GWSP
Global Water System Project

GLOBAL WATER NEWS

Earth System Science Partnership

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EDITORIAL

Welcome to the first Newsletter of the Global Water System Project (GWSP). Through this Newsletter we report to you generally about GWSP progress and about fresh developments in our knowledge of the global water system. In this issue we present the scientific framework for the project, and Joseph Alcamo and Charles Vörösmarty, co-chairs of the GWSP Scientific Steering Committee (SSC) highlight the Millennium Ecosystem Assessment. We also introduce the newly appointed members of the SSC and the International Project Office (IPO). Future issues will feature scientific articles and news from the projects.

The GWSP is an initiative of the Earth Science System Partnership that presents the challenge of a systems approach to global change studies of the global water system. The project's research fits an exciting and well-defined niche. The members of the SSC are all international leaders in the field, and we have core support from the German Government to facilitate the research activities. These are all essential ingredients for the success of the project, but we will need significant commitments from many members of the scientific community to achieve our ambitious goals, especially at this early stage. We welcome your interest and participation in the GWSP over the next decade. Feel free to contact us and seek information and opportunities to contribute to the scientific programme.

Eric Craswell
The author is Executive Officer of the GWSP's International Project Office

A NEW ASSESSMENT OF WORLD WATER RESOURCES AND THEIR ECOSYSTEM SERVICES

Since its launch in 2001 by Kofi Annan, the Millennium Ecosystem Assessment (MA) has carried out the first comprehensive and global evaluation of ecosystem services that contribute to human wellbeing. The MA has involved thousands of individual experts, both in the analysis itself and rigorous peer-review. An important part of the MA has been an examination of the current and future state of world water resources.

Freshwater water services are considered in a dedicated Chapter of the Condition and Trends Working Group Volume, which provides a picture of the recent history and contemporary state of global freshwater provisioning services, together with their recent trends. The assessment is based on both an extensive literature review and geographic analysis of existing data sets. Special attention is paid to quantifying water supply, demand, and their interactions. The assessment also considers the drivers of changes in the water provisioning system, specifically exploring the impacts of land management, climate change, and water engineering. An analysis also is made of the consequences—both positive and negative—of the observed changes to water provisioning services. The time horizon is from 1960–2010.

The specific services considered convey a broad range of benefits. Water provided for irrigation has an important role, producing 40% of global crop production. While it is estimated that today 1.1B people lack adequate access to clean water and 2.6B are without sanitation, more than 5B are provided with clean drinking water and over 3B have access to sanitation, which underpin good health and economic prosperity. Further, with continued investments in water infrastructure, much of the world's population has benefited from allied improvements in flood control, electrification, and economic development.

The assessment documents a growing dependence of human population on water services, which has resulted in a variety of activities aimed at stabilizing and delivering water supply. Eighty-four percent of the global population is served by 35–40% of renewable runoff and this fresh water is heavily managed. So effective has been the ability of water management to influence the state of this resource, in terms of its physical availability and chemical character, that anthropogenic signatures are now evident across the globe (e.g. Figure 1a). Much of the anthropogenic influence is negative due to overuse and poor management. The capacity of ecosystems to sustain freshwater provisioning services is thus strongly compromised throughout much of the world and likely to remain so should historic patterns of managed use persist. In the driest regions, it is esti-

Children collecting drinking water

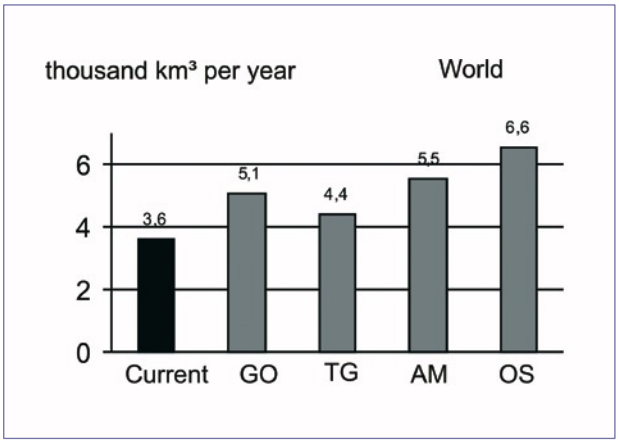

Figure 1b. *Global water withdrawals. Current = 1995. The remaining columns refer to 2050. Scenario GO = Global Orchestration, TG = TechnoGarden, AM = Adapting Mosaic, OS = Order from Strength. Source: Millennium Ecosystem Assessment*

mated that more than 1B people live under conditions that generate no appreciable supplies of renewable fresh water supplies. Water scarcity is endemic to these regions and current trends show a worsening of the situation.

The Millennium Ecosystem Assessment reviewed not only the current status of world water resources but also constructed four scenarios of changes in ecosystem services up to 2050. These scenarios were based on a range of assumptions about future socio-economic drivers such as population, income and technological change. A new dimension of these scenarios is that they are both qualitative and quantitative in nature—the qualitative part consists of storylines which provide a logic for changes in driving forces and ecosystem services, while the quantitative part provides numerical estimates of future water resources as generated by global water models.

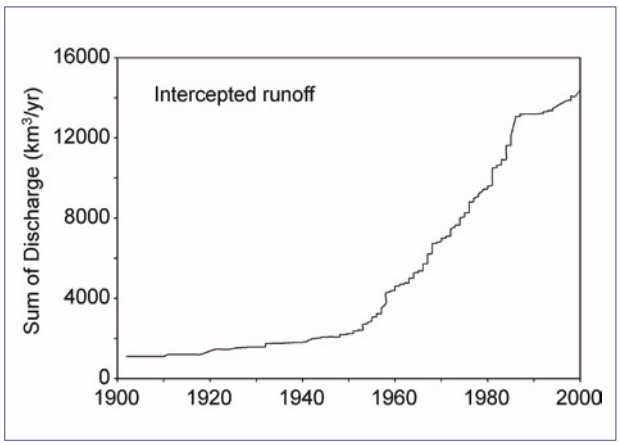

Figure 1a. *A times series depicting the interception of discharge to fill reservoirs shows that more than 15,000 km³/yr (40% of continental river flow) passes through large reservoirs today. Source: Millennium Ecosystem Assessment*

The "Global Orchestration" scenario describes a globalized world emphasising economic growth and public goods and taking a reactive view towards ecosystem changes. Under this scenario water availability increases over most countries because of increasing precipitation (related to climate change) but decreases in some important arid regions because of decreasing precipitation and warmer temperatures. Global withdrawals increase by over 40% (Figure 1b), leveling off in industrialized countries because of the saturation of water demands, but increasing substantially in developing countries due to aspirations for increased water use. Water stress (as estimated as the ratio of annual water withdrawals to availability) goes down in industrialized countries because of the higher water availability and stabilization of water withdrawals, but grows in developing countries because of massive increases in withdrawals and return flows. Water resource problems are expected to expand and intensify in developing countries under this scenario, threatening the services related to freshwater ecosystems.

The "TechnoGarden" scenario also describes a globalised world, but here society takes a pro-active attitude towards the management of ecosystems. The international control of greenhouse gas emissions leads to a somewhat lower level of climate change and hence a smaller change in water availability. Global water withdrawals increase by only half the amount as under the Global Orchestration scenario because technological progress is faster and leads to increasing efficiency in the use of water. An exception is Africa where withdrawals strongly increase (as in all scenarios) because the effect of population and the economic growth outweigh the effect of efficiency improvements. While wastewater flows increase in developing countries, the wealth and environmental concern of future

society is likely to lead to a higher level of treatment of wastewater as compared to other scenarios.

The "Adapting Mosaic" scenario describes a regionalised world with less cross border transfer of knowledge, technology and cooperation than the previous two scenarios. In this world particular emphasis is placed on local governance and adaptation to ecosystem changes. Even though the volume of wastewater flows increase very rapidly in Latin America and Africa, it is assumed that society will develop the technology and local institutions needed to deal with increasing pressure on water resources.

The "Order from Strength" scenario also describes a regionalised world, but one that puts more weight on national security and economic growth than protecting ecosystems. The increase in water withdrawals in developing countries is twice as large as in the Global Orchestration scenario. The level of water stress substantially increases in developing countries as well as the volume of wastewater flows. Three-quarters of the world population in 2050 live in river basins where wastewater flows double in the first half of the century. Since negligible attention is given to environmental protection under this scenario, it is expected that the rapid increase in water stress leads to water quality problems in many regions.

Summing up, the Millennium Ecosystem Assessment has provided an up-to-date estimate of the many ecosystem services provided by freshwater resources. But the Assessment also makes clear that these services are not static—on the contrary, we should expect dramatic changes in global water resources and the services they provide in the coming decades. Moreover, the direction and extent of these changes will depend on the pathway we take into the future.

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THE SCIENTIFIC FRAMEWORK FOR THE GLOBAL WATER SYSTEM PROJECT

One of the important consequences of the rapid growth of global environmental science has been our growing awareness of the linkages, interconnections and interdependencies in the global water cycle. We now realize that the various human and non-human facets of the cycle make up a *global water system*.

As a working definition, we define the global water system as the global suite of water-related human, physical, biological, and biogeochemical components and their interactions. These components include:

1. **Human components** – These are the sum of water-related organizations, engineering works, and water use sectors. Society is both a component of the global water system and a significant agent of change within the system.
2. **Physical components** – These are the physical attributes and processes of the traditional global hydrologic or water cycle, including runoff, geomorphology, and sediment processes.
3. **Biological and biogeochemical components** – This category includes the sum of aquatic and riparian organisms and their associated ecosystems and biodiversity. These organisms are also integral to the geochemical functioning of the global water system and not simply recipients of changes in the physico-chemical system.

While the global water system is an essential part of the non-living dynamics of the Earth System, it also plays a central role in human society. It can be argued that the concept of the global water system has emerged from the increasingly tight economic, social, technological and other couplings among society we term "globalisation". As an example, the water policies carried out by large international organisations have direct impacts on the levels of water abstraction and water diversions worldwide, and hence on the level of wastewater discharges, hydrologic regimes, the biogeochemistry of waters, and the state of aquatic ecosystems.

The Challenge of Understanding the Global Water System

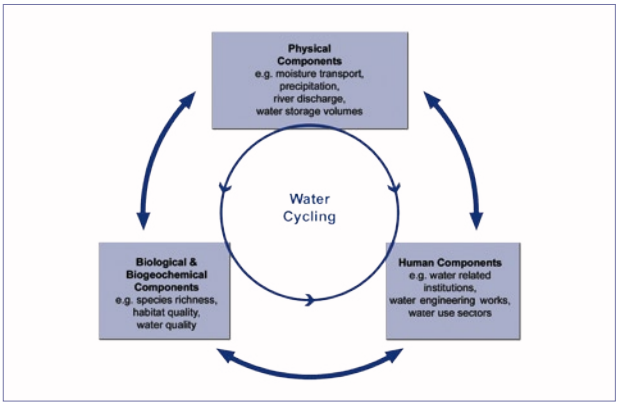
Along with the recognition of the global water system has come the awareness that human activities are significantly and rapidly changing this system. Some of the many "syndromes" that are causes and manifestations of rapid changes in the global water system include biodiversity loss, climate change, erosion, eutrophication, groundwater contamination, intensive water abstraction, interception of sediment flux, the introduction of exotic species, land-coastal linkages, pollution, nitrogen loadings, and salinisation. Although we are aware of these changes, we urgently need to improve our understanding of their underlying causes. Otherwise we will be unable to counteract the current and future threats to public health, economic progress, and biodiversity caused by these changes. But we should recognise that improving our understanding poses special challenges to scientific research. First of all, scientists must take a global view of the water system, although most water research and management up to now has been concerned with regional and local processes. In addition, rather than concentrating on a particular aspect of the global water system, scientists must especially study the linkages and feedbacks in the system. Scientists must also give equal attention to the many social science and natural science aspects of global water resources. For this reason, researching the global water system requires a multi-disciplinary and/or an interdisciplinary approach.

Establishing the Global Water System Project (GWSP)

In response to the urgent need to better understand the global water system, the organizations of the Earth System Science Partnership—i.e. the International Geosphere-Biosphere Programme, the International Human Dimensions Programme on Global Enivronmental Change, the World Climate Research Programme, and DIVERSITAS—decided to establish the Global Water System Project (GWSP). The central tenet of the Global Water System Project is that: Human-induced changes to the global water system are now globally significant and are being modified without adequate understanding of how the system works.

The GWSP Scientific Questions and Themes

The goal of the GWSP is to address the following overarching scientific question: 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? Three core questions follow from this overarching question, and these questions make up the three major research themes of the GWSP.



The watercycle and its components

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?
Theme 2. What are the main linkages and feedbacks within the earth system arising from changes in the global water system?
Theme 3. How resilient and adaptable is the global water system to change, and what are sustainable water management strategies?

Although the world's oceans play a central role in the global water cycle, global oceanic research is already covered by many other research programs. Hence, the GWSP will focus on the world's freshwaters.

Implementation Activities

The GWSP has laid out an ambitious program of research to broaden scientific knowledge about the current workings and future prospects of the global water system. This program is divided into three phases:
I. (Years 0 to 2) Program definition and initiation in which the project finalizes its plan and launches a mix of short, medium and long term initiatives.
II. (Years 3 to 5) Program implementation and product delivery in which the first short and medium term results become available.
III. (Years 6 to 10) Data synthesis and application of results in which results of the project are synthesized, applied and distributed.

The implementation of GWSP research is organized into research activities that fall under the above three themes, as well as cross cutting activities that address issues common to all research themes (such as data consolidation and modeling), and educational and capacity building activities.

The article is based on the Scientific Framework Document, composed by the Framing Committee (s. page 11)

A WORD FROM GWSP'S PARTNERS

IGBP-GWSP Synergies

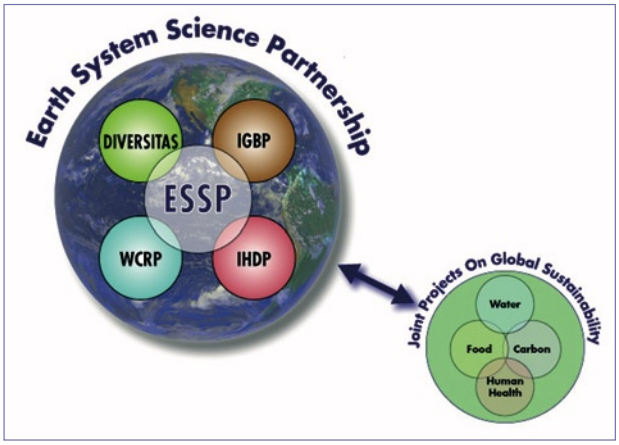
Much of the science of IGBP is organised around Earth System compartments (land, ocean, atmosphere) and the interfaces between these compartments, in an effort to better understand Earth System dynamics. The global water system however, spans all the Earth System compartments, and is an important aspect of Earth System functioning that is not comprehensively considered by IGBP core projects. GWSP research will thus help meet IGBP objectives and will complement WCRP research into the hydrologic cycle, by focussing on the land (and land interface) components of the hydrologic cycle. As IGBP also seeks to understand the role of humans in the changes that are occurring in Earth System dynamics, the GWSP's focus on human-driven change in the global water system including linkages and feedbacks will further help to meet IGBP objectives.

While IGBP seeks to undertake policy-relevant research, the focus of IGBP remains on advancing fundamental science. At the end of its first decade of research IGBP invested significant effort in integrating and synthesising its findings, however, this was largely for a scientific audience. IGBP seeks to collaborate with the GWSP to help apply both existing knowledge and the new knowledge that will emerge from IGBP and its ESS partner programme to the issue of sustainable water (and land) resources development, in a way that actively engages with policy makers—especially at the regional and national levels.

In particular, IGBP seeks collaborations between GWSP and the core projects LOICZ (Land-Ocean Interactions in the Coastal Zone) and GLP (Global Land Project), both of which are co-sponsored by IHDP. To engage at the regional and national level, IGBP hopes to collaborate with GWSP on regional scientific workshops and regional policy roundtables. These events in which IGBP is seeking to invest increasing effort, are an important way in which IGBP hopes to better engage with the IGBP, or Global Change National Committees—the grassroots of the Programme and the interface to national-level science and policy arenas.

For further information about IGBP, its objectives, plans and activities, please visit www.igbp.net or contact:

Bill Young
GWSP Liaison, IGBP Secretariat Royal Swedish Academy of Sciences, Stockholm. Contact: bill@igbp.kva.se



The members of the Earth System Science Partnership and their interconnections

IHDP and GWSP: Potentials and Expectations

By focusing on the global scale, the Global Water System Project has the potential to evolve as a leading contributor to improved knowledge of, and responsible interaction with the global water system. It could provide a forum for collaboration on improving the knowledge of, and responsible interaction with the global water system through enhanced global observation, consolidation of global data sets, predictive and coupled modeling to include socioeconomic aspects of human use and abuse.

The International Human Dimensions Programme on Global Environmental Change (IHDP) is one of the co-sponsors of the Global Water System Project (GWSP). Within the alliance of the four global change programmes, the so called Earth System Science Partnership,

Women play a key role in supplying water

IHDPs role is to analyse the anthropogenic drivers of global environmental change, the impact of such changes on human welfare, and societal responses to mitigate and adapt to global environmental change. IHDP puts people in the center of the analysis. It focuses on decision-making processes by taking the knowledge, values and preferences of social actors into account but also the economic, political, social and cultural contexts in which these decisions are embedded. This is the perspective from which IHDP is looking at GWSP. The six Core Research Projects of IHDP (Global Environmental Change and Human Security (GECHS), Industrial Transformation (IT), Institutional Dimensions of Global Environmental Change (IDGEC), Land and Ocean Interactions in the Coastal Zone (LOICZ) and Land Use and Land Cover Change (LUCC) as well as the new project developments: Urbanisation and Global Land Project) combine a broad array of anthropogenic factors—widespread changes in land use, increasing urbanization and industrialization, water and human health, water stress, water security—which influence the global water system and threaten human well being, livelihoods and ecosystems in direct ways. The GWSP should aim to strengthen and facilitate these current research activities and identify knowledge gaps.

There are many concrete areas for collaboration between the IHDP and the GWSP in the near future:

- Core Project Activities such as the International IHDP-GECHS Workshop "Human Security and Climate Change", 21–23 June 2005 in Oslo, Norway and the LOICZ Open Science Conference "Coasts and Coastal People, Scenarios and Responses", 27–29 June 2005 in Egmond an Zee, Netherlands.
- The 6th Open Meeting of the Human Dimensions of Global Environmental Change Research Community, 9–13 October 2005, Bonn Germany.
- Capacity Building Activities such as the 2006 International Human Dimensions Workshop to be held in Asia with a possible focus on water.

With the GWSP International Project Office situated together with the IHDP Secretariat at the University of Bonn, Germany, there will be many positive opportunities for additional future collaboration with our networks.

Debra Meyer-Wefering
GWSP liaison, IHDP in Bonn.
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WCRP's Message

The World Climate Research Programme (WCRP), as one of the founders of GWSP, welcomes the implementation of the GWSP and the formation of the GWSP scientific committee as well as the birth of this newsletter.

The two major objectives of the WCRP are to determine the extent to which climate can be predicted and the extent of human influence on climate. To achieve these objectives the WCRP promotes essential research and observations for understanding the basic behaviour of the physical climate system, and its relation to the broader Earth System and the needs of society. It consists of four core projects covering the main domains of interest to climate, that is the coupled atmosphere-ocean circulation, the stratosphere-troposphere interaction, the cryosphere, and the water cycle, as well as two numerical experimentation groups dedicated to the coordination of modelling activities for the global atmosphere and the coupled atmosphere-ocean system. WCRP is presently launching a new strategic framework for its activities, COPES (Coordinated Observation and Prediction of the Earth System) "to facilitate prediction of Earth system variability and change for use in an increasing range of practical applications of direct relevance, benefit and value to society".

Water is essential to life on earth

The objectives of GWSP seek to quantify the role of humans in transforming the water system, identify and understand the principal sources of anthropogenic change, explore water system feedbacks and thresholds, and assess vulnerability and adaptability of society to impending change. These objectives complement the research goals of WCRP and provide an opportunity for WCRP to address a broader water research agenda in close collaboration with other ESSP global environmental programmes. Through GEWEX (Global Energy and Water Cycle Experiment, a WCRP core project) and its other projects, WCRP has developed a capability to gather and manage global data sets, to develop water and energy cycle models of various scopes and complexities, and to assimilate data in models for understanding and forecasting climate. GEWEX looks forward to the opportunity to make use of this expertise in supporting GWSP activities. WCRP can also contribute by providing information on past and present climate, scenarios for future climate change and experimental seasonal predictions that could be used in better management of water resources.

WCRP hopes to learn from GWSP how changes in the global water system may alter the climate at regional and global scales, and to modify its models to account for the possible effects of built structures on flows and other hydrological signals. It is also anticipated that GWSP will build strong ties with the Water Resources Application Project within GEWEX and with the Integrated Global Water Cycle Observations theme of IGOS-P (the Integrated Global Observing Strategy Partnership). In more general terms, WCRP welcomes this opportunity to develop new links with the other ESSP programmes on water-related issues.

WCRP is jointly sponsored by the World Meteorological Organisation, the International Council for Science and the Intergovernmental Oceanographic Commission of UNESCO. WCRP is represented on the GWSP Executive Committee by Dennis Lettenmaier from the University of Washington, Seattle, USA.

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GWSP liaison, Joint Planning Staff for the WCRP.
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Richard G. Lawford
GWSP-liaison, Director of GEWEX International Project Office
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THE WATER CYCLE

The global water system is being transformed by major syndromes including climate change, erosion, pollution and salinisation. Major human-induced perturbations to the global water system include the following (numbers refer to figure):

Source: "Humans Transforming the Global Water System". Eos, Transactions, American Geophysical Union, 85:48 (Lettenmaier et al. 2004)

1 Hydrological cycle accelerated
2 Mountain snow/ice lost
3 Trees removal increases runoff, reduces transpiration, affects water table and landscape salinity
4 Wetlands dried up or drained
5,6 Ground- and surface water used for irrigated agriculture
7,8 Dams alter flow and reservoirs increase evaporation
9 Industrial water coolers release water vapour
10 Transfers between basins
11 Urban, mining and construction areas alter water flows and quality
12 Coastal salt water intrudes inland
13 Impoundments reduce flows
14 Siltation, erosion and nutrient flows change coastlines and affect water quality
15 Levees and locks modify flows and channels
16 Settlements alter floodplain landscapes
17 Grazing affects runoff and water quality
18 Industry causes acid rain
19 Coastal waters polluted and species lost

THE MEMBERS OF GWSP'S SCIENTIFIC STEERING COMMITTEE:

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Members of the Executive Committee met in New Hampshire, USA, Sept. 2004. From left to right: C. Pahl-Wostl, J. Alcamo, D. Lettenmaier, R. Naiman, C. Vörösmarty, E. Craswell (IPO)

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GWSP'S INTERNATIONAL PROJECT OFFICE

The International Project Office (IPO) for the management and coordination of the GWSP was set up in February 2004 at the Center for Development Research (ZEF) at the University of Bonn, Germany.

The staff members of the International Project Office in Bonn. From left to right: L. Wever, E. Craswell, B. Heller, T. Gaertner, M. Endejan.

Executive Officer

Eric Craswell is the first Executive Officer of the Global Water System Project (GWSP). After finishing his PhD more than 30 years ago, Eric has done research on land management and nutrient cycling at a number of institutions including the International Fertilizer Development Centre, the International Rice Research Institute, the Food and Agriculture Organization of the United Nations, and the Australian Centre for International Agricultural Research. From 1996–2001 he was Director General of the International Board for Soil Research and Management in Bangkok. In 2001–2002 he was a visiting fellow at Center for Development Research (ZEF) in Bonn and worked on ecological and policy aspects of global nutrient flows in trade. In 2002–2003, Eric was leader of an Australian project to support agricultural research management in Cambodia, and while there helped organise a Phnom Penh conference on water in agriculture in Asia.

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Deputy Executive Officer

Marcel Endejan was appointed in September 2004 as the Deputy Executive Officer of the GWSP. Marcel has a first degree in informatics and a Masters degree in environmental monitoring. His PhD (2003) was on the software architecture for integrated assessment models on global change. Marcel comes to Bonn from the Center for Environmental Systems Research at the University of Kassel, where he worked with GWSP Co-Chair Joseph Alcamo on a variety of global land and water modelling and assessment projects.

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Administrative Officer

Lara Wever was appointed in February 2004 as the administrative and finance officer of the GWSP. Lara has a diploma degree in International Management from the University of Applied Sciences of Bremen. She has international experience in Brazil and in Indonesia where she worked for a project on sustainable water management.

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CALENDAR

Call for Papers is open from February 1st – Mach 10th!
6th Open Meeting of the Human Dimensions of Global Environmental Change Research Community

GLOBAL ENVIRONMENTAL CHANGE, GLOBALIZATION AND INTERNATIONAL SECURITY: NEW CHALLENGES FOR THE 21st CENTURY,
University of Bonn, Germany, 9-13 October 2005

Application Timeline:
Sessions: 15 September – 15 November 2004 [Closed]
Paper abstracts and posters: 1 February – 10 March 2005
Training seminars: 15 November 2004 – 15 February 2005
Details at:
http://openmeeting.homelinux.org and http://www.ihdp.org
Please submit all applications to the OM website.

WATER CONFERENCE

International experts and policy-makers will discuss issues of

INTEGRATED ASSESSMENT OF WATER RESOURCES AND GLOBAL CHANGE: A NORTH-SOUTH ANALYSIS

in Bonn, Germany, 23–25 February 2005.

The Conference is being convened jointly by the German Federal Ministry of Education and Research (BMBF), the Initiative Hydrology for the Environment, Life and Policy (HELP) of the United Nations Scientific and Cultural Organization (UNESCO), the National Committee of the Federal Republic of Germany for the International Hydrological Programme (IHP) of UNESCO and the Hydrology and Water Resources Programme (HWRP) of WMO, the project on Global Change in the Hydrological Cycle (GLOWA) at the Center for Development Research (ZEF), University of Bonn, the International Association for Hydrological Sciences (IAHS), the Global Water System Project (GWSP), the Challenge Program on Water and Food (CGIAR), and InWent – Capacity Building International.
www.gwsp.org

Other related meetings:

28 Feb-4 March 2005
CEOP/ IGWCO Joint Meeting, Tokyo (Japan)
www.eorc.jaxa.jp/event/2004/ceop.igwco/index.html

7-8 April 2005
New Currents in Conserving Freshwater Systems:
The Centre for Biodiversity and Conservation's 10th Annual Spring Symposium, New York (USA)
cbc.amnh.org

11-13 April 2005
Water Resources Management 2005, Algarve (Portugal)
www.wessex.ac.uk/conferences/2005/waterresources05/index.html

16-22 May 2005
The Fluvial System – past and present dynamics and controls, Bonn (Germany)
www.giub.uni-bonn.de/fluvialsystem2005

23-25 May 2005
International Symposium on Arid Climate Change and Sustainable Development, Lanzhou (China) ⇒
www.gwsp.org/downloads/ISACS.Second%20Announcement.nov04.doc

25-27 May 2005
Water and Climate during the International Symposium on Flood Defence, Nijmegen (Netherlands)
www.isfd3.nl

6-10 June 2005
MTERM International Conference
Modelling Tools for Environment and Resources Management (MTERM), Bangkok (Thailand)
www.mterm.ait.ac.th

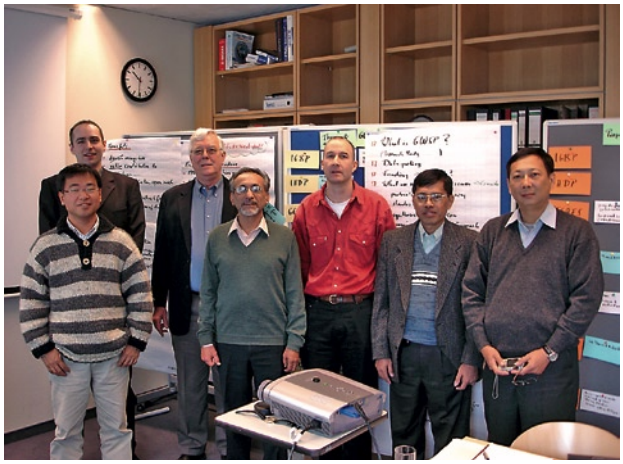
27-29 June 2005
LOICZ II Inaugural Open Science Meeting
Coasts and Coastal People-Scenarios of Change and Responses, Egmond aan Zee (Netherlands)
www.loicz.org

March 2006
Fourth World Water Forum:
Local Actions for a Global Challenge, Mexico
www.worldwaterforum4.org.mx.

FACTS AND NEWS

Consultation Workshop in Bonn

The work of the Global Water System Project (GWSP) will be based mainly on research done by different research organisations and projects under the umbrella of the Earth System Science Partnership (ESSP). In order to gather ideas about possible areas and modes for collaboration between the GWSP and other organisations, the IPO convened a two-day Consultation Workshop in Bonn on 6–7 December. The meeting was designed specifically to help develop guidelines for national committees and other organisations interested in participating in the GWSP. The meeting was attended by representatives of overseas organisations that have already expressed interest in collaborating with the GWSP, including: Felino Lansigan, UPLB, Philippines; Suppakorn Chinvanno, START-SEA; Makoto Taniguchi, GWSP-Japan; Hassan Virji, START, Washington. Representatives from the ESSP community included Bill Young from IGBP, Debra Meyer-Wefering, of IHDP and Maarit Thiem representing GECAFS. The visitors were welcomed to the meeting by Joseph Alcamo, Chair of the Scientific Steering Committee of the GWSP.



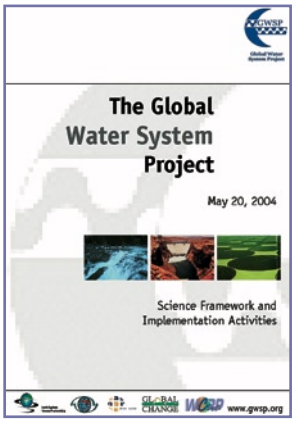
Participants in the Consultation Meeting in Bonn, December 2004. From left to right: M. Taniguchi, M. Endejan, E. Craswell, H. Virji, B. Young, F. Lansigan, S. Chinvanno.

As a result of this meeting, the IPO has gained valuable insights about collaborative models, endorsement guidelines, guidelines for affiliates, and potential areas of collaboration. The models for collaboration range from information and data sharing to fully fledged collaborative projects within the scientific framework of the GWSP. Training courses, working groups and regional networks are other options discussed. The meeting then considered the expectations from participants of the GWSP, as well as the basic issue of what the GWSP is, and how it works most effectively. The discussion of the endorsement guidelines was based on an initial draft developed at the SSC Executive Committee meeting in New Hampshire on 7–8 September 2004. A key issue for discussion at the next meeting will be the extent to which the GWSP endorses proposals rather than projects. The guidelines on endorsement will be presented on 21–22 February to the first meeting of the Scientific Steering Committee for discussion and decision.

One of the most valuable outcomes from the consultation was a list of specific areas of collaboration between the GWSP project and participating organisations. These were prioritised and the most important activities will be considered by the SSC as part of the project planning process. Overall, the spirit of the meeting was positive and encouraging, and augurs well for the future of the project.

Scientific Framework Document

The Framing Committee of the GWSP (C. Vörösmarty, D. Lettenmaier, C. Leveque, M. Meybeck, C. Pahl-Wostl, J. Alcamo, W. Cosgrve, H. Grassl, H. Hoff, P. Kabat, F. Lansigan, R. Lawford, R. Naiman have composed "The Global Water System Project: Science Framework and Implementation Activities". Earth System Science Partnership. (May 20, 2004).



The document is available online at **www.gwsp.org/publications.**

The members of the Framing Committee of the GWSP also wrote: "Humans Transforming the Global Water System". Eos, Transactions, American Geophysical Union, 85:48 (30 November 2004), which is available online as well at www.gwsp.org/publications.

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