WICP Water Information Coordination Program
ACWI Advisory Committee on Water Information
The SOH CONNECTIONS

Volume 1, Issue 2, March 2007

Subcommittee on Hydrology Newsletter

at http://acwi.gov/hydrology/index.html

In this Issue:

Upcoming Meetings:

- **SOH - April 12, 2007 – FERC Building, Washington, DC**

Welcome from the Chair:

The SOH 2006 Annual Report and associated slides I presented in the ACWI's 2007 Annual Meeting on 1/17 are now posted on our web site. Will Thomas and Ernest Dryer did a fine job in presenting their annual reports for the HFAWG and STIWG, respectively.

Robert M. Hirsch (l), Associate Director for Water, U.S.G.S. and Toni M. Johnson (r), Chief, Water Information Coordination Program (WICP), U.S.G.S., at the January 2007 ACWI Meeting in Washington, DC.

Overall 2006 has been a fruitful year as I presented in the report. Thank you all for the continued effort in maintaining and improving the SOH which has allowed us to meet our mission goals and more.

We are partners in our commitment to this Subcommittee. I applaud you all for your contributions in many ways to make this Subcommittee better. Particularly, your efforts inspire others to reach for the great promise of our Subcommittee. There are fewer things more satisfying than having someone take pride in us. NWS representative Tom Donaldson is leaving his post and moving to a greener pasture.

Tom said in his email of 1/23/07, "Please convey to the SOH members my gratitude for the many opportunities provided as a member of such a dedicated and competent group of individuals. My association with this group before joining the NWS was one of the reasons that made me decide to come to Washington DC in the first place. My association with this group turned out to be one of the shining stars in my time in Washington. Thank you all for contributing to my great memories of the last five years here."

We certainly will miss seeing Tom at our regular meetings and want to thank him for his dedication and valuable contributions to the Subcommittee and the Hydrologic Modeling Work Group. Our best wishes to Tom in his new venture.

It was a great job on the 1st issue of newsletter. We got positive responses about how this newsletter and web page will be of great value to those who view it. It is good for all of us to hear about the SOH's activities. Other related information provides for broader visibility and publicity to others who have an interest in SOH. Our great appreciation is extended to co-editors Don Frevert and Mary Greene.

Best regards,

S. Samuel Lin, Ph.D., P.E.
Chair, The SOH

About the Subcommittee on Hydrology:

The Purpose of the Subcommittee on Hydrology is, "To improve the availability and reliability of surface-water quantity information needed for hazard mitigation, water supply and demand management, and environmental protection." All members who join the SOH share in and support this common purpose as a network to fulfill our mission as defined in the Terms of Reference. The subcommittee is currently chaired by Dr. S. Samuel Lin of the Federal Energy Regulatory Commission. Dr. Lin can be reached by phone at (202) 502-8881 or by e-mail at ShyangChin.Lin@ferc.gov.

Detailed information about the subcommittee can be found at:

http://acwi.gov/hydrology/

Steve Blanchard (l) U.S.G.S. and S. Samuel Lin (r) F.E.R.C. , Vice-Chair and Chair of the Subcommittee on Hydrology (SOH), at the January 2007 ACWI Meeting in Washington, DC.

The Subcommittee on Hydrology reports to the Advisory Committee on Water Information that operates under the Federal Advisory Committee Act.

Work Group Reports:

The Subcommittee currently supports three active workgroups and is in the process of adding a fourth. The active work groups focus on:

- Hydrologic Frequency Analysis
- Hydrologic Modeling and
- Satellite Telemetry

The fourth work group which is currently being formulated will focus on Hydrologic GIS Applications.

Hydrologic Frequency Analysis Work Group

The Hydrologic Frequency Analysis Work Group was set up with the purpose of recommending procedures to increase the usefulness of the current guidelines for Hydrologic Frequency Analysis computations and evaluating other procedures for frequency analysis of hydrologic phenomenon.

The group meets two to three times per year and is currently chaired by Will Thomas. He can be reached at (703) 317-6268 or by e-mail at wthomas@mbakercorp.com.

Additional information about the Hydrologic Frequency Analysis Work Group can be found at:

http://acwi.gov/hydrology/Frequency/index.html

Flood Frequency Analysis:
Potential Revisions to *Bulletin 17B*

Flood frequency analysis and computational statistics have seen great advances since *Bulletin 17B* was published. Also, *Bulletin 17B* provides values of the generalized skew coefficient that have not been updated to reflect the 30 years of additional data that is now available, or the tremendous improvements in statistical methods available to correctly analyze such spatial data. Thus, Bulletin 17B is in the revision process.

The Hydrologic Frequency Analysis Work Group (HFAWG) under the Federal Interagency Subcommittee on Hydrology (SOH) developed a revision plan that was discussed with the SOH and approved by the SOH's parent committee, U.S. ACWI (Advisory Committee on Water Information) on January 12, 2006. More background information on Bulletin 17B and the revision plans can be found at the website http://water.usgs.gov/wicp/acwi/hydrology/Frequency/

Hydrologic Modeling Work Group

The Hydrologic Modeling Work Group has the primary objective of planning, organizing and running the Federal Interagency Hydrologic Modeling Conference which is held at four year intervals.

In 2006, the conference was held in conjunction with the Federal Interagency Sedimentation Conference and it is anticipated that the 2010 conferences will be held under the same joint format in order to save on travel costs and labor expenses.

The group meets by conference call two to four times a year. The present chair of the work group is Don Frevert. He can be reached by phone at (303) 445-2473 or by e-mail at dfrevert@do.usbr.gov.

Satellite Telemetry Interagency Work Group

The Satellite Telemetry Interagency Work Group (STIWG) was charted jointly by the Office of the Federal Coordinator for Meteorology and the Advisory Committee on Water Information to act as a users group for major users of the Geosynchronous Operational Environmental Satellite Data Collection System (GOES DCS) and to coordinate funding for user desired improvements to the GOES DCS.

The group met on July 26, 2006 to discuss an issue paper outlining GOES DCS vulnerabilities. The meeting goal was to alert management and environmental data users about circumstances that could limit data accessibility. The work group is also working with NOAA management to increase the priority of the GOES DCS within NOAA.

The successful meeting ended with agreement to provide the time on the agenda of the October 4, 2006 ACWI interim meeting for STIWG to discuss these issues with the full ACWI membership.

Representatives in attendance were from ACWI, SOH, STIWG, USGS, NESDIS, and USACE.

Charlie Bryant (l) NOAA and Ernest Dryer (r) U.S.G.S., STIWG, January 2007 ACWI Meeting in Washington, DC.

Hydrologic GIS Applications Work Group

The proposed Hydrologic GIS Applications Work Group will focus on development and support of GIS applications in hydrology and hydraulics. The group anticipates meeting at least three times per year. Additional information on the proposed work group can be obtained from Bill Merkel. He can be reached at (301) 504-3956 or by e-mail at William.Merkel@wdc.usda.gov.

Public Awareness

Ultimate Flood Protection Differentials between Agencies and Nations
(For Comparison only)

The public commonly has a high level of confidence in the safety of dams and levees. The objective of an agency's public safety policy is to ensure that the infrastructure under its jurisdiction does not create unacceptable risks to public safety (life and property), environment or cultural resources, lifeline facilities, or other concerns. However, the policy of public protection using all possible means varies, depending mainly upon the agency's mission.

Infrastructure safety enhancement is necessary to provide adequate public protection. Tolerable risk guidelines are usually expressed by indexes such as flood frequency (i.e., recurrence period in years), AEP (annual exceedance (or failure) probability, i.e., the inverse of the flood frequency), APF (annual probability of failure of infrastructure, or used as the probability of individual life loss, i.e., individual risk), AALL (average annual life loss, i.e., societal risk of infrastructure failure consequence), etc. Those indexes adopted by various agencies and other nations are provided in the tables below strictly for the purpose of comparison.

Table 1. Flood Protection Levels in USA

INFORMATION SOURCE	GUIDELINES
Federal Guidelines for Dam Safety	PMF (probable maximum flood) as the inflow design flood (IDF) after justified for a high or significant hazard potential dam; geographically varied AEP values of the PMF estimated in the US ("EPHSD", ASCE, 1988: the least AEPs could reach as low as 10^{-14} and 10^{-19} in Western and Eastern U.S., respectively)
US Army Corps of Engineers	The AEP for the PMF is unknown but using 10^{-4}/year for relative comparison purposes of dam safety alternatives within their risk portfolio assessment.
Bureau of Reclamation	Guidance for providing adequate and consistent levels of public protection in the evaluation and modification of existing dams and the design of new structures are described in the, "Guidelines for Achieving Public Protection in Dam Safety Decision making," (USBR, 2003). Two assessment measures of risk are considered in the decision process for a dam: 1) the AALL consequences resulting from unintentional reservoir release and 2) the probability of dam failure. Justification to implement risk reduction actions diminishes when AALL is less than 10^{-3} and when the APF of dam is less than 10^{-4}. In effect, this results in the dam safely passing a flood with an AEP of 10^{-4} or smaller when the potential for loss of life is large.
State of California	According to California State Division of Safety of Dams (DSOD)'s hydrology manual, the defined Skewness, Geographical Adjustment Value, and Total Class Weight (TCW) are used to determine a required flood protection frequency. When a TCW of 31 or greater is calculated, the DSOD calculates the PMP and resultant PMF.

Table 2. Flood Protection Levels in Other Nations

INFORMATION SOURCE	GUIDELINES	
ANCOLD* (Australian National Committee on Large Dams) Tolerable Risk Guideline (2003)	Individual Risk (= APF*(1-Evacuation Effectiveness))	Societal Risk (i.e., AALL)
	$< 10^{-4}$	A developed F-N (i.e., APF vs. Incremental No. of life loss) curve for a range of impacted flood events below two F-N curves representing existing and new structures, respectively (e.g., for 50 fatalities' AALL are 2.5E-03 and 2.5E-04, respectively) (The total AALL is equal to the area below the developed curve).
UK HSE* (United Kingdom Health and Safety Executive) Tolerable Risk Guideline (2001)	Individual Risk (= APF*(1-Evacuation Effectiveness))	Societal Risk (i.e., AALL)
	$< 10^{-4}$	< 2E-04 for 50 or more fatalities
Canadian Dam Safety Guidelines (Draft, 2006)	For purposes of risk assessment, the AEP of the PMF is uniformly assumed to be 10^{-6} for extreme consequence class dams. For high and very high consequence class dams, for purposes of flood frequency interpolation the AEP of the PMF is set at 10^{-4} and 10^{-5}, respectively.	
Netherlands: National Levee Protection Guidelines	Levee failure frequency is designed only up to AEP of 10^{-4} ("Water Science and Technology Seminar – Prediction, Protection, and Purification," Washington, DC, 4/28/06).	

*Note: The flood protection level is up to a PMP-based PMF to meet the standards as required.

This section has been provided in pull-out format for quick reference. The Subcommittee on Hydrology, ACWI, and WICP are not responsible for this information. Readers are encouraged to and are responsible for verifying this information to their satisfaction prior to its official use. For futher information, please contact Dr. S. Samuel Lin.

Latest News from Member Organizations:

Ice Jam Core Cadre

Submitted by
Kate White, PhD, PE, US Army Corps of Engineers Hydrology, Hydraulics, and Coastal Community of Practice (HH&C CoP), Kathleen.D.White@usace.army.mil

USACE Engineer Research and Development Center
Cold Regions Research and Engineering Laboratory

River ice jams pose a threat to public safety, infrastructure, and the environment due to flooding, ice impacts, and secondary impacts such as scour and resuspension of contaminated sediments. The Cold Regions Research and Engineering Laboratory (CRREL) of the US Army Corps of Engineers (USACE) Engineer Research and Development Center has provided capability in this area through its technical staff and with the aid of specialized facilities in the Ice Engineering Research Facility (http://www.crrel.usace.army.mil/facilitieslabstestsites/ierf.html). CRREL has also contributed to numerical modeling capabilities for river ice hydraulics such as the widely-used HEC-RAS (http://www.hec.usace.army.mil/software/hec-ras/hecras-hecras.html) and through development of specialized models such as the Discrete Element Model (http://www.crrel.usace.army.mil/sid/hopkins_files/Riverice/river_ice.htm). Technology transfer has also been actively fostered by the Ice Jam Clearinghouse (http://www.crrel.usace.army.mil/icejams/), which is supported by the USACE Civil Emergency Management Branch, and through active publication by the CRREL Ice Engineering Group (http://www.crrel.usace.army.mil/techpub/CRREL_Reports/html_files/Cat_D.html, . http://144.3.144.33/tectran/ieieb.htm).

Design and operation of ice jam mitigation measures has depended on some degree of predictability in ice conditions. For example, methods and design approached to mitigate freezeup ice jams are often quite different than for breakup ice jams.

Plattsburgh, NY, 1996 Flash Flood Ice Jam

CRREL Ice Jam Database

Plattsburgh, NY, 1996 Flash Flood Ice Jam

The CRREL Ice Jam Database (http://www.crrel.usace.army.mil/ierd/ijdb/) was begun in 1990 to assist in emergency response to ice jams and to serve as a compilation of data supporting long-term or structural ice jam mitigation measures. For many years, the database supported the design and construction of such ice control measures as the Hardwick and Cazenovia Creek Ice Control Structures (http://www.crrel.usace.army.mil/techpub/CRREL_Reports/reports/TR06-7.pdf, https://webcam.crrel.usace.army.mil/hardwick/).

However, observed changes in the formation mechanisms and timing of ice events in data collected for the database over the course of the past several years suggest that risk and uncertainty associated with ice jam response and mitigation are increasing, rather than decreasing as knowledge is gained.

These uncertainties are arising at a time when fewer trained specialists are available. For example, in 1990, CRREL had twenty staff either active in river ice response and mitigation, or with enough experience to support these activities. By the end of 2005, eight active staffers remained; the others had either retired or moved on to other research areas. Of the eight active staffers, only one is entirely funded by river ice research. The same loss of capability has been seen in the Corps of Engineers Districts and Divisions as retirements change the face of these organizations.

IERF's Test Basin. The Test Basin's capability to rapidly grow ice allows multiple test iterations for our customers' projects each week.

Recognizing the role of government in protecting public safety and infrastructure, particularly in technically complex areas such as river ice hydraulics, the HH&C CoP has recently begun taking steps to form an Ice Engineering Core Cadre. The

Montpelier, VT, 1992 Flash Flood Ice Jam

Tunbridge, VT, 1999 Flash Flood Ice Jam

Cadre will gather together CRREL and District engineers and scientists to begin formal capability building, knowledge transfer, and succession planning so that our capacity to respond to ice events is not diminished further by retirements and staff redirection. We are currently identifying District staff with ice engineering experience or a need to improve their experience level. We will be providing training sessions in Ice Jam Emergency Response and Ice Jam Planning and Design at the Corps-wide Infrastructure Systems Conference in June. We are also planning capacity building through active incorporation of District personnel in CRREL projects, especially numerical modeling.

We will also be looking to expand and formalize the relationships that have developed over the years between USACE staff and members of other government agencies through their joint participation in ice jam emergency response. For example, CRREL has provided training to National Weather Service staffers via its COMET courses since the late 1990's. Numerous training activities have involved Federal, state, and local agencies, such as the recent 2006 Montana Hydrology Conference sponsored by the National Weather Service.

The HH&C CoP would like to engage the Subcommittee on Hydrology as it begins to expand the Ice Engineering Core Cadre. Your feedback and ideas are welcome.

Montpelier, VT, 1993 Flash Flood Ice Jam

FEMA and NOAA Agree to Partner on Flood Forecast Inundation Mapping

A team comprised of representatives from the Federal Emergency Management Agency (FEMA) and the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) met on October 31, 2006 to discuss current mapping efforts and opportunities to collaborate on flood forecast inundation mapping and the conveyance of flood risk.

Based on user input, the NWS is developing inundation maps showing the potential area covered by flood waters along with the estimated depth of flooding in the vicinity of its forecast points. The NWS plans to provide images and geospatial data to allow users to visualize and quantify the impact of flooding based on selected river levels. This information, combined with river observations and forecasts will allow emergency managers and other decision makers to better plan for and respond to flooding. Both agencies agreed that the development of map inundation libraries at NWS service locations will enhance the communication of flood risk.

The NWS recently worked with the State of North Carolina, FEMA, and the U.S. Geological Survey (USGS) to develop map inundation libraries in North Carolina. Additionally, FEMA and the NWS recently partnered to develop inundation maps for a forecast location on Indian Creek in Overland Park, Kansas. FEMA, after developing an understanding of the NWS mapping proposal, expressed a desire to assist the NWS on its most recent demonstration in the Gulf Coast where the NWS is planning to develop inundation libraries for 30-35 additional river forecast locations. Potential FEMA support for this project includes facilitating coordination with FEMA Regional Offices to access to existing FIS data.

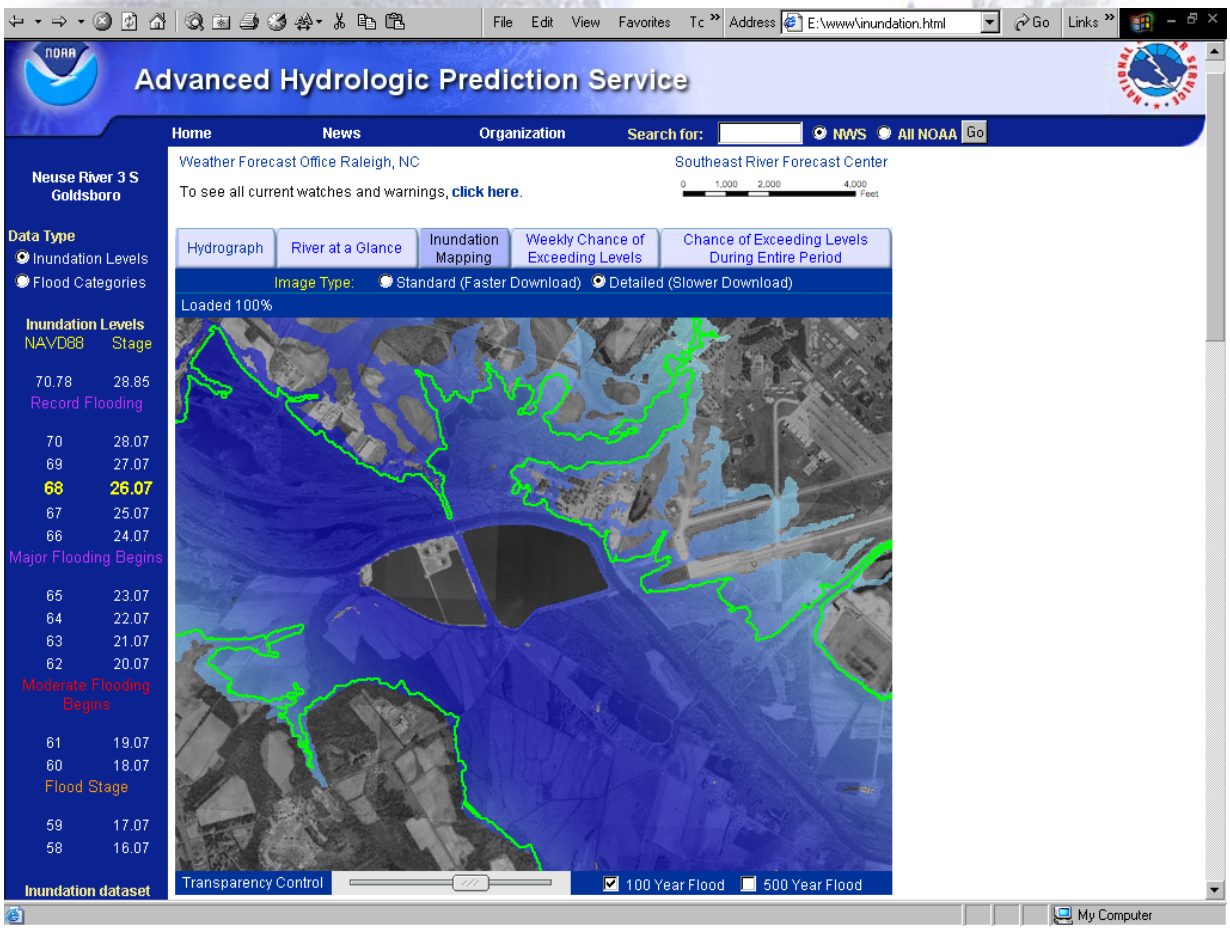
The data and modeling necessary to develop these inundation graphics were discussed. The data analysis and modeling process to update the hydrologic analysis and hydraulic analysis for DFIRMs (Digital Flood Insurance Rate Maps) and the NWS flood inundation maps described overlaps significantly. However, the percentage of the streams where the hydrologic and hydraulic analysis is being updated during FEMA's Map Moderization is relatively low. For Flood Insurance Studies (FIS) where the hydrology and hydraulics is updated, assembling the data and setting up the model comprises the majority of the cost and work associated with the project. FEMA and the NWS discussed how they could leverage each others ongoing activities to develop and provide access to this information which benefits emergency managers, at minimum cost to taxpayers. Preliminary estimates indicate that for a small additional increase (possibly as low as 1-2%) in cost, the NWS map libraries can be developed along with the flood insurance studies.

The NWS is developing guidelines for the development of map libraries which are consistent with the FEMA guidelines for FIS and would like to have the FEMA FIS

guidelines reference or incorporate the NWS guidelines. Standardizing the way flood inundation geospatial data is produced will result in better utilization for planners and responders using different computer software. The NWS proposes no changes to existing FEMA FIS procedures or products. NWS personnel stated that map inundation libraries are only needed at NWS forecast points, and expressed a desire to have NOAA personnel participate in CTP (Cooperating Technical Partner) kick-off meetings to enumerate the benefits of generating map inundation libraries.

NWS personnel also stated that the NOAA/NWS infrastructure could be used to provide enhanced access to integrated FEMA & NOAA Flood Maps and expanded outreach and user education on the National Flood Insurance Program.

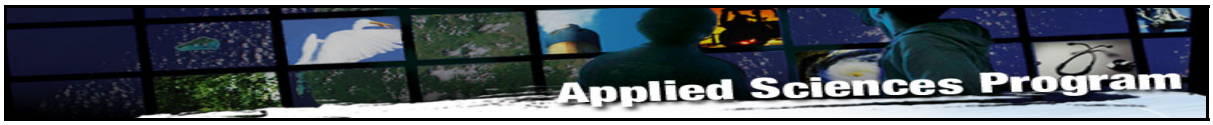
The NWS contact for this project is Tom Graziano. Tom can be reached at (301) 713- 0006 x158 or by email at thomas.graziano@noaa.gov. The new FEMA contact for this project is to be designated.



Prototype NOAA/NWS Flood Inundation graphic developed in coordination with the North Carolina Floodplain Mapping Office, USGS, and FEMA. The graphic depicts the expected the inundation area in blue for a local river stage of 26 feet on the Neuse River at Goldsboro, NC. The green line depicts the extent of the FEMA 100 year floodplain.

NASA Research Announcement:

Using Earth Science Products in Water Management

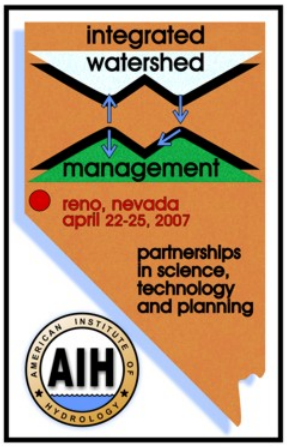


The NASA Applied Sciences Program seeks proposals in the 'ROSES-2007' solicitation to integrate NASA Earth science research results into decision support systems serving applications of national priority and to document improvements in the performance of the decision support systems. The overall objective of these projects is the sustained use of NASA Earth science observations, model products, and other research results by operational organizations in their decision-making activities to benefit the nation and society. The Program encourages project proposals to include teams of organizations spanning organizational sectors (e.g., academia, private, Federal, public, nonprofit, etc.) and expertise (e.g., technical, management, scientific, etc.). Funding for the projects begins in Federal Fiscal Year 2008. Information about the Applied Sciences Program is available at: http://science.hq.nasa.gov/earth-sun/applications.

The opportunity provides funds for organizations to assess and integrate NASA Earth science data into national/regional decision support systems that the organizations (and the users they support) employ in their decision making processes. The proposals are due May 25th. The solicitation asks for Notices of Intent (NOI) by March 15th--NOIs are optional, especially given the timing. We expect to fund about 20 projects, and each project is approx. $240K-320K per year for three years. The Water Management Program is one of twelve national application areas. The Water Management program has organized its activities around four themes: Water Quality, Water Delivery and Irrigation, Drought, and Flow and Flood Forecasting (http://wmp.gsfc.nasa.gov). See the announcement for specific featured and discouraged areas.

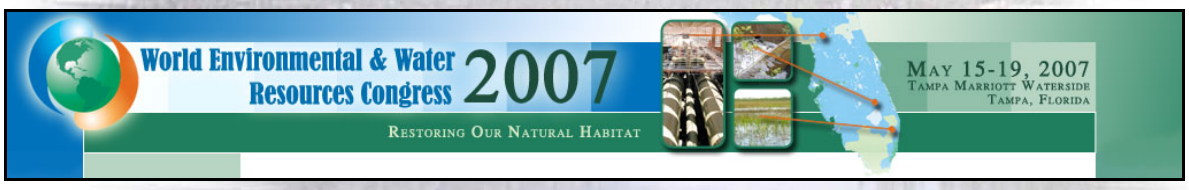
Upcoming Conferences:

2007 American Institute of Hydrology Annual Meeting



The American Institute of Hydrology (AIH) will hold its annual meeting April 22-25, 2007 at John Ascuaga's Nugget Hotel and Casino in Reno, Nevada. The theme of the meeting will be *Integrated Watershed Management: Partnerships in Science, Technology and Planning.* Presentation topics will include Hydrologic Effects Associated with Climate Change, Cooperative Conservation Efforts, Adaptive Management, Groundwater and Stream Interactions Lakes and Reservoirs, Emerging Contaminants as well as discussions of issues in the San Francisco Bay – Delta Program, Carbonate Aquifer Systems in Nevada and Utah and Hydrologic Issues in the Klamath Basin. Additional information can be found at: http://www.aihydro.org

2007 American Society of Civil Engineers World Water Congress



The American Society of Civil Engineers (ASCE) will hold its annual World Environmental and Water Resources Congress from May 15-19, 2007 at the Marriott Waterside Hotel and Marina in Tampa, Florida. The theme of the congress is *Restoring our Natural Habitat*. A number of sessions will focus on national issues like stream restoration, dam removal, green infrastructure and delta restoration as well as local issues like water resources recovery strategies in Florida and Everglades restoration. Additionally, general topical areas like surface water, ground water, environmental processes, irrigation and drainage, water quality, hydraulics, stochastic hydrology and watershed management will be addressed in technical sessions and tracks.

Specific information on the program, accommodations and registration is available at: http://www.asce.org/conferences/ewri2007

Conference and Exposition of the National Hydrologic Warning Council

The Seventh Conference and Exposition of the National Hydrologic Warning Council will be held June 11-14, 2007 at the Hyatt Regency in Savannah, Georgia. The conference is the largest in the United States devoted specifically to real-time hydrologic warning systems, and how this technology assists local officials with storm readiness, emergency response, and disaster recovery. The theme for the conference is *"Building Bridges to Hydrologic Warning Partnerships"*. The event will feature plenary sessions, in-depth workshops, and multi-track concurrent sessions over the four day period. The latest information on registration and conference details can be found at: www.alertsystems.org.

Technical Exhibition and Conference of the Water Environment Federation

The Water Environment Federation will hold its 80th Annual Technical Exhibition and Conference at the San Diego Convention Center October 13-17, 2007. Water quality related topics such as coastal issues, collection systems, contaminants, disaster planning, facility operations and industrial issues will be discussed. Additional information on the conference can be found at: http://www.weftec.org/home.htm

31st Annual Conference of the Association of State Flood Plain Managers

The 31st Annual Conference of the Association of State Flood Plain Managers will be held June 3-8, 2007 at the Waterside Convention Connection in Norfolk, VA. The conference will include technical sessions, workshops, technical field tours, products and services exposition, and networking opportunities. The conference theme, "Charting the Course: New Perspectives in Floodplain Management", will challenge participants to track progress, make critical decisions, and identify resources to accomplish sustainable flood mitigation and community goals. Additional information can be found at:

www.floods.org/norfolk

Jointly held ECOR-4 and EC-DNAPL-2 in Amsterdam, The Netherlands

The Second European Conference on Dense Nonaqueous Phase Liquids and the Fourth European Conference on Oxidation and Reduction Technologies for in situ Soil and Groundwater will be held on October 16th and 17th at the Mercure Hotel Amsterdam, the Netherlands.

Major topics include:

- Site Characterization (DNAPL, LNAPL and Other Organic Contaminants)
- Injection Equipment and Application Systems
- Technology Screening and Testing
- Modeling, Risk Assessment and Fractured Bedrock Consideration
- Monitoring and Performance Evaluation
- Economics of Oxidation and Reduction Technologies
- Regulatory Issues

The deadline for abstracts is April 27, 2007 and early registration is due by Friday, June 29, 2007.

Conference information can be found at:
http://www.redoxtech.com/

9th International Conference on Fluid Control, Measurements and Visualization

The 9th International Conference on Fluid Control, Measurements and Visualization (FLUCOME) will be held at Florida State University in Tallahasse, September 16-19, 2007. Primary theme areas for the conference include Flood Control, Fluid Measurement and Visualization and Computational Fluid Dynamics.

More detailed information on the conference can be found at:
http://www.eng.fsu.edu/flucome9/index.php

Dam Safety 07 Conference

Association of State Dam Safety Officials

The Association of State Dam Safety Officials (ASDSO) will sponsor the Dam Safety 07 Conference in Austin, TX, September 9-13, 2007 at the Hilton Austin Hotel. The conference will cover a wide variety of aspects of Dam Safety Engineering. Additional information on this and other ASDSO conferences can be found at the ASDSO website:

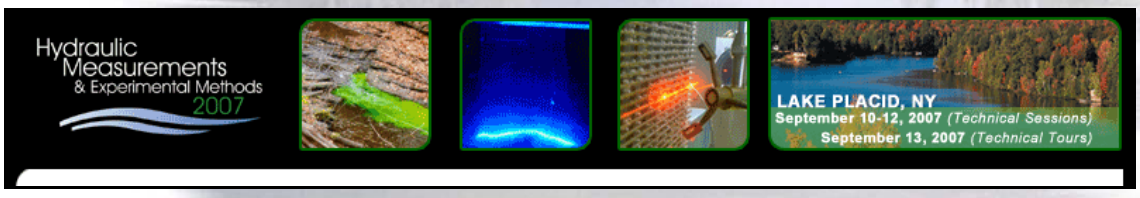
http://www.damsafety.org/

International Conference on Water Resources Management

The International Association of Science and Technology for Development (IASTED) is hosting its second International Conference on Water Resources Management August 20-22, 2007 in Honolulu, Hawaii. Major theme areas of the conference will include Water Supply and Sustainable Use, Wasterwater and Stormwater Management, Integrated Watershed Management, Pollution Prevention and Reduction in Industry and Issues in Implementing Environmentally Sound Technologies.

Papers need to be submitted by April 1, 2007. Instructions for submitting papers and other information about the conference can be found at: http://www.iasted.org/conferences/home-578.html.

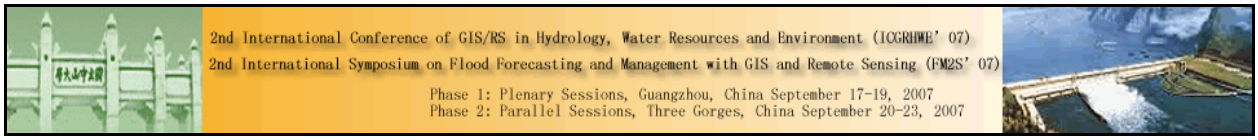
Third Conference on Hydraulic Measurements and Experimental Methods



The American Society of Civil Engineers and the International Association of Hydraulic Engineering and Research are jointly sponsoring the Third Conference on Hydraulic Measurements and Experimental Methods September 10-13 in Lake Placid, New York. Major topical areas include Advances in Measurement Technology, Measurements for Fundamentals of Flow Processes, Measurements of BioGeoPhysical Integrated Parameters, Experimental Methods and Data Analyses and Commercial Measurement Equipment.

Additional information on the conference can be found at the website: http://content.asce.org/conferences/HMEM07/abstract.html

2nd International Conference of GIS/RS in Hydrology, Water Resources and Environment and the 2nd International Symposium on Flood Forecasting and Management with GIS and Remote Sensing



The 2nd International Conference of GIS/RS in Hydrology, Water Resources and Environment and the 2nd International Symposium on Flood Forecasting and Management with GIS and Remote Sensing will be held in Guangzhou and Three Gorges, China, September 17-23, 2007. The deadline for submitting abstracts is March 31, 2007.

The conference topics include Hydrology, Water Resources, Environmental Issues, GIS and Remote Sensing. Three workshops on Precipitation Estimation and Forecasting, New Generation Flood Forecasting Methods; and Monitoring, Prediction and Mitigation of Water-Related Disasters will also be held during the conference.

More information is available at the conference website: http://www.hydroinfor.sysu.edu.cn.

Editor's Corner:

Thank you to those who provided news & information for this issue of the newsletter, your efforts are greatly appreciated.

To submit articles for future issues, please contact:

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