Focusing on Integration of Flood Risk Management with Environmental Restoration

As you know, we have been involved in several major flood fights and the Corps is bringing its special expertise, professionalism, and compassion to assist our fellow citizens throughout the entire Mississippi River Valley. Our thoughts and prayers go out to the people who have suffered both loss of life and property in the valley, and our number one response priority is public safety.

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This flooding is more intense, although of shorter duration (so far!) than the 1993 flood, and is the flood of record in many communities. Early indications have been that all Federal levees that overtopped far exceeded their design conditions and provided adequate time for public evacuation.

We have over 12,000 miles of levees in the Federal inventory, but there are many, many thousands more in local and private ownership – of unknown quantity and condition. Many of these levees were originally constructed to protect agricultural assets but subsequent unrestricted community and business development has significantly changed the risk and consequences in "protected" areas.

In many peoples' eyes, we've become the face of levees for this event and we are thus challenged to ensure the public and media understand our limited authorities and roles with regard to levees. The majority of the levees above St. Louis are not in the federal program, but when people see us flood fighting side-by-side with local, state and federal responders, they draw the conclusion that these are our levees.

Our planning and response teams are supporting FEMA with debris removal, provision of emergency drinking water, commodities, temporary housing, and emergency power teams. More missions are being assigned as needs are identified and we expect to be engaged for some time.

Lastly, we are emphasizing the risks associated with living and working behind levees and the shared responsibility among federal, state, local agencies and private

landowners; and we are working with all these parties to educate them on how they can participate in buying down their total flood risk, of which levees may or may not be a component. Zoning laws, building codes, insurance, and evacuation plans are other important elements of prudent flood risk management.

We have a great amount of information on our web at www.usace.army.mil that you may find useful. We have magnificent and selfless public servants working very long hours, and the Chief and I are enormously proud of them. Thanks for your continued support!

Most Respectfully, Major General Don T. Riley
Deputy Commander for Civil and Emergency Operations

The National Flood Risk Management Program

Peter Rabbon, IWR-HEC

In May 2006, the U.S. Army Corps of Engineers (USACE) established the National Flood Risk Management Program for the purpose of integrating and synchronizing USACE flood risk management programs and activities, both internally and with counterpart activities of the Department of Homeland Security, Federal Emergency Management Agency (FEMA), other Federal agencies, state organizations and regional and local agencies.

Flood risk management in the United States is a shared responsibility across the Federal, state and local levels of government as well as the private sector. At the Federal level, agencies such as the USACE and FEMA have programs to assist states and communities in reducing flood damages and promoting sound flood risk management. However, the authority to determine how land is used in floodplains and to enforce flood-wise building code requirements lies entirely in the hands of state and local governments. In the absence of continuous collaboration, multiple layers of government can work at cross purposes through conflicting policies, programs and interests, thus undermining efforts to improve flood risk management nationwide.

Some specific goals of the National Flood Risk Management Program are:

- Providing current and accurate floodplain information to the public and decision makers,
- Identifying and assessing flood hazards posed by aging flood damage reduction infrastructure,
- Improving public awareness and comprehension of flood risk,
- Integrating flood damage and flood hazard reduction programs across local, state, and Federal agencies, and
- Improving capabilities to collaboratively deliver and sustain flood damage reduction and flood hazard mitigation services to the Nation.

The long-term objective of USACE is to work through the National Flood Risk Management Program with other Federal agencies, state and local governments and agencies, and the private sector to develop a national flood risk management strategy that eliminates conflicts between different flood risk management programs and takes advantage of all opportunities for collaboration. For more information about the National

Flood Risk Management Program go to http://www.iwr.usace.army.mil/nfrmp/ or contact Pete Rabbon at 530-756-1104 or 202-761-4669, or Laura Zepp at 703-428-7760.

The Role of Coastal Restoration in Storm Surge Mitigation

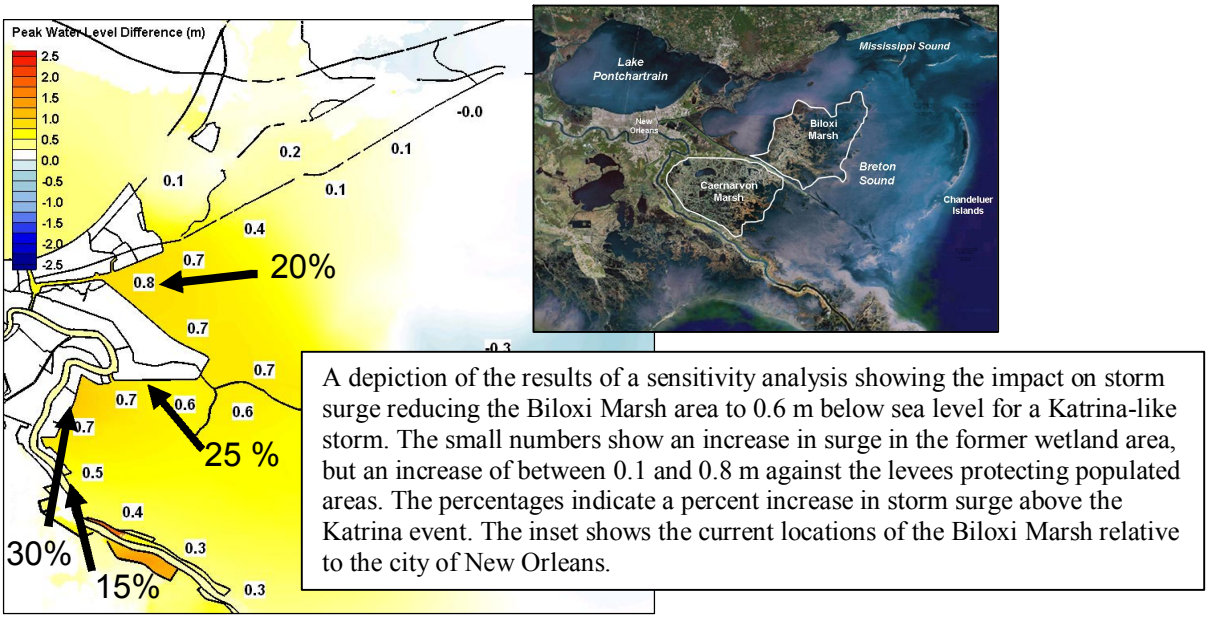
Ty Wamsley, Barb Kleiss and Jane Smith, ERDC

Hurricanes can generate extreme storm surge and wave conditions resulting in coastal flooding that can affect from tens to several hundred miles of coastline. The magnitude of surge and wave energy and extent of severe conditions depend greatly upon the size of the storm, its intensity, how those parameters evolve as the storm approaches landfall, and the shelf and local bathymetry/topography. Hurricane Katrina, a large storm in terms of spatial extent and its intensity, produced devastating surge and wave conditions for the entire east facing levee system of southeast Louisiana and the entire coast of Mississippi, a coastline of nearly 200 miles in length.

It is generally acknowledged that coastal features, such as wetlands, coastal ridges, barrier islands, dunes, reefs and coastal floodplain complexes can reduce surge and waves. These natural features can provide two related, but different functions. First of all, coastal features can absorb some of the energy of the surge and waves diminishing water levels before they reach populated areas. Secondly, coastal features can be placed in locations which will absorb energy and help protect and minimize erosion of or damage to other parts of flood protection systems such as levees. Because these natural features also provide ecological benefits, they are attractive components of an overall storm flood mitigation system. However, little is known regarding the necessary scales and arrangements of these natural features to maximize surge and wave reduction benefits. It is also clear that some of the existing "rules of thumb" which relate "miles of wetland to reduction of storm surge in feet" are gross oversimplifications of a complex situation and cannot be used in storm and flood damage reduction planning.

In order to address the role of some of these coastal features, the U.S. Army Engineer Research and Development Center (ERDC) has assembled a team composed of academic researchers, government researchers, and representatives from consulting. The team has obtained support from the Louisiana Coastal Area Science and Technology Office, the System-Wide Water Resources Program (SWWRP), and the storm and coastal protection studies performed by the Mobile and New Orleans Districts. Preliminary work is focused on two areas: 1) broad scale sensitivity analyses designed to determine if currently planned coastal restorations plans and scenarios, which address the loss of existing wetland resources, result in significant differences in storm surge heights and the wave environment; and 2) the closer examination of the relationships between coastal feature characteristics and their influence on surge height.

Preliminary results of the sensitivity analyses provided information indicating that the current configuration of wetlands in the south Louisiana coastal area can play a significant role in the protection of the coastal area. Restoration of large, contiguous areas is likely to provide maximum benefits, and the maintenance of existing wetland resources is critical. Although these results are promising, the continued development of this work is critical.

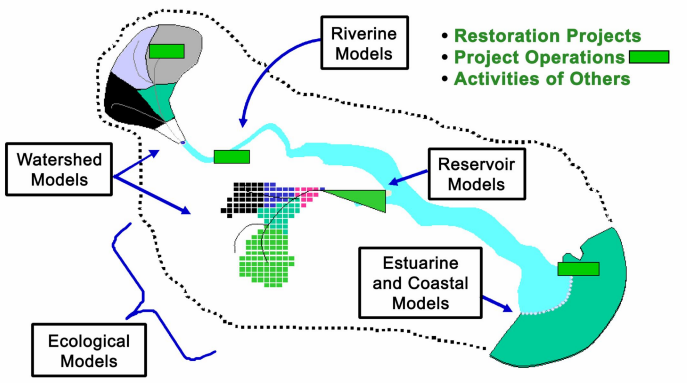


A depiction of the results of a sensitivity analysis showing the impact on storm surge reducing the Biloxi Marsh area to 0.6 m below sea level for a Katrina-like storm. The small numbers show an increase in surge in the former wetland area, but an increase of between 0.1 and 0.8 m against the levees protecting populated areas. The percentages indicate a percent increase in storm surge above the Katrina event. The inset shows the current locations of the Biloxi Marsh relative to the city of New Orleans.

For more information, contact Ty Wamsley, Ty.V.Wamsley@usace.army.mil.

SWWRP Tools Contribute to Nation's Ecosystem Restoration
Steve Ashby, ERDC-EL

The System-Wide Water Resources Program (SWWRP) provides the Corps, its partners, and stakeholders a technological framework for analytical tools to restore and manage the Nation's water resources. Program products are designed to apply current and improved technologies to multi-disciplinary system-wide assessments rather than only to individual project-level analyses. Geospatial technologies, measurement and monitoring methods, and selected numerical and index models are being connected, with user-friendly Web access. Some of these technologies are described below.



Tools to assess impacts of wetland restoration and degradation on storm surge and wave energy include a coupling of the ADvanced CIRCulation model (ADCIRC) and the STeady-state spectral WAVE model (STWAVE). ADCIRC models wind-, tide-, and wave-forced circulation and water levels. STWAVE models wave energy generation and propagation. The ADCIRC-STWAVE system is also being used to evaluate barrier island restoration and impacts of sea level rise.

Another SWWRP tool, Cascade, is being used to look at environmental and ecological considerations in the restoration of coastal barrier islands. Cascade is a sediment transport and coastal change numerical model that simulates shoreline change relative to regional morphologic constraints. Cascade acquires its name from its ability to

model different time and space scales that cascade from long to short and from large to small over which long-term calculations of coastal morphology change occur.

HEC-RAS (Hydrologic Engineering Center-River Analysis System) is an integrated system of software for one-dimensional calculations. HEC-RAS can be coupled with a two-dimensional model, such as Adaptive Hydrology/Hydraulics (ADH), to provide more accurate modeling. ADH can be used with one-, two-, or three-dimensional flow and transport to simulate groundwater flow, internal flow, and open channel flow. Thus ADH can refine the quality of a broad mesh to provide more accurate hydrodynamics and transport.

GSSHA, Gridded Surface Subsurface Hydrologic Analysis, can be used in watershed analysis and management. GSSHA has the ability to simulate the movement of water, sediment, nitrogen, and phosphorus across watersheds. It is capable of simulating streamflow generated by excess runoff, saturated source areas, exfiltration, and groundwater discharge to streams. It is also capable of simulating soil moistures and groundwater levels at the grid scale as well as wetland hydraulics, storm drainage networks in urban areas, and tile drainage networks in agricultural areas.

The Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) tool has a long history of use in the development and evaluation of flood damage reduction alternatives. Capabilities for surface erosion, channel sediment transport, and water quality simulation are now being added. These new capabilities share methodologies with other SWWRP tools and allow interconnected use, even for large watersheds. The HEC-HMS tool can be easily applied in medium to large watersheds and produce excellent results, and can provide boundary conditions to tools such as GSSHA and ADH and to channel tools such as HEC-RAS.

In summary, SWWRP offers and continues to develop a suite of enterprise tools within a hierarchical approach to assure the right tool or combination of tools can be applied to the issues and concerns being addressed. These tools and methods are being assembled for watershed, river, reservoir, estuarine, coastal or combined system-wide analyses to forecast physical, chemical, and biological responses to water management activities. For more information visit The Water Resources Depot at https://swwrp.usace.army.mil, or contact the SWWRP Program Manager at Steven.L.Ashby@erdc.usace.army.mil .

Watershed Analysis Tool (HEC-WAT)

Chris Dunn, IWR-HEC

The Watershed Analysis Tool (HEC-WAT) is new software developed by the Hydrologic Engineering Center (HEC). Funding for the development of HEC-WAT was provided through the System-Wide Water Resources Program and the Flood and Coastal Storm Damage Reduction Research and Development Program. This development process began in earnest during FY2004 and the Beta Version of the WAT was released in the second quarter of FY2008. The WAT was developed to help the Corps (USACE) and its study partners conduct watershed and water resources management studies. HEC-WAT modeling teams will benefit because they will develop their models in a closely coordinated manner, track progress of other models, and automatically retrieve results from previous model runs, thus assuring more efficient and coordinated results. The

management team will benefit by using a common interface to track project status through each modeling component and being able to easily display results during public and project status meetings.

The WAT streamlines and integrates the analytical process using software commonly applied by multi-disciplinary teams (HEC-HMS, HEC-RAS, HEC-ResSim, and HEC-FIA, etc.). The integration of the software is accomplished through the use of a concept called a "plug-in." The "plug-in" concept allows the WAT to know little about individual software, but provides an analysis framework for the software. A "plug-in" can provide the ability to access and edit software parameters, and view results available from the software through the WAT framework. In other cases where the integration with software is not as tight, the "plug-in" only provides the viewing of results, with the changing of software parameters being done outside of the WAT.

A common, central framework is provided through the WAT. From the framework, GIS-based layers can be loaded such as shapefiles and DEMs; stream networks and schematics can be established; locations (common computation points) can be identified where models would share information; existing models are imported; and new models are developed. The WAT framework meets the following objectives: organize and develop alternatives; access applications directly; and, view and compare alternative results. In future versions, the WAT will be able to facilitate the entry of the data necessary for Risk and Uncertainty (R&U) computations; and, facilitate National Economic Development (NED) plan selection.

The Beta release is available to Corps users from our Web site www.hec.usace.army.mil/software/hec-wat; non-Corps, users please contact Penni Baker to receive download information. This is the first release of the software and is available for your use, review, and comment. HEC has tested the HEC-WAT, but it is a new piece of software with new concepts. HEC would like suggestions, comments, and reports on bugs regarding WAT, and these should be sent to hec.wat@usace.army.mil. Specifically, we would like comments and suggestions on the usability of HEC-WAT, and also, would like suggestions on what kind of output other than the individual model output, the user would like to see from the HEC-WAT. For the Beta version most of the supporting software has been included for testing of the HEC-WAT concepts, however this software should not be considered final products. Once the Beta release has been tested, and updates have been made to the WAT, the release of Version 1.0 is scheduled for the end of FY 2008. For further information regarding HEC-WAT, contact Christopher Dunn (christopher.n.dunn@usace.army.mil) or Penni Baker (penni.r.baker@usace.army.mil) at 530-756-1104.

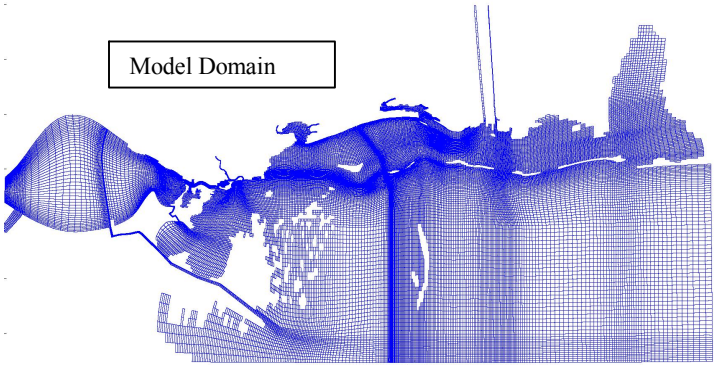
Evaluating Impacts of Freshwater Diversions

Mark S. Dortch, ERDC-EL

Numerical, three-dimensional (3-D), hydrodynamic and water quality models were applied to the Mississippi Sound and neighboring waters to evaluate the impacts of various freshwater diversion alternatives. The study was conducted by the U.S. Army Engineer Research and Development Center for the U.S. Army Engineer District, Mobile, in support of the District's Mississippi Coastal Improvements Program (MsCIP). MsCIP was authorized by Congress in response to damages along the Mississippi Coast

during Hurricane Katrina. It was to include analysis and design for comprehensive improvements in the interests of (1) hurricane storm damage reduction, (2) prevention of saltwater intrusion, (3) preservation of fish and wildlife, (4) prevention of erosion, and (5) other related water resource purposes. Several measures are under consideration for restoring resources along the coast including construction of dunes, seawalls, and levees onshore; development of surge mitigation measures; wetland and ecosystem restoration; barrier island and beach restoration; and freshwater diversion. The model study focused only on freshwater diversions.

The CH3D-Sigma (sigma level vertical coordinates) model code was the hydrodynamic model that was used to provide transport fluxes for the CE-QUAL-ICM water quality model. The model domain included Mobile Bay, the Mississippi coastal bays, Lakes Pontchartrain and Borgne, Biloxi Marsh, and part of Breton Sound. The 3-D model had five sigma coordinate vertical layers. The model included 15 water quality variables including temperature, salinity, inorganic and total suspended solids, dissolved oxygen, dissolved and particulate organic carbon, various forms of inorganic and organic nitrogen and phosphorus, phytoplankton biomass, chlorophyll a, and underwater light extinction.



The model was calibrated for the period April through September 1998. Three diversions were simulated, diversion of freshwater flow from the Mississippi River at Bonnet Carre′ spillway and into Lake Borgne near Violet, LA, and diversion of all of the Escatawpa River flow into Grand Bay. Summer average salinity was decreased along the western portions of Mississippi Sound by as much as 11 parts per thousand for the Bonnet Carre′ diversion. For the Violet diversion, summer average salinity reductions were as great as 6 to 8 parts per thousand in western Mississippi Sound. The Escatawpa River diversion had little effect on Mississippi Sound. The Mississippi River diversions will also result in higher concentrations of nutrients, TSS, phytoplankton, and TOC, and greater light extinction, thus, less light reaching the bottom. For more information contact Mark.S.Dortch@usace.army.mil .

Kansas City District Integrating Watershed Management and Urban Ecosystem Restoration

Brian Rast, Kansas City District

Two studies in Kansas City will benefit from the Corps' multipurpose emphasis and systems approach. The Upper Turkey Creek project and the Brush Creek Basin project are both facing complex circumstances with many stakeholders. The projects are using the watershed approach to back proposed "nexus projects." (The term was coined at a 2007 floodplain managers conference to reference the significant nexus between the programs at the Corps and at FEMA.) These nexus projects are defined by the high level

of integration uniting local, state, and Federal initiatives and recommendations for future water quantity and quality management goals of the watersheds. The projects are providing forward-looking, collaborative planning efforts to assemble multipurpose alternatives along several reaches of urban streams, rather than only flood risk management. Separable Costs-Remaining Benefits (SCRB) are an important part of the Corps' evaluation. Planning goals include combining results of recent Federal Emergency Management (FEMA) re-mappings, integrating support from the Environmental Protection Agency's (EPA's) green infrastructure and local BMPs, involving Kansas City's efforts to satisfy CSO and non-point source pollution requirements, addressing recommendations from U.S> Geological (USGS) studies on loss of riparian corridors and tree cover, constructing wetland areas that overlap with local Best Management Practices (BMPs), and including bike trails. The studies will reduce redundant efforts and leverage funds, applying grants from Watershed Restoration and Protection Strategy (WRAPS) and being mindful of national urban tree cover funding initiatives. The projects are examples of how a watershed approach in an urban setting can assimilate a watershed management plan and show the significance of an urban ecosystem restoration when recovering streamway setbacks and re-establishing suburban wetland areas. Contact Brian Rast, Brian.T.Rast@usace.army.mil, for more information.

Vegetation on Levees – Update – The Revision of Engineer Manuel (EM) 1110-2-301

Kevin S. Holden, Rock Island District

As a result of heightened attention to levee conditions following Hurricane Katrina, Congress funded the U.S. Army Corps of Engineers (USACE) to initiate an inventory and assessment of levees for which USACE has inspection responsibility. The initial nationwide inventory showed that policies and standards for operation and maintenance were not being applied and enforced consistently, especially as pertaining to vegetation: current standards prohibit vegetation (except grasses) on, or within 15 feet of, levees and their critical appurtenances. As USACE began to tighten enforcement, some levee owners began asking the Corps to relax the vegetation standards to make them more consistent with existing conditions, suggesting that the standards are needlessly restrictive and lack scientific basis.

USACE vegetation standards are meant to address two reliability concerns: (1) obstruction, and (2) direct impacts. First, obstruction is undesirable: the intent of vegetation standards is to provide unrestricted access for maintenance, inspection, flood fighting and associated monitoring. Some levee owners suggest that unrestricted access is not necessary and some restriction should be acceptable. However, for USACE, public safety is paramount, and some restriction of access equates to some detriment to system reliability. This need for access – both physical and visual – is an above-ground issue and is fairly clear. Second, direct impacts are primarily root-related and include piping, seepage, embankment destabilization, and critical loss of embankment due to tree overturning during flood events. Other than potential detriment to the grasses that provide erosion protection, direct impacts are a below-ground issue that is anything but clear, due to the complexity of multiple variables whose combinations are unique to each project

location. These variables include plant species, soils, climate, moisture, and potential weather conditions during flood events.

Some levee owners suggest that USACE should allow trees on levees because they are environmentally and aesthetically beneficial and are costly to remove. Further, some cite plant science to assert that vegetation is actually beneficial to levee stability. The USACE understanding of the threat posed by vegetation is based on engineering principles and on practical experience, and is supported by plant science; but that science includes very little in the way of research specific to levee environments. Some levee owners believe this lack of levee-specific research casts doubt on the rationale behind the vegetation standards.

In 2007, USACE initiated a two-phase review of its vegetation standards. Phase I has two objectives (1) revise EM 1110-2-301 to eliminate ambiguities and improve the clarity of the current standard and (2) identify areas of weakness in our scientific knowledge of vegetation/soil dynamics and draft a responsive research proposal. Phase I is substantially complete and, later this year, following independent peer review, the revised EM will be released to the public as ETL 1110-2-571 *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*. Proposed research is expected to proceed as funding becomes available. Phase II will consist of a three-year research program, the products of which will help to determine any need for revision to current vegetation standards. After all appropriate revisions, the ETL will be reissued as an EM.

Further research will improve our understanding but is unlikely to give cause to diminish current minimum standards, for two reasons. First, obstruction and the need for access is an Operations and Maintenance (O&M) concern, not likely to be diminished by improved understanding of vegetation/soil dynamics. Second, direct impact is a threat best reduced by maintaining distance between vegetation and infrastructure. The distance required under the current standard is based primarily on the above-ground need for access, not on a precise analysis of the potential for impacts related to root/soil dynamics; our present knowledge is not sufficient for such analysis. Perhaps more to the point, even with improved knowledge of root/soil dynamics such analysis may be too complex to be practical, given the number of variables. The current standard simply recognizes that the distance required between tree and structure provides a measure of protection from these impacts, which present knowledge and practical experience suggest is generally adequate.

Rapid Repair of Levee Breach Study

Don Ward, ERDC-CHL

One of the more daunting tasks within a Department of Homeland Security program to look at the Nation's levees is to develop a method of rapidly closing a breach in a levee while the water is still flowing through the breach (as opposed to closing the breach after the water levels have stabilized on both sides of the it). In addition to strong currents and water forces, the sides of the breach are continuously eroding, and the geotechnical strength of the levee can be compromised due to saturation.

A small, 1:50 (model:prototype) scale model was developed at the Coastal & Hydraulics Laboratory (CHL) to test initial design concepts. A cross-section of a typical

Sacramento River levee was built for the model with a breach cross-section developed from analyses of breaches in dams.


Looking upstream through the breach in the model levee section

The model levee was placed in an insert designed to fit in an existing flume at CHL. Some options considered included a net that could be draped across the breach and then clogged with material to gradually reduce the flow; large geotextile tubes (scaled 30-ft diameter tubes were tested in the model); a floating gated structure; and a standard barge that could be sunk to span the breach after which various options were tested to seal the space around the barge.

The 1:50 scale model will not allow the determination of a system that will work on a real breach. Rather, it has allowed the testing of multiple ideas quickly. Some ideas were eliminated, while others underwent design improvements. Also, by using commonly available materials such as sheets of plastic and duct tape to make the geotextile tubes, a mesh laundry bag for the net, and a spring-loaded fish scale to measure tensions on cables, all ideas were tested relatively inexpensively.

The best ideas from the 1:50-scale model will be tested in a 1:16-scale model at CHL. Forces and stresses in materials will be measured to see if they agree with calculations, and problems such as deployment and anchoring will be more fully addressed. The best idea (or two) will then be demonstrated at a large 1:4 scale. For more information, contact Donald.L.Ward@usace.army.mil.

Links of Interest?

A copy of the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementations Studies, dated March 10, 1983 is available at: http://www.usace.army.mil/cw/cecw-cp/library/Principles_Guidelines.pdf

A copy of the Water Resources Development Act of 2007 is available at: http://www.usace.army.mil/cw/cecw-cp/links/wrda2007_hr1495.pdf

Conferences

20-22 August 2008. Florida's Wildlife: On the Frontline of Climate Change. www.ces.fau.edu/floc

25 - 29 August 2008. 2nd International Disaster Reduction Conference – Davos, Switzerland. info@idrc.org http://www.phree-way.org/resources/community-events/international-disaster-reduction-conference

25 - 28 August 2008. National Association of Flood & Stormwater Management Agencies (NAFSMA) Annual Conference – Napa, CA. http://www.nfdaflood.com/events_activities.php

31 August - 5 September 2008**.** 31st International Conference on Coastal Engineering (ICCE 2008) - Hamburg, Germany. http://icce2008.hamburg.baw.de/

1 – 4 September 2008. 13th World Water Congress—Montpellier, France. wwc2008@msem.univ-montp2.fr - www.worldwatercongress2008.org

2 – 5 September 2008. 2008 Annual Conference Floodplain Management Association. San Diego, CA. http://www.floodplain.org/

7 - 11 September 2008. Dam Safety '08 - Indian Wells, CA. http://www.damsafety.org/conferences/?p=8a505588-202e-4463-8fac-9b31475217ac

15 – 18 September 2008. Wetlands and Global Climate Change - Portland, OR. http://www.aswm.org/

15-20 September 2008. Association of Environmental & Engineering Geologists' (AEG) 51st Annual Meeting. New Orleans, LA. www.aegweb.org

17 – 20 September 2008**.** Managing Water in a Climate Changing World: Implications for Irrigation, Drainage and Flood Control, A USCID Water Management Conference – Portland, OR - http://www.uscid.org/08gcc.html

21 – 24 September 2008. California Stormwater Quality Association (CASQA) Annual Conference. Oakland, CA. http://www.casqa.org/meetings/locations.php

30 September – 2 October 2008. European Conference on Flood Risk Management - Research into Practice, FloodRisk 2008, Oxford, UK. http://www.floodrisk2008.net/index.htm

11 – 15 October 2008. 4th National Conference on Coastal and Estuarine Habitat Restoration – Providence, RI. conference@estuaries.org http://www.estuaries.org/?id=4

15-17 October 2008. American Shore and Beach Preservation Association-Chicago, IL. http://www.asbpa.org/

19 – 22 October 2008. Coastal Zone Asia Pacific Association Conference – Qingdao, China. www.czapa.org/

5 November 2008 - Extreme Flooding 2008 – Emergency Planning and Flooding London, UK - bob.earll@coastms.co.uk

5 - 7 Nov 2008 – ICSE-4 Tokyo 2008: Fourth International Conference on Scour and Erosion, Tokyo, Japan. http://icse-4.kz.tsukuba.ac.jp/index-e.html

11-14 November 2008. Gulf Coast Hurricane Preparedness, Response, Recovery & Rebuilding Conference. Mobile, AL. http://www.pianc.iwr.usace.army.mil/

17-20 November 2008. American Water Resources Association's 44th Annual Water Resources Conference. New Orleans, LA.
http://www.awra.org/meetings/NewOrleans2008

17 – 20 November 2008. Coastal Cities Summit – St. Petersburg, FL.
http://www.coastalcities.org/

26 – 28 November 2008. 4th International Conference and Exhibition on Consequences of Climate Change and Flood Protection, Hamburg, Germany. http://www.acqua-alta.de/

25 - 27 November 2008. 21st Annual Emergency Preparedness Conference, Vancouver, British Columbia, Canada. www.jibc.ca/epconference

1-6 December 2008. International Conference on Water Scarcity, Global Changes, and Groundwater Management Responses. Irvine, CA.
http://www.uwrc.uci.edu/documents/SCARCE-WATER-BROCHURE-Final.pdf

2-6 December 2008. XV Panamerican Congress and I World Congress on Ocean and Coastal Engineering. Brasilia, Brazil. http://www.wec2008.org.br/

8 – 11 December 2008. Florida Bay and Adjacent Marine Systems Science Conference – Naples, FL. http://conference.ifas.ufl.edu/FloridaBay2008/

5-7 January 2009. "Thailand 2009: An International Perspective on Environmental and Water Resources Conference." Bangkok, Thailand at the AIT Conference Centre. Organized by the Environmental and Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE) and the Asian Institute of Technology (AIT).

18-21 May 2009. 8th Conference and Exposition of the National Hydrologic Warning Council. Vail, CO. www.hydrologicwarning.org

26 - 28 May 2009**.** 4th Tsunami Society Symposium, East-West Center, University of Hawaii, Honolulu, HI.

Some Publications of Interest….

New journal provides an international platform for knowledge sharing in all areas realated to flood risk. Check out the *Journal for Flood Risk Management* at www.floodriskmanagement.org .

"A Strategy for Federal Science and Technology to Support Water Availability and Quality in the United States" prepared by the National Science and Technology Council, Committee on Environment and Natural Resources, Subcommittee on Water Availability and Quality September 2007, available at: http://www.ostp.gov/galleries/NSTC/Fed%20ST%20Strategy%20for%20Water%209-07%20FINAL.pdf

"National Flood Insurance Program: Greater Transparency and Oversight of Wind and Flood Damage Determinations are Needed", prepared by the Government Accountability Office, December 2007, Report number GAO-08-28, available at: http://www.gao.gov/new.items/d0828.pdf

"Imperiled Treasures: How Recent Supreme Court Decisions and Agency Actions Have Endangered Southwest Waters and Wildlife", prepared by National Wildlife Federation, Trout Unlimited, New Mexico Wildlife Federation, Ducks Unlimited, January 2008, available at: http://www.nwf.org/nwfwebadmin/binaryVault/SW_WATER_REPORT.pdf

"Presenting Uncertainty About Climate Change to Water Resource Managers: A Summary of Workshops with the Inland Empire Utilities Agency", by David G. Groves, Debra Knopman, Robert J. Lempert, Sandra H. Berry, and Lynne Wainfan, 2008, available at: http://www.rand.org/pubs/documented_briefings/DB550/

"Interaction of Shore-Parallel Geotextile Tubes and Beaches along the Upper Texas Coast" by Daniel J. Heilman, M. Cameron Perry, Robert C. Thomas, and Nicholas C. Kraus, Engineer Research and Development Center, Coastal and Hydraulic Laboratory, January 2008, ERDC/CHL CHETN-II-51, available at: http://chl.erdc.usace.army.mil/library/publications/chetn/pdf/chetn-ii-51.pdf

Subscribe – Unsubscribe – Feedback

To Subscribe/unsubscribe: http://operations.usace.army.mil/flood.cfm.

We would love your input - recommended article length is ½ to 1 page. Articles should be submitted to Mr. Doyle L. Jones, Canvassing Editor, Doyle.L.Jones@usace.army.mil . Also, we would appreciate your feedback. Contact Dinah McComas, Managing Editor, Dinah.N.McComas@usace.army.mil or Doyle Jones.

Upcoming Newsletter Themes

So you can begin to formulate articles for future issues, here is the current plan for newsletter themes:

September 2008 – Coastal Flood Risk Management – LACPR, MSCIP, etc.
December 2008 – Water Allocation/Water Supply