2013 ASFPM Foundation
Texas State Flood Risk Symposium
March 19, 2013 – Austin, Texas

TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION
ESTABLISHED 1988

ASFPM foundation
sustainable floodplain management policy

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The mission of the Association of State Floodplain Managers (ASFPM) Foundation is to promote public policy through select strategic initiatives and serve as an incubator for long-term policy development that promotes sustainable floodplain and watershed management. In order to advance that mission, the Foundation established a periodic gathering of leading experts in flood policy and floodplain management to facilitate national discussion of important floodplain management issues. These Forums develop policy and research recommendations and establish an ongoing record of flood policy issues and directions for the future. The Forums have been named in honor of Gilbert F. White, who championed the sound, comprehensive management of floodplains and the adoption of a broad range of adjustments to floods. One of the most influential floodplain management policy experts of the 20th century, he noted: *"Floods are 'acts of God, but flood losses are largely acts of man."* The Forums are not only a tribute to his work, but also provide recognition of the success of his deliberative approach to policy analysis and research.

Periodically the Forum explores one pressing national flood policy issue by assembling and facilitating a dialogue among topical experts who represent various stakeholders from government, industry, and academia. The goal of each Forum is to identify needed research and policies that will reduce the human casualties and economic losses associated with flooding, as well as protect and enhance the natural and beneficial functions of flood-prone areas.

In 2011, the Foundation began teaming with State Chapters throughout the nation to hold Statewide Symposiums to review the findings of the 2010 Gilbert F. White Forum detailed in *Managing Flood Risks and Floodplain Resources.* The Texas Floodplain Management Association (TFMA), in partnership with the ASFPM Foundation brought together 80+ individuals from diverse backgrounds for a one-day symposium to identify how the collective resources of these individuals could assist and shape policy and future approaches to flooding within Texas.

At the 2010 national forum, participants were asked to write perspectives on flood risk management, based on their own experiences. A compilation of all those papers were shared with each of the state forum participants prior to the event to provide some context for the issues which would be discussed throughout the symposium.

Symposium Itinerary:

- Welcome and introduction by hosts, ASFPM and TFMA
- Introduction of all participants. Participants each idenitifed a challenge related to flood risk. See full list included at the end of this report.
- Video – D. Mileti, *Behavior Factors and How to Effective Changes in Flood Mitigation*
- Setting the Stage for Risk Management
- Status of Floodplain Management in Texas
- Breakout Session One – Flood Risk Indicators to build a Mitigation Dashboard
- Breakout Session Two – Challenges and Strategies to Flood Risk Reduction
- Group Report Outs and Discussion
- Action Plan and Wrap Up Session

Flooding in Texas

A few sobering data points about the flood hazards within the State of Texas:

Figure: *1935 Flood - Austin, Texas*
Courtesy of Austin History Center, PICA 008484-A

- Texas regularly leads the nation in flood related fatalities and property damage.
    - Texas leads the nation in flood-related deaths most every year -- averaging twice the next nearest state: California.
    - Texas leads the nation in flood-related damages most every year - sharing this distinction with Florida and Louisiana.
    - Texas is among the top four states with repeat flood losses to the same properties. (Source: Blue Ribbon Study)
    - In 2001 alone, 40 died and over $5 billion in flood related damages was realized
- Deaths from all natural disasters are declining… except for flash flooding
- Texas has world record rainfall amounts and a predominance for extreme flooding events
- Texas holds half of the 12 world record short duration (48 hours or less) flood events:
    - Thrall, Texas (1921) received 32” of rain in less than 12 hours
    - D’Hanis, Texas (1935) received 22” of rain in 2 hours and 45 minutes
- Texas geography leaves the state vulnerable to Tropical Hurricanes and large air masses that bring tremendous amounts of rainfall from any direction
- Worst storms are Gulf of Mexico (Hurricanes & Tropical Systems) and Balcones Escarpment (Flash Flood Alley)
    - Central Texas has been identified as the most flash-flood prone area in the United States by the National Weather Service.
    - From 1986 to 2000, Texas experienced 4,722 flash flood events. (Source: Blue Ribbon Study)
- Major populations centers (Houston, San Antonio, Dallas & Fort Worth) within the state are in these most vulnerable regions.
    - Some 20 million of Texas' 171 million acres are flood-prone - more than in any other state. (Source: 2001 Blue Ribbon Committee Study -- Texas Senate Concurrent Resolution 68)
    - Texas has approximately 8 million structures in floodplains. 3 million of these have no flood insurance. (Source: Blue Ribbon Study)

Figure: *1935 Flood - Colorado River Bridge in Columbus, TX*
Courtesy Nesbitt Memorial Library 00160

There are a few indicators that signify the attention that should be given to flood related education:

- 89% of the communities (1225 communities) within the State are currently participating in the NFIP
- 13% of all flood policies in the US are held within the State of Texas
- TFMA is the largest state chapter with the most Certified Floodplain Managers (CFMs) in one state *(July 2013: Over 2000 members and 1600 CFMs)*
- Over 2000 participants have attended the last 5 state conferences
- In 1999, TFMA prepared and presented a white paper to the Governor's office, advocating higher standards for floodplain management.
- A freeboard survey was organized and has been conducted for 10 consecutive years. Of the 255 communities that participated in the study, results show:
    - 211 communities require freeboard above the Base Flood Elevation (BFE) (83% of respondents)
    - 64 communities prepared fully developed (ultimate conditions) flood analyses (25% of respondents)
- 58 Texas Communities/Counties participate in FEMA's Community Rating System (CRS) (less than 5% of Texas communities participate)
- In 2012, the Texas Water Plan was updated to include Flood Mitigation Needs
- The Texas Natural Resources Information System (TNRIS) has collected high resoultion elevation data aloing the Texas Gulf Coast amongst other locations throughout the state.
- Following Hurricane Ike, Galveston County used the Hazard Mitigation Grant Program to buyout 750 structures on the Bolivar Peninsula.
- TFMA has prepared a school campaign for Turn Around, Don't Drown, furthering a National Weather Service intiative.

There are some bright spots concerning the legislature and their understanding of flood risk:

- House Bill (HB) 1018 – requires all communities to adopt minimum floodplain management regulations
- Senate Bill (SB) 936 – Allows counties to adopt higher standards
- SB 1436 – Established the Texas Floodplain Management Fund
- HB 1445 – requires cooperative agreements between cities and counties to manage development in the ETJ
- HB 1831 - gives Texas mayors and county judges who order, for example, a hurricane evacuation the authority to remove residents who refuse to evacuate
- HB 1481 - Class B misdemeanor if a person drives around a barricade where a warning sign or barricade has been placed because water is over any portion of a road, street, or highway. It also specifically creates a traffic violation for driving around a barricade put in the roadway because of dangerous conditions.

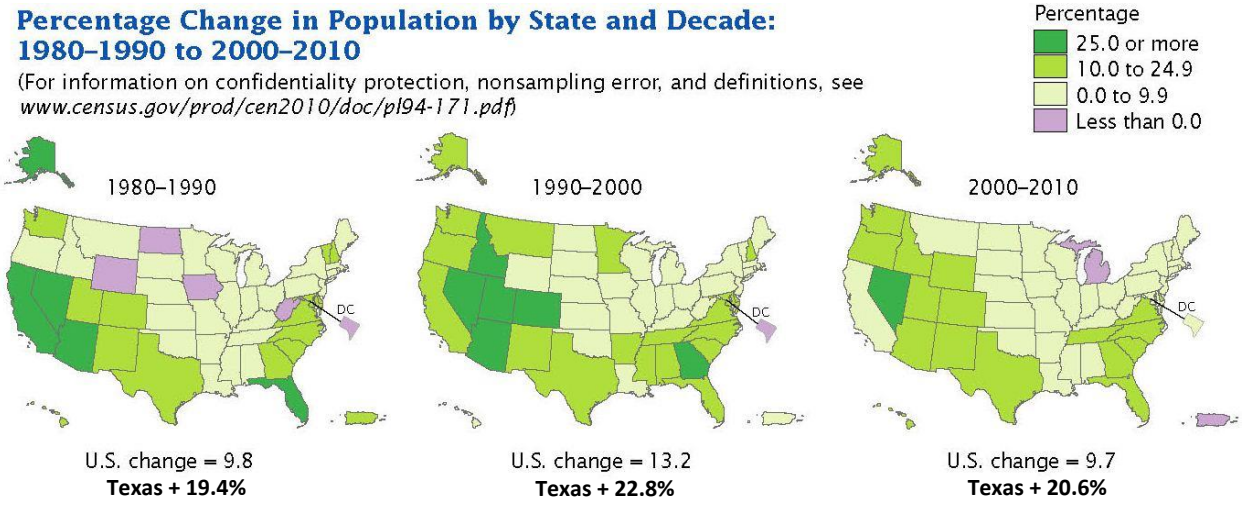
There are also some concerns regarding our State's Decision Makers' flood risk awareness:

- In 2011, Senate Bill 1436 did not fund the Texas Water Development Board (TWDB) to fully fund their on-going programs.

- This led to a reduction in staff and reorganization of flood mitigation focused staff within the state departments. Training, education and outreach activities have stalled over the past few years in the adjustment.
- There is no state law requiring standards in excess of the National Flood Insurance Program minimums. Most other states do require some higher standards.
- There is no certification, training or education requirement for local elected officials or community staff overseeing floodplain management.

The Need for a Proactive and Integrated Flood Risk Management Strategy

Between 2000 and 2010, Texas experienced an incredible population increase, up by 4.3 million people. The concentration of high percentage changes among the western and southern states maintains a pattern from recent decades. See figure below for an overview of the population change over the past three decades.



Source: US Census Bureau, 2010 Census, Census 2000, 1990 and 1980 Census

All ten of the most populous metro areas in 2010 grew over the decade, with Houston, Atlanta, and Dallas-Fort Worth (26.1%, 24.0%, and 23.4%, respectively) the fastest-growing among them. The Houston and Dallas-Fort Worth metro areas together accounted for almost one-half (49.0 percent) of Texas' population and over one-half (56.9 percent) of its population growth. With the sustained growth in metropolitan areas throughout the state, it is crucial that the State be proactive and prepared to the increased flood risk introduced by prolonged development activity occuring throughouth the state, especially within these most populous areas to minimize future increases in flood losses to both life and property. It is imperitive that the State of Texas embrace a proactive stance towards flooding. As the State Mitigation Plan notes, Riverine Flooding is the most likely natural occuring hazard, followed closely by Coastal Flooding.

If the trend for population inflow continues, it is not a question of if the losses will increase. If a more proactive stance is taken, it is a matter of when will it become economically impractical to remain on the current course.

"It Never Floods Here" - Drought to Flood Conditions

There is something in the human psyche that compels us to deny the prospect of large scale disasters. People cling to the belief that such events will happen to "someone else." Even in areas prone to flooding (Flash Flood Alley), it is common to hear "It never floods here." Historic investments in large flood control structures throughout the state decreased the severity of flooding in certain areas, however, these structures have not removed the risk. The impoundment of water within each of the high hazard dams throughout the state poses an added risk to the population downstream if these structures are not maintained.

Over the last decade of the 20th century, at least 1 billion people were directly affected by natural calamities. (Outside the Beltway, February 2004). Even with better understanding of how disasters occur, the ballooning world population – mostly in the very areas most vulnerable to natural hazards – means that the human, if not economic, impacts have continued to rise exponentially.

It does flood in Texas. The facts within the State Hazard Mitigation Plan speak volumes:

- On average, Texas suffers approximately 400 floods annually, more than double the average of the second-highest State (ascertained by local data relating to events resulting in damages of at least $50,000).
- Since 1953, Texas experienced 30 Federal disaster declarations as a result of flooding events.
- Between 1978 and 2000, an estimated $1.4 billion in flood insurance claims were filed in Texas, and an estimated $5 billion in uninsured flood damages occurred.

It is necessary to analyze and accept the possibility of flooding in areas throughout the state. It is necessary for the agencies, departments, and other interested parties to beat the drum constantly and consistently to assure that home owners, business owners, community, state, and federal leaders are aware and acting in a manner to support the long-term reduction of risk.

Education for Everyone

From the State Legislature and the Governor's office to the homeowners and business owners, there is a need to educate people throughout the state to the risks posed by flooding. There is a need for the government entities at the Federal, State, and Local levels to pool their resources and collaborate in efforts to reach a broader audience with less effort to communicate risk at any one level. Although risk communication can be tricky, a constant and consistent message leads to an informed and prepared public. There is a need throughout the State of Texas to take a proactive stance to communicate the possibility of flooding and a need to look for ways to promote educational efforts in a variety of arenas.

State Legislature (House and Senate): It is necessary to educate the state decision makers, who are responsible for budget decisions, on the advantages of flood risk mitigation for the State of Texas, the need to embrace the mitigation strategies within the State Mitigation Plan,

and motivation to align state departments and agencies related to flooding. Promoting and understanding flood and other natural hazard risks can lead to an integrated use of state resources to better assist communities minimize their future risks. State mitigation priorities and strategies could be developed for each of the climatic/geographic regions to provide localized risk reduction to optimize the effectiveness of future investments.

If the state were to track its mitigation investments through existing federal and state programs, it could calculate the loss avoidance of its investments over time. For instance – if the state were to track the GPS location (latitude, longitude), footprint and finished floor elevation of each structure it aquired, the state could calculate savings due to mitigation investment after each flood event. Tracking and logging these investments with a few data points would allow communities and the State to review its investments over time.

Community Elected Officials and Floodplain Staff: Local officials have limited resources and many competing priorities. Understanding flood risk throughout a community and mitigation strategies and long-term projects to reduce risk to life and property is an important priority that must be considered. Mitigation actions taken to reduce flood risk within a community could include increasing open space, requiring freeboard for construction near flooding sources and asking that development within a community be constructed to ensure public safety (adoption and enforcement of building codes, etc. These are a few ways to minimize additional community damage during future storms.

The Association of Mayors, Councilmembers and Commissioners (AMCC) and the Texas Municipal League (TML) encourage elected officials to learn as much as possible about their governance roles and city government in general by offering a variety of educational opportunities. The training does not currently require any education on floodplain management, mitigation planning, or strategies to reduce risk from natural hazards within their community. It may be beneficial to partner the Texas Division of Emergency Management, Texas Water Development Board, and TFMA with the AMCC and TML to prepare floodplain management training for newly elected officials.

Public Awareness & Education (Home & Business Owners): The largest communications gap that currently exists is that with the public. The Turn Around Don't Drown Flood Safety Education and Outreach Program provides information for teachers to use in educating the state's youth on the flood risk at low water crossings. But this is only one current effort. Since the human psyche has a tendency to remain optimistic and think that these things will happen to other people, it is necessary for the organizations, departments, and agencies related to hazard mitigation and planning, floodplain management, and emergency management to constantly communicate the risks within a community.

Dr. Mileti's video noted a few key take aways that should be reviewed during the planning of any public outreach campaign:

- Use evidence based approaches and research based results.
- Stop doing things that don't work. Percentages and probabilities do not motivate people to change their behavior
- Use multiple sources of information. No one organization can be effective alone.

- Brand the message. Think Coca-Cola.
- Use mulitple information channels
- Communicate over the “long-haul”
- Tell people what to do to prepare.
- Explain consequence reduction
- Position cues for people to see. Monkey-see, monkey-do.
- Target talking. Encourage people to talk about preparing and mitigation with others.

An effective campaign for public awareness of risk and actions that can be taken to reduce risks will lead to a public that expects their local officials to seek out opportunities to reduce long-term risks due to flooding.

Mitigation Planning Provides Community Integration Opportunities

Throughout the State there are a number of agencies, departments, organizations and civic groups interested in increasing awareness of risk related to flooding events throughout the state. Communities may identify numerous cost-savings opportunities by reorganizing their approach to all of the planning efforts expected throughout a fiscal year. For instance, during the creation (or update) of a Local Hazard Mitigation Plan, community officials can also complete the required planning efforts for FEMA’s Community Rating System (CRS) as outlined in FEMA’s Local Mitigation Planning Handbook, March 2013. Additionally, preparing a list of potential mitigation strategies required for a Local Mitigation Plan may allow a community to prepare a list of Capital Improvement Projects at the same time.

Many local agencies have interest and responsibility in mitigation and should be included in the planning process. For example, both the emergency management and planning/development staff in local government have unique knowledge and experience to make them natural leaders for a mitigation planning process. Local emergency management staff have an understanding of local threats and hazards, risks, and consequences and may have more experience working with State and Federal agencies on mitigation projects and activities. Community planning staff are familiar with zoning and subdivision regulations, land use plans, economic development initiatives, and long-term funding and planning mechanisms to implement mitigation strategies, and they may be trained to facilitate public outreach, conduct meetings, and develop a plan document.

Both community development and emergency management departments, among others, are capable of providing leadership in the development of a local hazard mitigation plan. When determining leadership, consider which department has the time and resources to commit to the entire planning process. In addition, in multi-jurisdictional plans, each participating jurisdiction should identify a lead representative to coordinate their community’s planning process. Communities should be committed to the planning process to assure they have a working and living document that meets their needs for a sustainable and disaster resilent community in the future.

Who is Going To Pay For It?

There is a cost associated with the planning and implementation of the efforts identified. Communities are expected to comply with a myriad of state and federal regulations and oversee and implement numerous programs through their administration. Communities may benefit from taking a step back from their current practice to understand the overlap in department regulations and responsibilities.

Show me the money. US Environmental Protection Agency (EPA) Smart Growth Grants, Housing & Urban Development (HUD) Community Development Block Grants (CDBG), and other flood related grant opportunities exist through FEMA and the US Army Corps of Engineers.

In additon to these federal funding sources, the Texas Water Development Board and Texas Division of Emergency Management have funding through FEMA's Pre-Disaster Mitigation Grants and other Hazard Mitigaiton Grant Programs. Funding for these programs has been regularly reduced by Congress, but remain as a possible avenue for communities for funding of eligible projects.

In order to become sustainable and disaster resilient, communities will need to be both resourceful and innovative to find funding opportunities. Water utilities have been created in many areas of the State to produce revenue for flood mitigation projects and acquisitions. Both the Harris County Flood Control District and the San Antonio River Authority have been successful in implementing flood mitigation strategies and funding them through internal revenue sources.

Can Mitigtion Save you Money? In times of a disaster, funding is needed for each response activity – labor and resources costs associated with response to a pending disaster, costs to evacuate and shelter residents outside of their home, debris clean up, post disaster assessments, and many more. These costs can be reduced or eliminated with certain mitigation actions. Replacement of a low water crossing that strands residents of a subdivision may be an investment that saves community funds and resources during a future disaster. Communities should review and consider their first responder and response costs when prioritizing projects. This will optimize the investments, expenditures, and resources of local communities related to natural hazard preparedness and response.

Conclusions

TFMA plans to move forward with a collaborative approach to adressing flood risk and mitigation solutions for Texas. The ASFPM State Symposium provided our state a wonderful opportunity to bring together all of the key stakeholders (state, federal, local, and private) to discuss challenges that we face in implemting flood risk reduction solutions.

Moving forward TFMA plans to continue to stregthen communication with all stakeholders on success stories and lessons learned. The two TFMA conference held each year provide an excellent opportunity to revisit the successes from this Symposium and continue to build upon them.

The partnership between TFMA and our state agency, the Texas Water Development Board (TWDB), is critical to achieving flood risk reduction in Texas. TFMA and TWDB have similar goals and missions for educating our local communities and providing motivation for all to promote sound floodplain management.

2014 TFMA Next Steps to Implement ASFPM State Symposium Outcomes:

- Host Quarterly Coordination Meetings between TFMA/TWDB
- Submit proposal to TWDB to jointly work together on CAP activities and subcontract some CAP funds from TWDB/TFMA – training support
- Become an active participant in Texas Silver Jackets Program – attending first meeting April 2014
- Promote more regional TFMA Meetings that bring together floodplain management profesisonals similar to North Texas events
- Build relationship with TNRIS (State CTP) to implement more planning and mapping throughout Texas
- Create TFMA's Texas Floodplain Mapping Committee to mirror ASFPM's Engineering and Mapping Standards Committee.
- Focus on education for 2015 Texas State Legislature to re-develop flood insurance fund for Texas that will provide funding for State NFIP and CTP programs. TFMA will have a key role in the education of legislators and grass roots effort to support this action.
- Participate in ASFPM State Symposium Working Group to discuss lessons learned and success stories across the states.

Top Flood Risks

Each participant at the Texas Flood Risk Symposium was asked to share their top flood risk concern or issue. Below is a summary of responses.

- People
- Finance
- Coordination between FPM/Emerg. Managers
- Education – Communities, Politicians and the Development Comm.
- Complacency
- FP Mapping Accuracy
- Levees Local Perspective
- Incentives
- Common Sense Approaches
- Roles and Responsibilities
- Risk communication
- Training Local FPAs
- Mitigation for PreFIRM structures
- Misinformation
- Communication
- Higher Standards
- Calculating BFEs
- Affordability
- PreFIRM Structures + Trust with low income areas
- Denial, Demographics, Dollars
- Try Different Things
- Higher Standards
- Public Involvement
- Coordination
- Implementing Change thru Policy
- Education for Minorities and Bilingual
- Assessing Levee Conformance
- Cultural Change – Shared Risk
- Acutarial Flood Insurance
- Effectively Educate all Citizens
- Flooding Agriculture Land & Dam Safety
- Balance Funding w/need
- Dam Breach Risk
- Hydrology 101 for Dummies
- Passing Floods thru Reservoirs
- Ultimate Conditions
- Implementing Mitigation
- Nat/Local Coord.
- Neighborhood Land Use
- Complacency in Education (No Flood since 2007)
- Educating Politicians & Decision Makers
- Local Level take Responsibility
- Educate State Legislature - Put $ into State Program
- Attitude Adjustment
- Communication – change dialogue
- Tools & Power for Locals to do Mitigation
- Shared risk at all levels - Ownership
- Leverage Resources
- Transfer of Knowledge

Texas Flood Risk Symposium Participants

FIRST NAME	LAST NAME	ORGANIZATION
Daniel	Aguilar	San Antonio River Authority
Brad	Anderson	ASFPM
Joe	Arellano	NOAA
Jessica	Baker	Halff Associates
Juling	Bao	Fort Bend County
Bruce	Barr	Texas Association of Counties
Curtis	Beitel	HDR
Chad	Berginnis	ASFPM
Wes	Birdwell	Halff Associates
Elizabeth	Borstad	City of Corsicana
Samuel	Brody	Texas A&M Galveston
Diane	Brown	ASFPM
Bill	Brown	City of Arlington
Brad	Burnett	Brazos River Authority
Diane	Calhoun	TFMA
Jerry	Cotter	USACE
Daya	Dayananda	City of Pasadena
Kelly	Dillard	Freese & Nichols
Janine	Ellington	ISO
Joe	Fernandez	San Antonio River Authority
Greg	Frank	Costello, Inc.
David	Garcia	City of Dallas/National Committee on Levee Safety
David	Gattis	City of Benbrook
Julia	Germany	Texas Dept of Emergency Management
Ataul	Hannan	Harris County Flood Control District
Margarita	Hernandez	City of San Antonio
Charles	Hickman	Guadalupe/Blanco River Authority
Kristen	Hicks	Mission Aransas Nat'l Estuarine Research Reserve
Tommy	Hill	Guadalupe/Blanco River Authority
Mark	Hines	City of Waco
JoAnn	Howard	H2O Partners
John	Ivey	Halff Associates
Chris	Johnson	City of Fort Worth
John	Johnston	City of Victoria
Mike	Jordan	USACE / SWD
Jill	Jordan	City of Dallas
Romin	Khavari	City of Grand Prairie
Nim	Kidd	Texas Dept of Emergency Management
Matt	Koch	ASFPM

FIRST NAME	LAST NAME	ORGANIZATION
Shashi	Kumar	Houston Galveston Area Council (HGAC)
Scott	Leimer	USACE /GAL District
Jeff	Linder	Harris County Flood Control District
Craig	Loftin	USACE/FWD
Lynn	Lovell	Halff Associates
Dorothy	Martinez	H2O Partners
John	McEnery	University of Texas at Arlington
Cathy	Meek	H2O Partners
James	Mercier	Texas Department of Transportation
Domingo	Montalvo	Texas Colorado River Floodplain Coalition (TCRFC)
Tom	Mountz	RPS Group
Mike	Moya	Halff Associates
Saul	Nuccitelli	LAN
Francisco	Olivera	Texas A&M - Water Resources/GIS
Frank	Pagano	FEMA Region VI
Jose	Pastrana	City of Baytown
Greg	Pekar	Texas Dept of Emergency Management
Kelly	Porter	HGAC
Mickey	Reynolds	Texas Colorado River Floodplain Coalition (TCRFC)
Ross	Richardson	FEMA Region VI
Amy	Ronnfeldt	Texas Department of Transportation
Bob	Rose	Lower Colorado River Authority
Warren	Samuelson	Texas Commission on Environmental Quality (TCEQ)
Elizabeth	Savage	Accenture/DHI – FEMA Region VI RPML
Roy	Sedwick	TFMA
Kevin	Shunk	City of Austin
Ronnie	Skala	NRCS
Walter	Skipwith	Halff Associates
Hildy	Soper	Texas Dept of Emergency Management
Jeff	Sparrow	ASFPM
Jack	Tidwell	North Central Texas Council of Governments
Joe	Trammel	Tarrant County
Marie	Vanderpool	USACE/FWD
Heather	Wade	Texas Sea Grant
Gilbert	Ward	Texas Water Development Board
Karl	Winters	USGS
Carl	Woodward	Harris County Flood Control District
Andrew	Yung	Dodson/Walter P. Moore