

Update on Global Scale Initiative (GSI)

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10th GWSP Scientific Steering Committee Meeting
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GSI Highlighted Activities

(current)

- GWSP-DIVERSITAS River Threats
- Deltas Initiative
- GEF Transboundary Water Assessment Project
- Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP)

GWSP-DIVERSITAS River Threats



- 220 citations as of October 2012
- \$1.4M NSF-funded follow-on project (engineering, biodiversity, economics)

Visit: www.riverthreat.net



Earth System
Science Partnership

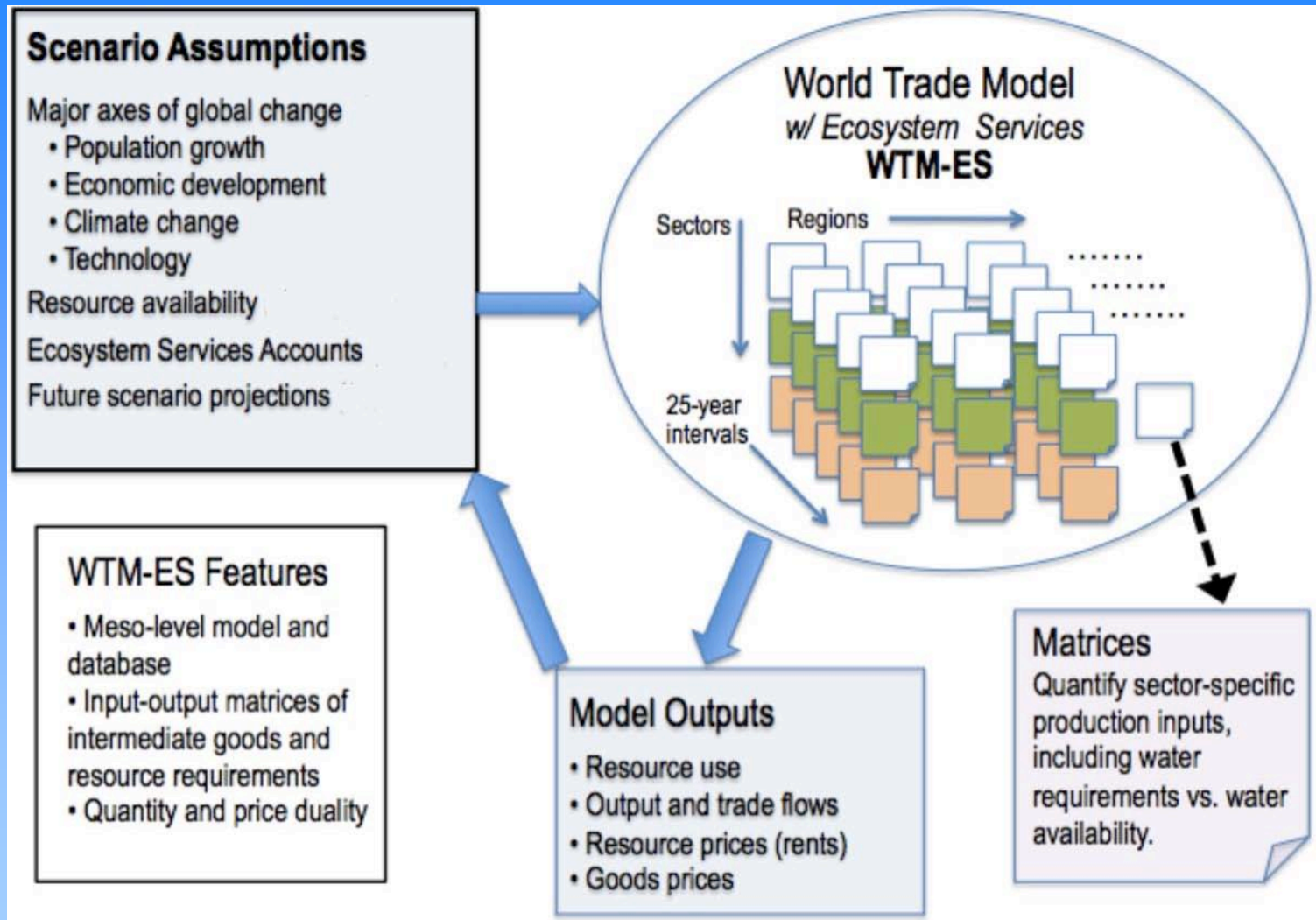


Nature: September 30 issue

Advancements over *Nature* paper



1. Move into the 21st century via scenarios
2. Explicit links to freshwater ecosystem services
3. Assess how condition of ecosystem services influences world economy in individual sectors (food, energy, domestic water supply, fisheries), and global trade
4. I.D. critical thresholds, constraints, feedbacks, & consider tradeoff strategies that reduce emerging water resource constraints, preserve ecosystem services, and yield economic benefits in the future economy



12-regions

GWSP-related issues

- Workshop on Human Water Security (planning/hosting/support for six working group participants)
- Work on Asian Water Outlook (Int'l Water Center; S. Bunn, E. Abal) to extend/downscale/validate threat mapping
- Dedicated Session at OSC?
- Link to IIASA Scenarios activities?
- Interest from Stockholm Environment Institute (*Director: Jakob Granit*)

Deltas Initiative: Int'l Year of the Delta

Background:

- Recall: sequence of targeted workshops that GWSP and LOICZ and CSDMS co sponsored since 2007
 - Resulted in various publications in *Science*, *Nature*, *EOS* and *LOICZ Research & Studies*
- Voluntary consortium forwarding the IYD initiative (see: <http://www.iyds-2013.org/>) - website under continued development & will provide updates on emerging science and implementation plans for a "International Year of Deltas", (literally a longer term research focus shall be established)
- A parallel Belmont Forum Proposal (International Opportunities Fund) has just been invited to be further developed into a full proposal - the project - if finally approved - would start in late 2013 and run for 3 years.

Deltas Initiative: Int'l Year of the Delta

Emerging UNEP-interests:

- UNEP is interested in developing and supporting a stronger concerted focus on deltas
- Three main thrusts: "**Delta Report Cards**", "**Joint Land-Ocean Threat Mapping**" and "**Delta Scenarios**" for current status and future trends
 - Reports cards and Joint Mapping** would be based on
 - (a) upstream-downstream biogeophysical data (incl. ocean forcings)--a merge of Vörösmarty et al. (2010) and Halperin et al. (2008)
 - (b) human alterations and drivers across the relevant water continuum
 - (c) overlay of governance information (market, government civil society)
 - (d) institutional dimensions (legal frameworks and management)
 - (e) ecosystem goods and services assessment,
 - Scenarios** would reflect likely future socio political and environmental developments
 - CUNY/GWSP** developing a delta "Fingerprinting System" compiled from comprehensive datasets, satellite imagery and historical information (e.g. microwave radiometer flood extent scanning linked to river discharge)

Deltas Initiative: Int'l Year of the Delta

Next Steps:

- (a) continue dialogue between parties on finding endorsement for the IYD effort by UNEP
- (b) arrange for a first science session on the current status and way forward associated to the GWSP Open Science Meeting (21-24 May 2013 Bonn Germany)
- (c) explore options for a second session as part of the upcoming UNEP conference (J. Alder to provide detail)
- (d) developing a full proposal and explore options may be through GEF as a global science project in transboundary waters
- (e) Syvitski/Vörösmarty drafting article to GWSP newsletter

GEF Transboundary Water Assessment Project

- Indicator-based assessment in affiliation with UNEP-DEWA
- Broad consortium of partners
- Both contemporary and future states
- **COMPONENTS:**
 - River Basins
 - Lake basins
 - Aquifers
 - Oceans
 - Large Marine Ecosystems

GEF Transboundary Water Assessment Project

GOAL: To promote real investment in management and development of transboundary water systems through strong stakeholder engagement.

THROUGH:

- A mechanism for regular global assessments of the world's transboundary water systems
- An improved, ecosystem-based methodology to conduct this assessment
- The required capacity and data for conducting assessment and
- Monitoring the effect/impact of interventions by GEF/other institutions on the environmental status of transboundary



GEF Transboundary Water Assessment Project

- Core Partners
 - Universities of Kassel and Frankfurt (Germany)
 - City University of New York (CUNY)
 - International Geosphere-Biosphere Programme (IGBP).
 - Centre for International Earth Science Information Network (CIESIN)
 - International Union for the Conservation of Nature (IUCN).
 - UNEP-DHI Centre
 - Stockholm International Water Institute (SIWI)
 - Oregon State University
- Data Harmonization/Baseline Established
- Link to GWSP ATLAS?

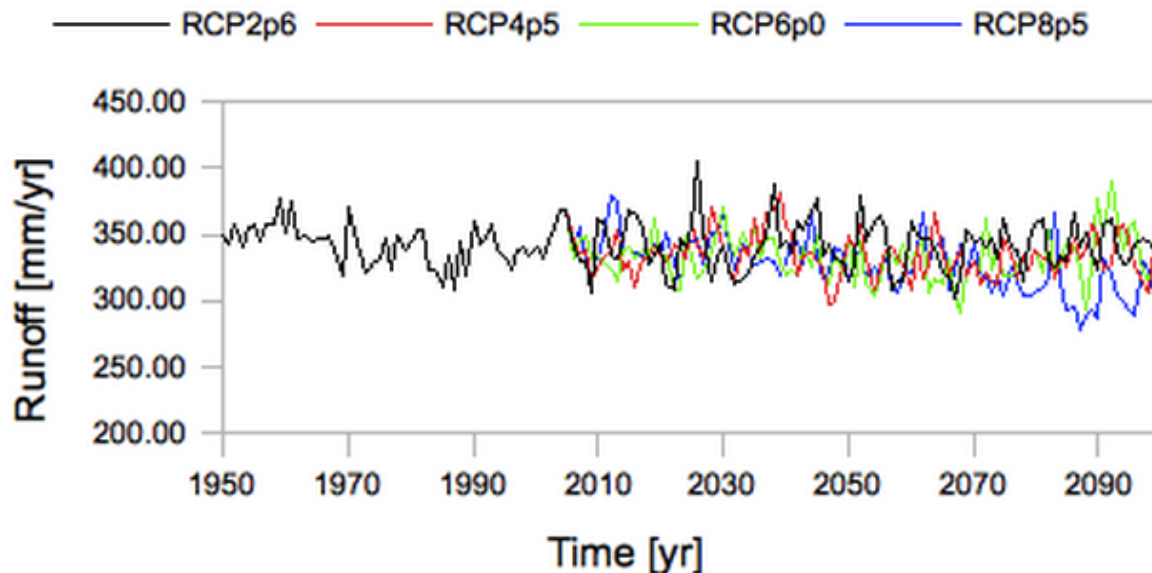
Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP)

- **Series of 5 GCMs** (HadGEM2-ES, IPSL-CM5A-LR, MIROC-ESM-CHEM, GFDL-ESM2M, NorESM1-M)
- **4 Concentration Pathways Scenarios** (RCP2p6, RCP4p5, RCP6p0, RCP8p5)
- **ca. 40 groups/sectors models**
- **8 applications areas**

water/ag/ecosystems	water/ecosystems
water	ecosystems
agriculture	agric/ag-economics
infrastructure	health

Inter-Sectoral Impact Model Intercomparison Project (ISI-MIP)

- Contrasts of “pristine” vs human-dominated water cycle
- Attribution studies
- Special issue of *PNAS*
- GWSP interests could be forwarded



Example of
“pristine run,
showing range
of GCM-
derived
variability due
to climate
forcings

Courtesy B. Fekete

GSI Highlighted Activities

(emerging)

- GEMS-UNEP-GWSP Global Water Pollution Load Assessment
- Vox Naturae: Glaciers/Water Towers (w/UNU, UNEP)
- Links to Private Sector
- Un-invited Belmont Forum “Future Water” Blueprint

GEMS-UNEP-GWSP Global Water Pollution Load Assessment

- Extension of Report on Water Quality Guidelines for Aquatic Ecosystems (UN-Water/UNEP; J. Bogardi)
- Two-stage: Global HotSpot Analysis

A 2-phase strategy

Phase I (2 years)

1. Using existing models and data:
 - Identify current hot spot areas of degraded water quality (use preliminary water quality guidelines as benchmark)
 - Identify main water quality data gaps
2. Begin water quality data push
3. Develop water quality guidelines



A 2-phase strategy

Phase II (3 years)

1. With new data from Phase I, fill in gaps in assessment of current water quality situation.
2. Develop scenarios that show trends and policy options over 10-20 years.
3. Evaluate policy measures -- Assess feasibility of ecological wastewater treatment approaches (constructed wetlands, ...); assess integrated watershed management approaches to manage water quality in developing countries.
4. Assess governance at all levels that would support management of water quality.



Vox Naturae: Glaciers/Water Towers

(w/ UNU, UNEP)

- Media event to develop awareness of climate change (Svínafellsjökull Glacier)
- Sept. 2013
- Global follow-ons (e.g., U.N. Secretariat building [NYC], Times Square, “American Response”:NEA grant, other glaciers around the world)



**Melting glaciers: symbol for the impact of
climate change**

VOX
Naturae



Putting a spotlight on the impact of climate change

VOX
Naturae

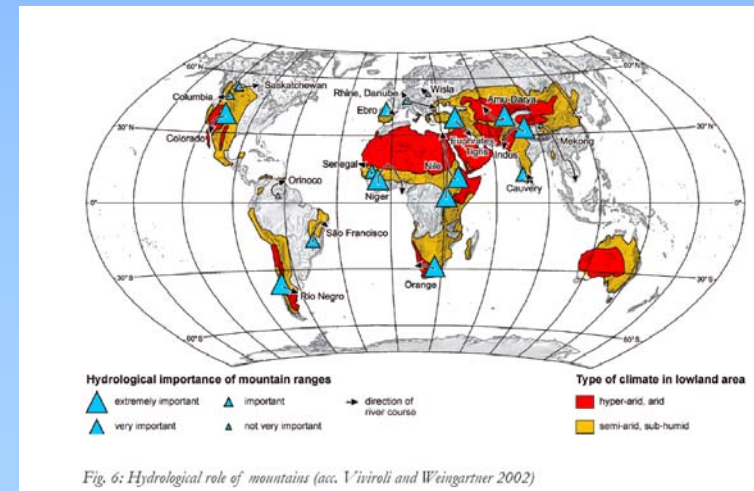
Vox Naturae: Glaciers/Water Towers

(w/ UNU, UNEP)

- "Water Table"

an international policy initiative that will bring together global leaders in government, the private sector, civil society and academia who are concerned with the water, ice and climate change challenge. The Water Table will draw upon existing initiatives focused on water and related issues to leverage focus on the cryosphere.

- Proposal by UNEP (T. Chiramba Division of Environmental Policy Implementation (DEPI) to work jointly with GWSP on "Water Towers of the World" within this context.



Links to Private Sector

- C. Vörösmarty approached by Deloitte (enterprise risk group) to identify chief water-related constraints/opportunities in the water sector
“Water as entry point to the Green Economy” (R. Lawford)
- S. Bunn, through Griffith U. Alumni Office, link to American Express
- Opportunity for GWSP to create private sector stakeholder dialogue—a “Global Water Sector Forum” or equivalent name? Deloitte would potentially co-fund if the fit is good

BELMONT WATER:

An International Partnership Synthesizing Global Change Research and Producing a Blueprint for the Freshwater Agenda of Future Earth

RATIONALE:

- *Earth System Science Partnership (ESSP) contains wealth of knowledge on environmental systems, in particular water*
- *These knowledge resources are untapped*
- *These knowledge resources poorly entrained into the policy arena*

PARTICIPANTS:

GWSP, GEWEX, IGBP, DIVERSITAS, IUCN, CI, IHDP, GCP, IFPRI, ICLR, UNEP-DHI

BELMONT WATER:

- Current status: Pre-proposal was not invited to full competition
- Partnership still engaged
- Provide a useful framework for Future Water as part of GWSP OSC??

BELMONT WATER'S CHIEF GOAL:

To provide a state-of-the-science synthesis of freshwater-related knowledge from the ESSP of direct relevance to stakeholders in the watershed risk and protection, food, energy, and urban water sectors.

- *Theme-based*
- *Notion of data providers/data consumers*
- *Articulates water security issues from the perspective of human water security (conflict, economic, political, health, habitability, resilience) and natural system security (ecosystem services, biodiversity protection)*
- *Will produce a blueprint for a water agenda under Future Earth.*

BELMONT WATER: POINTS OF CONTACT ON POLICY-ENGAGEMENT

- ***Transboundary Waters Assessment Programme (TWAP):*** Multi-lateral effort to optimize environmental protection investments in present and future water stress/opportunity points, engaging >50 participating groups
- ***Int'l Food Policy Research Institute (CGIAR):*** Water-food security, enhancing rural livelihoods and designing environmentally sustainable food systems
- ***Global Carbon Project (ESSP):*** Water-energy-carbon nexus; water-urban-industrial planning.
- ***Institute of Catastrophic Loss Reduction (ICLR):*** disaster prevention research and communication

SCIENCE SYNTHESIS TEAMS (Leads)

ST-1: Water Quantity: Supply, Use & Stress (*WCRP/GEWEX*)

ST-2: Water Quality: Fingerprints of Human-Water Interactions (*IGBP*)

ST-3: Ecosystems: Mapping Services & Biodiversity (*DIVERSITAS/IUCN-CI*)

ST-4: Human-Water Systems: Governance & Socioeconomics (*IHDP*)

POLICY ENGAGEMENT TEAMS (Leads)

PE-1: Water & Energy (*GCP*)

PE-2: Water & Food Security (*IFPRI*)

PE-3: Water, Urban & Industrial Systems (*GCP*)

PE-4: Water & Risk (*ICLR*)

PE-5: Transboundary Water Management & Protection
(*UNEP/DHI*)

FUTURE WATER SYNTHESIS TEAM (FWST)

Produces Blueprint for Future Earth Water Agenda