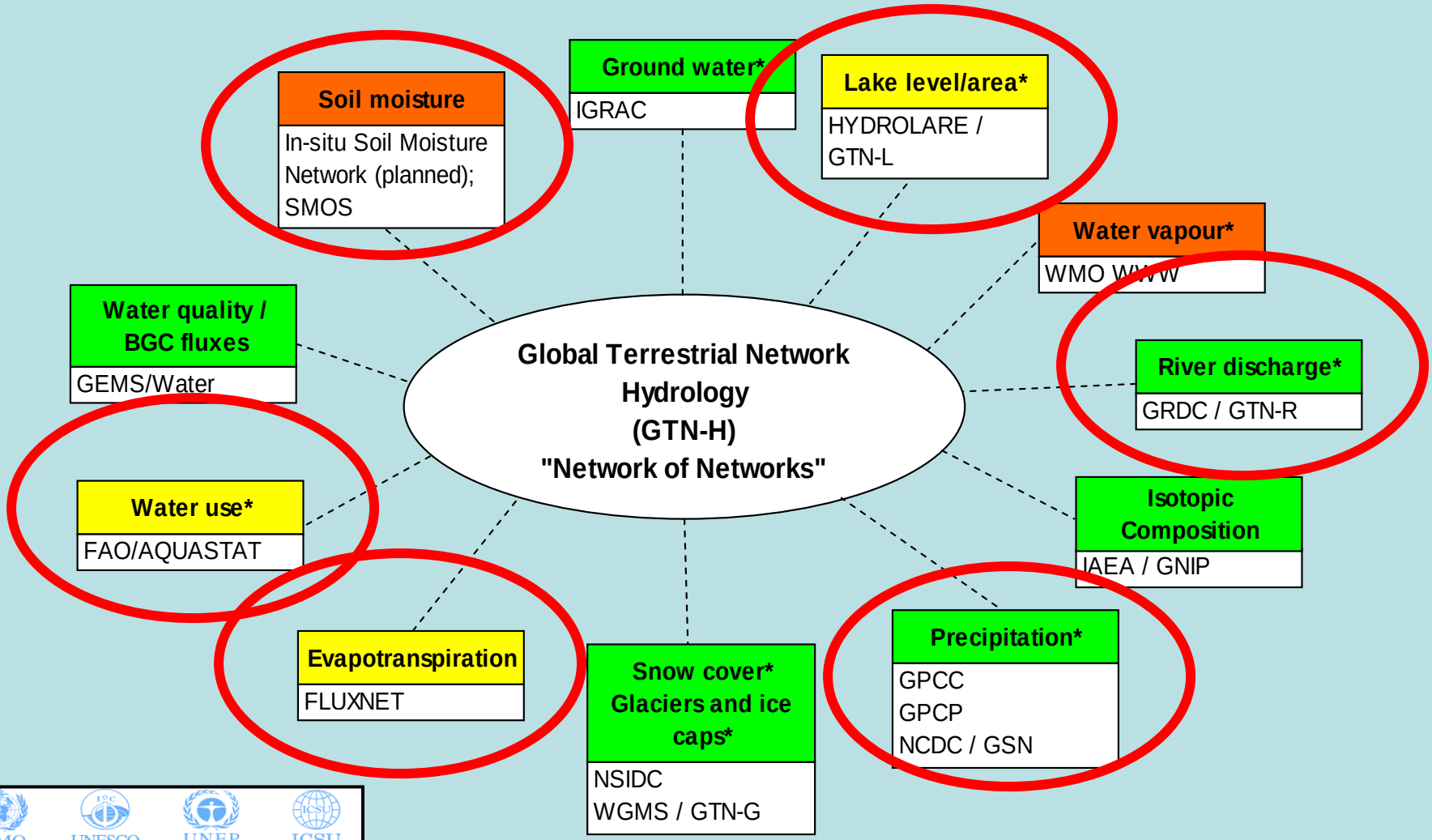


WMO UNESCO UNEP ICSU

GCOS GTOS HWRP

Themed Approach

e.g. Hydrologic Extremes (flood & drought) Monitoring and Assessment



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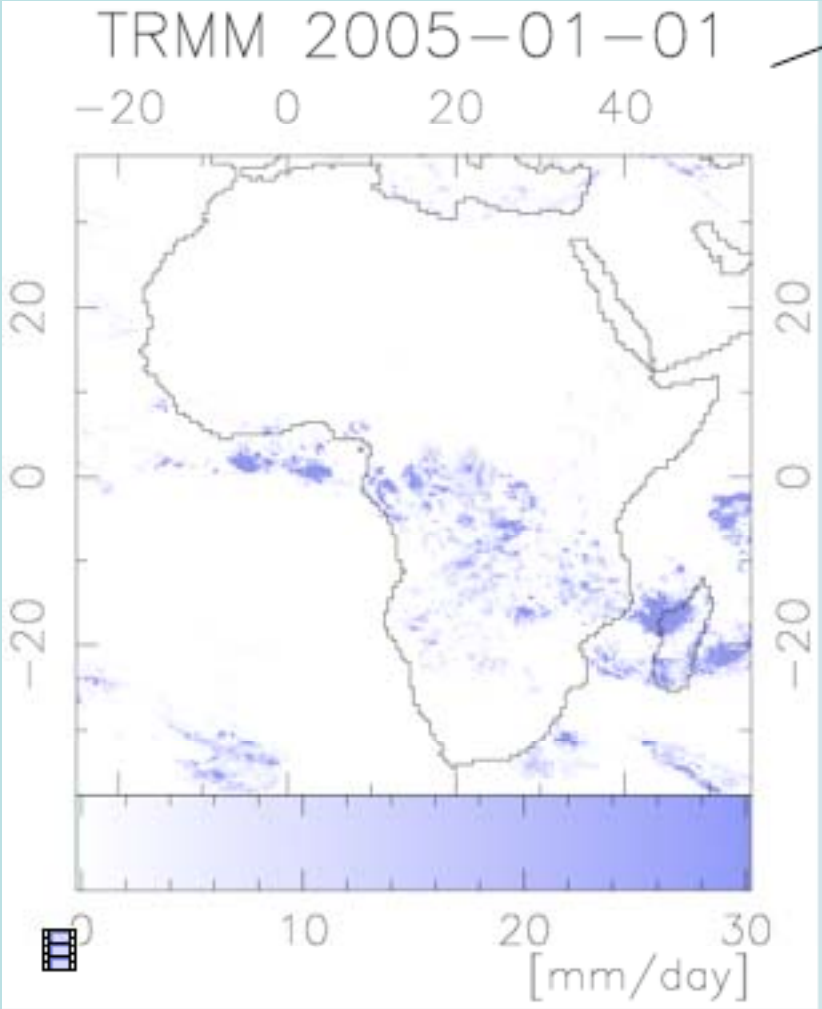
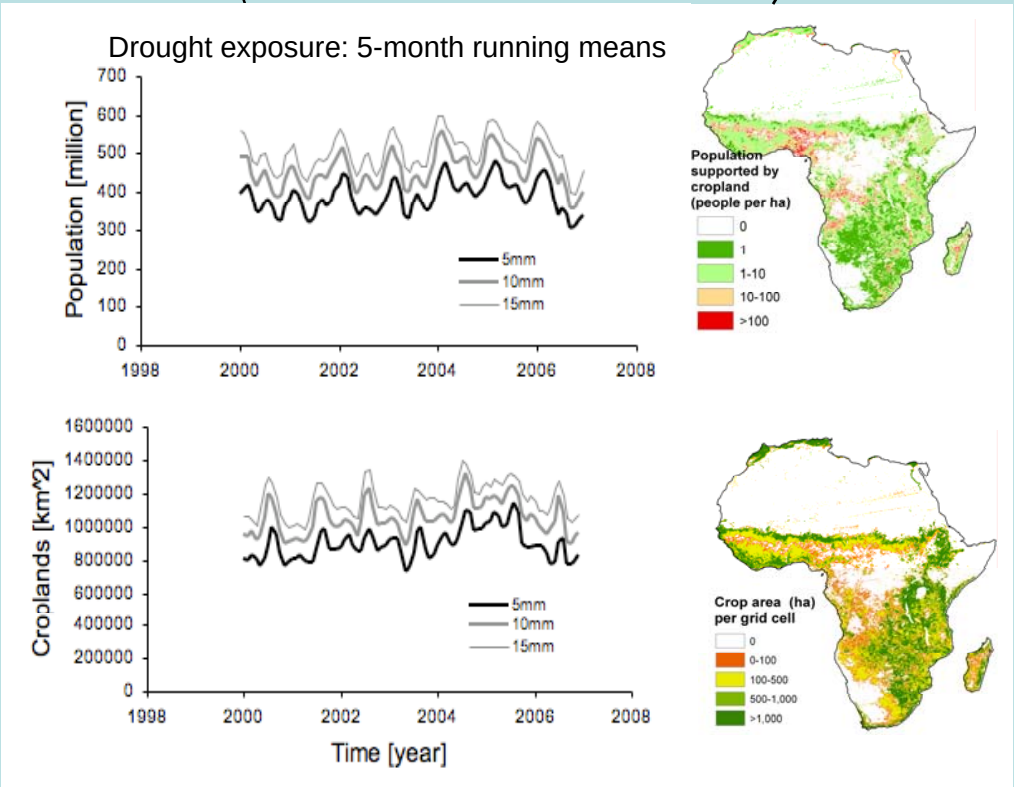
State-of-the-Global Water System: "Operationalizing" Water Resource Assessment for Timely Assessment



"GEOSS-class" Geophysical data

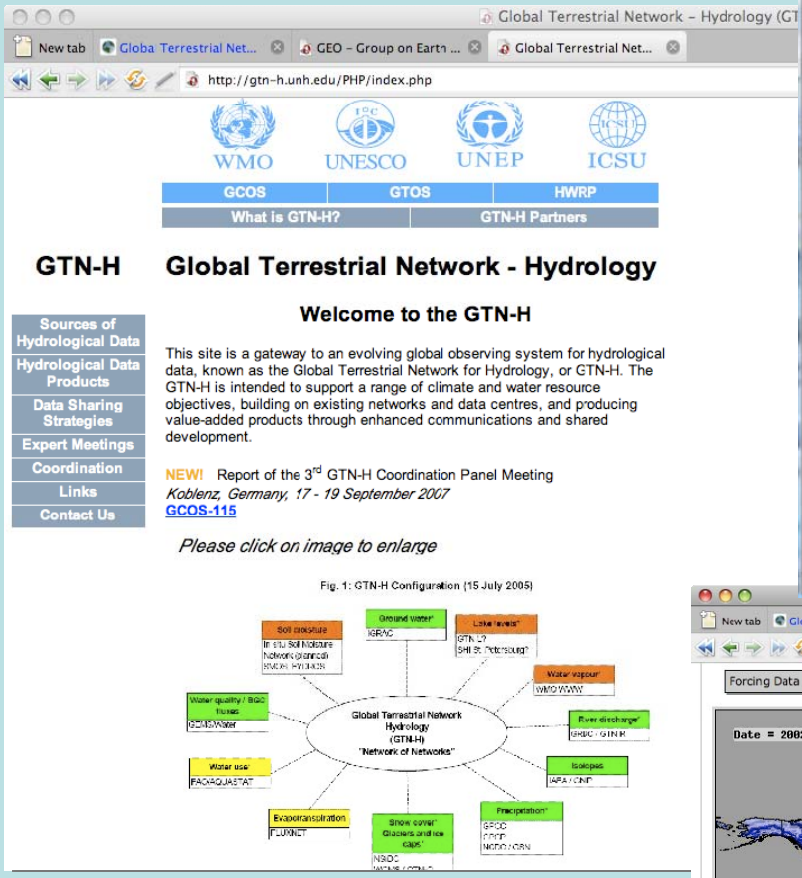
Derived Products (e.g. hazard exposure)

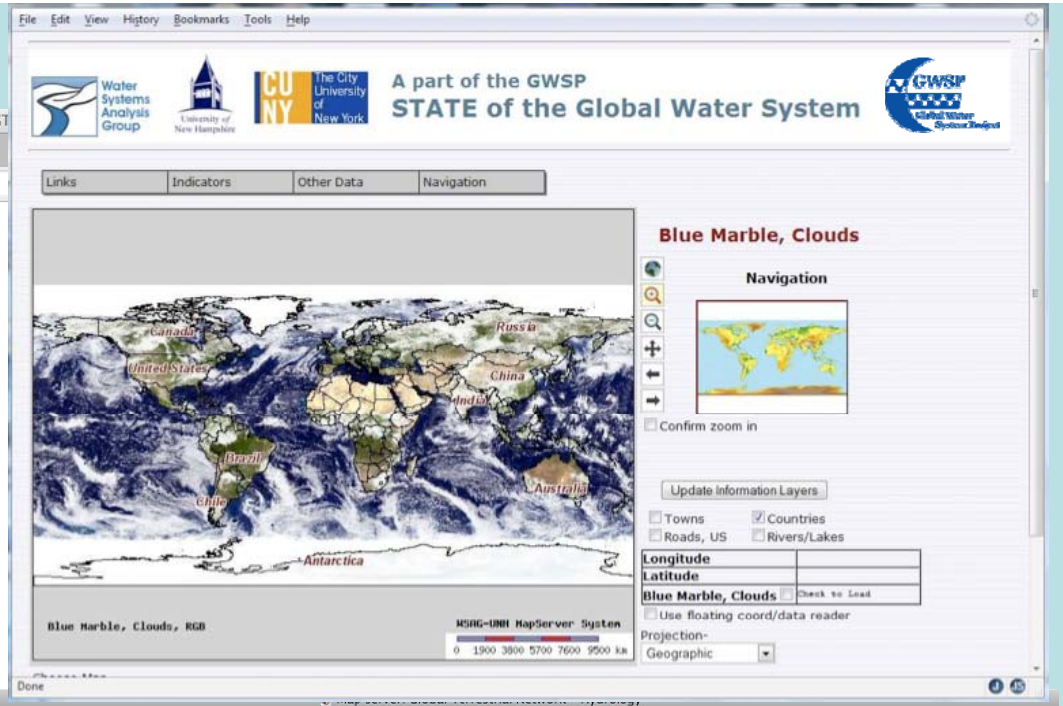
Geospatial Socio-economics

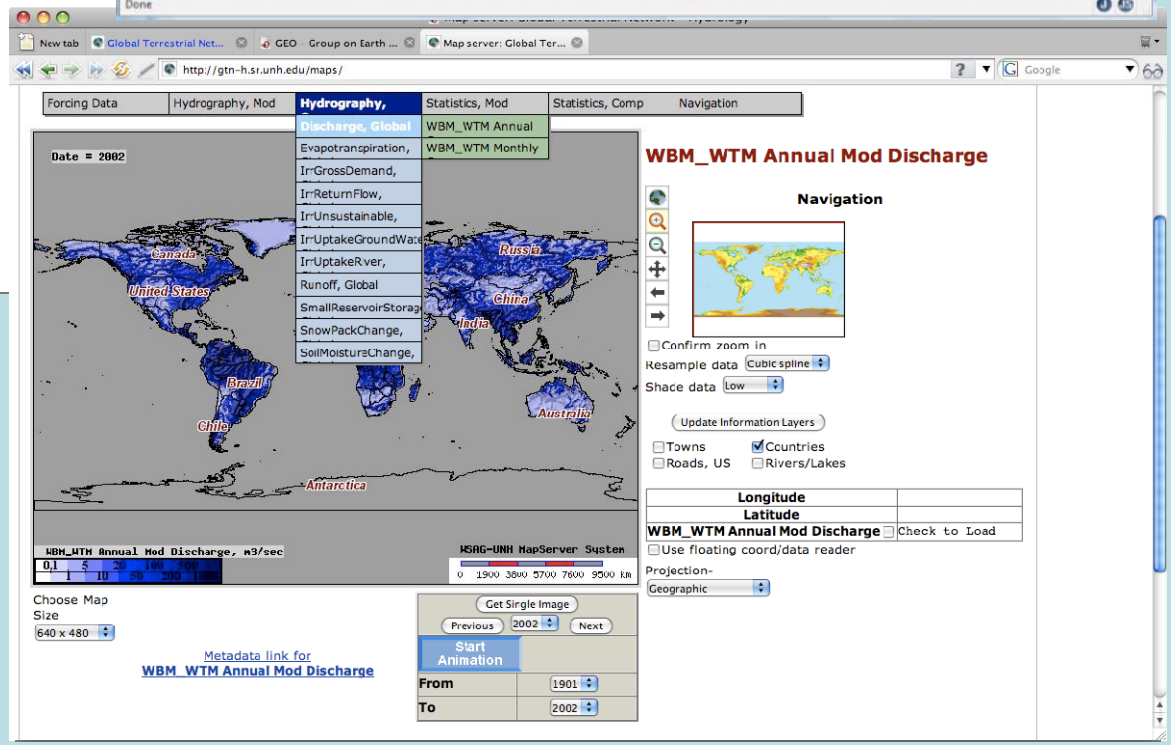


Three Points of Engagement

- GWSP "Global Scale Initiative"
- GTN-H and Its Coordination *(in conjunction with WMO and GCOS)*
- World Water Assessment Programme







http://rbis.sr.unh.edu/

http://gtn-h.unh.edu/

http://www.gwsp.org/

We gratefully acknowledge the financial and in-kind support of:

- *NASA Terrestrial Hydrology and Applied Sciences Programs*
- *NOAA National Ocean Service*
- *Global Water System Project / ICSU*
- *World Meteorological Organization / Hydrology & Water Resources Department*
- *UN World Water Assessment Program*
- *UN Environment Program*