

## Upcoming Events

August 10-12, 2009  
[2009 AMS Summer Community Meeting](#); Norman, OK

August 10-14, 2009  
[33<sup>rd</sup> IAHR Congress](#); Vancouver, BC

September 14-16, 2009  
[Forest Service to Host 2nd International Conference on Forests and Water in a Changing Environment](#)

October 12-15, 2009  
[Scintillometry Workshop](#) - Socorro, NM

October 18-21, 2009  
[2009 GSA Annual Meeting](#) - Portland, OR

November 9-12, 2009  
[Water-Ecosystem Services, Drought, & Environmental Justice: 1st Millennium Conference of ESA](#) - Athens, GA

December 14-18, 2009  
[AGU Fall Meeting 2009](#), San Francisco, CA

March 13-20, 2010  
[DISCCRS: Interdisciplinary Climate Change Research Symposium](#) - Saguaro Lake Ranch, AZ

April 25-29, 2010  
[National Water Quality Monitoring Council 7<sup>th</sup> National Monitoring Conference](#) - Denver, CO

August 23-27, 2010  
[ASCE 2010 Watershed Management Conference](#) - Madison, WI

## For Your Information

**DISCCRS IV Symposium** — The Dissertations Initiative for the Advancement of Climate Change Research (DISCCRS, pronounced discourse) symposium will be held in the Tonto National Forest outside Phoenix, Arizona on March 13 - 20, 2010. The gathering brings together graduates across the entire spectrum of natural- and social-science fields relevant to climate change/impacts. Participants will provide oral and poster presentations in plenary format.

## Synthesis Summer Institute Capstone & HMF Sensor Workshops All a Rousing Success

- **A history of human-water interactions in the Northeast United States: Dynamics in a water-rich environment**—July 26-27, 2009 in West Point, New York. Sponsored by the City University of New York.



The CUNY Summer Synthesis Institute on Human-Hydrologic Interactions took place in New York City from June 15 through July 27. Twelve graduate scholars from universities across the United States took part in the six-week program researching the relationships between hydrologic and human systems in Northeastern United States during the nineteenth century. This is the second in a series of four annual Institutes, funded by NSF, tracing human-water interactions over a 500-year period (1600-2100). Students came from a wide range of disciplines:

hydrology, geomorphology, geography, geochemistry, landscape ecology, climatology, economics, history, and engineering. Their stated research goal was to "quantify the widespread alteration of hydrologic systems over local-to-regional domains focusing on the Northeast corridor of the United States." They developed the following question to guide their research, "to what degree was water availability (defined as both quantity and quality) constrained by natural factors and human activities?" The research approaches employed during the six weeks were: modeling of the hydrologic cycle; mining contemporary sediment cores, written records, and industrial data to understand historical pollution; synthesizing spatial and temporal information about landscape change and resulting sedimentation; and assessing the impact of the burgeoning canal and railroad transportation networks on the hydrologic cycle. During the institute, speakers and faculty participated weekly, assisting scholars in their research. Visiting mentors to the scholars included: Jennifer Arrigo (East Carolina U.), Dan Bain (U. Pittsburgh), Upmanu Lall (Columbia U.), Martin Melosi (U. Houston), Adam Schlosser (M.I.T.), Robert Thorson (U. Connecticut), Richard Vogel (Tufts U.), and Wil Wollheim (U. New Hampshire). Among the research results, scholars found that there was an increasing trend in runoff during the 1800s and that the wetter period that followed intensive deforestation was, in part, the cause of this trend. Human engineered storage increased between 1800 and 1900, from +0.5mm to approximately +.15mm. Water stress, in terms of compromised water quality, was increased significantly due to manufacturing and population growth in urban centers. The concentration of pollutants in sediments in the Northeast increased dramatically during the latter half of the nineteenth century, due to increased manufacturing. The Summer Synthesis Institute served as a springboard for scholars' future research and many of them are incorporating this research into their graduate work. The scholars are continuing their research over the fall and will be presenting their research during the Fall AGU meeting.



- **Advancing predictability of water cycle dynamics at the catchment scale**—August 3-5, 2009 in Vancouver, British Columbia. Jointly hosted by the University of Illinois at Urbana-Champaign and the University of British Columbia.

Dr. Murugesu Sivapalan and colleagues from the

hone interdisciplinary communication and team skills, and discuss emerging research, societal and professional issues with each other and with established researchers invited to serve as mentors. Participation will be limited to 34 early career scholars identified by an interdisciplinary committee of research scientists based on review of submitted applications. **Application Deadline 31 August 2009.** [[more information](#)]

**CUAHSI 2009 Hydrograf(x) Competition Expanded** — CUAHSI's Hydrograf(x)—a competition for short films in hydrology—has been expanded this year to include entries from both undergraduate and graduate students. This includes both pre-service and in-service K-12 educators doing Continuing Ed coursework to meet professional certification requirements. **The deadline for entries is 15 November 2009.** The goal of this competition is to foster greater understanding and appreciation of hydrologic science. This competition also provides you and your students with an opportunity to present principles of hydrology in a non-traditional format as well as a means to interact with audiences that would not regularly be reached through more formal means. [[more information](#)]

**HydroHUB: Proposed Modeling Infrastructure for the Water Science and Engineering Communities** — Computer models play a central role in meeting the science challenges facing hydrology and other water-related sciences because we need them to test hypotheses, and ultimately to provide simulations that guide policy and decision making. Despite their importance, aspects of simulation tools are far from ideal and this has motivated recent workshops and projects to seek improvements. Learn about a proposed new web-based, collaborative infrastructure for science and engineering fields broadly related to water. [[more information](#)]

## Contact CUAHSI

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University of Illinois at Urbana-Champaign are leading an effort to advance the predictability of human-induced change propagation (climatic, land-use and land-cover) through the hydrologic system, both in time and over space, using "synthesis". An intensive summer institute and concluding capstone symposium were recently held by this group in Vancouver, B.C. at the University of British Columbia.

A diverse selection of 11 students and 12 rotating mentors spent 6 weeks carving new paths using "hydrologic synthesis". This team used a patterns-based approach to demonstrate the feasibility of developing a novel, unified and robust predictive framework that is focused on the cascading of hydrologic variability across a range of scales (local -- hillslope -- watershed -- river basin), and their impact on nutrient transport and export.

The summer institute projects shared the common perspective of the landscape as comprising a set of dynamic, cascading, hierarchical, non-linear filters, which propagate and modify the variability inherent to the climatic and land-use inputs, and highlight the relative roles of climatic, transport (hydrologic) and reaction (biogeochemical) timescales, the role of memory or legacy effects, and the buffering role of ecosystems (e.g. vegetation, micro-organisms). Two specific paths of exploration included 1) analysis of inter-annual variability of the water balance and vegetation response, expressed as the ratio,  $H=E/W$ , of annual evapotranspiration (E) to plant available water (W), termed the Horton Index and 2) examination of inter-annual variability in nutrient delivery ratio (NDR) as moderated by interactions between hydrologic and biogeochemical processes across the climate-hillslope-stream network continuum.

CUAHSI co-hosted a concluding event, where 12 additional colleagues, primarily early career individuals, gathered to discuss the summer's work and share their own progress. Drs. Francina Dominguez (Arizona) and Darrel Jenerette (UC-Riverside), 2007 CUAHSI Early Career Fellows, were among the attendees. Summer institute students and mentors are now preparing to formally present their results at Fall AGU.

**Students:** Antoine Aubeneau (Northwestern), Kaiyu Guan (Princeton), Ciaran Harman (Illinois), Sally Thompson (Duke), Hal Voepel (Nevada-Reno/DRI), Mary Yaeger (Illinois), Sheng Ye (Illinois), Stefano Zanardo (Purdue/Padua), Patrick Little (UBC - Session 3), Bryan Moravec (Arizona - Session 4), Andy Neal (Arizona - Session 4), Bart Rossman (Illinois - Session 1).

**Mentors:** Nandita Basu (Iowa), Paul Brooks (Arizona), Simon Donner (UBC), Matej Durcik (Arizona), Luigi Fraccarollo (Trento - Italy), Marwan Hassan (UBC), Gavan McGrath (UWA), Aaron Packman (Northwestern), Suresh Rao (Purdue), Ben Ruddell (Arizona State), Murugesu Sivapalan (Illinois), Peter Troch (Arizona).

**Project PIs:** Murugesu Sivapalan, Praveen Kumar, Don Wuebbles, Bruce Rhoads

- **HMF Sensor Workshop: In situ Optical Sensors for Water Quality**—August 2-5, 2009 at the Rubenstein Ecosystem Science Laboratory, University of Vermont, Burlington, Vermont. Sponsored by CUAHSI, USGS, and UVM.



Approximately 30 people participated in this workshop on emerging new instruments that could revolutionize research and monitoring in aquatic ecosystems. Participants included faculty and students from academic institutions in the US, Canada, and the UK as well as research professionals in government agencies and technical experts from industry. The workshop took a systems approach and began with a consideration of the principles of optical measurements, including spectrophotometric and fluorescent methods. Brian Pellerin, Bryan Downing, John Franco Saraceno, and Brian Bergamaschi from the USGS California Water Science Center provided a thorough overview of current technology for in-situ optical measurements and lead a discussion on practical considerations common to most in-situ optical measurements

and various strategies for instrument deployment. Several workshop participants then drew on their personal experiences to discuss the considerable challenges that must be faced to deploy these instrument systems in rivers and lakes. Several industry representatives attended the workshop, including Andrew Barnard (WET Labs), Barrett Gaylord (Sontek/YSI), Cyril Dempsey (Satlantic) and David Alexander (s::can) which added a unique perspective to the discussions. The workshop focused on a group of in-situ optical tools that have recently become available including the ISUS in-situ ultraviolet spectrophotometer (Satlantic, Inc., Halifax, Nova Scotia, Canada), colored dissolved organic matter (CDOM) and chlorophyll fluorometers (e.g., WETLabs, Philomath, Oregon, USA), the AC-9 visible range spectrophotometer (WETLabs, Philomath, Oregon, USA), the model 6920 V2 multi-parameter sonde (YSI, Inc., Yellow Springs, Ohio, USA), and various pumps, regulators, dataloggers, and controllers that are commonly used to integrate and control these instruments. The participants also had the opportunity to beta-test and comment on a new in-situ (wet chemistry) auto-analyzer currently in production by WET Labs (the Cycle-P). The participants considered diverse aspects of in-situ optical instrument deployments including the rationales for instrument choices, the design and engineering of instrument systems, the challenges of different installation environments, the acquisition of data including data telemetry, and the management and analysis of data. Two active field deployments in Lake Champlain and a small urbanized stream provided hands-on experience with the instruments in a field trip setting. Jeff Horsburg from Utah State University joined the workshop remotely to explain how tools developed by CUAHSI's Hydrologic Information System could be employed to organize and publish data for others to use. The experience level of participants in the workshop ranged from novice to expert and included users and developers and so the discussions ranged from how these instruments work to how they could work better to serve the user community. Among several important recommendations the user group strongly advised instrument developers to consider ways to standardize key functions on their instruments (e.g. ports for power, input controller data, and output data) to facilitate interoperability of complex instrument systems. There was also a strong desire to create a user listserv to allow the community to more effectively communicate with each other about problems, tips, solutions, and recommendations. More information about this workshop including relevant literature and technical specifications of representative instruments can be found on the workshop website: [www.cuahsi.org/hmf/sensor/index.html](http://www.cuahsi.org/hmf/sensor/index.html). Additional information from the workshop, including data produced and instructions to access the listserv will be posted at this site in the future. This workshop was supported by CUAHSI, the [USGS California Water Science Center](http://www.usgs.gov), and the [Vermont Water Resources and Lake Studies Center](http://www.vt.edu).



For more information on the Synthesis Summer Institute Capstone events, please visit [www.cuahsi.org/capstone.html](http://www.cuahsi.org/capstone.html).

Additional information on the HMF Sensor workshop can be found at [www.cuahsi.org/hmf/sensor/](http://www.cuahsi.org/hmf/sensor/).

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