

Natural Hazard Mitigation Association

Proceedings

Doing More with Less: Mitigation in a Changing Environment

2012 International Hazard Mitigation Practitioners Workshop

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Session Title: Plenary 1: **Doing More with Less: Mitigation in a Changing Environment**

Date/Time: Tuesday, July 17, 2012 4:45-6:15 p.m.

Moderator: **Dennis S. Mileti**, Professor Emeritus, University of Colorado-Boulder

Speakers: **Marco F. Cocito-Monoc**, Director of Regional Initiatives, Greater New Orleans Foundation

Deborah Ingram, Assistant Administrator, Recovery Directorate, Federal Emergency Management Agency (FEMA), Department of Homeland Security (DHS)

Mike Kline, Rivers Program Manager, VT Dept of Environmental Conservation

Dave Miller, Associate Administrator, Federal Insurance and Mitigation Administration (FIMA), FEMA, DHS

Recorder: **Lynne M. Carter**, Associate Director, Southern Climate Impacts Planning Program and Coastal Sustainability Studio, Louisiana State University

Dennis Mileti, session moderator, opened by highlighting the increases in disaster events every year, economic losses on the rise, and demographic, social, environmental, and climatic shifts occurring, as we continue living in vulnerable areas. He charged the speakers to address the issue of *doing more with less* with a version of a Winston Churchill remark – “Friends there is no money, we will have to think!” Each speaker was asked to address: Mitigation Challenges, Mitigation Needs, and Mitigation Successes.

1A

Marco F. Cocito-Monoc:

Mitigation Challenges:

- Coastal wetland loss: every 38 minutes Louisiana loses a football field size of wetlands due to many factors including: oil and gas canals, pumping of water and other liquids, sea level rise, and subsidence.
- Place-based living/staying: there are many reasons that people stay in vulnerable coastal areas including: access to livelihood, e.g., fisheries, poverty--thus inability to move--and community.
- Fear of the implications of change: for example, St. Bernard Parish, even after the devastation of recent hurricanes and levee failures continues to allow houses built slab-on-grade because they are afraid that residents could not afford to return if they require more.

Mr. Cocito-Monoc said the Louisiana State Coastal Master Plan is updated every five years and the newest requires \$50 billion over 50 years, to undertake actions already identified to protect some portions of the coast. He said the BP spill funds that are allocated to this funding are reduced for Louisiana as they need to be shared with the other impacted states of Mississippi and Texas. He added that the Coastal Master Plan is criticized for its perfunctory inclusion of public input.

Mitigation Needs:

- For the Louisiana Coastal Master Plan: better public input process, e.g., include the Houma Nation
- Large sediment and river diversions for coastal restoration
- More resilient housing, e.g., no more slab-on-grade
- Implement multiple layers of coastal protection
- Be honest about what can and cannot be done to protect the coast and specific locations and at what cost and to whom.
- Better cooperation among those working on coastal issues and making use of the connections already in place. Develop an online tool for coordination among state, local, academic organizations and others.
- Better cooperation and cooperative planning among coastal parishes, e.g., the “5 + 1” program (five coastal parishes and New Orleans).

Mitigation Successes:

- Water challenge – an award from Tulsa Partners to develop an integrated water management effort
- Based on Dutch examples that could lead to the creation of a private industry on water
- Management, and the focus of government on new options.
- 5+1 program with a focus on community engagement to bring in more public input
- Transportation volunteers
- Three community foundations helping to determine community needs and address them: St. Bernard Community Foundation, Jefferson Community Foundation, and Plaquemines Community Foundation.

1B

Deborah Ingram

Mitigation Challenges:

- Mitigation needs to become part of the recovery process. There is great need to develop a risk-conscious culture with influence at the community level and recognition of how risks change after an event. What is sustainable for the long-run? Consider how decisions impact others and vice-versa.
- Recognize that climate change is already impacting us and consider how the climate will change in the future and how the impacts will also continue to change.
- Post-disaster: the present practice of building quickly versus building smartly. Need to rethink what to do and how.

Mitigation Needs:

- Need to demonstrate and communicate the 4:1 ratio (\$4 benefits for every \$1 in pre-disaster efforts) and develop other ways to put this benefit into economic terms, attracting businesses to invest in and develop more resiliently.
- More safety consciousness, e.g., more effective implementation and use of land-use plans and building codes.
- Making it happen: show successes, applaud good work, spread the word to influence decision-makers. New thinking is required at all levels . . . How are we going to plan and recover?

Mitigation Successes: not done but some progress:

- National Disaster Recovery Framework is a good base for concepts, language, tools, and dialog.
- Collaboration is good in a number of ways and should be built upon, e.g., Silver Jackets program between USACE and FEMA.
- “Whole community approach” means to recognize that the feds are not going to come in and save the day but rather it is “What Happens at the Community Level.” Embrace actions by municipal organizations, businesses, faith-based organizations – everyone.

1C

Mike Kline

Mitigation Challenges and Needs:

- On surviving a major disaster that covers an entire State: have your team learn to pace themselves, work to keep good communications between all involved agencies, keep the issue of resiliency high on the list of critical issues to be planned for and dealt with at the State level.
- Prior to disasters: need to create regional centers with broadly trained teams capable of integrating conservation, hazard, community development, and transportation perspectives to support towns and to help them to support each other. In any process you need to recognize that no plans go unchanged and you need to trust the teams to make good decisions on-the-fly.
- In the case of floods, the damages and hazards may be due to systemic river instabilities far removed from the site level where damages are being assessed; be sure to focus on the causes of the problems and not the symptoms. Imminent threats that exist after a flood disaster necessitate emergency measures and require

operational systems in place to mitigate future hazards from the immediate response on through the recovery phase of a disaster.

- During large disasters, the best-laid plans for in-state coordination may be confounded by the large influx of federal and NGO disaster-related personnel from outside the state, who are unfamiliar with either the nature of the damages, the imminent threats or the affected communities. Critical relationships and trust for effective and efficient recovery may be hindered by this unfamiliarity. Building communication systems to enhance these new relationships, prior to disasters, may be a critical mitigation process. Pre-established interagency agreements concerning local and state emergency and recovery standards can save time needed to focus on hands-on community work.

Mitigation Successes:

- Bennington, Vermont, sought to support economically important development opportunities in locations—not mapped floodways or “special flood hazard areas”—identified as high risk for river erosion hazards. Following one such instance, and after a lengthy court challenge, the town began working with the Vermont Agency of Natural Resources to identify the flood and erosion hazard areas in its community. This work resulted in the community having a better understanding of the need to protect floodplains and river corridors with new land use regulations. This prompted the state to work with the town to fund floodplain mitigation efforts to remove encroachments from the erosion hazard areas. During Tropical Storm Irene, this work resulted in Bennington’s escape of major damages it historically experienced in major floods. The state of Vermont is now seeking to work with its federal partners to form a “Flood Resilient Communities Program” that will support the types of mitigation incentives and partnerships that have proved so successful in Bennington.

1D

David Miller

Mitigation Challenges:

- Building a risk-conscious culture. How would you do that? Have a conversation with mayors – the three things you might ask them to consider: 1. Do you know the real risks (science-based, economic, etc.) that your community faces and do you discuss those publically? 2. What could your community not live without for 72 hours or more (transportation, education resources, regional interactions)? 3. What are you willing to invest in to sustain your community through its threats (within and outside the community)?

Mitigation Needs:

- Need to have a discussion of community problem-solving/risks. Think outside the box and be ready for tomorrow’s events, communities, technologies, not yesterday’s.
- Need to understand the real community dynamic and changes that are underway. Challenge the assumptions of what a community will and can look like. Might be better to move in concert with the community rather than just repairing what is there, e.g., maybe need to relocate the hospital.

Mitigation Successes:

- Yesterday's success does not mean it will be a success for tomorrow. Need to synergize and synthesize for future needs.
- Building codes are good but we might consider what risk we are building to and analyze how we can build to address more than one risk at a time.
- See what we can learn from successes in different locations, e.g., Community Rating System of the National Flood Insurance Program (NFIP).

Final Comments:

Right now we assign risk too often to those who cannot accept it. NFIP should reflect the risk in its charges—we should provide incentives to do good things and penalties for bad behavior.

2

Session Title: Plenary 2: Overcoming Mitigation Challenges and Moving Forward

Date/Time: Wednesday, July 18, 2012 8:30 am - 10:00 am

Moderator: **Bob Anderson**, Senior Engineering Geologist, California Seismic Safety Commission

Speakers: **Barbara Carby**, Director, Disaster Risk Reduction Centre, University of the West Indies, Mona Campus

Rosemarie Geier Grant, Program Director of Research, Technology Research and Innovation Laboratory, Building Technology Research Unit, State Farm Insurance

William H. Hooke, Director, Policy Program, American Meteorological Society

Recorder: **Lisa Grow Sun**, Associate Professor, Brigham Young University Law School

2A

Barbara Carby began by discussing the history of the University of West Indies and the long history of mitigation in the Anglophone Caribbean region, including the 1985 groundbreaking international conference on mitigation in Jamaica, Jamaica's 1998 drafting of a national mitigation policy, and the 2011 development of a model mitigation policy for English speaking regions by the Caribbean Disaster Emergency Management Agency (CDEMA). She also discussed the importance of mitigation for the region, pointing out the damage (both economic and in terms of lives lost) from the Haiti earthquake, as well as from Hurricane Ivan.

Dr. Carby described successes of mitigation in the region, including obtaining grant money for retrofitting roofs after hurricanes, as well as a community level model plan that guides communities in hazard analysis and development of mitigation plans that are specific to the community and that set community priorities. One rural community in Jamaica—Ashkenish—had success with using science to inform mitigation measures after large cracks in the ground indicated the beginning of landslide activity. Landslide susceptibility mapping was performed and houses in danger were relocated to safer areas based on the landslide maps. At the national level, hazard assessments are now incorporated in environmental impact assessments and the national emergency management agency is included in development planning.

Dr. Carby noted that there is always a gap between theory and practice, and that one major practical challenge is the very high exposure of national assets to hazards and the fact that there is no policy for retrofitting vulnerable critical facilities and infrastructure. (One exception is the road to the airport, which is being raised to withstand a category 3 storm with funding from the Chinese government). She also noted that, in Jamaica, both the very rich and the very poor inhabit high hazard areas. She said the poor inhabit the fringes of urban waterways on unstable slopes, and the rich occupy unstable land above Kingston, with a combined estimate of 600,000 to 700,000 people living on unstable slopes.

Barbara Carby explained that another practical challenge is keeping hazard maps updated, because mapping is usually completed with grant funding, and there is no provision in the budgets of technical agencies to continue hazard mapping programs. She said the use of probabilistic risk analysis is not yet widespread, but Jamaica is moving toward an internet-based and open access risk atlas that will allow the public to view maps, although currently, local authorities do not consistently use hazard maps. She said a major question is how to ignite sustained, large-scale public interest in mitigation. She pointed out that government funding cutbacks are also likely to affect university-funded research but there are opportunities to include mitigation approaches under the climate change adaptation banner, and Caribbean countries are taking advantage of these opportunities.

2B

Rosemarie Geier Grant presented a private sector perspective on mitigation challenges, opportunities, and successes. She noted that new and innovative approaches to hazard mitigation are both sociological and technical. She said State Farm Insurance has been learning more about what its customers want and need, learning more about what messages resonate with customers, and developing “visuals” to communicate risk. She said the company has found that the timing of the messaging matters a lot. She provided an example where it was found to be more effective for people get a message about hailstorm mitigation (focused on impact resistant roofs), when they are considering installing a new roof. She said the company is also investigating how to communicate more effectively with different age groups, testing, for example, the use of text messages with younger consumers and putting mitigation information on the Internet’s YouTube).

Ms. Grant explained that one major challenge for mitigation is that lots of research is geared toward new construction, whereas there is not much focus on retrofitting existing homes. She said funding is a constant challenge, as is the fact that architectural design tends to be divided into silos by type of mitigation--wind, flood, seismic--even though homes often face multiple hazards. She also pointed out that there is not much quantifiable statistical data to establish the cost-effectiveness of mitigation measures because of the long feedback loop; hazard mitigation measures may not pay dividends for twenty or thirty years, so much of the evidence about the effectiveness of mitigation is more anecdotal than statistical. She contrasted this with automobile injury programs, where the feedback loop for mitigation measures, such as child booster seat laws, is much shorter.

Ms. Grant illustrated approaches taken by the insurance industry, requiring versus encouraging mitigation such as in Florida, where State Farm gives discounts for wind mitigation for homes, which is a mandatory program through the state, or the impact resistant roofing program for hail is a voluntary discount program. She noted however, for wildfires, State Farm will not ensure homes that have not cleared defensible space, even

though that means State Farm might lose some customers. She said the Home Fire Sprinkler Coalition has used video to help publicize the advantages of home fire sprinklers.

2C

William Hooke began by discussing the fact that the challenge of mitigation today is that we need mitigation approaches that are cheap, quick, and effective. He asked the audience, what NHMA and the Last Supper have in common, explaining that the answer is the power of an idea and a viral approach. He said NHMA has a powerful idea and needs a viral emergent approach.

He proposed that there are four emergency approaches that can become viral: 1) getting the policies right; 2) utilizing place-based approaches and social networks; 3) developing and equipping leaders, which is easier than convincing everyone; and 4) building on a foundation of facts. He emphasized that we must solve tomorrow's problems with tomorrow's tools, instead of yesterday's tools.

Dr. Hooke concluded by identifying five policy changes that would make a difference: 1) no adverse impact development, as advocated by the Association of State Floodplain Managers; 2) learning from experience, building on the example of the aviation industry which has kept the number of accidents basically steady even though the number of flights has increased dramatically, by having the National Transportation Safety Board analyze every aviation accident to find out why it occurred; 3) keeping score; 4) fostering public-private strategic partnerships, recognizing that the private sector is a disaster victim, vector, critical infrastructure provider, emergency responder, and recovery driver; and 5) reaching out to and revitalizing the U.S. Department of Commerce, rather than working through DHS or FEMA, because of its expertise in business continuity, economic development and vulnerable populations. He suggested the development of new leaders is also critical.

3

Session Title: Track 1: Mitigation Challenges – The Promises and Pitfalls of Encouraging the Adoption of Higher Mitigation Standards

Date/Time: Wednesday July 18, 2012 10:15 – 11:30 a.m.

Organizer: **Cynthia Palmer**, Workshop Planning Committee Member, NHMA

Moderator: **Gavin Smith**, Executive Director, Department of Homeland Security Center of Excellence – Coastal Hazards Center, University of North Carolina-Chapel Hill

Speakers: **Laura M. Herbert**, Lead Mitigation Planner, Florida Division of Emergency Management

John Ingargiola, Senior Engineer, Federal Emergency Management Agency (FEMA)

Janiele Maffei, Chief Mitigation Officer, California Earthquake Authority

Recorder: **Judy Sears**, Community Liaison, Regional Training Institute – Community Emergency Preparedness, Office of Extended Education, Humboldt State University, Arcata, CA.

3A

Gavin Smith, moderator, opened by describing the intent of this session as an opportunity to explore how we can more affectively encourage the adoption of higher standards of mitigation planning. He gave a brief overview of a six-year federal plan-quality analysis study being conducted as a follow-up assessment to the Disaster Mitigation Act (DMA) of 2000. He said the study evaluates state and local mitigation plans that have been written in response to the DMA, asking if the DMA has been successful in promoting development of improved plans. Focusing on the land use planning dimension, Dr. Smith said the study explores how plans are being implemented, what are the processes of monitoring progress over time, assessing inter-organizational coordination including government, non-profits and other public stakeholders to address risk reduction, and asks who is being included in the planning processes. He reported that over-all results in the study are disconcerting, particularly which specific groups of stakeholders are actively involved in the planning process. He said the participation dimension, on a zero-to-ten scale, after assessing one hundred seventy-five (175) hazard plans, was rated at five.

Gavin Smith also reported disappointing assessment scores for risk and vulnerability, explaining that vulnerability planning has focused more on critical public facilities and less on the environment and social vulnerability. He also suggested that the assessments of capability and the development of programs and polices meant to help reduce risk, which are not required by the DMA, were disappointing as well. He said they lead to the consideration of including capability building as a plan requirement in the future. He noted the subject plans generally did not look at broader topics such as resilience or sustainability. He also suggested the majority of the plans assessed by UNC seem to have been developed looking backwards at vulnerable structures rather than forward to future development placement in relation to hazards. He said the reviewers found there was little monitoring of progress using indicators was adequately developed to measure what specific objectives for mitigation have been accomplished. Dr. Smith said one of the lowest scoring assessments was that of inter-organizational coordination between different actors in the community (score of two out of ten) suggesting a serious lack of nexus between the fact base and policies, and between plans and effective mitigation. He reported that the study suggests that if a plan is weak in one of its dimensions it may have a cascading effect, weakening the entire plan. He stated that the interconnectivity of a plan's components is critical to its success.

3B

Following this overview of challenges to comprehensive and effective mitigation planning, Gavin Smith introduced **Laura Herbert**, lead mitigation planner for the Florida Division of Emergency Management. Ms. Herbert shared Florida's planning specific to hurricane mitigation, which in turn could be applied to other hazards and in other locations across the country. She said that while mitigation planning presents many pitfalls, there are also many solutions.

Ms. Herbert said one major pitfall for communities to adequately plan mitigation that addresses risks is lack of resources, both in staff and money. She suggested that by thinking creatively, state players can assist communities in ways other than simply handing out money; by attending their meetings, helping them to write grant applications and working with them to discover partnerships that can help move them towards effective risk reduction. She explained that Florida's Post Disaster Redevelopment Planning (PDRP) is such a vehicle that allows communities to look at how they want to redevelop to avoid

repetitive damage, and the PDRP helps to integrate all local land use plans to eliminate redundancy of effort and discover gaps. She added that another mitigation effort by the state of Florida—27P22 of the Florida Administrative Code—requires each community to report annually how it wants its mitigation funds spent. Ms. Herbert said this keeps communities in touch with their mitigation planning process on a year-to-year basis, and in addition, interns developed monitoring and documentation strategies for communities to help them more easily gather pertinent information annually for the five-year cycle of federally mandated reporting. She said Flood Resistance Standards have been integrated into Florida’s Building Codes and are applicable to other types of hazards.

3C

The second speaker, **Janiele Maffei**, is a structural engineer and Chief Mitigation Officer with the California Earthquake Authority (CEA). She observed that in some cases, rather than higher mitigation standards there is the question of having any mitigation standards at all, giving the example of standards for new buildings but few for pre-existing buildings. She stated that definitions of standard performance levels include a spectrum from life safety, meaning occupants are able to safely leave a building following an earthquake, all the way to when the building may again be safely occupied, and in between, standards to establish feasibility of safely sheltering in place for residential structures. Ms. Maffei stated that it is also necessary that the standards of mitigation be consistent with the means through which communities may receive financial incentives.

Ms. Maffei explained the levels of government at which the standards are set, specifically that the executive branch makes most decisions regarding earthquakes. She said the 1977 National Earthquakes Hazard Reductions Plan was last renewed in 2004, severely limiting earthquake mitigation dollars flowing from the federal government. She described California arrangements in which the state, CalEMA, CalTrans, California Water Authority, California Earthquake Authority, counties, multi-county organizations, municipalities, public and private agencies are each responsible for pieces of the planning, policy and implementation of mitigation standards. She added that the CEA uses its funding to create a culture of seismic awareness, integrating multiple disciplines in mitigation to get around the earthquake risk versus political risk dichotomy.

3D

The final speaker, **John Ingargiola**, Senior Engineer at FEMA, addressed the concept of higher mitigation standards for floods and tornados. He argued that questions in the debate of the feasibility and effectiveness of the most appropriate hazard provisions for development have already been answered at the national level through an ongoing, comprehensive dialogue including a wide range of stakeholders in the development of the Consensus Codes and Standards (CCS), drawn principally from the International Residential Code, the International Building Code and the referenced standard ASCE 24 for Flood Resistant Design and Construction, inclusive of considerations for regional adaptability and affordability. He stated that flood hazards in CCS already exceed the 40-year-old minimum NFIP criteria. He said CCS contains more specific requirements and some higher standards that have resulted from the lessons learned and forensic studies of building performance following major disasters. He added that if local jurisdictions have higher minimum flood levels than designated in the CCS, then the local designations take precedence in concert with other minimums as designated in the national code, such as the height of utilities, use of fill, and the nature of materials used. He said a more complete list of the specific and higher CCS flood provisions can be found at

<http://www.fema.gov/library/viewRecord.do?id=4575> . Mr. Ingargiola explained that while the CCS standards are no less stringent than the minimum NFIP criteria, they may not address every local situation in the floodplain and therefore communities are advised to follow the most stringent criteria available. As to whether communities using the national CCS for flood regulations, he reported a recent evaluation conducted by FEMA showing over 50% of communities with flood hazards have adopted these CCS requirements, up from 34% in 2008.

Regarding tornados, Mr. Ingargiola stated that over 20,000 residential safe rooms and 1,300 community safe rooms have been constructed since 2001 using FEMA Hazard Mitigation Assistance funds to meet the design and construction criteria in *FEMA 320* and *FEMA 361*. He said many of these safe rooms have saved lives and continue to do so in actual events. He reported that the next edition of CCS coming out in 2015 will require all new K-12 schools and first responder facilities to have safe rooms. He said this results from FEMA's proposal being approved by the International Building Code Committee at its Code Hearing in May 2012.

Mr. Ingargiola concluded by emphasizing widespread code improvements, saying "These are not your father's codes my friends." He proposed that NHMA members and all organizations work together to educate each other and move toward adopting and using CCS requirements which provide the public the minimum protections necessary against natural hazards in the US.

3 Q/A

The discussion that followed the panelists' presentations included comments on the influence of forensic analysis following disasters, potentially leading to litigation if building codes are not being followed. Another observer said post-disaster reports seem to suggest that enforcement of codes is relatively lax. Ms. Maffei responded by saying California's earthquake codes are quite stringent. In response to a question asking if compliance with codes had any payoff in reducing cost of hazard insurance, Ms. Herbert said there are benefits for wind mitigation in Florida, and Ms. Maffei added in California there are insurance benefits for seismic mitigation. Mr. Ingargiola noted the CRS program already rewards communities enforcing CCS with points that can lower the cost of flood insurance in the community. An observer said the rate of non-compliance with codes in Louisiana tended to negate getting insurance at all.

4

Session Title: Track 2, Mitigation Needs: *Presidential Policy Directive 8: Integrating the Whole Community*

Moderator: Roy Wright, FEMA

Speakers: David Mallory, Denver Urban Drainage and Flood Control District
Jim Schwab, American Planning Association
Darrin Punchard, AECOM

Recorder: Deborah Mills, Dewberry

4A

Roy Wright: Moderator's Opening Remarks. He said PPD-8 is titled National Preparedness. Mr. Wright explained that during the one year process, in bringing in

stakeholders, there was a disparate view as to the meaning of PPD 8. He said hazard mitigation refers to capabilities to lessen the impacts to people and property, including but not limited to efforts to reduce impacts to infrastructure from natural hazards and terrorism.

Mr. Wright summarized the process:

- Bringing in these stakeholders who did not know each other was a challenge.
- Infrastructure divided into two areas: resilience and sustainability.
- Broke down silos and forced us to look at infrastructure issues critical to society such as water (electric and communication systems usually come first).
- Kansas City stakeholder meeting resulted in massive input, then a two-day draft composition effort.
- The concepts from the draft resulted in the final plan after more than 2,000 adjudicated comments.

Mr. Wright suggested the directive will make some definitive statements about mitigation that will drive federal programs in the future: 1) it will set resilience and sustainability as guiding principles, and 2) it will establish resilience as the “end state” of effective risk management.

He said seven categories were maintained in the successive drafts, not as novel ideas, but defining a nation focused on its risks and bringing elements together in making risk-informed decisions within five societal elements of the National Recovery Framework:

- Economic
- Housing
- Infrastructure
- Health and community welfare
- Cultural and natural resources

Mr. Wright explained the draft document is presently at the White House for final review during the next few weeks. He said the May 2, 2012, draft is mostly intact; graphics are slightly changed. He said a mitigation framework leadership group was created to oversee and ensure that capabilities move forward, and includes state, local, and federal entities.

4B

David Mallory, Denver Urban Drainage and Flood Control District

Mr. Mallory reported on his experience on the core writing team for integrating stakeholder comments into implementation schemes for PPD-8. He said representatives of many organizations attended the meeting in Kansas City, leading to even more written comments totaling over 130 pages, from which the team worked to craft a 40-page draft.

Mr. Mallory said there will be some fundamental changes, because the discussion has grown far beyond traditional FEMA mitigation programs:

1. Mitigation in PPD-8 is about building capabilities and capacity without new resources.
2. It is clear that we have to do more with less. A basic workshop premise to participants was not to create a new program.

3. Conversations need to be much broader. Floodplain managers need to talk to emergency managers, for example.
4. Theme from Dave Miller, FEMA: *Mitigation is the thread that weaves through the fabric of emergency management.*
5. The new framework reflects many positive aspects of Risk MAP: delivery of regulatory and non-regulatory products to help communities make good decisions.

4C

Jim Schwab: Manager, Hazards Planning Research Center, American Planning Association

Mr. Schwab listed what he considers to be important issues and concerns in the evolution toward PPD8-based mitigation programming and the emphasis on capabilities:

1. Does the built-in tension between national security and natural hazards emphasis become a barrier to success?
2. How is DHS/FEMA evolving? The initial creation of FEMA involved fairly strong national defense cold-war staffs. It evolved toward civilian help to local governments with disasters Andrew, Northridge, Fran, Floyd, and then push-back to a national defense role with the attacks of 9/11. Then bounce-back to a military assistance emphasis in the Katrina response, but Katrina was as much a man-made as a natural event due to lack of quality and capacity of infrastructure. We made problems larger than they needed to be.
3. It is not clear that planners have the luxury to focus on natural mitigation when there is an urban environment and urban design principles to consider. For example: Design for national security in the Nation's Capital.
4. What caused the recent Colorado wildfires? The mix of human and natural causes. For wildfire mitigation, the cause does not really affect the outcome or how we mitigate. Conditions determine outcome based on relationship between natural and built environments.

Mr. Schwab referenced the 2010 American Planning Association report: *Hazard Mitigation: Integrating Best Practices into Planning*. He said the FEMA-sponsored report came from the approach that there is a lack of emergency managers integrating local planners into the local HMP process. He said local hazard mitigation planning has no legal bearing; a comprehensive plan does, so it makes sense to link them. He said related work is now underway with a new FEMA contract, to revise the 1998 disaster recovery planning guide known as the "Green Book" to reflect new federal policy in DMA2000, NDRF and PPD-8.

Mr. Schwab suggested three examples where pre-planning will aid effective disaster recovery:

- Iowa Smart Plan Act: integrated FEMA and EPA concepts and defined what a local comprehensive plan should contain, with ten requirements and 13 qualifiers—one is a local Hazard Mitigation Plan—plus integration of smart growth.
- Cedar Rapids, Iowa: integrated emergency management into its new comprehensive plan.

- Roseville, California: proactive flood resistant community motivated from 1995 floods, Folsom Dam, major military arsenal accident many years ago and seismic hazards. (See Onion video on Folsom Dam). Roseville tends to make little distinction between natural versus man-made hazards.

4D

Darrin Punchard, AECOM

Mr. Punchard explained that he had represented NHMA at the Mitigation Framework Stakeholder Event in Kansas City, January 2012. He said the session used fast feedback technologies for providing input to further define “mitigation core capabilities,” interconnections with other mission areas—prevention, protection, response, and recovery—and stakeholder roles and responsibilities within local communities.

Mr. Punchard said FEMA’s David Miller started off the event by stating a theme many have heard before: *“Mitigation is the thread that permeates the fabric of national preparedness.”* He said this sentiment was echoed in the resulting draft of the National Mitigation Framework, and considering how mitigation could have been classified—not a mission area at all—in the new National Preparedness System, this is quite an endorsement. Mr. Punchard explained the final draft NMF document is very dense, difficult to get through, yet it can be seen as a composite reflecting the drafting process, and represents the wider community, with evidence of all the sentiments heard at the stakeholder event. He said a hundred years from now, because of its breadth, whether we got it right or wrong, people will be able look back and know what we were thinking in 2012.

Mr. Punchard posed a question: *What does the Framework mean for us as mitigation practitioners? He suggested, “For most of us, probably not much – at least directly or in the near term, because it is mostly about federal doctrine.”* He said practitioner members of NHMA tend to be extensively engaged in efforts that already contribute to the capability targets assigned in this new Framework to the mitigation mission area and continue to help strengthen our national preparedness. Mr. Punchard also explained this new initiative is going to be accomplished by assessing, communicating and mitigating the risks that are most important and relevant to practitioners, and our communities or organizations. He said mitigation experts should expect to be asked or encouraged to bring more professional groups into the discussion and process, and perhaps address new kinds of hazards, but the central mission will remain the same—to reduce loss of life and property by lessening the impact of disasters. He said an issue still remains, concerning future allocation of resources in support of national preparedness, including mitigation grant funding, and how much those allocations will be guided by the targets or performance thresholds used for each core capability.

Darrin Punchard posed a second question: “What does the Framework mean for NHMA?” He said he believes it is a tremendous and timely opportunity, because: 1) NHMA was founded through a grassroots effort to bring together individuals and organizations working in the field of hazard mitigation, and 2) as we continue to grow from the bottom up, there are clear connections to be made with a National Framework that is being driven from the top-down, and by its own volition, is the shared responsibility of the “whole community.” He suggested NHMA has been extremely successful in pulling together a cross-section of this “community” – many disparate disciplines and geographies dealing

with multiple hazards. He said NHMA members include individuals, communities, the private and nonprofit sectors, faith-based organizations, plus federal, state, and local governments.

Mr. Punhard further suggested that NHMA strongly resembles a solid example of what is being called a *Coordinating Structure* in the National Mitigation Framework. He explained that this new term is defined by the PPD-8 Program Executive Office as “*a coordinating structure is composed of representatives from multiple departments or agencies, public and/or private sector organizations, or a combination of the preceding, and is able to facilitate the preparedness and delivery of capabilities. Coordinating structures provide guidance, support, and integration to aid in the preparedness of the whole community. They ensure ongoing communication and coordination between all parties involved in preparing and delivering capabilities.*” He said NHMA might best be described as one that spans horizontally at the local level, but also extends vertically from the individual to the national level. He said NHMA could be most effective at bringing people together.

Concerning next steps for the mitigation framework, Mr. Puncard suggested it is similar to a design or blueprint for a new vehicle, where there may be a prototype, something perhaps rolled out onto the test tracks. He said it seems there may be an immediate opportunity for NHMA, but also an opportunity for FEMA and its partners, to begin facilitating and somehow testing, in a more realistic and measurable way, the application of the horizontal and vertical coordination sought through the Framework using NHMA as a vehicle to engage the whole community, and enable the delivery of the core capabilities advocated in the Framework document.

He noted that one of the capability targets for the Mitigation Mission Area is to “Achieve a measurable decrease in the long-term vulnerability of the Nation against current baselines amid a growing population base and expanding infrastructure base.” He said it would be necessary to test how this notion can be applied and examined under the microscope at the local community level – perhaps by working in cooperation with NHMA and its recently launched seven pilot communities who will be working together as the Resilient Neighbors Network, through peer-to-peer networking on strengthening and expanding their local hazard mitigation programs. Mr. Puncard proposed it would be worthwhile to see how these local communities and their private sector partners would develop or revise their plans based on the information provided through the National Mitigation Framework. He said this would help clarify whether the Framework would potentially change the way things are done in order to reduce community vulnerability, and also whether the experience would alter the Framework in the future.

Concerning the five distinct mission areas, Mr. Puncard said these areas might become less stove-piped for operations closer to the local level. He said this would help specify how the “integrated, all-of-Nation, capabilities-based approach to preparedness” sought through the National Mitigation Framework can be refined based on some further vetting/testing process with communities across the country in widely dispersed regions, facing many different threats and hazards, and varied capabilities. He said this testing would need to examine the true capabilities for integration on a smaller scale—potentially more attainable.

Mr. Puncard offered comments about what NHMA can do to help achieve the goals of PPD-8 in general and the Mitigation Framework in particular. He said all advocates need to

make a better business case for mitigation, recognizing that PPD-8 calls for an assessment of national preparedness, including quantifiable performance measures to track progress over time, including mitigation programs. Mr. Punchard said it is likely these assessment results will inform future federal program decisions and budgets, adding to the importance of data that fully reflect the benefits of actual mitigation investments.

Considering the overall value of this pursuit, Mr. Punchard observed it is a challenge, but also huge and important opportunity for mitigation advocates who are constantly concerned, if not simply dumbfounded, by the lack of understanding or appreciation for how important the mitigation of natural hazards is becoming for this country. He stressed the term “natural,” though recognizing that PPD-8 and the National Mitigation Framework is an integrated, all-hazards approach to preparedness.

For other mission areas, Mr. Punchard proposed that in matters such as the protection activities or disaster response there will be new benchmarks developed for the assessment of progress, perhaps involving the measurement the “operational readiness” against target capability levels identified in the National Preparedness Goal. He said these targets will likely include metrics such as the number of what are being called “readily deployable assets” such as SWAT teams, urban search and rescue teams, bomb squads, canine explosive detection teams. He noted such standards may make it more rigorous a process to present Congress with facts and figures that demonstrate capability targets are being met or gaps being filled for natural hazards mitigation, and to describe how important they are in support of our national preparedness. He called attention to the fact that—when done right—mitigation activities can eliminate the need for many readily deployable assets in terms of emergency response and disaster recovery.

Mr. Punchard said one of the greatest concerns he has heard expressed by fellow NHMA members, but also shared here by many in the past few days of the workshop, is that the true value of mitigation is often invisible, and does not result in the instant gratification or immediate, measurable benefits that are more easily recognized and supported in the name of homeland security. He contrasted that sense with the many explicit mitigation success stories about results where many lives have been saved, damages and losses avoided, and many taxpayer dollars saved. He proposed that mitigation advocates are good at telling these stories to each other, but the need is to do a much better job of communicating risk awareness and the value of mitigation externally, and not just to the leaders in Washington, but to local community leaders, the media, the insurance industry, and the general public as well.

Regarding a mutual opportunity for NHMA, and for FEMA and its partners, Mr. Punchard proposed more emphasis pursuing and documenting clear and measurable returns on investment for mitigation, especially the non-structural solutions versus the brick-and-mortar projects. He said the latter has already been demonstrated to create a 4:1 return on investment, meaning the former could be something much greater. He said the discussions at this workshop demonstrate convincing evidence that NHMA and the experience and expertise of its members can certainly help in pulling together a strong business case for mitigation that represents the interests of the “Whole Community,” and can help FEMA and its partners in measuring progress of the Framework over time.

4 Q/A

Audience Questions, Answers and Discussion

Question: Your definition of preparedness doesn't resonate with the design community. They think it's all about police, fire and rescue. How do you reach out to designers, builders and developers?

Answer: (Roy Wright) Broad based economic vitality, housing, and infrastructure are the three lenses used in the discussion as Congress defined "preparedness," and we can't change it. We need to demonstrate what works, and how it produces profit to private sector. In the urban planning realm we need a bridge to connect mitigation lingo to the design community.

Answer: (Jim Schwab) What is the scale of design? For architects it is a building, for planners it is a larger section of the community. Another sector is the landscape architects who are open to discussion of environment, and then engineers. If we consider varying scales, we may open the discussion context.

Question: What was the role of design/developers with the new Mitigation Framework?

Answer: Homebuilders were "in the room," but were not a major factor. The Constitution forbids federal influence on local land use, but feds can influence reduction or cause of risk. 30% revenue from state government is federal funds—the disaster relief fund. Categories C - G infrastructure grants could hinge on a community's efforts to reduce risk through adoption of a building code and similar measures.

Question: How do you anticipate the new framework to trickle down to requirements of DMA planning?

Answer: (Roy Wright) There should not be a lot of space between a Threat and Hazard Identification and Risk Assessment (THIRA) and a Hazard Identification and Risk Assessment (HIRA). The first round is minimal to states and not required for communities. The Comprehensive Preparedness Guide (CPG) 101 will be superseded by CPG 100. Mr. Wright said he is committed to making sure we are doing good planning, advanced appropriately to bridge gaps, and not be too prescriptive. He said FEMA does not want engagement in redundant activities.

Question: What we do at the state level is tied to 44CFR, we use the crosswalk and plan review tool, even if it is not required by 44CFR. It might help you identify core capabilities and make changes in the regulation. We do not have to do it, and we will not force our communities to do it.

Answer: (Jim Schwab) I was happy to see the new emphasis on integration. States could go further, and assist integration by state requirements.

Answer: (Roy Wright) FEMA has tried to make it clear as to what is required and what would make it stronger, and also attempted to look at 44CFR201 and incentivize greater efforts.

Answer: (Darrin Punchard) Pre-DMA 2000 some states launched voluntary HMP effort; such as an example in North Carolina, requiring a hazard mitigation plan to be in place to get FEMA Public Assistance program support, i.e., funding for infrastructure repair after a declared disaster.

Question: Much has been said about integration of climate change adaptation, mitigation, comprehensive planning and emergency management. What is the mechanism to implement and bring money to the table? *America Burning 2002*, a FEMA publication, documents reducing urban fire in 200 years through rewards such as lower insurance rates. We need to show communities how to bring monies to development commissions, etc.

Answer: (Roy Wright) We need to identify community economic drivers. Craig Fugate says the greatest indicator of mitigation is the resilience of the local government tax base. Resilience ensures stability and sustainability of services the public expects.

5

Track 3: Mitigation Success Stories

Session Title: **The Role of Private / Nonprofit Sector Innovation in Mitigation**

Date/Time: Wednesday, July 18, 2012 10:15-11:30 am

Moderator: **Tim Lovell**, Executive Director, Tulsa Partners, Inc.

Speakers: **Tom Bennett**, Past President, National Storm Shelter Association
Elizabeth English, Associate Professor, School of Architecture, University of Waterloo

Sheryl Siddiqui, Co-Chair, Language and Culture Bank, Tulsa Partners, Inc.

Recorder: **Ann Patton**, Owner, Ann Patton Company, LLC

Tim Lovell introduced the session by saying that this session would highlight the challenges and successes of private and nonprofit sector innovators in the mitigation field. Panelists will focus on how innovation fostered by the public, private, and nonprofit sectors can assist in meeting the environmental and hazard mitigation challenges faced by local communities.

5A

Tom Bennett explained that he is past president of the National Storm Shelter Association, executive producer of weather programs for KOTV in Tulsa, and owner of a company that manufactures and sells SafeRooms, Jim Giles SafeRoomMs. He described the evolution of SafeRoom technology through a combination of public, private, and nonprofit actions over the past 40 years.

Bennett said the story of SafeRooms starts in 1970 when an F5 tornado hit Lubbock, TX. The devastation inspired Dr. Ernst Kiesling and others at Lubbock's Texas Tech University to set out on a life-long search for ways to increase life safety and reduce losses from tornadoes. He said that at that time, people believed tornado wind speeds were so intense that it would never be possible to design a building that could withstand a tornado. He said for many years, Dr. Kiesling's teams studied tornadoes intently and dispatched research

teams for field investigations after more than 25 tornadoes, leading to a key observation that small interior bathrooms or closets were most likely to survive the storm. He said Dr. Kiesling designed an engineered version of that small interior room – a SafeRoom, specially anchored and armored to withstand even the strongest tornado, and designed to actually allow the house to separate from the SafeRoom if needed. He said these SafeRooms can be built inside, outside, or under a building.

Bennett showed an aerial photo of the 2011 Joplin tornado, including an above-ground SafeRoom in which people survived the storm. He also showed photos of community SafeRooms and shelters, including those in Alabama and Mississippi and noted that interest in SafeRooms is now international in scope.

5B

Elizabeth English said her work has focused on building resilience with amphibious foundation architecture, buildings that normally rest on dry land but actually rise and float on the surface during floods. She said she named her work the “Buoyant Foundation Project,” founded in 2006 in New Orleans. She said this type of construction could be used, for example, in the Lower Ninth Ward in New Orleans, which she said was more culturally appropriate than the static alternative which would be elevated with long staircases, because floating home design could preserve the area’s front porch culture and could be used for new construction or retrofits.

English said the buildings become free-floating pontoons, tethered for stability like a floating dock, and include three elements: buoyancy blocks inserted under the house, vertical guidance, and a tie to stabilize the building. She stated that the system can be used in areas of still rising water, not flowing water, and is not intended for coastal areas subject to storm surge. She built a prototype in 2007. She showed examples in rural Louisiana fishing camps and summer cottages, the Netherlands, on the Thames River in the UK, and in Bangladesh. One version uses plastic water bottles for buoyancy. She said the system is passive and very simple and long-lasting, without batteries or electrical systems. She said that people may want to disconnect utilities. She added that the floating house would not be an alternative to evacuation in areas where people should evacuate.

5C

Sheryl Siddiqui said the Tulsa Language and Culture Bank is a program of Tulsa Partners Inc., a nonprofit organization working to create a disaster-resilient, sustainable community. She said TLCB is a grassroots group of volunteers who are working to make sure that everyone, even those who don’t speak English or have disabilities, gets lifesaving warning and preparedness information. Siddiqui said the group connects bilingual and multi-cultural volunteers to agencies working with Tulsans whose ability to receive this lifesaving information may be compromised by cultural, ethnic, or religious traditions or language. She explained that, in addition to translating the messages into many different languages, including sign language, the TLCB produces information pieces with representatives of the various cultures – so a preparedness message for Hispanics would be in Spanish and delivered by someone Hispanic, for example. “In times of stress like disasters, people are often looking for somebody who looks like them for information and comfort,” she said.

Siddiqui said the philosophy that guides the TLCB is that every Tulsan should get life-saving information in a medium they can understand, and in time to save their own life. She said the group is preparing themselves first, then their communities. She said volunteers take

extensive training in subjects such as FEMA protocols and interpretation, with a goal of becoming field-ready volunteers. She explained the group is also building bridges of understanding across cultures, but their focus is on disaster-related issues. “We’re not trying to do everything for everybody,” she said. “We’re in the information and connections business.” In response to audience questions, she agreed to share messages developed by the TLCB with other communities.

6

Session Title: **The Challenge of Making Mitigation Matter**

Date/Time: Wednesday, July 18, 2012 1:30-2:45 p.m.

Moderator: **Erin Capps**, Project Manager, H2O Partners, Inc.

Speakers: **Chris White**, Chief Operations Officer, Anchor Point Group, LLC
Roy Wright, Deputy Director, Risk Analysis, Federal Insurance and Mitigation, Administration (FIMA), Federal Emergency Management Agency (FEMA), Department of Homeland Security (DHS)
Rhonda Price, Committee Coordinator, Gulf of Mexico Alliance (GOMA), Coastal Community Resilience Priority Issue Team
Walter Peacock, Professor and Director, Hazard Reduction and Recovery Center, Texas A&M University

Recorder: French Wetmore, President, French & Associates, Ltd.

6A

Chris White was previously employed by Boulder County, Colorado, but is now with Anchor Point Group, a company of fire managers and fire scientists. He noted the trends that more people are “moving to the woods,” i.e., the wildland urban interface and that, while there are fewer wildfires, they are bigger. He said June 2012 saw the second highest number of acres burned and the third least number of fires. He explained this is not just a U.S. problem, as there have been killer fires recently in Russia, Australia and Israel.

Mr. White said Anchor Point has developed No-HARM, the National Hazard and Risk Model, which maps the country’s “firesheds” – areas of similar exposure to fire hazard. He said instead of mapping historic fires, its fire behavior modeling accounts for factors such as development, ground cover, distance to fire stations, and likelihood of fire or embers from high hazard areas to threaten adjacent lower hazard areas. He stated the model can show “ember zones,” areas that do not match the traditional wildfire susceptibility profile that are at risk from neighboring areas.

Mr. White described how No-HARM identifies 22 million firesheds that average 175 acres each. He said the model reports that 45% of the US population is at risk from wildfire, with 14% of the population in “high,” “very high,” and “extreme” hazard areas. Mr. White suggested No-HARM can help with wildfire management in three ways:

1. It provides objective data that can help policy, prioritize efforts and funding based on scientific data, instead of subjective grant writing
2. It can provide data to show the value of mitigation measures.
3. It can be used for more accurate benefit/cost analyses.

6B

Roy Wright manages FEMA’s Risk MAP program (“MAP” stands for Mapping, Assessment, and Planning). He said the program’s annual surveys of citizens and local officials find a difference of opinion of their communities’ flood risk (45% of the citizens and 68% of the officials feel their communities are at risk). He said the objective of Risk MAP is to get people to understand their risk, not just know where the boundary of the water hazard. Mr. Wright suggested that those who understand their risk are more likely to do something about it.

Mr. Wright explained that when FEMA staff meet with local officials, they expect more than the mapping engineers to participate, especially including community development staff, the mayor’s office, the Chamber of Commerce, and others who drive actions in the community. He said FEMA has found that people get their information from the news media and their local officials, so FEMA wants to get those officials into the middle of the process, not only telling people about the hazard, but also what they can do about it. He said this work is being done more at the watershed level.

Mr. Wright said FEMA has a new program called “Know Your Line,” that involves setting high water marks in public places, supported by seven federal agencies and 12 pilot communities. He said the water marks are usually set on public buildings, with a goal of helping individuals see the relation between flooding and their neighborhoods or their own homes—rather than a theoretical concept shown on a map. He said the program will be sensitive to local concerns as it aims to improve local recognition of flood risk.

6C

Rhonda Price works for the Mississippi Department of Marine Resources and is the leader of the community resilience team of the Gulf of Mexico Alliance (GOMA). She explained that GOMA represents the five Gulf states (TX, LA, MS, AL, and FL) and a variety of federal agencies. She said the mission of the team is to “coordinate and enhance efforts of local, state, federal, business and non-profit partners to assist coastal communities and ecosystems in the Gulf of Mexico region in becoming more resilient in structure and function.” She said GOMA defines resilience as “the capacity of both social and environment systems to adapt to and recover from change.”

Ms. Price said GOMA’s team has developed five tools to help communities become resilient:

1. StormSmart Coasts is a web-based clearinghouse. There is one for each of the five states with state-specific information on tools, funding, and case studies. It is a “one stop shop for coastal decision makers” with guidance on what to do before, during and after a coastal storm.
2. StormSmart Connect is a networking site for decision makers, with over 250 registered users. Users can send messages, share files, form groups with similar concerns, and plan events.
3. The Resilience Index is a self-assessment that can identify community strengths and weaknesses and is designed to get users to think about the problems in their communities.
4. Each of the five states will have its own Homeowner Handbooks.
5. Sea-Level Rise Modeling (www.csc.noaa.gov/digitalcoast/tools/slrviewer) shows users the areas impacted by various scenarios and includes social and economic data.

6D

Walter Peacock is a professor at Texas A&M University and director of the Hazard Reduction and Recovery Center. He reviewed the findings of a recent project by the university that surveyed planning directors, city managers, and mayors of 26 counties and 98 municipalities which represented 90% of the population in coastal Texas. He said the survey sought to find out which of 44 mitigation measures were used by the communities, with results organized in ten categories:

1. Development Regulation and Land Use Management (7 measures)
2. Limiting shoreline development and activities (3)
3. Building Standards (5)
4. Natural Resource Protection (5)
5. Public Information and awareness (5)
6. Incentives tools for environmentally sensitive/hazardous area (5)
7. Property acquisition programs (3)
8. Financial tools (3)
9. Critical public & private facility policies (3)
10. Private-public sector initiatives (5)

Dr. Peacock said the study found that only 15 of the 44 measures were used to any degree, and of the top three (National Flood Insurance Program, building codes, and flood protection standards), two are driven by the federal government. He said the study's main conclusion is that communities are using a "limited portfolio" of mitigation measures.

Dr. Peacock discussed three factors that influence the use of the measures:

1. Planning authority: larger cities were more comprehensive while counties have limited authority.
2. Capacity: more data, funds, community support, and staff mean more mitigation.
3. Commitment: buy-in can be measured by agreements, staffing levels, and involvement of others.

He said #3, commitment, is the most important influence for achieving mitigation.

7

Session Title: Track 2: Mitigation Needs. International Experiences of Natural Hazard Mitigation Professionals

Date/Time: Wednesday, July 18, 2012 1:30-3:15 p.m.

Organizer and Moderator: Tom Fahy, Managing Director, Capitol CR Group

Speakers: **Larry Brazil**, President and CEO, Riverside Technology, Inc.
David Curtis, Vice President, WEST Consultants, Inc. and President, National Hydrological Warning Council
Bob Glasgow, Structural Engineer and Principal, Miyamoto International

Recorder: **Antonia Rosati**, North American Regional Climate Change Assessment Program (NARCCAP) User Community Liaison, National Center for Atmospheric Research (NCAR)

7A

David Curtis began by discussing background information about Chile such as the country's location, climate, economic forces, GDP per capita, economic history, e.g., in the early 90s Chile grew much faster than its neighbors, and military influences in the area.

He said major uses of water went to economic uses whereas environmental factors did not get worked into the cost benefit analysis. He said one example is a hydroelectric power development to build a \$7 billion dam, causing bitter controversy.

Mr. Curtis said Chile's mining needs, i.e., copper, and living standards all require a lot of water. He said flash flooding is a big issue in Chile, including the most recent incident in Punta Arena in May 2012. He said the nation wants sustainable environment and to live with the landscape.

Mr. Curtis said his organizations have provided hydrology and hydraulics training – to government agencies, utilities, water, and sewer agencies. He said 90% of the water is treated and Chile has great water quality. He said the result, better methods of handling water and water resources—even glaciers—and the goal is to get to 40% hydroelectric production as total production for country. He said climate change will affect all this.

Mr. Curtis provided the website link to NHWC's upcoming Jacksonville conference:
<http://hydrologicwarning.org>

7B

Larry Brazil began by thanking NHMA for the invitation, his first occasion at a Practitioners Workshop. He gave a brief history of Riverside Technology, Inc., noting its website:
www.riverside.com

Mr. Brazil described the Nile River basin—drainage from 10 countries, currently 200 million people already limited by insufficient water and food and a projected population growth to 400 million by 2025, too much water in some places, too little in others, land degradation, poor access to energy, dominated by issues of erosion, siltation, food insecurity and poverty.

He described the Nile Basin Initiative (NBI), an intergovernmental organization formed in 1999, funded by donors such as the World Bank. He explained that while many entities want to invest in the basin, NBI looks at how investments benefit all countries, not just one.

He said Riverside Technology, Inc. is involved with DSS, Forecast system design, web portal with SharePoint technology, and pilot studies.

Mr. Brazil said the Nile Decision Support System is designed to “fight problems associated with water stress...” He added that DHI is a major partner to evaluate changes in operation, irrigation, reservoir systems, etc. He said the decision support system takes current future environmental data and infrastructure into a central database and central model, simulates

impacts to object information for decisions. This way, he said, “They don’t fight over who has a better model. There is consensus between stakeholders.”

Pilot studies for flood risk mapping in Ethiopia and Sudan were reported by Mr. Brazil. He said the objective is to reduce future flood damages by producing tools for guiding infrastructure development and preparing for floods. He said the project is designed to teach locals how to do flood cross-sections, DEM, asset assessment converted to flood vulnerability and then produce flood risk maps with tools such as USACE’s HEC. He said this is the only place in the Nile Basin that has done this sort of work.

Mr. Brazil said initial results are encouraging by measures such as use of technology, technology capacity building and sharing of information.

He said the lessons learned so far include: to practice expectation management—what is achievable—and the benefits of showing early results to keep interest and involving future users.

Mr. Brazil highlighted key issues: 1) new Nile state, South Sudan, where will their support be? 2) Grand Millennium Dam in Ethiopia, comparable to Hoover Dam, which was not approved by downstream groups, 3) the Cooperative Framework Agreement has three holdouts to this legally binding document on water distribution. He said major questions include: availability of data, appropriate tools and technology, continued donor support, and uncertainty if trained people will stay with the program and in their locations? He said climate change is an overriding question.

7C

Bob Glasow overviewed the Haiti earthquake where his firm, Miyamoto International, has been active since the January 2010 event. He explained data on damages and losses, noting the number of homeless persons has been reduced from 1.2 million to 810,000 in 2011.

Mr. Glasgow described principal activities: 1) Assessing homes using the standard of the Applied Technology Council, ATC20, developed in California but tailored to Haiti structures, 2) Training 600 engineers on ATC20 through Haiti’s Engineer and Mason Training Program, 3) Assessing 400,000 objects including mapping/GPS locations for each. He explained that ATC20 has three levels of damage—green/ok, yellow/damage, red/unsafe—with Haiti’s results of approximately 50% green tagged, 30% yellow, the balance being red.

Mr. Glasgow summarized results: 1) Repair of yellow-tagged homes started in January and should end in September. 2) 7,200 homes repaired to date, occupied by about seven persons per dwelling. 3) Over 50,000 people left camps and returned home because of these repairs. 4) 30,000 houses repaired by other nongovernmental programs. 5) 60-70% of debris removed. 6) Over 5,000 masons, 600 engineers and over twenty contractors trained. 7) Masons hired were locals.

7 Q/A

Questions:

To Mr. Brazil – FEMA flood mapping takes money and time. Were shortcuts used in Africa?

Answer: Mapping was optimized based on availability of data. Data resolution of 90m and other 30m was not as accurate, supplemented with cross sections. Lots of surveying done by locals, using standard HEC tools but adapted based on resolution available. Labor

intensive, so pilot studies were done. The work will also generate hydro information that helps justify the expense.

To Mr. Brazil - With doubling of population, is there an estimate of needs, and what is the political fallout?

Answer: Expecting major stress from this growth. Ethiopia is moving to control the Nile. Generally it is cheaper to fund these programs than fund a war.

To Panel – What are the best ways to foster sustainability?

Answer: Unanimously agreed, continuous training is important. Cooperative development is also important because the people must feel they own both the changes and the choices being made in their area.

To Panel – Please rank the importance of equipment, software, and capacity

Answer: Capacity is the most important because technology is useless if people do not know how to use it.

To Panel – What are the most pressing needs in international hazard mitigation?

Answer: The ability to pay for things. Many of these countries do not have an economy with internal demand like Chile or the US.

To Mr. Glasgow – Was Haiti repaired to a higher standard?

Answer: Yes, via such features as horizontal wire reinforcing, 4 to 5 times more resilient buildings.

To Mr. Glasgow – Was there a multi-hazard approach to repairs in Haiti?

Answer: Technically, this was not rebuilding but rather repair, however, the project was able to use strap-down techniques to secure some buildings against higher winds than before.

8

Session Title: Mitigation Successes on the Ground

Date/Time: Wednesday, July 18, 2012 1:30-2:45pm

Moderator: Darrin Punched, Senior Project Manager, AECOM

Speakers: Timothy Trautman, Flood Mitigation Program Manager, Charlotte-Mecklenburg Storm Water Services, North Carolina
Christina Randall, Wildfire Mitigation Administrator, Colorado Springs Fire Department, Colorado

Recorder: Stacy Franklin Robinson, Senior Planner, Atkins

Darrin Punched began the session by welcoming those in attendance and providing a brief introduction for Tim Trautman who serves as Flood Mitigation Program Manager for the Charlotte-Mecklenburg Storm Water Services in North Carolina.

8A

Tim Trautman began his presentation by explaining that there have been a lot of challenges and successes in Charlotte/Mecklenburg with flood hazards. He explained that

the community has solutions for some challenges and still has other issues it is trying to solve.

He said Charlotte/Mecklenburg experienced two floods in the 1990s that prompted a public outcry and triggered a need for action. He said the community decided to deal with two issues: 1) address existing problems or “sins of the past,” and 2) to prevent from adding to the problem in the future as Charlotte continued to develop. He said the community decided to make changes to the way it developed its floodplains and to implement many features such as better planning and no adverse impact techniques. He said Charlotte leaders were asked, “What could our floodplains look like when Charlotte is built out?” He noted that the National Flood Insurance Program, NFIP, looks at the present but communities should also be looking into their future. He said Charlotte/Mecklenburg created maps of future conditions floodplains using adopted land use plans to estimate future conditions and incorporate them into Flood Insurance Rate Maps, FIRMs, and use those to regulate development. He said several challenges were encountered in this process, such as:

- How do you regulate existing construction by future standards? How do you communicate it to homeowners?
- What assumptions are you making in developing the maps? How do you get buy-in on those assumptions?
- How are you going to maintain the data as plans change and structures are added, moved, etc?
- How can they meet the need to educate the stakeholders on the difference between the FEMA regulations and the City regulations which are more stringent?

He said that in order to address existing flood problems, a thorough plan was needed, thus Charlotte/Mecklenburg is in the process of finalizing a new Risk Assessment and Risk Reduction Plan, created in digital form so it can be updated frequently as properties change or new information becomes available. He said the new plan is used to guide the Capital Improvement Program and determine where mitigation should be applied, based on flood risk and other community priorities.

Mr. Trautman said Charlotte/Mecklenburg has had several successes over the last 12 years, including the removal of 250 buildings/homes in floodplains and relocation of over 450 families, 120 acres of floodplains restored, and \$5.5 million in water quality projects implemented. He stated that areas have flooded many times since they were mitigated and damages have been avoided to hundreds of buildings. He said the cumulative investment, and benefits in mitigation comparison clearly show the value of these efforts, with expenditures of about \$49 million and predictions to avoid \$280 million in losses. He reported successful areas of mitigation include Little Sugar Creek area and Westfield Road as well as the Cullman Avenue buyout. Mr. Trautman said that a couple efforts had been funded locally, without federal or state assistance and that the community developed a pre-disaster recovery plan that helps foster greater resources, increases political will and helps accomplish cost savings. He said Charlotte/Mecklenburg implemented a locally funded “Quick Buy” in 2008 after flooding from Tropical Storm Fay, which was not a federally declared disaster. He said the program offered pre-disaster market value to property owners to mitigate flooded areas through buyouts that took place three to four months after the flood event, with about 50 properties acquired. He said Charlotte/Mecklenburg used this same process to buy another 22 flood damaged homes after flooding in 2011.

Next, **Iain Hyde** from the Colorado Division of Homeland Security and Emergency Management introduced Christina Randall as the Wildfire Mitigation Administrator for the Colorado Springs Fire Department.

8B

Christina Randall began her presentation by describing the systematic approach Colorado Springs uses for wildfire mitigation including elements such as wildfire hazard risk assessment, education and outreach, fuels management, development review, fire behavior analysis, bans and warnings. She described the fire history of Colorado Springs, particularly the average fire return interval which is about fifty years, and the geographic pattern, with most of the city's wildland-urban interface being located west of Interstate 25.

Ms. Randall explained the city's Wildfire Hazard Risk Assessment, which uses the Wildfire Hazard Information Extraction (WHINFOE) model that processes twenty-five (25) weighted values. She said there was some initial concern about making this data publicly available as residents were afraid that their insurance rates might rise as a result of the risk identification, but it was made public and has not resulted in increased insurance rates. She said the map can be found at <http://csfd.springsgov.com>. Ms. Randall discussed education and outreach, noting the primary audience is adults who buy homes, while fuel management is typically undertaken through stewardship with property owners, and most mitigation work is performed on private lands by private owners. She said the city manages common areas and open spaces, and protects city-owned assets. She said for forested areas, the city prefers not to clear-cut or cut fire breaks and feels that this selective approach works best, in combination with fuels management. She noted that development review is done through the city's Hillside Ordinance, which looks at hardening at the beginning of development instead of waiting to mitigate later. Ms. Randall said the city also has a citywide Class A Roof Ordinance, with over 50,000 roofs having been mitigated through this effort.

She offered lessons learned thus far:

- It is more effective to educate adults about wildfire mitigation than children because adults are the primary decision makers in development as well as individual property mitigation.
- Enforcement is unpopular but education has proved successful in encouraging property owners to mitigate.
- Those residents who understand their risk are more motivated to mitigate it.
- Detractors can be champions if they are educated on the benefits of what the local government is trying to accomplish. Conversely, developers and realtors are important to helping this cause.

8 Q/A

Darrin Punchard invited audience members to ask questions of the panelists.

Kamer Davis asked Tim Trautman--Are owners of properties not located in the Special Flood Hazard Area buying flood insurance? **Tim Trautman** replied that the City has not studied this yet but indicated that some of the future floodplains are dropping as a result of recent map updates and the City promotes flood insurance widely.

Ken Topping asked Christina Randall—Did dead-end streets and cul-de-sacs hinder the response to the recent Waldo Canyon Wildfire? **Christina Randall** replied that they affected evacuation traffic but really didn't impact firefighting access because the fire department had worked with the neighborhoods previously and knew their access points and barriers.

Tim Trautman noted that there are similarities between what the Charlotte/Mecklenburg stormwater agency has experienced and the Colorado fire risk issues and how good data and maps are sometimes opposed due to fear of publicly available data and its potential implications.

Barry Hokanson asked Tim Trautman—Is there an association where stormwater staff with Charlotte/Mecklenburg communicate with peers in other communities to share your approach and lessons learned? **Tim Trautman** replied that peer-to-peer connections are something that the city could improve upon but in one instance the city shared experiences with the City of Nashville, Tennessee, following flooding there and some of the Charlotte/Mecklenburg ideas were employed by Nashville.

Iain Hyde asked—How is Colorado Springs doing more with less in terms of matching grant funds? **Christina Randall** replied that the city's match was partially provided by recording expenditures for its chipping crew, fuels crew, fuels technician and program coordinator and by tracking projects in the private sector too. She said the City tracks individual mitigation activities in neighborhoods and counts those efforts as grant match also.

Nathan Slaughter asked—Do people from other communities ask to see successful PDM applications by Colorado Springs? **Christina Randall** replied no, the city does not share it because they achieve the grant match by working with neighborhoods to capture time/materials costs, so it is very specific to Colorado Springs.