Letter from the Editor — Harry Kitch, HQ

The HH&C community has always dealt with risk. Now we have to consider it in new and more comprehensive ways. More importantly, we have to learn better ways to explain all the uncertainties and variability to both the public and the decision makers. This will be a real challenge.

Another challenge will be the continuing struggle to develop new approaches, new tools and new data sources with our always limited resources - both funding and human resources.

It is an exciting time to be in the Corps, to pool our collective talent to meet these challenges and to continue to provide the nation with the vital water resources infrastructure that all our citizens have come to expect.

Thanks, Harry E. Kitch. P.E. Flood Risk Management Business Line Leader

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Flood & Coastal Storm Damage R&D Program

Bill Curtis and Jack Davis, ERDC
Coastal & Hydraulics Laboratory

The Flood & Coastal Storm Damage Reduction (FCSDR) R&D Program is improving capabilities to plan, design, construct, operate, maintain, and improve water resource projects. **Beach-fx**, **HEC-FDA**, and **HEC–FIA** are examples of advanced processes and design models for improved flood risk management measures. Economic models and decision support software such as **IWR-PLAN** are extended to increase efficiencies in project planning. Infrastructure condition and risk assessment requirements are achieved through continued development and application of **Dam Safety Portfolio**

Risk Assessment Tool Box modules and guidance. Products such as flood-alert systems and rapidly deployable real-time monitoring instrumentation increase public safety and improve our capability to collect and analyze real-time data that accurately characterizes project design and operational parameters.

The objectives of the FCSDR R&D Program are to improve capabilities to sustain multi-purpose flood & coastal storm damage reduction projects, to improve emergency management capabilities, and to increase our ability to address water supply issues.

Researchers in the FCSDR R&D program include staff from the Institute for Water Resources (www.iwr.usace.army.mil/), the IWR Hydrologic Engineering Center (www.hec.usace.army.mil/) and the laboratories of the Engineering Research and Development Center (www.erdc.usace.army.mil/).

Research is prioritized and tracked by the FCSDR Research Area Review Group comprised exclusively of field staff with representation from the Flood Damage Reduction Planning Center of Expertise (PCx), the Hurricane & Storm Damage Reduction PCx, and the Water Supply PCx, as well as engineers, planners, and economists from other MSCs and Districts. Harry Kitch and Jerry Webb lead the Review Group.

For more information about the General Investigations FCSDR R&D Program and its specific R&D activities, click on the Research and Development link on the Flood Risk Management Gateway at http://operations.usace.army.mil/flood.cfm. The web pages are still under development. Check back frequently as more information will be posted.

Great Lakes Coastal Infrastructure: Critical Protection at Risk

Linda Sorn, Chicago District

The Corps of Engineers is initiating an effort to collaborate with state and local officials to develop a strategy to ensure the continued protection of critical coastal infrastructure. The first step will focus on prioritizing limited funding to critical commercial harbor infrastructure using risk-based methodology. A team of experts has been established to develop consistent methods to assess harbor infrastructure condition and determine the risks associated with the potential failure of structures. This information will be used to prioritize limited federal funding in a manner that reduces risk to the Great Lakes navigation system.

The second step will determine the best strategy for protecting vital harbor infrastructure that is no longer a budget priority. For structures that are no longer a federal budget priority, the Corps is initiating a dialogue with state and local officials to inform them of the current condition of the infrastructure, the projected risks posed by deferred maintenance, and the resource requirements for maintenance and repair. Together we can investigate options that would allow non-federal entities to assume maintenance responsibility for these structures if state or local officials want to preserve the navigation, recreation, and flood damage reduction benefits they provide.

Although the challenges posed by limited funding for harbor structure maintenance are serious, the best opportunity for protecting the valuable Great Lakes coastal resources

lies in working collaboratively on local, state, and federal levels to prioritize limited resources and develop innovative and effective solutions.

For information about the coastal infrastructure at any of the federal harbors in the Great Lakes, contact the following U. S. Army Corps of Engineers offices:

Harbors in MI, MN, & WI	**Harbors in IL & IN**	**Harbors in OH, NY & PA**
Wayne Schloop	Shamel Abou-El-Seoud	Kathy Griffin
Detroit District	Chicago District	Buffalo District
Wayne.Schloop@usace.army.mil	Shamel.Abou-El-Seoud@usace.army.mil	Kathy.M.Griffin@usace.army.mil

This information is excerpted from a brochure posted on the Detroit District web-site for the Great Lakes:
http://www.lre.usace.army.mil/_kd/Items/actions.cfm?action=Show&item_id=5170&destination=ShowItem

Levees, Flood Risk Management, and Actions for Change in the South Pacific Division

Boni Bigornia, South Pacific Division

After Hurricanes Katrina and Rita, the Corps of Engineers leadership commissioned studies to help the agency analyze what went wrong not only from an engineering standpoint but also from a planning standpoint. The results of the Interagency Performance Evaluation Taskforce (IPET) and Hurricane Protection Decision Chronology (HPDC) reports led Corps leadership to develop the Corps 'Actions for Change.' This initiative encourages a shift from a traditionally narrow focus on the economics-based NED (National Economic Development) Plan to a broader, risk-based decision-making process, integrating environmental and social considerations with the economic considerations. New methodologies initially developed and tested with the Louisiana Coastal Protection and Restoration (LACPR) project will be used as a first step. Our goal is to be able to further refine and utilize these newly-developed tools and methodologies to apply them in California to allow environmental, public safety, economic, and social goals to be exhibited and analyzed together to yield an integrated and collaborative solution set from a full range of stakeholders.

The levee systems in the South Pacific Division are complicated by massive amounts of vegetation, both old and new, that might impact levee integrity, inspection and operations activities, and flood fighting capabilities. Negative impacts include potential increases in seepage and piping, obstruction of vehicular access, animal or insect habitation/burrowing, and increased erosion potential. Adding to the complexity is the sometimes conflicting research offered by proponents of maintaining the vegetation. Clearly, we need to gather available science and engineering information, identify research gaps (of which there are some), and use all that information to develop engineering standards to confirm or revise our existing policies. Another complication is the numerous physical encroachments both on and adjacent to the levee design prism, which also impact vehicular access and possibly structural integrity. Most notably, levee managers are concerned with flood fighting capabilities, as some encroachments (e.g., fences, landscaping, swimming pools, etc.) prevent visual identification of seepage boils that indicate piping and seepage problems. These ‘social’ encroachments are not easily

removed. Yet another complication is the environmental compliance related to vegetation removal. There are over 300 threatened and endangered species in California alone. Federal environmental laws, including NEPA, ESA, the Migratory Bird Treaties Act, and others, will need to be considered, and some State laws are even more rigorous.

Clearly, we need to examine these complex levee issues through a systematic and collaborative approach. The SPD is working with the Corps research community to utilize the lessons learned, tools, and methodologies from IPET, HPDC, LACPR, and other recent studies to help solve this puzzle. The Actions for Change hold much promise in applying a comprehensive systems approach with a risk-informed decision framework to better identify risks and communicate them to the public and stakeholders. Only then can the full breadth of social, environmental, cultural, economic, and most importantly life safety impacts be analyzed effectively. Resulting trade-offs can then be weighed for both long- and short-term solutions, thus producing a truly educated decision.

The levee (and the entire flood damage reduction system) challenge is daunting, but the combined efforts of the field, the research community, and other stakeholders will meet those challenges with a collaborative solution that leverages the skills and resources available in such a varied group of experts and interests.

Literature Review on Levee Vegetation

Maureen Corcoran, ERDC
Geotechnical & Structures Laboratory

In response to comments on the Vegetation White Paper (mentioned in the 3 Oct 2007 FRM newsletter), the U.S. Army Corps of Engineers Headquarters requested that the U. S. Army Engineer Research and Development Center (ERDC) conduct an extensive literature review of vegetation on levees. The team assigned to this task was a multi-disciplinary group of engineers and scientists within ERDC. The accumulated studies are presented in an unbiased format and are catalogued based on published format. The objective of this compilation and preliminary assessment was to better understand the effect, if any, of vegetation on levee integrity as studied and accepted in open literature. Instead of the traditional method of a literature review that includes just abstracts, the team identified the purpose, study location, vegetation type, observations, and recommendations as defined by the author or authors of each document. The review encompassed journal articles, proceedings, newspaper articles, websites, and guidance documents (federal, local, state, and international). "Gray" literature, those documents not easily or readily accessible by the general public, but accepted in an engineering and scientific community, was also included. While researching the topic of levee vegetation, it was soon recognized that documents outside this realm could offer an insight into the complexity of soil erosion and vegetation. Many of these documents are included in the literature list, but were not considered in the assessment phase. The consensus of the literature is that future research should address the entire levee system under various geological, geographical, and climatological conditions. In this additional research every impact of vegetation on levees should be considered. Contact Maureen Corcoran for more information, Maureen.K.Corcoran@usace.army.mil .

Protecting Levees Against Wave and Surge Overtopping

Steve Hughes, ERDC, Coastal & Hydraulics Laboratory

Analysis following Hurricane Katrina showed that during overtopping, the protected sides of levees are exposed to significantly higher velocities and much greater erosive force than the front side (see figure). Building levees so they will never be overtopped is not practical; therefore, protecting levees from erosion by surge overflow and wave overtopping is absolutely necessary to assure a viable and safe levee system. Solving the engineering issues related to erosion by overtopping of earthen levees by waves and surges will provide immediate and far-reaching benefits.

Levee damage caused by Hurricane Katrina (protected side is to right in photo).

The Department of Homeland Security is funding the Engineering Research and Development Center (ERDC) to investigate and develop affordable alternatives for protecting the levee crest and protected-side slope from the erosive forces of overtopping flows. The project, titled Affordable Levee Strengthening and New Design, is a 4-year multi-laboratory research program that includes researchers from the Coastal and Hydraulics Laboratory (CHL), the Geotechnical and Structures Laboratory (GSL), and the Environmental Laboratory (EL). The primary goal of this project is to produce sound engineering design guidance for affordable strengthening of earthen levees using a variety of practical solutions (e.g., native vegetation, soil strengthening, turf reinforcement mats, armoring products) that will withstand the anticipated range of wave overtopping, surge overflow, or combined wave and surge overtopping conditions. New and innovative techniques will be proposed and tested, and deployment guidelines will be developed for those alternatives that prove successful. The eight main study tasks are listed below.

Full-Scale Unsteady Overtopping Flow Testing Facility. An existing large steady-flow flume at ERDC will be modified by adding a wave generator to reproduce unsteady overtopping flows at full scale to minimize scale effects in the fluid/soil/structure interaction.

Comprehensive Overview of Levee Protection Alternatives. Existing guidance and knowledge will be compiled into a comprehensive levee protection design manual that documents the present state-of-practice. The manual will be updated as study results become available.

Scour and Protection at Overtopped Floodwalls. Scour caused by wave and surge overtopping at vertical floodwalls will be investigated using the full-scale Overtopping Flume. Viable scour protection methods will be tested.

Levee Strengthening Using Natural Protective Coverings. Different levee protection options, such as mature vegetation or soil enhancements, will be prepared in special trays that can be lifted into the full-scale Overtopping Flume for testing. Each vegetation or soil type will be subjected to a variety of overtopping flow conditions

including wave-only, surge-only, and combined overtopping. Erosion resistance will be monitored, and flow conditions will be gradually increased until damage occurs.

Small Sediment Sample Rapid Testing Facility. Not all soil mixtures can be tested in the large scale facilities due to the large number of potential levee soils. This testing facility will be used to rapidly screen soil mixtures, so optimum candidates can be selected for evaluation in large-scale facilities.

Levee Armoring Using Engineered Protection. Selected armoring alternatives will be placed over a soil slope in the Overtopping Flume and subjected to wave and combined wave/surge overtopping flows. The main research objectives are to determine threshold limits for a variety of armoring alternatives including turf reinforcement mats, and to determine if scaling issues inhibit testing armoring alternatives at reduced scales.

Expedient Levee Protection Alternatives. Previous research at ERDC examined several commercially-available products for expedient temporary flood protection. This task will select for further testing those products appearing to have the most potential for providing affordable temporary protection of levees.

Equivalence Between Steady and Unsteady Overtopping Flows. This task will establish the equivalence between armor stability thresholds under steady overtopping flow and armor stability under unsteady overtopping flow. A successful equivalence relationship will allow armor stability results from previous full-scale laboratory tests to be reliability extrapolated to the equivalent unsteady flow situation arising from wave overtopping or combined wave and surge overtopping.

Program management oversight is being provided by Dr. Mike Sharp, GSL. Dr. Steven Hughes, CHL, is the point of contact for the Affordable Levee Protection work unit.

Interim Guidance on Certification of Levee Systems
Tammy Conforti, Institute for Water Resources-at-HEC

The draft Engineer Technical letter (ETL) 1110-2-570, "Certification of Levee Systems for the National Flood Insurance Program (NFIP)" was released in mid-September 2007. This ETL consolidates USACE guidance for levee and floodwall systems certification determinations, and supplements and clarifies existing policy and procedural/technical guidance. The draft was issued (1) to provide interim guidance to Corps offices for their use in supporting the FEMA NFIP and (2) to solicit comments and suggestions for improving the ETL. The comment period is complete. The ETL team is in the process of reviewing the hundreds of comments received. The anticipated schedule for the final ETL will be decided upon within the next month or so.

The draft ETL 1110-2-570 is still to be used as interim guidance. It is available at http://www.hec.usace.army.mil/publications/publications.html . This site also contains a 'Frequently Asked Questions' page which has more information on ETL 1110-2-570.

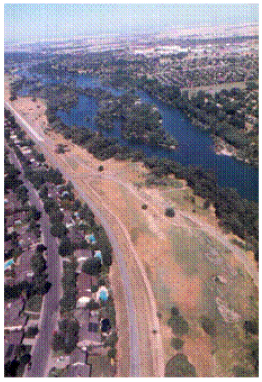
Planning CoP Conference 2008 — Bruce Carlson, HQ

The next Planning Community of Practice conference will be held at the Crowne Plaza Riverwalk Hotel in San Antonio, Texas, May 20 to 22, 2008. The conference, "Planners Leading Strategically: Developing Sound Water Resources Solutions," is being

hosted by the Southwestern Division. The "Call for Abstracts" was issued in the December issue of Planning Ahead, with a deadline of 8 February. The Conference web site is http://www.usace.army.mil/cw/cecw-cp/2007pres/Conference%20web%20site.htm .

The 2008 conference will be structured to emphasize how the Planning Community of Practice supports the strategic direction of the Corps. It will provide a forum to discuss planning issues and innovations related to Corps strategic initiatives including systems approaches, risk informed decision making, risk communication, collaborative planning, and professionalism and technical expertise. Topics will be presented in a mix of joint and concurrent sessions, including plenary sessions addressing big-picture topics, and concurrent sessions highlighting "field applications," "corporate issues," and meetings of the economics, environmental, plan formulation, and cultural resources working groups. The format will allow for discussions of policy and strategic initiatives, field lessons learned, case studies, and current and potential future issues facing the Corps. Issues relating to the full range of Corps activities, across mission areas and across the full project life-cycle may be discussed.

California Vegetation on Levees Symposium, August 2007



This symposium was sponsored by the Corps of Engineers, State of California Reclamation Board, California Department of Water Resources and Sacramento Area Flood Control Agency (SAFCA) to explore science, real-world experience, challenges, and policy solutions related to levee vegetation. Over 511 people from 21 states nationwide registered for the symposium, representing over 151 agencies from federal, state and local flood management, resource agencies, academic institutions and consulting engineering and environmental firms. The symposium program, with speakers' abstracts and bios, audio clips from the presentations, speakers' Power Point presentations, a transcript of each presentation and an index to key topics per presentation and a link to media clips are posted on the SAFCA website, http://www.safca.org/.

Following the symposium, senior leaders representing the US Army Corps of Engineers, the State of California Reclamation Board, California Department of Water Resources, the California Department of Fish and Game, the U. S. Fish and Wildlife Service, NOAA National Marine Fisheries Service, and representatives of local flood control agencies met to discuss how they could cooperate in achieving better levee safety while protecting and enhancing the environmental values that natural vegetation along levees also provide. This new effort, called the California Levee Roundtable (Roundtable), agreed to collaborate to draft a phased, system-wide plan that will result in both short and long-term actions to address public safety and public trust obligations. Due to the complexity of the issues and the desire of all to work in an effective collaborative fashion, Roundtable participants agreed that levee-maintaining districts should defer any substantial vegetation removal along levees while this plan is being developed. A draft framework for the plan will be available for stakeholder review in early 2008. The joint communiqué that was released by the Roundtable on September 21, 2007 is also available on the referenced website.

Other items of interest

2008 Coastal Workshop - The Coastal Working Group of the HH&C Community of Practice will hold its 2008 workshop in Vicksburg, MS, 3-4 June. See our March issue for details.

Levee Vegetation Management Policy Review
http://www.hq.usace.army.mil/cepa/corpspoints/10-2-07.htm

A Few Publications

"Issues Regarding Vegetation Management On Levee Embankments," REMR Technical Note EI-M-1,4. http://www.wes.army.mil/REMR/pdf/ei/m-1-4.pdf

"National Flood Programs and Policies in Review — 2007" prepared by the Association of State Floodplain Managers, Inc.
http://www.floods.org/Publications/NFPPR_2007.asp

"The US Economic Impacts of Climate Change and the Costs of Inaction," prepared by the Center for Integrative Environmental Research (CIER) at the University of Maryland, October 2007.
<http://www.cier.umd.edu/documents/US%20Economic%20Impacts%20of%20Climate%20Change%20and%20the%20Costs%20of%20Inaction.pdf>

New Flood Risk Management Journal

This new journal is the "Journal of Flood Risk Management," published in partnership with the Chartered Institution of Water and Environmental Management and supported by MWH, Arup and Royal Haskoning. It is edited by David Balmforth, Jim Hall, Paul Samuels, Jochen Schanze and Kaoru Takara.
http://www.blackwellpublishing.com/journal.asp?ref=1753-318X&site=1

Prospect Course

Flood Warning Preparedness Program (Control Number: 345)
March 31— April 4, 2008 Omaha, NE

This course provides participants with an understanding of nonstructural flood damage reduction measures generally, and Flood Warning/Preparedness Programs specifically. The course presents an overview of planning, design, and implementation considerations for nonstructural measures. A more detailed discussion of the technical requirements for planning, designing, and implementing flood warning systems is presented. The course also emphasizes the roles and responsibilities of local, state, and federal agencies and includes presentation of several case examples. To attend this course or to receive

additional information about this or other PROSPECT training courses, please contact the USACE Learning Center at http://pdsc.usace.army.mil .

Upcoming meetings

This is not a complete list of FRM-related meetings. The meetings listed are not endorsed by the Corps of Engineers unless specifically stated. The information listed below is for information only.

28 Jan – 30 Feb 2008 – 9th Annual CIRP-FSBPA Workshop, Hyatt Sarasota, Sarasota, FL. http://www.fsbpa.com/workshop.htm

30 Jan – 1 Feb 2008 – 2008 National Conference on Beach Preservation Technology Hyatt Sarasota, Sarasota, FL. http://www.fsbpa.com/seminar.htm

18 – 20 Feb 2008 – Kansas Dam Safety Conference 2008, Holiday Inn Campus, Manhattan, KS. http://www.ksda.gov/structures/content/194/cid/1099

3 -7 Mar 2008 – 62nd Interdepartmental Hurricane Conference, Francis Marion Hotel, Charleston, SC. http://www.ofcm.gov/

31 Mar – 4 Apr 2008 – National Hurricane Conference, The Rosen Centre Hotel, Orlando, FL. http://www.hurricanemeeting.com/

1 April 2008 – 10th HR Wallingford Annual Flood Risk & Insurance Seminar, Wallingford, UK. http://www.ehis.navy.mil/coe-london/conferencelist.asp?confType=7

13 – 16 April 2008 – The Coasts, Oceans, Ports, and Rivers Institute (COPRI) of ASCE, Solutions to Coastal Disasters Conference 2008, Oahu, HI. http://content.asce.org/conferences/cd2008/index.html

13 – 16 April 2008 – Association of State Dam Safety Officials, Southeast Region Conference, Crowne Plaza Resort, Asheville, NC. http://www.damsafety.org/conferences/?p=e7f329d8-e484-47ba-a38c-157015706b6f

16 - 18 April 2008 – Nature-oriented Flood Damage Prevention - Demonstrating Theory in Practice, International Conference, Darmstadt, Germany http://nofdp.bafg.de/servlet/is/14733/

28 April – 2 May 2008 – United States Society on Dams, 2008 Annual Meeting and Conference, Portland, OR. http://www.ussdams.org/08conf.html

May 2008 – European Union Flood Command, Sweden, http://www.eufloodcommand.eu

5 - 7 May 2008 – Risk Analysis 2008, Sixth International Conference on Computer Simulation Risk Analysis and Hazard Mitigation, Cephalonia, Greece. http://www.wessex.ac.uk/conferences/2008/risk08/index.html

6 – 9 May 2008 – 2008 Flood Warning Systems, Technologies and Preparedness Conference, 22nd Conference and Exposition of the ALERT Users Group, Palm Springs Hilton, Palm Springs, CA. http://www.alertsystems.org/aug/2008conf/2008AUGConf.pdf

6 -8 May 2008 – 4th International Symposium on Flood Defense, Toronto, Canada. http://www.flood2008.org/flood/

18 – 23 May 2008 – Association of State Floodplain Managers Annual Conference, John Ascuaga's Hotel, Reno-Sparks, NV. http://www.floods.org/Conferences,%20Calendar/Reno-Sparks.asp

20 – 23 May 2008 – National Flood Conference, Chicago, IL

18 - 20 June 2008 – DEBRIS FLOW 2008, Second International Conference on Debris Flow including all Aspects of Debris Flow, Monitoring, Modelling, Hazard Assessment, Mitigation Measures, Case Studies, and Extreme Events, Erosion, Slope Instability and Sediment Transport, The New Forest, UK. http://www.wessex.ac.uk/conferences/2008/debris08/index.html

2 - 3 July 2008 – FRIAR 2008, International Conference on Flood Recovery - Innovation and Response, Institution of Civil Engineers (ICE), London, UK http://www.wessex.ac.uk/conferences/2008/friar08/index.html

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

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

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

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

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

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

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

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http://operations.usace.army.mil/flood.cfm.

We need your input to adequately cover the varied interests and business lines involved with FRM. Recommended article length is ½ to 1 page. Article should be submitted to Mr. Doyle L. Jones, Canvassing Editor, Doyle.L.Jones@usace.army.mil .

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:

March 2008 – Climate Change

June 2008 – Integration of Flood Risk Management with Environmental Restoration – highlighting projects

September 2008 – Coastal Flood Risk Management – LACPR, MSCIP, etc.

We welcome articles on any subject at any time, so please let us hear from you. For the next issue, December 2007, we ask that articles be submitted ASAP. Again, submit articles to our Canvassing Editor, Doyle.L.Jones@usace.army.mil .