HydroPredict'2012

http://web.natur.cuni.cz/hydropredict2012/

3rd International Interdisciplinary conference on
Predictions for Hydrology, Ecology and Water Resources Management:
Water Resources and Changing Global Environment

24-27 September 2012, Vienna, Austria

The deadline for abstract submission is 1 February 2012

SCOPE AND OBJECTIVES

Water resources systems being the main link between the people and the climate are affected by human activities (such as land use change) and climate change. Thus, any assumption related to stationarity of the water resources systems characteristics is highly questionable, maybe not valid any more. Direct human interactions with the water cycle are occurring at the small catchment scale while the climate change impacts dominate at the large catchment scale. However, there are examples of the opposite – impacts in large basins like the Aral Sea, the Tchad, and the Nile are caused by water management practices, while the hydrology of small high Alpine catchments with major contributions from glacier runoff is predominantly affected by climate change, with limited human impacts.

There is a clear need for better understanding of complex interactions between water resources and global environment. This conference will focus on **complexity and uncertainty** as two main characteristics of global change. New tools for solving water resources problems will need to be developed, or existing tools will need to be adapted to respond to the challenges of global change.
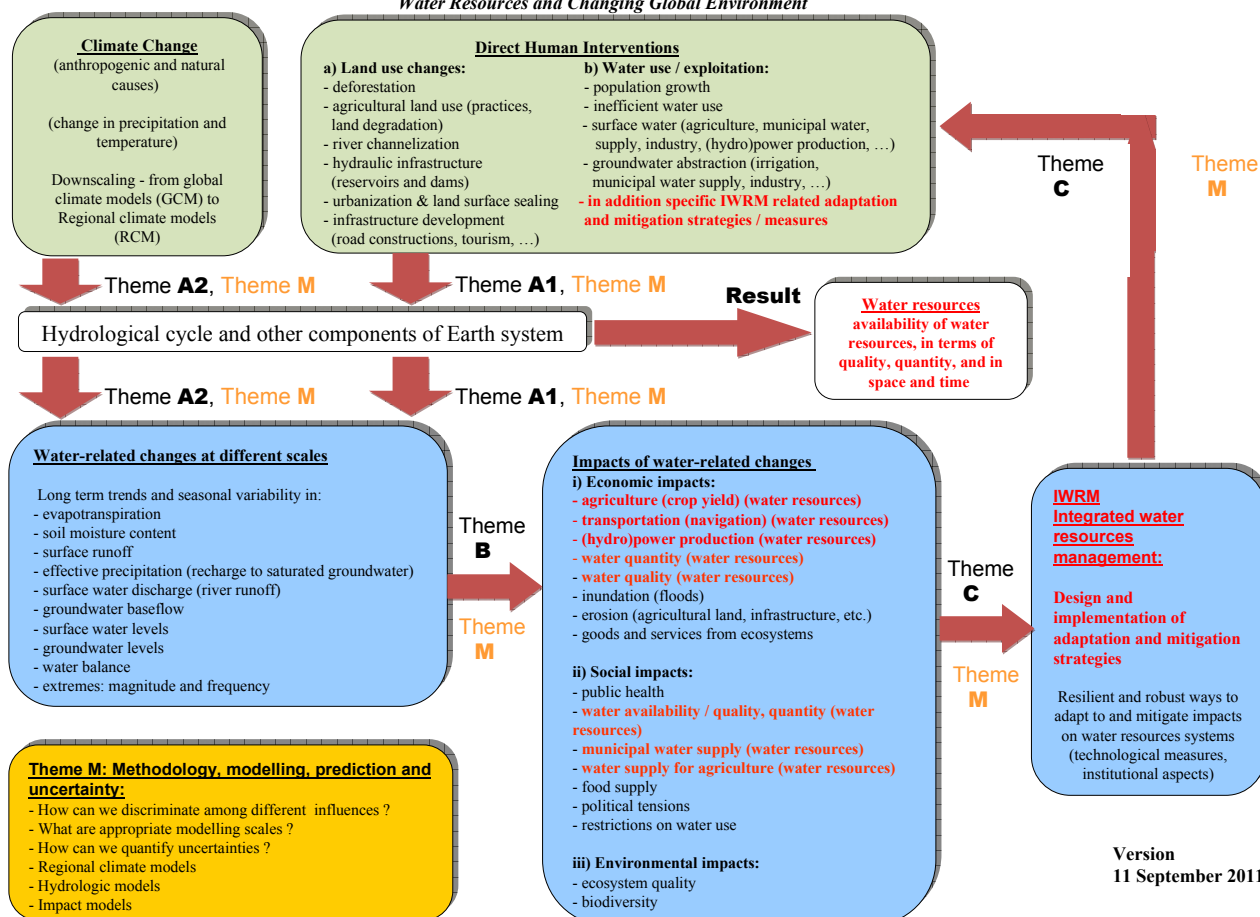
Complex dynamic water resources systems, bridging the span between ecosystems to climate, can have tipping points at which a sudden shift to a contrasting dynamic regime may occur. Although predicting such critical points before they are reached is extremely difficult, work in different scientific fields is now suggesting the existence of generic early-warning signals that may indicate for a wide class of water resources systems if a critical threshold is approaching. This conference has **prediction** as one of the main themes.

The objectives of HydroPredict2012 conference are: (i) to present tools and methods which assist in assessing and discriminating between human and climate change induced impacts on water resources systems; (ii) to discuss the predictive capability of simulation models used for water resources issues, including the model output uncertainty; (iii) to present tools and methods for adaptation to changing global conditions; (iv) to address water management policy to reduce vulnerability and to increase the resilience of water resources systems; and (v) to analyze the role of water resources within the complex social-economic-climatic system.

The conference will bring together professionals, scientists and members of governmental institutions dealing with water resources management. Representatives of natural, social and engineering sciences will meet together to exchange experience and present the current views on **the adaptation and mitigation of adverse effects of global change on water resources systems**.

HydroPredict'2012
3rd International Interdisciplinary Conference on Predictions for Hydrology, Ecology, and Water Resources Management:
Water Resources and Changing Global Environment

Climate Change
(anthropogenic and natural causes)

(change in precipitation and temperature)

Downscaling - from global climate models (GCM) to Regional climate models (RCM)

Direct Human Interventions

a) **Land use changes:**
- deforestation
- agricultural land use (practices, land degradation)
- river channelization
- hydraulic infrastructure (reservoirs and dams)
- urbanization & land surface sealing
- infrastructure development (road constructions, tourism, …)

b) **Water use / exploitation:**
- population growth
- inefficient water use
- surface water (agriculture, municipal water, supply, industry, (hydro)power production, …)
- groundwater abstraction (irrigation, municipal water supply, industry, …)
- **in addition specific IWRM related adaptation and mitigation strategies / measures**

Theme **C**   Theme **M**

Theme **A2**, Theme **M**   Theme **A1**, Theme **M**   **Result**

Hydrological cycle and other components of Earth system

Water resources availability of water resources, in terms of quality, quantity, and in space and time

Theme **A2**, Theme **M**   Theme **A1**, Theme **M**

Water-related changes at different scales

Long term trends and seasonal variability in:
- evapotranspiration
- soil moisture content
- surface runoff
- effective precipitation (recharge to saturated groundwater)
- surface water discharge (river runoff)
- groundwater baseflow
- surface water levels
- groundwater levels
- water balance
- extremes: magnitude and frequency

Theme **B**

Theme **M**

Impacts of water-related changes
i) **Economic impacts:**
- **agriculture (crop yield) (water resources)**
- **transportation (navigation) (water resources)**
- **(hydro)power production (water resources)**
- **water quantity (water resources)**
- **water quality (water resources)**
- inundation (floods)
- erosion (agricultural land, infrastructure, etc.)
- goods and services from ecosystems

ii) **Social impacts:**
- public health
- **water availability / quality, quantity (water resources)**
- **municipal water supply (water resources)**
- **water supply for agriculture (water resources)**
- food supply
- political tensions
- restrictions on water use

iii) **Environmental impacts:**
- ecosystem quality
- biodiversity

Theme **C**

Theme **M**

IWRM Integrated water resources management:

Design and implementation of adaptation and mitigation strategies

Resilient and robust ways to adapt to and mitigate impacts on water resources systems (technological measures, institutional aspects)

Version
11 September 2011

Theme M: Methodology, modelling, prediction and uncertainty:
- How can we discriminate among different influences ?
- What are appropriate modelling scales ?
- How can we quantify uncertainties ?
- Regional climate models
- Hydrologic models
- Impact models

CONFERENCE THEMES

Theme A1: How can we identify and quantify water-related changes due to <u>direct human interventions</u>

Theme A2: How can we identify and quantify water-related changes due to <u>climate change</u>

Theme B: How can we quantify/ prognose/ predict the effect/consequences of water-related changes in terms of <u>economic, social and environmental impacts</u>, including impact on water resources

Theme C: What are the appropriate <u>adaptation and mitigation strategies</u> to reduce vulnerability and to increase the resilience of our water resources systems

Theme M: Methodology, modelling, prediction and uncertainty

For TOPICS distinguished within each of these themes, please refer to conference website.

Special Session S1: Risks of water supply systems originating from climate change and land use changes
Special Session S2: Ensemble predictions in a decision making context

VENUE The conference will be held in the building of the University of Natural Resources and Life Sciences -- in German: Universität für Bodenkultur Wien (BOKU), Muthgasse 18, Vienna.

SCIENTIFIC ADVISORY COMMITTEE András Bárdossy (*Germany*), Luis Araguas (*Austria*), Berit Arheimer (*Sweden*), Okke Batelaan (*Belgium*), Janos Bogardi (*Germany*), Fi-John Chang (*Taiwan*), Christophe Cudennec (*France*), P.S. Datta (*India*), Victor A. Dukhovny (*Uzbekistan*), Jacques Ganoulis (*Greece*), Salvatore Grimaldi (*Italy*), Pierre Hubert (*France*), Zbygniew Kundzewicz (*Poland*), Esko Kuusisto (*Finland*), Deborah Lawrence (*Norway*), Henrik Madsen (*Denmark*), Hans-Peter Nachtnebel (*Austria*), Jens Christian Refsgaard (*Denmark*), Liliang Ren (*China*), Huub Savenije (*The Netherlands*), Andreas Schumann (*Germany*), Jan Seibert (*Switzerland*), Uri Shamir (*Israel*), Slobodan Simonovic (*Canada*), A.M. Subyani (*Saudi Arabia*), Edward A Sudicky (*Canada*), Kaoru Takara (*Japan*), Albert Tuinhof (*The Netherlands*), Brian Wagner (*USA*), Chunmiao Zheng (*USA*).

FOR MORE INFORMATION PLEASE CONTACT

o *Hans-Peter Nachtnebel,* Universität für Bodenkultur Wien (IWHW-BOKU), Vienna, Austria, hans_peter.nachtnebel@boku.ac.at
o *Karel Kovar*, PBL Netherlands Environmental Assessment Agency, Bilthoven, the Netherlands, karel.kovar@pbl.nl

Further information at http://web.natur.cuni.cz/hydropredict2012/