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In This Issue

CHS



COASTAL HAZARDS SYSTEM

tool

The Coastal Hazards System (CHS) is a coastal storm

The Coastal Frazerics System (Cho) is a coastal solin hazards data storage and mining system. It stores comprehensive, high-fidelity, numerical modeling stormresponses such as storm climatology, storm surge, water level, wave height, wave period, wave direction and current magnitude. CHS also stores observed

coastal storm responses. Comprehensive statistical information about the modeling and measurements are also stored. The data can be easily accessed, mined, potted, and downloaded through a user-friendly web

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to Access HS Web Too

Small Project, Large Impact for the Logan, WV Community

The Island Creek Local Protection Project, a nearly \$39 million channel modification endeavor and flood warning system, is designed to bring a much-needed reprieve from the damages of all too frequent flooding in Logan, WV. The project provides between 10-year and 20-year frequency flood protection.

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Deployment of the Coastal Hazards System (CHS)

A new product developed by the Flood & Coastal Storm Damage Reduction (FCSDR) R&D program, the Coastal Hazards System (CHS), has been deployed and is available for use by the USACE, partner agencies and the general public. The CHS is a coastal storm hazards data storage and mining system.

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Emergency Flood Inundation Maps: The SWF Experience

USACE has a unique capability to develop forecast inundation maps. These maps show decision makers and the public what areas and communities are at risk of flooding before flood waters arrive. This capability is critical to making sound emergency planning and emergency response decisions.

From the Director By Karen Durham-Aguilera, P.E., SES, USACE Director of Contingency Operations and Office of Homeland Security



Karen Durham-Aguilera, P.E., SES, USACE Director of Contingency Operations and Office of Homeland Security

Greetings all! I would like to open this edition of the Flood Risk Management (FRM) Newsletter with a hail and farewell, and an award announcement. First, we say farewell to Mr. Frank Randon, who served as acting Deputy for Homeland Security (OHS) from early April through mid-August 2015. Frank is an Emergency Support Function (ESF) #3 Team Leader, Permanent ESF #3 Cadre, in the Directorate of Contingency Operations. Frank has done a fantastic job as the Deputy and as the Director of the National Flood Risk Management Program (NFRMP). We thank Frank for his leadership and excellent work over the last several months, and wish him continued success in his return to the Cadre.

We hail and say welcome back to Mr. Mark Roupas, selected as the permanent Deputy for Homeland Security. Mark is likely a familiar face to many as he served as Acting Deputy from October 2013 to December 2014. Mark will oversee the Flood Risk Management, Emergency Management, and Critical Infrastructure Protection and Resilience Programs. Mark joins us from his position as a



Frank Randon, Disaster Program Manager, ESF #3 Permanent Cadre

"Frank has done a fantastic job as the Deputy and as the Director of the National Flood Risk Management Program (NFRMP)."

Senior Policy Advisor and the USACE Liaison Officer, Office of the Assistant Secretary of Defense for Homeland Defense and Americas' Security Affairs. He has continued to advise the Assistant Secretary of Defense and other senior DoD civilian and military leaders on USACE emergency response activities and actions under ESF #3, the National Disaster Recovery Framework, and Public Law 84-99. Mark remained very close to the programs and activities within OHS, so we expect him to get up to speed on the current challenges very quickly. Please say welcome back to Mark!

Last, congratulations to Mr. Steve Stockton, SES, Director of Civil Works, HQ USACE, on receiving the Goddard-



Mark Roupas, Deputy Chief Office of Homeland Security

"We hail and say welcome back to Mr. Mark Roupas, selected as the permanent Deputy for Homeland Security."

White Award from the Association of State Floodplain Managers (ASFPM) at their annual conference. This is their most prestigious award and highest honor. The award is named after Jim Goddard and Gilbert White, who as many of you know, were instrumental early leaders in the field of flood risk management. Mr. Stockton is recognized as a leader in moving USACE from "flood control" to "Integrated Flood Risk Management" and focusing on shared partnerships with state, local, and tribal governments and the private sector. Mr. Stockton is very deserving of this high honor! In recognition, I asked him to reflect on what flood risk management means to him and offer our community his thoughts and vision for flood risk management within the agency.

Spotlight on Mr. Steve Stockton: Director of Civil Works Perspectives on the Evolution of USACE FRM Missions and Roles By Steve Stockton, Director of Civil Works



Mr. Steven L. Stockton, P.E., SES, Director of Civil Works

Receiving the Goddard-White Award was certainly a surprise to me. I certainly feel honored by this prestigious award. While I have certainly tried be a strong advocate for flood risk management, and a supportive partner to ASFPM, and also to the National Association of Flood and Stormwater Management Agencies (NAFSMA), another of our close nongovernmental partners in Flood Risk Management (FRM), I would have to say they are recognizing the efforts of the entire USACE FRM team rather than any specific activity I've been involved in. This honor has certainly caused me to reflect on the change in philosophy we have experienced within the agency and within the nation for FRM.

As you may be aware, there have been significant changes in attitude and approach to FRM over the past several decades. When I began to practice, we looked at the probability of flooding and the economics, designing a structure that would maximize net economic benefits, with the full acknowledgement that if the design parameters were exceeded, the structure would fail. Now, in my view, we try to focus more on what will happen if and when the structure fails, and aim to design the structure to incorporate resilience concepts, such that if there is a failure, the structure can fail gracefully. We've seen an evolution toward sustainability, toward taking a comprehensive approach to flood risk management that considers structural solutions, nonstructural solutions, natural or nature-based solutions, and combinations of the three.

Much of this evolution has occurred since Katrina struck in August 2005. I've said many times before, Katrina was a wake-up call, both for the nation and for USACE. As an agency, we did a lot of soul-searching to understand how this happened. The Interagency Performance Evaluation Task Force Report and other evaluations provided some hard truths, and required us to evaluate our policies, design standards, and overall approach to managing flood risk. Based on these lessons learned, we made some tough changes. We adopted a philosophy of "never again," determined that we would develop policies and practices that would support wise investments, and to enhance our ability to communicate flood risk. Enhancing risk communication was especially important, I feel, as it was apparent to me after Katrina occurred that some people truly believed that the system in place in New Orleans in 2005 provided them with protection from any and all storm events of all sizes. The changes that we made were not popular or easy, and we had to stand up to both political and local pressure as we made those changes, but I strongly believe that we made the right decisions.

I think the differences in experiences after Hurricane Sandy provide evidence that we moved in the right direction after Katrina. After Sandy, we immediately understood that we were not the only agency that would be involved in the response and recovery, and that it would not only be government agencies that would need to be involved. We developed Rebuilding Principles in collaboration with our National Oceanic and Atmospheric Administration (NOAA) partners that would capture and communicate the lessons learned from Katrina. We hoped by capturing these lessons and developing interagency principles in this way, that all of the partners involved in the recovery process could benefit and we could work toward rebuilding in a more strategic manner. The lessons learned from Katrina also strongly influenced the Hurricane Sandy Rebuilding Strategy developed by the Hurricane Sandy Rebuilding Task Force and the North Atlantic Coast Comprehensive Study.

Though we've come a long way in how we view FRM, both as an agency and as a nation, there are still significant challenges to overcome. I think one of the biggest challenges we face is resistance to change. We've seen this many times, whether it's a change in levee vegetation standards, design standards, inspection or assessment standards, or even a Presidential initiative such as the Federal Flood Risk Management Standard. It really takes a crisis in order to capture people's attention and make the case that change is necessary. Despite this, we must continue to advocate for taking smart preventative actions and making wise investments in floodplain and flood risk management. We must continue to

advocate for long-term, strategic, systems thinking that will lead us to decisions that make the nation more sustainable and resilient. Doing so will help us mobilize our partners and stakeholders and build the political will that will be necessary to make hard choices about our long-term needs.

Moving forward, I believe there continues to be a strong role for USACE in FRM. We have an interesting governmental system for FRM, and water management overall, in that there are over 20 Federal agencies that manage some aspect of water quality or water quantity, and the Federal government has a fairly limited role. What is truly needed in this situation is an integrator to bring together all the necessary partners to solve these large, complex problems. USACE can fill this role, and is actually very well positioned to do so, as we are the one agency that does not have a single, focused mission, but rather must balance multiple competing demands. We have already stepped up to the plate to play the role of integrator, through the National Flood Risk Management Program, and we continue to actualize this role through the Silver Jackets teams. We also know from working with our partners and stakeholders, especially at the state and local government level, that they need data, information, technical expertise, leadership, and technology – all things that USACE will continue to provide.

To close, I issue a challenge to the FRM community. First, embrace an understanding of risk and make use of all the tools in your toolbox to manage and reduce that risk. Second, communicate

the risk. We have made great progress in how we communicate and present risk, but there is still room for improvement. Finally, think long-term, think sytems and think strategically, rather than focusing on the short-term, here and now. Once an event is occurring, whether it's a flood or a drought or some other event, there is only so much to be done. What we need is a long-term strategy for addressing the variability in the hydrologic cycle, considering those times that have too much water and the times that have too little water and the times in between. I'll close with the Gilbert White quote, "Floods are acts of God, but flood losses are largely acts of man." I believe that this is as particularly good guiding principle for all of us in the FRM community. 🖼

Updating National Flood Risk Management Program Guidance

By Doug Bellomo, Institute for Water Resources

The USACE NFRMP is currently operating under guidance that was developed six years ago. That guidance has served the program well and helped align many of the flood risk management responsibilities within the USACE. The program continues to be a focal point for integration as our efforts to lead the nation in managing flood risk adapts to improvements in technology, current political realities, a shifting legal landscape, and ongoing fiscal constraints. A lot has been accomplished, but the dynamic nature of flooding and our programmatic environment means we must be vigilant in ensuring what guides us remains current and relevant to the challenges we face today.

Throughout the month of September, we have stood up a small team of flood risk management experts from Headquarters, our districts, and divisions to review and update where appropriate the Flood Risk Management program guidance document (Oct 2009), the Program Management Plan (Jul 2012), and the Communications Plan (Jul 2012). That team will work closely with a broader, USACE-wide group that has been stood up. The broader team will bring a wider set of perspectives and act as reviewers of any proposed changes. Members of the review team will include representatives from operations, regulatory, environmental, planning, climate change, coastal, resiliency, and the levee and dam safety communities.

We will also share proposed changes to these foundational documents with you and more broadly with key stakeholders outside USACE including other Federal agencies with whom we work closely on flood risk management-related issues. Rest assured we will cast a broad net, sharing our ideas and concepts along the way and soliciting input before making any final changes. But it isn't over when the new documents are published. We work in a dynamic environment and thus will need to be continuously learning and adapting our plans and guidance. As such, we will also be establishing a



An aerial view of Minot, ND during the 2011 flooding there.

routine process for keeping these key documents current.

Make no mistake though, a strong set of guidance documents and well thought out plans are necessary, but insufficient when it comes to meeting our goals and objectives. It is people that make a difference through their choices and actions both inside and outside the Federal family. All of us need to listen to various points of view, be open to change, develop creative ideas together, take calculated risks, learn, and adapt if we want to strengthen our nation in the face of ever changing flood risk profile.

Alaska District Completes Salmon Creek Section 205 Feasibility Study By Jason Norris, Alaska District

SEWARD, Alaska – The Seward area is composed of multiple steep, small watersheds drained by alluvial streams. The glacial-fed streams carry enormous sediment loads, with streams aggrading to about 21 feet during a single year. The streams are subject to flash flooding during heavy precipitation events, which can threaten homes and businesses.

In 2011, the U.S. Army Corps of Engineers-Alaska District, in conjunction with the Kenai Peninsula Borough, completed a planning assistance to states, or PAS, study that evaluated the risks posed by the area's streams.

During the course of the PAS study, the Seward Bear Creek Flood Service Area, a subdivision of the Kenai Peninsula Borough, contacted the Corps' Alaska District in hopes of initiating a Section 205 feasibility study on upper Salmon Creek – referred to locally as "Kwechak Creek" – which the flood service area identified as its highest risk stream.

For decades, local residents and the Seward Bear Creek Flood Service Area maintained a berm of river-run materials. During high-flow events, residents and contractors mobilized bulldozers to the stream bed and pushed the material up into the berm to protect homes and businesses in the Bear Creek Subdivision area.

In March 2014, the Corps and the Kenai Peninsula Borough signed a feasibility cost-sharing agreement and began studying options for risk management alternatives along the creek. The Corps worked with the Kenai Peninsula Borough, Seward Bear Creek Flood Service Area and local land owners to formulate a plan that would reduce flood risk to homes and businesses, while also maintaining the area's recreational value. In July, Pacific Ocean Division approved the Corps' recommended plan to provide a permanent channel training structure in the form of an armored berm. The berm will be capable of managing flows from events with a 0.02 percent annual chance of exceedance. The plan also incorporates simple recreational features, like a trail behind the berm.

During the process, the Corps worked with the U.S. Forest Service and State of Alaska Department of Natural Resources to implement measures that would limit the amount of vehicular traffic accessing the area, to preserve the area's environment.

The Corps' Alaska District and the Kenai Peninsula Borough are negotiating a design and implementation agreement, with an estimated agreement execution date of the fourth quarter of fiscal year 2015. Construction could take place as early as the fourth quarter of FY2016, pending funding and resource availability.



Small Project, Large Impact for the Logan, WV Community By Sherry Adams, Huntington District



A photo of flooding in Logan, WV taken on March 15, 2012. Flooding along Island Creek and its tributaries is a continuing problem.

The Island Creek Local Protection Project, a nearly \$39 million channel modification endeavor and flood warning system, is designed to bring a muchneeded reprieve from the damages of all too frequent flooding in Logan, W.Va. The project provides between 10-year and 20-year frequency flood protection.

The Island Creek Basin has experienced numerous damaging floods. The maximum flood of record in the Basin occurred in March 1963. During the March 1963 flooding, the area's residences, and commercial and industrial establishments were flooded to a depth of up to 15 feet. Other major floods have occurred in January 1957, January 1974, April 1977, May 1984, May 1996 (one death), March 1997, May 2002, February 2003, September 2003, November 2003 (one death), May 2004, and June 2004.

Flooding along Island Creek and its tributaries is a continuing problem. Due

to the steep terrain and the scarcity of land suitable for building, extensive development has occurred on the relative flat flood plains of the basin. The flood plains along the major streams are occupied almost entirely by residential and commercial structures, highways, and railroads. As a result, almost all development within the basin is susceptible to damage by even moderate flood events.

"I can't tell you how stressful it is for a small business owner to keep operations going when you run the risk of losing everything to floods year after year," said Jesse Queen, proprietor of Stereo Video Unlimited. Queen described numerous incidents when he and his staff hustled frantically to secure audio visual equipment as flood waters gushed into his Logan store, submerging the shop in up to eight feet of water.

Other residents described cars floating like boats and personal property from

basements and garages flowing freely down inundated streets. "I am grateful to everyone who made this project happen, everyone who cared enough about Logan to help us," said Queen.

Much more than caring was needed to get the Island Creek project off the ground. Natalie McKinley, regional economist, explained that she and her colleagues needed to demonstrate the project would be a good investment of Federal dollars. Through a cost-benefit analysis, McKinley and others were able to show the project was a wise and beneficial undertaking for the nation.

The Logan County Commission and The West Virginia Conservation Agency, Guyan District, became the nonfederal project sponsors. They provided lands, easements, rights-of-way, relocations and disposal sites as well as nearly \$2 million. Construction of the project began in 2010 and was completed in May 2014. Continued from page 5.

"It's not just about the flooding; it's about the people and their anguish after each flood event. The recovery is never easy for residents or business owners, so this project is money well spent," said John Oblinger, treasurer at the Guyan Conservation District. "We are grateful to the Corps of Engineers for their expertise and support and are hopeful this project is going to relieve the anguish folks in Logan have suffered over and over again."

The project included widening the Island Creek channel to an 80-foot bottom width for a distance of 3,600 feet upstream of its confluence with the Guyandotte River. Along the channel reach, a post and panel retaining wall and sloped bank lined with stone slope protection and concrete revetment will stabilize the creek bank behind adjacent commercial structures.

During construction and since completion the project has been tested by flood waters. The business owners and residential homeowners in the area of Island Creek sent a letter after the last flood in the spring of 2015 offering their thanks and acknowledging their appreciation for the work completed by the Corps on the flood control project at Island Creek in Logan, W.Va. The letter stated:

"We 'Doubting Thomases' were not fully sold that planned work by the Corps would take care of the floods and high water. We have endured the past flood season without flood, mud, and high water or losses to our businesses and we are convinced that this flood control project has been an impressive success."

"There were many times I thought about giving up, but I am happy I've managed to stay in business over the years and I have to thank my friends, family, neighbors and customers for their support," said Queen.

The NEW Flood Risk Communication Toolbox

By Stacy Langsdale, Institute for Water Resources

Why is a Flood Risk Communication Toolbox needed?

Risk communication resources are decentralized and there is a lack of national consistency across the Corps in conducting risk communication activities. Programs like Silver Jackets and Dam and Levee Safety have developed their own materials, so there is an opportunity for learning through sharing these resources.

Is the Flood Risk Communication Toolbox for me?

The resource was developed to serve the needs of USACE District staff; however, the content may be useful to anyone who is involved in the aspects of communicating risk with others. The content may be especially useful for:

- Flood Risk Managers
- Silver Jackets Coordinators
- **Operations & Maintenance**
- Recreation Field Staff, Rangers
- **Emergency Managers**
- Levee Safety Staff
- Dam Safety Staff

Contact

- Coastal Staff
- Public Affairs Officers
- **Project Managers**
- Planners

How will the Flood Risk

Communication Toolbox help me? The collected resources emphasize these principles and best practices for effective risk communication:

- Risk is a shared responsibility.
- Use two-way dialogue (not only informing).
- An informed public can more effectively engage in USACE processes and decisions.
- Increase awareness of flood risk so communities and individuals can make informed decisions and take actions affecting their risk.
- Discuss both current and future risk.
- Discuss how USACE actions reduce risk.
- Emphasize the concept of residual risk.
- Communication should be clear, concise, and actionable.



In the Flood Risk Outreach section, you can find materials that can b

To provide feedback on the Toolbox or schedule a demo contact Stacy Langsdale at the Institute for Water Resources: (703) 428-7245

Email: Stacy.M.Langsdale@usace.army.mil

Feedback Welcome!

As this is the first version of this toolbox, we welcome your feedback on the content and format! We plan to expand the database in the future, so let us know what you find most useful and what is missing.

Also please spread the word to your colleagues that this is available. Contact us if you would like a demonstration.

Where can I find it?

The toolbox is accessible on the Corps Risk Analysis Gateway at this direct link: http://www.corpsriskanalysisgateway.us/ riskcom-toolbox.cfm 🖬

What is the Toolbox?

The Flood Risk Communication toolbox provides a suite of searchable resources to help USACE personnel effectively communicate flood risk with stakeholders and the public. There are three sections:

- 1. How to Communicate Risk. with USACE guidance and policy documents, USACE methods and strategies, other organizations' methods and strategies, and peerreviewed literature and research.
- 2. Flood Risk Outreach materials that can be used to conduct flood risk outreach (e.g., fact sheets, multimedia, and interactive tools). The materials cover topics including basic descriptions of floods, the 1% annual chance exceedance flood, reducing flood risk through mitigation, reducing flood risk through preparedness, and levees and dams.
- 3. Case Studies and Testimonials that demonstrate best practices in flood risk communication from successful applications around the country.

FY15 Flood & Coastal Storm Damage Reduction R&D Program Review

By Dr. Cary Talbot, Engineer Research & Development Center Coastal & Hydraulics Lab

The annual In-Progress Review (IPR) for the Flood & Coastal Storm Damage Reduction (FCSDR) program was held on 26-27 August 2015 at the Engineer Research & Development Center (ERDC) in the Coastal & Hydraulics Lab located in Vicksburg, MS. Principle Investigators (PIs) gave 20-minute presentations detailing their progress in development of the tools, capabilities and deliverable products for each of the 30 work units being executed within the program in FY15. Program work units are grouped into five focus areas within the program: Risk & Uncertainty/ Alternatives Analysis, Coastal Systems, Watershed Management, Resilient Infrastructure and Emergency Management. PIs for the program come from five different ERDC laboratories (Coastal & Hydraulics, Cold Regions Research & Engineering, Environmental, Geotech & Structures, and Information Technology) and also from the Institute for Water Resources' Hydrologic Engineering Center (IWR-HEC). PDF copies of each of the IPR presentations are available for download from the FRM R&D Gateway at: http://operations.usace.army.mil/flood. cfm along with a PDF description of all FY15 program work units. Point of Contact for the FCSDR R&D Program is Dr. Cary Talbot, Program Manager, Cary.A.Talbot@usace.army.mil, 601-634-2625. Imi

FY15 Research Area Review Group Meeting

By Dr. Cary Talbot, Engineer Research & Development Center Coastal & Hydraulics Lab

The annual Research Area Review Group (RARG) meeting for the Flood Risk Management business line was held on 15 May 2015 at the Institute for Water Resources (IWR) headquarters in Alexandria, VA. The RARG is tasked with presenting, reviewing, ranking and prioritizing all submitted Statements of Need (SoN) from the USACE field for consideration as new work units within the Flood & Coastal Storm Damage Reduction (FCSDR) R&D program in a following fiscal year. The RARG is comprised of Community of Practice leads or designated representatives from across the various disciplines and business lines that have interest in FRM issues within the USACE. This year's meeting included representatives from Engineering & Construction (Hydraulics & Hydrology, Geotech & Materials, Structural), Emergency Management, FRM and Planning (Economics) in addition to representatives from the Research directorate at HQUSACE. A total of 40 SoNs were presented and discussed with 18 of them eliminated due to being combined with other SoNs, overtaken



Attendees at the Research Area Review Group (RARG) meeting for the Flood Risk Management business line. The meeting was held on 15 May 2015 at the Institute for Water Resources (IWR) headquarters in Alexandria, VA.

by developments or already being addressed with current R&D efforts. The remaining SoNs were then ranked and prioritized by the CoP leads and will inform the FRM Technical Director, Business Line Lead and FCSDR Program Manager as they shape the R&D work plan for FY16 and beyond.

Statements of Need can be submitted by the USACE field through the FRM R&D Gateway at: <u>http://operations.</u> <u>usace.army.mil/flood.cfm</u>. Point of Contact for the FRM R&D process is Mr. Bill Curtis, FRM Technical Director, <u>William.R.Curtis@usace.army.mil</u>, 601-634-3040.

Deployment of the Coastal Hazards System (CHS)

By Dr. Cary Talbot, Engineer Research & Development Center Coastal & Hydraulics Lab

A new product developed by the Flood & Coastal Storm Damage Reduction (FCSDR) R&D program, the Coastal Hazards System (CHS), has been deployed and is available for use by the USACE, partner agencies and the general public. The CHS is a coastal storm hazards data storage and mining system. It stores comprehensive, highfidelity, numerical modeling stormresponses such as storm climatology, storm surge, water level, wave height, wave period, wave direction and current magnitude as computed by state-ofthe-art numerical coastal storm models developed and used by the Coastal & Hydraulics Laboratory (CHL) of the Engineer Research & Development Center (ERDC). Additionally, CHS stores storm and response joint statistics and uncertainties as well as observed coastal storm responses.

"A significant benefit of the CHS is its ability to provide comprehensive statistical information about the modeling data and measurements."

A significant benefit of the CHS is its ability to provide comprehensive statistical information about the modeling data and measurements. CHS stores data from comprehensive flood risk modeling studies, such as the NACCS and FEMA regional studies, which include storms and associated responses that span a broader range of historical storms and processes than other comparable data resources. Average annual recurrence intervals for responses cover a range from 1 year to 10,000 years. Epistemic uncertainty (e.g. model errors) as well as sea level change



Screenshot of the Coastal Hazards System website, found at https://chs.erdc.dren.mil.

effects are included. Because the data are derived from high fidelity numerical model solutions and observations, they represent a more complete database from which to develop simplified distributions for use in, for example, risk analyses and planning studies than what is generally available. Users can have greater confidence in statistical samplings derived from the CHS because they are based on state-of-the art joint probability methods that minimize extrapolation and longer historical records. The CHS also provides advanced tools for conducting joint probability methodoptimal sampling (JPM-OS) analyses, further increasing the confidence and reliability of the derived data.

CHS data can be easily accessed, mined, plotted, and downloaded through a userfriendly web tool found at <u>http://chs.</u> <u>erdc.dren.mil.</u> At present, the CHS has stored data for much of the East coast, the Gulf Coast and the Great Lakes regions. Efforts are underway to extend coverage to the rest of the US coastline. Point of Contact for the CHS is Dr. Jeff Melby, Jeffrey.A.Melby@usace.army.mil, 601-634-2062. Imi

Levee Safety: Then and Now

By Tammy Conforti, Headquarters USACE



Flood risk reduction earthen levee in Vestal, New York, July 7, 2015. The levee was built by the Corps. NYSDEC operates and maintains the levee. (U.S. Army Photo by Sarah Gross)

The past 10 years have been a whirlwind of activity for the Levee Safety Program. Devastating hurricanes, super storms and flood events have left their mark on our nation, but have greatly affected how the program has adapted, evolved, and transformed.

We have worked through several interesting challenges since the Levee Safety Program officially got off the ground in 2007. For example, how USACE participates in FEMA's flood insurance program; vegetation management; I-wall performance; inspections—annual and periodic; and designing risk assessment tools, to name a few. In the near future we will embark upon a risk communication effort by taking all this great information we have been gathering and sharing it to improve the understanding of benefits and risks of levee systems. At the start there seemed like there were many puzzle pieces to put together – inspections, operation and maintenance activities, emergency response, various programs, different overlapping authorizations, different federal agencies, levee sponsors, community needs and multiple considerations (economic, environmental). What we are beginning to see is these pieces fit together to create a clear picture for achieving our objectives for levee safety.

"These strategic changes significantly influenced the Levee Safety Program."

What follows are areas in which we've transformed infrastructure system planning, assessing, design, construction,

and operation and maintenance. These strategic changes significantly influenced the Levee Safety Program. These transformations will be reflected in a comprehensive levee safety guidance document that will be used to govern the fundamental elements of the agency's program: how we assess the levees under our various authorities; communicating or talking about what we know about these levees with our project sponsors; and how we help manage the risks and benefits associated with the levees.

Decision making: How we make decisions, at the agency portfolio level and the individual levee system level, now includes a specific requirement to assess and consider the risks and uncertainty in the systems environment and to account for new and changing information, including physical

Continued from page 10.

processes such as land subsidence and climate change, and the latest scientific information relevant to our missions and operations. "Risks" are broadly defined and include not only delivery risks (cost, schedule), but specifically the potential for loss of life, economic damages, and environmental loss. Risk and uncertainty are becoming the primary means under which we consider concepts such as sustainability, systems evaluation, resiliency, climate change, and other emerging issues.

Science and Technology: In the post-Hurricane Katrina environment, USACE has leveraged current and emerging science and technology to vastly improve our understanding of the physical environment and improve the quality of data being input to decisions. Some examples: research into new failure mechanisms and risk drivers (overwash erosion, internal erosion, I-wall performance, and the social science of evacuation and mobilization); risk assessment via tools such as the Levee Screening Tool; and applications such as the Levee Inspection System.

Governance: The pre-Katrina model for governance was based on a highly-decentralized and distributed organization that had constructed more than 3,000 infrastructure systems that are now more than 50 years old on average. We've built new and deeper competencies in technical and management organizations and the individuals that work within these organizations that consider a new environment of less new construction and more recapitalization efforts. Examples: Levee Safety Program; USACE's lead role in the National Levee Safety Program; National Technical Centers; improved agency review processes; and training and education.

Communication and working

together: Risk communication, sponsor engagement, and public education and awareness are now fundamental elements of project and program development and risk management. Examples: Silver Jackets Program; Flood Risk Management Program; improved efforts with FEMA and its various levee programs. Communication of levee risk characterizations is leading to improved understanding of shared responsibilities and actions by local sponsor to implement risk reduction activities.

Policy and Guidance: All of these transformational elements are going into our new levee safety policy document. We're already seen these concepts in the areas of evaluating levees for the purposes of the National Flood Insurance Program, design of levees, evaluation of I-Walls, communication and sponsor engagement, drilling in Earthen Embankments, the System Wide Improvement Framework, and eligibility for the Rehabilitation Program.

The Levee Safety Program is off to a great start and will continue to transform as the puzzle soon comes together to create the clear roadmap ahead.

Spotlight on FRM: Jamie McVicker



This is a new, recurring feature in the newsletter that will highlight FRM accomplishments within the broader USACE community. The intent is to demonstrate successful FRM at work across USACE by sharing accomplishments, team member successes, or successful projects with all of our community.

Ms. Jamie McVicker, MVS Levee Safety Program Manager, was recently recognized by Ms. Karen Durham-Aguilera, Director of Contingency Operations and Homeland Security, for her contributions to the goals of flood risk management. In her capacity as Levee Safety PM, Ms. McVicker has worked tirelessly to reduce risk to communities and to effectively communicate risk to partners and stakeholders. Ms. McVicker has worked with sponsors and communities to develop interim and long-term risk reduction strategies, informed by her understanding of the risks associated with local levees, and has been instrumental to the success of the System Wide Improvement Framework (SWIF) initiative within the District.

Ms. McVicker embodies the goal of the National Flood Risk Management Program (NFRMP) to work with partners internal to USACE and external to develop shared solutions for flood risk management. Ms. Durham-Aguilera and the NFRMP would like to thank Ms. McVicker for all of her efforts in support of flood risk management.

Emergency Flood Inundation Maps: The SWF Experience By Jason Sheeley, Kansas City District

USACE has a unique capability to develop forecast inundation maps. These maps show decision makers and the public what areas and communities are at risk of flooding before flood waters arrive. This capability is critical to making sound emergency planning and emergency response decisions.

In May 2015 the Fort Worth District (SWF) was challenged with weeks of extreme rainfall and a major flood event covering much of central and east Texas, including Dallas-Fort Worth, Houston and all areas in between.

Flood inundation maps are an important tool during such emergencies. They help to inform USACE emergency management, water management and dam/levee safety decisions and are also critical tools for situational awareness and reporting at all USACE command levels. It is also common for state and local emergency management officials to request technical support from USACE requiring production of hydraulic models and inundation maps.

SWF activated the USACE Flood Inundation Modeling and Mapping (FIM) Cadre to meet the demands of internal and external inundation map information requests. Cadre members from Vicksburg, Jacksonville and Kansas City Districts worked virtually to assist SWF water management, hydraulics and geospatial staff as needed to create the rapid turnaround emergency products.

During the flood fight, SWF and FIM Cadre staff worked as a team to complete inundation modeling and mapping requests from the state of Texas and other federal agencies. In less than one week, the team produced multiple inundation map scenarios for eight river basins covering more than 2,400 stream

Forecast Inundation Maps Produced for 2015	Texas Flood
River System	Miles
Trinity	800
Neches	568
Sabine	514
Nueces	37
Brazos	382
Colorado	57
San Jacinto	68
Total stream miles mapped	2,426

miles. The Corps Water Management System (CWMS), HEC-RAS, the Flood Extent Simulation Model (FESM) and the Modeling, Mapping and Consequences (MMC) Production Center's mapping toolkit were vital tools helping the team meet the emergency flood risk management need.

"The FIM Cadre can be activated to provide its full suite of capabilities, or simply to augment particular disciplines where the district has a resource limitation."

The USACE FIM Cadre was formed to assist districts when needed to run CWMS and hydraulic models during floods, as well as to develop flood inundation maps from the model results. Cadre members cover disciplines of 1D and 2D hydraulic modeling, geospatial analysis, mapping and consequences assessment. The FIM Cadre can be activated to provide its full suite of capabilities, or simply to augment particular disciplines where the district has a resource limitation.

SWF staff ran CWMS and HEC-RAS models for the Texas flood and the FIM Cadre supported by using FESM for basins where SWF had no models, and by developing inundation map products for all model results.

More information about the FIM cadre is available in the USACE All Hazards OPORD and at http://prod.mmc. usace.army.mil/mmc/ including points of contact, a fact sheet and links to a Sharepoint folder that provides access to product examples, documentation and map templates.

To view interactive examples of 2015 Texas Flood inundation maps visit <u>https://maps.mmc.usace.army.mil:9443/</u> <u>DataViewer/map/1521</u>. More than 50 flood extent and flood depth layers are posted for interactive analysis of forecast river inundation and what-if reservoir release scenarios.

Continued from page 11.



Depth map from possible reservoir release scenario, Dallas-Fort Worth metro



Other Important Information

Conferences

This listing is for information only and is not a complete list of FRM-related meetings. These meetings are not endorsed by the Corps of Engineers unless specifically stated. If we have failed to list a conference/meeting/symposium that would be of interest to the Flood Risk Management community, please forward the conference details to us.

8-11 September 2015 – Floodplain Management Association – FMA 2015 Annual Conference – Rancho Mirage, CA - <u>http://</u> floodplain.org/annual-conference

26-28 October 2015 – **"Dune Management Challenges on Developed Coasts" workshop** – Kitty Hawk, NC – POC: Nicole Elko, <u>nelko@elkocoastal.com</u>

9-11 November 2015 – **World Ocean Council** – Singapore, China – <u>http://www.oceancouncil.org/site/</u>

16-19 November 2015 – American Water Resources Association (AWRA) Annual Conference – Denver, CO – <u>http://</u> www.awra.org/meetings/Denver2015/

10-14 January 2016 – **96th American Meteorological Society** Annual Meeting – New Orleans, LA – <u>https://ams.confex.com/</u> ams/

21-24 March 2016 – **National Hurricane Conference** – Orlando, FL - <u>http://hurricanemeeting.com/</u>

8-10 June 2016 – **3rd International Conference on Environmental and Economic Impact on Sustainable Development** – Valencia, Spain – <u>http://www.wessex.</u> <u>ac.uk/16-conferences/environmental-impact-2016.</u> <u>html?utm_source=wit&utm_medium=email&utm_</u> <u>campaign=eid16cfp&uid=184019</u> 19-24 June 2016 – Association of State Floodplain Managers (ASFPM) – Grand Rapids, MI – <u>http://www.floods.org/index.</u> asp?menulD=223

29 June – 1 July 2016 – **5th International Conference of Flood Risk Management and Response** – San Servolo, Venice, Italy - <u>http://www.wikicfp.com/cfp/servlet/event.</u> <u>showcfp?eventid=45833</u>

12-15 July 2016 – River Flow 2016 – Eighth International Conference on Fluvial Hydraulics – St. Louis, MO - <u>http://www.</u> <u>iihr.uiowa.edu/riverflow2016/</u>

17-21 October 2016 – **3rd European Conference on Flood Risk Management** – Lyon, France - <u>http://floodrisk2016.net/</u>

Good to Know 🗕

FRM Statements of Need: Submitting "Statement of Need" is the first step in the process of a concept becoming a requirement for research and development. If USACE District personnel have problems or situations they feel should be addressed by research, the Flood Risk Management Gateway, http:// operations.usace.army.mil/flood.cfm, is the place to submit these research Statements of Need (SoNs).

Past issues of this newsletter, various links, news items, and presentations, are all available on the Flood Risk Management Gateway, http://operations. usace.army.mil/flood.cfm. Check it out! Save the Date

2015 Flood Risk Management Workshop,

30 Nov-4 Dec 2015, Southbridge, MA

This newsletter is a product for and by the Flood Risk Management Community. The views and opinions expressed in this unofficial publication are not necessarily those of the U.S. Army Corps of Engineers or the Department of the Army.

If you would like to submit an article or an idea for an article for the next edition of the newsletter, or if you have any comments or questions about articles in this edition, please email <u>Stephanie.N.Bray@usace.army.mil.</u>





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