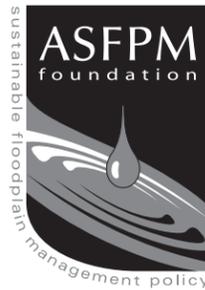


MANAGING FLOOD RISKS AND FLOODPLAIN RESOURCES

Report of the
Third Assembly
of the
Gilbert F. White National Flood Policy Forum

Marvin Center
George Washington University
Washington, D.C.
March 8–9, 2010



Hosted by the
ASFPM Foundation

FOREWORD

Flood risks will increase significantly in the coming years, and the work we do today is of vital importance for addressing and mitigating those risks for future generations. The major challenges are twofold. (1) The U.S. population is expected to grow by 100 million people in the next 40 years, and it is important to plan ahead for where they will live, as there will be considerable development pressures placed on our floodplains, both riverine and coastal. (2) The economic pressures that regulators face today and into the future will have a significant effect on floodplain management practices – even loosening floodplain management regulations in some cases. The authors of this book believe firmly that progressive public policy achieved through innovative thinking and far-reaching communication will reduce the risks and damages to our citizens as well as our natural resources.

The mission of the 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. To that end, the Foundation has 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, the most influential floodplain management policy expert of the 20th century. 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.

The discussions and recommendations for action and research formulated at each Forum are summarized and distributed as a report by the ASFPM Foundation. It is anticipated that policymakers and their constituent groups will review these reports to determine which actions could be undertaken to reduce flood losses in the nation and reduce the risk to the natural resources and functions that floodplains provide. Furthermore, these reports are expected to provide the bases and priorities for conducting the research necessary to improve policy or program implementation.

The first Forum, held in 2004, examined the question of the sufficiency of the 1% annual chance flood standard, which is the basis for most floodplain management today, both here and abroad. The 1% standard is not just an issue for the National Flood Insurance Program. Probability-based flood standards—including the 1% chance frequency—underlie floodplain management at all levels of government. The report from this Forum laid out six options for action and defined and prioritized the related needs for data, policy, and research.

The second Forum, held in 2007, addressed the question of the long-term future of floodplain management and its role in shaping the United States of 2050. The assembly comprised 92 nationally and internationally known experts, who used their considerable wisdom to consider what the future of floodplain management could look like under both a business-as-usual scenario and also under an alternative scenario of carefully crafted and aggressive action. This work resulted in six recommended guiding principles for achieving safe and sustainable relationships with our water resources.

The most recent Forum, held in March 2010, confronted the daunting and overarching challenge of managing the flood risk to humans and floodplain resources. Two symposiums leading up to the Forum focused on defining and measuring risk, and on risk perception, communication, and behavior. Additionally, the Foundation held a roundtable discussion about natural resources and the functions of floodplains. Also leading up to the Forum, the Foundation collected over 60 invited papers on various topics related to managing flood risk. These comprehensive, thought-provoking papers outlined the thinking of the nation's best experts as they ponder whether a risk management approach will be an appropriate and more effective way to managing floods and floodplain resources in the future. The Forum aimed to address what such a framework would entail, what it should seek to achieve, and what obstacles must be overcome.

We have made significant strides in identifying, communicating, and reducing flood risks across the nation, but our work is far from over. The work that we all do today is improving the outlook for our children, but we must never stop asking the questions, improving the policies, and mitigating the risks. Our future generations depend on it.

Scott Edelman, PE
ASFPM Foundation President

ACKNOWLEDGMENTS

Planning Team:

Doug Plasencia, PE, CFM, ASFPM Foundation Trustee and Events Committee Chair, Michael Baker, Jr., Inc.

Sam Riley Medlock, JD, CFM, Policy and Partnerships Program Manager, ASFPM

Larry A. Larson, PE, CFM, Executive Director, ASFPM

Jacqueline Monday, JLM Associates

Diane A. Brown, Communications and Events Manager, ASFPM

Dale Lehman, PE, CFM, ASFPM Foundation Trustee and Fundraising Committee Chair, URS Corporation

Debbie Pond, Financial Manager, ASFPM

Firas Makarem, CFM, ASFPM Foundation Trustee, CDM

George Washington University:

Greg Shaw, Co-Director, Institute for Crisis, Disaster and Risk Management

Facilitators:

Gerald E. Galloway, University of Maryland

Bruce A. Bender, Bender Consulting Services

Chad M. Berginnis, Michael Baker, Jr., Inc.

Linda Manning, The Council Oak

Pamela Pogue, URS Corporation

Speakers:

Sam Riley Medlock, CFM, JD, ASFPM

Jeanne Christie, Executive Director, Association of State Wetland Managers

Dennis Mileti, PhD, Professor Emeritus, University of Colorado – Boulder

Doug Plasencia, PE, CFM, Michael Baker, Jr., Inc.

The ASFPM Foundation thanks the sponsors of the 2010 Forum:

AECOM

CDM

Dewberry

ESP Associates

Greenhorne & O'Mara

H2O Partners

Michael Baker, Jr., Inc.

PBS&J

Stantec Consulting, Inc.

URS Corporation

EXECUTIVE SUMMARY

About The Gilbert F. White National Flood Policy Forum

The Association of State Floodplain Managers (ASFPM) Foundation has 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, the most influential floodplain management policy expert of the 20th century. The Forums are not only a tribute to his work, but also in 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 floodprone areas.

The discussions and recommendations for action and research formulated at each Forum are summarized and distributed as a report by the ASFPM Foundation. It is anticipated that policymakers and their constituent groups will review these reports to determine which actions could be undertaken to reduce flood losses in the nation. Furthermore, these reports are expected to provide the bases and priorities for conducting the research necessary to improve policy or program implementation.

The 2010 Assembly of the Forum

The third assembly of the Gilbert F. White National Flood Policy Forum was held March 8-9, 2010, at George Washington University in Washington, D.C. Its topic was "Management of Flood Risks and Floodplain Resources." The assembly comprised 100 nationally and internationally known experts, invited specifically for their knowledge and experience in resource management; engineering; economics; demography; land use; insurance; local, state, and federal government; environmental sciences; planning; risk analysis; the law; building and construction; emergency management; communication; transportation; finance; and policy analysis. They used their collective wisdom to consider how the risk management concept and its attendant techniques could be applied to minimize flood risk to humans, the built environment, infrastructure, society, and the natural functions and resources of floodplains. This report conveys the results of that dialogue.

CONTENTS

Acknowledgments

Executive Summary

Part 1. WHY FLOOD RISK MANAGEMENT?

Part 2. A VISION OF WELL-MANAGED FLOOD RISKS AND FLOODPLAIN RESOURCES

Part 3. A STRATEGY FOR ACHIEVING THE VISION

Components of a Strategy

Monitoring Progress and Recognizing Benchmarks

Fostering needed Changes in Public Behavior and Decision-making

What Motivates People to Protect Themselves from Floods?

Part 4. MAKING NEEDED CHANGES IN POLICY AND PROGRAMS

Part 5. GAPS IN KNOWLEDGE, APPLICATIONS, AND DATA

Part 6. CONCLUSIONS / SUMMARY

Part 7. ACTION AGENDA

APPENDICES

Appendix A. List of Participants in the 2010 Assembly

Appendix B. Agenda of the 2010 Assembly

Appendix C. Agenda and List of Participants from Symposium 1, Symposium 2, and Natural Functions Roundtable

Appendix D. List and Location of Supplemental Materials Published Separately (background papers, speakers' PowerPoints or papers, other resources)

PART 1. WHY FLOOD RISK MANAGEMENT?

After more than a century of work to reduce flood damage in the United States, losses continue to rise and floodprone ecosystems—both riparian and coastal—continue to be degraded. It is time to formulate methods for setting goals and evaluating progress in the reduction of flood risk and the protection/restoration of the natural functions and resources (sometimes called “services”) of floodplain areas, including lake and ocean coasts, estuaries, marshes, and wetlands.

In general, today’s (and yesterday’s) floodplain management programs, as implemented, do not work toward targets that are quantifiable or that have been defined in terms of desired societal outcomes. It may be that the word “management” as used in our current floodplain management programs is overly generous: today’s floodplain management outcomes typically are expressed, at most, as broad principles rather than as targets or goals. In the absence of quantified targets for management approaches, we doom ourselves to merely “keeping score” of escalating flood risk and increasing environmental degradation.

The recent application of the concept of “risk management” to the problem of flooding by experts in the United States and elsewhere could result in the creation of a more robust management framework. Many such experts believe that flood risk management may prove to be a better means of minimizing the detrimental impacts flooding continues to have on humans than past strategies, provided that the risk management strategies are crafted in ways that anticipate quantified outcomes associated with flood risk and floodplain resources.

To move our management strategies forward along this path, however, requires an understanding of the fundamental differences between floodplain management and flood risk management as practiced. Floodplain management is about managing competing land uses in a space that has been defined as the floodplain. In practice, this approach has incorporated little consideration of the cumulative impact of these land use decisions—either on the risk to investment in infrastructure and development or on the natural functions and resources of those floodplain areas, and lands outside of the floodplain. Flood risk, on the other hand, typically looks at the cumulative impacts of such decisions but, if left only partially developed as a policy line, could result in inadequate attention being given to actions in flood prone areas that will result in increasing/decreasing risk and a related loss of focus on floodplain resources.

Past Approaches to Managing Floodplains have been only Partially Successful

- Managing (controlling) the flood and/or flood waters
- Managing the building and other development taking place in floodprone areas
- Managing the land area considered to be susceptible to flooding
- Managing the damage from floods (with relief measures, insurance, and recovery assistance),
- Managing individual floodplain functions and resources (with regulatory controls or land management)
- Managing the vulnerability of development (by applying site-specific mitigation measures).

Flood risk management could provide a more comprehensive approach to coping with unwanted impacts than any of our past efforts (see box). These approaches have met with some success, but they often work at cross-purposes as a result of inconsistent or even contradictory policy foundations, they are far from well-integrated as programs across multiple federal and local agencies, they have resulted in unintended consequences, focus only on the floodprone area itself rather than the entire watershed, and, taken together, they have not

reduced flood losses nationwide. Further, population growth and movement, anticipated changes in climate, and continued resource degradation can be expected to increase the potential for detrimental impacts and costs from flooding in the decades to come.

To better manage the watersheds of the future requires broadening the management framework to incorporate a comprehensive view of program impacts and consequences (both intended and unintended). These conflicts include achieving the appropriate balance of water resources development, flood risk management, and natural resource protection. It includes taking the next steps of broadening accepted strategies into comprehensive flood risk management programs. For example, we tend to view flood protection infrastructure purely from a “safety” platform with little regard for annual or catastrophic risk, and a mindset that failure cannot happen. As a result, we have developed programs primarily focused on managing the structure with little regard for the impact that structure might have (directly or indirectly) on changing both annual and catastrophic risk potentials currently and long term. Flood risk management provides a framework to evaluate and measure various scenarios and offers the opportunity to more fully consider all impacts. Finally, flood risk management may provide floodplain management with a welcome “do-over” because inherent in its framework are goal-setting and measurement of progress that have been largely lacking in floodplain management to date.

The Third Assembly of the Gilbert F. White National Flood Policy Forum was aimed at reaching agreement among recognized experts about the fundamental components and likely effectiveness of applying the risk management concept to craft a national strategy for the management of flood risks and floodplain resources.

Procedures used at the Forum and Preliminary Symposia

The complexity of the topic, Flood Risk Management, dictated that this Forum be approached through a series of events rather than a single meeting. Consequently, two symposia were convened during the fall of 2009. Symposium 1, held September 16th, addressed “Defining and Measuring Flood Risk and Floodplain Resources.” Symposium 2, held November 4th, explored “Flood Risk Perception, Communication, and Behavior.” These preliminary meetings served to consolidate thinking about the importance of natural land and water resources to successful flood risk management, the need for effective and appropriate messages to change human behavior, and the challenges in defining and measuring flood risk. The agenda and participants lists from these preparatory events are included in the Appendix.

Each participant invited to the Forum was asked to prepare a short paper on some aspect of “Managing Flood Risk.” The papers were distributed to all participants before the Forum in order to shape the discussions, and are retained on the Forum website as part of the Forum archive to guide after-action reports and to serve as a record of the thinking of policy experts at this time.

Existing policies and programs for managing flood hazards and water resources in the US are not strong enough to keep damage at bay or to ensure healthy ecosystems in the face of the pressures that will accompany our projected population growth. For any nationwide approach to be successful, we must have a framework that enables Congress to make wise choices and still retain political support.

PART 2. A VISION OF WELL-MANAGED FLOOD RISKS AND FLOODPLAIN RESOURCES

No effective strategy can be developed without knowing its intended purpose. What is the outcome that we seek? What targets will help us measure our progress? Discussions at the Forum and at its preliminary meetings revealed that we do not have a universally accepted definition of risk, or of risk management—each discipline and/or program area having adopted its own. Experts agreed unanimously, however, that any definition of flood risk management must incorporate the natural functions and resources of floodplain areas. Floodplains provide important open space, habitat, and water quality improvements, services that have often been omitted from many flood risk management plans and strategies.

In the past, this omission has resulted in natural functions degradation, even if damages were reduced in the short term. More work needs to be done to refine a definition of flood risk management that will account for the reality that we are not simply managing an unwanted risk (such as a dam failure, nuclear plant accident, or other event to which risk management techniques are often applied) but are simultaneously managing a desirable—indeed vitally needed—set of water-related natural resources and functions as well.

What is our vision of successful risk and resources management? What should the future look like? In a brainstorming session, the Assembly listed dozens of characteristics that that future should have, including:

- the nation has sustainable, disaster-resilient communities and states;
- infrastructure is resilient and maintained;
- society’s inequities are not exacerbated by flood risk, and vice versa;
- human occupation of all high risk flood zones has been abandoned;
- flood insurance is universally held;
- room is provided for rivers, lakes, oceans, and their adjacent floodplains to function naturally;
- the principle of individual responsibility is reflected in public policy.

In the end, there was little if any disagreement about the outcomes that are desired. Arguments can be made about how to “group” them and which could be considered subsets of the others. The visions developed at the Forum agreed closely with the future vision of sustainability, disaster resilience, and natural flood protection that grew out of the 2007 Forum, “Floodplain Management 2050.” The desired outcomes of a strategy for management of flood risks and resources are:

- (1) Floods cause minimal harm to society.** The trend of deaths and injuries is more or less steadily downward; social disruption and economic losses are minimal.
- (2) Floods result in minimal damage/loss to the built environment.** New and proposed residences, commercial buildings, infrastructure, and critical facilities are outside of floodprone areas or have high-standard mitigation features incorporated.
- (3) The natural functions and resources of floodplains are protected; previously damaged ones have been restored.** Riverine areas, coastal zones, and lakeshores support their natural habitat, allow water filtration, provide biomass, store and move flood water naturally, and in general are allowed to

Existing policies and programs for managing flood hazards and water resources in the US are not strong enough to keep damage at bay or to ensure healthy ecosystems in the face of the pressures that will accompany our projected population growth. For any nationwide approach to be successful, we must have a framework that enables Congress to make wise choices and still retain political support.

function naturally.

(4) The nation, its households, and its communities are resilient and sustainable. At all levels, there is willingness and ability to “live with floodplains”, allow room for rivers and coasts to function so communities can recover from inevitable floods.

(5) There is a fair and proper apportionment of the costs of flood damage and of environmental degradation. Individuals and households take personal and financial responsibility for their flood risks and for protecting local floodplain resources. Communities do not pass the costs of unwise flood prone development, for example, onto federal taxpayers or on to those not living at flood risk. Public policy at all levels reflects this principle.

The last two outcomes, (4) “resilience” and (5) “appropriate apportionment of costs”, reflect a forward-looking outlook: first, that a certain number of flood disasters are inevitable in the United States, and that communities and states should work toward an ability to bounce back from them with minimal damage and disruption; and second, that a “socialized” approach under which all taxpayers continue to pay for the flood damage that others incur is unacceptable. It should be noted that ways to measure resilience and cost apportionment may well prove difficult to devise.

OUTCOMES desired from a STRATEGY for MANAGING FLOOD RISKS & FLOODPLAIN RESOURCES

- (1) Minimal harm to society**
(fewer deaths & injuries, minimal social & economic disruption, other)
- (2) Minimal damage/loss to built environment** (new and proposed residential, commercial, infrastructure, other)
- (3) Protected & restored natural floodplain functions & resources**
(habitat, water filtration, buffers, recreation, biomass, other)
- (4) Resilient households, communities, & nation**
(ability to “live with floodplains” and to bounce back from floods)
- (5) Proper apportionment of costs**
(human awareness, behavior, & responsibility for risks & resources)

Natural Floodplains and Coastal Areas Are Essential

Development in flood-prone areas of the United States continues to destroy the natural functions and resources of floodplains (defined as all riparian areas, lake and ocean coastal zones, wetlands, and estuaries). The critical functions and resources of these areas are well-documented, and include flood storage, storm buffering, habitat, water filtration, ground-water recharge, recreation opportunities, carbon sequestration, and others. The onset of climatic changes, accompanying potential for sea level rise, a burgeoning population, and the urbanization of watersheds are stressors that will only exacerbate the degradation of water-related ecosystems in the future.

Although lip service has been paid in national policy to the importance of the “natural and beneficial functions” of floodplains, such values must now be fully incorporated into new and existing legislation, policy, regulations, and programs. This is not merely a matter of “adding on” to programs and policies in place, but in many instances will require re-thinking and re-framing goals and principles that underlie such programs. Preservation and enhancement of these functions must be treated as an assumption in all planning activities that involve water resources and floods. For the future well-being of society, these floodplain attributes must be protected more carefully than in the past and, in many cases, be restored to a healthy condition.

The Natural Floodplain Functions Alliance

A new alliance of not-for-profit organizations, states, federal agencies, and others) is committed to the protection and restoration of the natural resources and functions of floodplains.

The Natural Floodplain Functions Alliance (NFFA) an outgrowth of the November 2009 roundtable held in preparation for the Third Assembly of the Gilbert F. White National Flood Policy Forum, means to identify opportunities—through legislation, policy development, rules and regulations, program implementation, or other means—to raise the status of the natural functions and resources of floodplains so that their protection and restoration are considered to be at least as important as reduction of property damage, economic development, or other agendas that do not consider environmental values.

The NFFA will help the Administration, Congress, federal agencies, states, local governments, and non-governmental organizations determine how to improve the integration of floodplain resource protection with existing floodplain management and flood risk management strategies. It will help apply the lessons learned from the last three decades and help answer the question, “What can all levels of government best do with limited dollars to protect and restore natural floodplain functions and resources, especially in conjunction with flood loss reduction efforts?”

PART 3. A STRATEGY FOR ACHIEVING THE VISION

A comprehensive, integrated strategy for management of flood risk and floodplain resources is essential if we are truly to minimize flood damage in the future and also forestall ecosystem degradation. A nationwide strategy would need to be established through cooperative action, with federal leadership. A properly crafted strategy ought to

Encompass a range of principles established as outcomes. These outcomes would reflect the hydrologic, hydraulic, environmental, economic, and demographic factors that affect the level of flood losses and floodplain and coastal resource degradation, now and in the future. The Forum recommends the five outcomes discussed in the previous section, with accompanying sub-goals.

Embrace measurable goals, and set benchmarks so that progress can be assessed. This also would enable measurement of change in risk and change in degradation of resources if added development occurs, populations increase, ecosystems collapse, or the hazards change. This benchmarking or quantification process is discussed below.

Identify the individual and collective behaviors that will foster progress toward the goals and outcomes. This is needed so that outreach and education can be properly designed and targeted and so that funding and efforts are not wasted. As with the other outcomes, the behavioral and attitudinal outcomes should be monitored for progress. Effective ways to foster appropriate behavior are discussed in the next section.

Identify barriers and enumerate the needed changes to existing policy and programs, and the gaps in data and research, and take steps to make the changes and fill the gaps. These changes and needs should be re-evaluated as the years pass. Shifts and refinements to programs in existence today are discussed in a separate section, below.

Monitoring Progress and Recognizing “Benchmarks”

A national strategy for managing flood risks and floodplain resources must incorporate specific goals and specify ways of measuring progress toward those goals. This has been lacking in floodplain management, with the exception of the 1994 version of *A Unified National Program for Floodplain Management*, which, unfortunately, was not widely implemented. Quantification of flood losses, damage avoided, resources degraded, social disruption, and many of the intangibles of floodplain management has been uneven to date.

In general, several methods can be used to quantify the risks posed to society by floods (see Baecher, 2009), including the probabilistic approach, the scenario approach, the risk matrix, consequence estimation, and others. These methods capture, to a greater or lesser extent, expected damage to property, economic losses, and other factors. In theory, periodic quantification of flood risk by one or more of these methods would be a way of gaging progress in managing risk.

Methods to quantify the natural resources and natural functions of floodprone areas, in contrast, are not widely used in floodplain management, although analogous techniques, such as ecological risk assessment, economic impact analysis, and ecosystem valuation, have been employed to set values on conserved land, wetlands, habitat, recreational opportunities, and other attributes and services provided by floodplains (see Plasencia and Monday, 2009). The benefit/cost analyses so prevalent in project decision-making is *not* a suitable method for tracking progress toward desired outcomes, nor does it adequately reflect the more intangible values of floodprone areas.

In preparation for the Forum, Symposium 1 tackled the issue of quantifying flood risk and floodplain resources. Taking the “risk equation” (Risk = Probability x Consequences) as a starting point, the experts examined the usefulness of each of a number of quantification methods. They concluded that, although the risk equation in a broad sense does hold true, it has not been used fully or accurately in floodplain management. The main drawback is that we have not been accounting for all of the “consequences,” many of which are ill-suited to quantification (externalization of costs, ecosystem degradation, social inequity, etc.).

In considering the desired outcomes from a strategy for managing flood risk and floodplain resources (as described in Part 2), the experts at Symposium 1 saw little prospect for being able to establish a single number or qualitative descriptor to reflect flood risk no matter what scale was being considered, because this would not give a complete picture suitable for decision-making. They concluded that flood risks and floodplain resources should be quantified on a number of different levels, with a suite of indicators.

Accordingly, at the Forum, participants engaged in an exercise (see box) to develop mock “dashboards”—like the dashboard on a car—to monitor and measure changes in floodplain occupancy, ecosystem health, human behavior, building damage, and other pertinent factors. Experts were enthusiastic that a dashboard has potential for clarifying thinking and also can be a management aid by reflecting the status of various aspects of flood risk and floodplain resources and functions.

A range of indicators would be needed for each of the five outcomes towards which the strategy is directed. Some indicators would be numerical, some would be qualitative. A few ideas (not at all an exhaustive list) are:

(Outcome 1) Minimal harm to society

- Number of deaths annually due to flooding
- Number of injured annually due to flooding
- Days of business closures due to flooding
- Number of persons dislocated and number of days dislocated
- Dollar value of economic disruption due to flooding

(Outcome 2) Minimal damage/loss to built environment (new and proposed residential, commercial, infrastructure, other)

- total number of buildings in floodplains, starting with the 100 and 500 year floodplains (locally, statewide, nationwide)
- number of communities with higher than minimum regulatory standards

(Outcome 3) Protected & restored natural floodplain functions & resources

- acreage of floodplains with intact natural functions and resources; (habitat, water filtration, buffers, recreation, biomass, other)
- the acreage of floodplains preserved as open space; acres of floodplain restored

(Outcome 4) Resilient households, communities, & nation (ability to “live with floodplains” and to bounce back from floods)

- Number of households with flood disaster plans
- Number of communities with current/updated mitigation plans

(Outcome 5) Proper apportionment of costs (human awareness, appropriate behaviors, & responsibility for risks & resources)

- the number of at risk properties with (and without) flood insurance
- percentage reduction (or increase) in disaster aid payouts, insurance claim payments, and non-

monetized losses

- number of repetitive flood loss properties and their percentage of cost to the NFIP

One key question concerns the terms or language to use to establish the desired “outcome.” For example, should goals and benchmarks be expressed in terms of qualifiers (such as “minimal” social disruption), in terms of numbers (such as “x number of lives lost”), or “as much environmental restoration as possible?” We should not shy away from devising some sort of metric for how much responsibility and/or cost people are bearing for flood risk and floodplain resources.

In a spatial context, flood risk, consequences, and impacts should be assessed on a watershed scale, even though that presents some challenges in reflecting traditional social, political, and other realities. Technology such as geographic information systems, however, makes it possible to dissolve those spatial discontinuities for management purposes. Many communities and regions are leveraging increasingly available data to identify and mitigate flood hazards on regional and watershed scales, resulting in more informed and effective risk management.

In a temporal context, flood risks and resources should be benchmarked regularly (perhaps a 10-year interval) but there also should be provision for event-driven interim benchmarks (such as a serious flood, a dramatic ecological change within the watershed, or an administrative renewal cycle for a land use or mitigation plan, for example).

The Forum experts agreed that a range of indicators (a dashboard) was likely the most useful way of assessing and monitoring both flood risk and floodplain functions and resources. Any national strategy should formalize the most useful of these indicators. We need to quantify and monitor flood risks and floodplain resources on several levels, depending on what we want to do with the information. It should be noted that quantified baselines are desperately needed for every aspect of flood risks and floodplain resources. Further, local-level indicators will be needed as well as nationwide benchmarks.

Fostering Needed Changes in Decision-making and Public Behavior

It will not be possible to induce the indicators on the “management strategy dashboard” to register progress without appropriate action (or behavior) on the part of individuals, households, governments, organizations, and other groups. In all too many cases, the actions routinely being taken today are not resulting in effective management of flood risk and resources. Thus, changes in behavior will have to be brought about. Research over the last several decades has illuminated a range of factors that influence behavior by individuals and by collectives, but the exact processes by which people (alone or in groups) make decisions about their response to hazards such as floods, remain cloudy. In addition to the mystery of decision-making processes, other known obstacles must be overcome to obtain appropriate mitigative behavior, notably political, financial, and social factors.

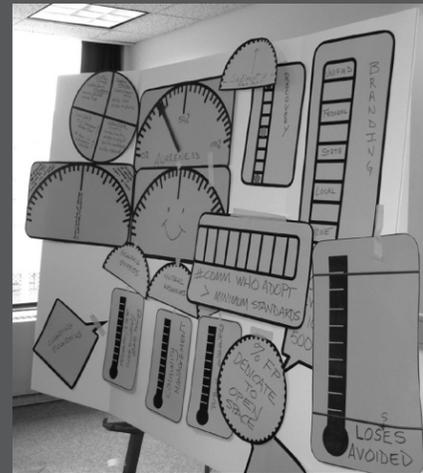
Certain motivators are known to be effective in inducing certain types of behavior, but many initiatives that floodplain managers typically use to try to motivate people are of uncertain value or have even been shown to be ineffective. For a review of the social science research on adoption of mitigative behavior, see Mileti (1999).

Today, most floodplain management initiatives operate on the conventional wisdom that, given accurate and understandable information about flood risks and resources, people will choose to do the “right” thing. Unfortunately, this has not proved to be the case. People resist buying flood insurance even when the risk is documented. People drive into flooded roadways even though that is how most flood deaths are caused each year. Communities put short-term economic gains ahead of the long-term health of their marshes or

other ecosystems. The most recent social science research demonstrates unquestionably that individuals and households are not, in fact, influenced to take mitigative or preparedness action when they receive information about the threat of natural hazards (like floods) and/or terrorism. Instead, the vast majority of people respond appropriately only when they are given concise, repeated information about a few specific steps that they should take, and are told where they can find out more if they need to.

A DASHBOARD OF INDICATORS

The second day of the Forum was devoted to the difficult task of assembling the basic components of a flood risk management strategy and conjuring the individual and institutional behaviors that would foster progress. To facilitate this discussion small groups constructed “dash boards” similar to what one might see in their own automobile. In facilitated small groups, the invited experts identified a number of indicators that might be used to manage flood risk, and then, following collaboration with other groups, discussed revisions in programs and policy that would effect change with the set of indicators or gauges selected. For example, they said, we could gauge progress via a combination of measures, including perhaps the acreage of floodplains with intact natural functions and resources; the number of communities with strict regulatory standards; the number of repetitive flood loss properties; the linear miles of levees that have been removed or restored; the number of properties with (and without) flood insurance; the acreage of open space; the percentage reduction (or increase) in disaster aid payouts, insurance claim payments, and non-monetized losses; and the total number of buildings in floodplains. Each of these indicators suggested a need to create basic inventories that do not yet exist, but perhaps are pointing towards a means of outcome-based operation that will gauge the performance of a functioning flood risk and floodplain resource management policy.



Picture X reflects one breakout group’s vision for the “dash board” they would build to monitor and manage flood risk and floodplain resources.

Fostering appropriate behavior on the part of neighborhood associations, city councils, and the like (or “collectives”, to use the social science term) is critical to a successful flood-risk-and-resource management strategy because many of the most effective mitigation techniques (land use, building codes, open space creation and maintenance) cannot be carried out individually. Thus special consideration in any national management strategy needs to be given to how collective decisions about risk and environmental issues are made and can be influenced.

The behavior of collectives is influenced in part by motivators that differ somewhat from those that affect individuals and households, but it is just as poorly understood. For example, political considerations are obstacles to many collective decisions, but play much smaller roles in households. However, it is known that a key motivator for local government decision-making with regard to hazard mitigation is the presence of an energetic, knowledgeable individual who will advocate for appropriate changes. Thus, over the long term, educating and motivating individuals should yield a positive influence on the decisions made by collectives. Beyond that, it is still not clear exactly what messages about flood risks and benefits will influence decision-makers to take appropriate action.

Of all the ways available to change behavior with regard to flood risk and floodplain resources, the Forum experts considered these to be the most effective:

Providing incentives (financial and societal) for avoiding floodplain and coastal areas in development and redevelopment. These incentives must counter the many current incentives that encourage development in flood hazard areas.

Devising a unified, appealing motto and/or mascot to inspire ownership of and responsible action toward minimizing flood risk and maximizing floodplain resources.

Reviving programs that foster locally driven processes for change that includes public, private and citizen participation (e.g., FEMA’s Project Impact).

Making flood insurance premiums reflect the true risk.

Providing clearer definitions and delineations of areas of flood risk and of vulnerable resources (for local decision-making).

Obtaining more “buy in” by increasing the involvement of stakeholders such as real estate agents, lenders, and insurance agents.

In any case, it is clear that major corrections need to be made in the way we communicate to the public and to groups, especially decision-makers, in order to induce actions and attitudes that will make it possible to protect (or reclaim) floodplain resources and to minimize future flood damage. This is particularly important in view of impending changes in climate, population growth, and intensified development.

Existing and recent programs or activities that send messages about flood risk and/or floodplain resources in anticipation of motivating desired behaviors need to be re-evaluated in light of research findings and marketing successes.

INFLUENCES ON BEHAVIOR

The ways by which floodplain managers seek to influence behavior toward flood risks and floodplain resources can be thought of as falling into five broad categories.

- Information & Education (messages to bring understanding and awareness)
Examples: flood maps, handbooks, etc.
- Persuasion & Marketing (messages to induce specific behavior)
Examples: Turn Around, Don’t Drown; FloodSmart, etc.
- Incentives & Disincentives (financial rewards, technical assistance, funding, recognition)
Examples: mitigation grants, Community Rating System, conservation easements, etc.
- Standards (guides for degrees of safety or quality)
Examples: 100-year flood, freeboard, “clean” water, “no net loss of wetlands,” etc.
- Mandates (laws or rules requiring or prohibiting behavior, with penalties attached)
Examples: Coastal Barrier Resources Act, mandatory purchase requirement, etc.

WHAT MOTIVATES PEOPLE TO PROTECT THEMSELVES FROM FLOODS?

Surprising Results from Research

How can floodplain managers convince people to protect themselves, their homes, and their businesses from floods? The answer is not what we always thought.

A breakthrough study completed in the last few years at last has isolated those factors that contribute—and do not contribute—to people’s inclinations to take action to mitigate flood damage and to prepare for flood disasters. *

The researchers, a team led by noted disaster experts Dennis S. Mileti and Linda B. Bourque, found that information is the key factor that motivates the public to get ready for floods and other hazards. However, they also found that providing information is not effective unless it is formulated and disseminated in specific ways. They synthesized their findings into a “toolkit” for motivating individuals and households to take preparedness and mitigation action. Because of the sweeping design and implementation of the project, we know that this approach works in all geographic areas of the United States and for all ethnic and racial groups.

STEP 1. STOP DOING THINGS THAT DON’T WORK. Don’t try to motivate the public with increased probabilities or details about the threat of flooding.

The perception of risk—even high risk—does not motivate people to take mitigative action. Increasingly sophisticated flood maps, for example, may be an aid to decision-makers, but they will not induce the public to change its behavior.

STEP 2. FOCUS THE INFORMATION ON ACTION. The most effective thing to say to motivate people to get ready is, “Do this and that.” They also are more likely to take the action if they are told where to find out more about how to do it.

STEP 3. BRAND THE MESSAGE AND MAKE IT CONSISTENT. Brand the message, not the messenger; it’s about them, not you.

Convince groups to stop providing unique messages. Work with other information providers so everyone tells the public the same thing.

A catchy slogan, logo, or other memorable device helps people conceptualize the message, remember it, and apply it to their behavior. According to Mileti, floodplain managers should sell their message “like they sell Coca-Cola®.”

STEP 4. USE MULTIPLE INFORMATION SOURCES AND MULTIPLE INFORMATION CHANNELS. People do more when they get the same information different ways.

Provide the same message about flood mitigation from as many different sources and through as many different media as possible—television, radio, websites, billboards, mailings, booths, handouts. You need partners to be really effective.

STEP 5. EXPLAIN CONSEQUENCE REDUCTION. People are more likely to take readiness actions if the information they receive explains how those actions can cut their losses if something happens.

Tell them how flood damage, inconvenience, financial hardship, and other problems will be reduced if they take readiness actions.

STEP 6. POSITION “CUES” FOR PEOPLE TO SEE AND ENCOURAGE DISCUSSION. People are more likely to do things that they see other people doing and that they think are their own ideas.

Get flood preparedness and mitigation out of the closet and into the streets. Encourage people to talk to each other about getting ready for flooding and protecting themselves from it.

STEP 7. COMMUNICATE OVER THE “LONG-HAUL.” People do more after receiving the same message many times.

It’s better to communicate over time and not just for a day or week, and even better if the message dissemination is ongoing.

** The study is applicable to individuals, not to groups or communities.*

“National Survey of Disaster Experiences and Preparedness,” was funded by the U.S. Department of Homeland Security through the National Consortium for the Study of Terrorism and Responses to Terrorism (START), a Center for Excellence of the U.S. Department of Homeland Security based at the University of Maryland in College Park (grant number N00140510629; sub-awards 0000052171 and Z923001); the National Science Foundation (grant number SES-0647736); and the National Science Foundation through the University of Colorado at Boulder (grant number 1543106).

The study, completed in 2008, tested every factor mentioned in decades of social science literature as potentially having an influence on human behavior with regard to preparedness for all kinds of disasters. It surveyed over 3,000 people in every state and all ethnic/racial groups in proportion to the U.S. population. The desired preparedness behaviors investigated included learning about the risk (natural hazard, terrorism, etc.), getting the household ready, training and practicing (evacuation), accumulating supplies and equipment, protecting a building’s (home’s) contents, protecting the building’s structure, and safeguarding family finances. The research yielded impeccable findings—clear, consistent, and replicated information about what makes individuals and households take mitigative action. There were strong correlations for all models of information dissemination tested.

Information about the project, its methods, questionnaires, and results can be accessed at http://www.ph.ucla.edu/sciprc/3_projects.htm.

PART 4. ADJUSTMENTS IN POLICY AND PROGRAMS

A national strategy for the management of flood risks and floodplain resources **MUST** not be created in a vacuum. The many existing federal, state, and local laws, policies, and programs would need to be refined to encompass more targeted approaches and methods proven to be more effective than those in use. Six categories of federal-level refinements, at least, would be needed.

Benchmarking flood risk and floodplain resources and functions at national, state/regional, and local levels;

Compiling a comprehensive inventory of floodplain and coastal resources and functions and their condition;

Establishment of comprehensive flood risk management targets and goals (including both risks and resources), perhaps as part of an updated and reinvigorated Unified National Program for Floodplain Management;

Creation of a unified messaging campaign, taking cues from the comparatively successful efforts to protect wetlands in the United States (see box);

Continued support for such collaborative efforts as the newly revived Federal Interagency Task Force on Floodplain Management; and

Consideration of whether the development of a Water Resources Management Act (in lieu of a Water Resources Development Act) could set a more appropriate tone for flood risk and other water resource management initiatives into the future. Consideration could also be given to the development of a national floodplain or flood risk management act.

It should be noted that there already has been some integration of federal (and federal/state) programs, but success has been sporadic. The Administration’s recent revival of the Federal Interagency Floodplain Management Task Force is a highly promising sign of the advent of an era of better integrated management. We may well be on the verge of changes in policy that will support the professional discussions that have been occurring about how programs and policies should work together.

Forum experts also agreed that the most effective local and regional programs are self supporting. Many options exist for program financing, including development of special districts with taxing authority, public-private partnerships, conservation easements and trusts, and other finance mechanisms to support effective management of flood risks. Such efforts already bear fruit where they are operating, but technical and capacity-building support is needed to expand on this model.

An important step in shaping proper incentives for appropriate individual action would be to make

Laws, Executive Orders, Etc.: An Opportunity to Effect Change?

Many existing laws, policies, and programs address in some way the protection of floodplain resources and functions, including the Endangered Species Act, the Clean Water Act, Executive Orders 11988 and 11990, The Water Resources Development Act, the Unified National Program for Floodplain Management, the National Environmental Policy Act, the National Flood Insurance Program, Nonpoint Source Pollution Control Act, and many others. Initiatives by professional groups also foster floodplain resource protection to varying degrees, such as the Smart Growth, NAI Floodplain Management, sustainable development, green building, LID, and others.

Which of these policies and programs need to be updated to reflect the criticality of protecting floodplain functions and resources? Which (like the Executive Orders, the Principles and Guidelines, and the National Flood Insurance Program) are or soon may be revised and therefore present an opportunity now for stronger protection and restoration language? What form should such changes take in order to provide more protection for natural floodplains? How can implementation be improved so that resources do not suffer further? What new measures are needed?

PART 5. GAPS IN KNOWLEDGE, DATA, AND APPLICATIONS

To establish and implement a strategy such as that recommended by the Forum, additional information about certain issues and deeper understanding of various processes is desirable. However, the lack of some information should not inhibit getting started.

1. Inventory of floodplains. We need a multi-faceted inventory of our floodplain areas nationwide, organized at the watershed level. Coastal, estuarine, and wetlands areas would be included. Ideally, the data would be perfectly compatible between the two crucial aspects of the nation's floodprone areas—the natural features of the floodprone lands and the human use of them. Such a database must be integrated across all agencies and programs. It will be impossible to measure progress without this baseline data.

An inventory of floodplain resources nationwide: including characterization of degree of functionality of floodplains and their watersheds (including coastal watersheds), pertinent ecosystems, a better understanding of the role of sediment in degrading water quality and exacerbating flood events, and changing floodplains

An inventory of floodplain development nationwide, including type and value of structures in various flood risk zones, critical facilities.

Find, accumulate, and correlate data that already exist, in GIS layers and in other formats, and find ways to make them compatible if they are not already.

Develop data for essential features needed for the inventory that do not already exist.

2. Better accounting for behavior and decision-making processes. The assumption that people will make wise decisions (and take action) with regard to floodplain risks and resources once they receive understandable information has been shown to be flawed. We must stop doing what does not work and revise our programs to capitalize upon what does.

Either through basic research or through review of existing findings, determine what motivates developers and communities to use floodplain lands in certain ways, and why people purchase property where they do. While land use plans and zoning drive new development, more needs to be understood about what drives planning and purchase decision-making.

Isolate the contributors to successful community-based approaches to floodplain resource management and to mitigation. What makes them work? This should not be a series of case studies, but an analysis of contributing (and detracting) factors.

Cultivate a better understanding of risk avoidance. Is there any way to get people to change their behavior?

More research should be done on effective planning and zoning. What drives local governments to do (or not do) planning? Integrate the expert and research-based information from the Urban Land Institute, American Planning Association, and others into a flood risk-and-resources management framework.

3. Advanced application of economics and valuation. In our market-based economy it is critical that values be placed upon natural functions and ecosystem services that have previously been considered intan-

Wetlands Protection vs. Floodplain Management

From the mid 1950s to the mid 1970s, the United States lost an estimated 500,000 acres of wetlands every year. In the early 1970s, the National Wetlands Inventory began mapping these environmentally sensitive areas according a scheme based on vegetation (Cowardin, 1974). A national wetlands policy was formulated in the mid to late 1980s, with the memorable goal of “no net loss of wetlands” nationwide, endorsed by President-elect George Bush in 1988. Acreage loss diminished steadily until 2008, when success was declared. Although nationwide mapping of wetlands is still incomplete, and some of the inventoried “wetlands” are of questionable value, the turnaround accomplished in 30 years is remarkable.



The same cannot be said for the nation's floodplains. Although their natural resources and functions provide critical services their value has not been widely recognized. While wetlands have always been mapped as a resource, floodplains have been mapped in terms of risk. Floodplain managers can learn from the management history of wetlands. The differences and similarities between the two fields in terminology, graphics, mapping, regulations, management techniques, and research tells a story of two different approaches.

Lessons Learned from Wetlands

- Identify partners and advocates for the protection of floodplains.
- Identify current incentives and disincentives and revise public policies accordingly.
- Articulate revisions and inform your friends.
- Pay attention! Public opinion and support must keep pace with changes.
- Be careful what you wish for. The “no net loss of wetlands” concept culminated in an attitude that an acre of wetland anywhere was equal to any other acre—not necessarily the case, given that ecosystems vary and that connections between ecosystems can have special value.

Ideas for Moving Ahead in Protecting Floodplain Resources

- Identify the impacts of federal programs on the natural resources and functions of floodplains (a study similar to Impact of Federal Programs on Wetlands, Part I, published in 1988).
- Bring together partners with similar interests in addition to the “likely suspects.”
- Map the “natural” floodplains (after a definition is agreed upon).
- Document floodplain values by demonstrating overlap with wetlands, fishery habitat, etc.
- Develop river restoration science to reconnect rivers and floodplains.
- Talk about floodplains functions and values using terms the public can understand and support.

Taken from 2010 Forum presentation by Jeanne Christie, Executive Director, Association of State Wetland Managers

gible. There are many established means of doing this; an assessment and decision about the appropriate applicability needs to be made.

Develop a method to assess the full cost of local decisions with regard to floodplain and/or coastal development—externalization rarely has been quantified to date.

Quantify the value of floodplain and coastal functions and resources in a way that is measurable.

4. A broader picture of what is in place and how it can be improved. Any national strategy must necessarily build upon what exists, in terms of programs, data, linkages, procedures, and expertise. Assemble a comprehensive list of all federal and state programs that affect floodplains, coastal areas, estuaries, wetlands, and lakeshores.

Empirical data should be collected and tabulated. Which programs and techniques have been most successful at changing behavior and decision-making? Enduring successes from the old Project Impact, and initiative such as that being undertaken by the Urban Drainage and Flood Control District in the Denver area, ought to be showcased.

Greater advantage should be taken of post-flood assessments that are already being done. More such documentation and investigation should be undertaken. A “toolkit” for such efforts would be helpful. Disincentives in federal (and other) policies should be fleshed out so that remedies can be proposed. The ASFPM has conceptually developed a matrix approach which systematically will identify programs and laws that impact flood risk and evaluate means in which to improve them.

5. Preparation for impacts of climate change. The modest successes of the past in managing flood risk and resources could easily be overwhelmed with the onset of shifts in climate that alter hydrologic and other regimes.

Identify anticipated impacts of climate change on the natural functions of floodplains and coastal areas, and on changes in ecosystem types.

Conduct research to understand whether intact ecosystems that are connected to each other are more resilient to climate change. If so, are they better equipped to provide the services to which we are accustomed?

Develop practical applications for downscaled climate data (drought, water supply). Figure out how to integrate what exists into local and regional plans for climate change adaptation and other uses.

Meanwhile, no flood mitigation activities should be put on hold while data or official positions about climate change are vetted. This is often referred to as the “no regrets” approach. We should not forget that, as a nation, we are not ready for the floods and environmental degradation we are seeing from year to year now, let alone those that will occur under different climatic conditions.

PART 6. CONCLUSIONS/SUMMARY

A well-conceived national strategy for managing flood risk and floodplain resources will help move our focus away from a misleading flood boundary line to a more meaningful measure of the potential for impacts throughout a watershed or other appropriate geographic area;

Further, it should be used to guide more-informed decision-making at all levels. All entities need to be brought onto the same platform for measuring and identifying risk and resources, with provision for tailoring to localized situations.

Over-arching conclusions were reached over the course of the Forum.

There is more work to be done to arrive at a commonly accepted definition of “flood risk.” No matter how risk management is defined, it must embrace the value of the natural resources and functions of floodplains—riverine, lacustrine, and coastal.

Progress will not be made unless we set some defined goals and indicators that will show whether “success” is approaching or receding.

Base data and a process for continual recording of changes in that data are needed so we can tell if we have made any progress from year to year.

Although a national strategy is essential to managing flood risks and floodplain resources, most action occurs at the local level, so goals and approaches should be locally based and techniques and indicators of progress should be scalable.

We need to quantify and monitor flood risks and floodplain resources on several levels, depending on what we want to do with the information. Quantified baselines are desperately needed for every aspect of flood risks and floodplain resources. Nationwide benchmarks as well as local and State-level indicators are needed.

Too much time has been spent trying to communicate the complexities of flood risk to the public on the assumption that they will take action in response to that message. Research shows that that approach does not work. A different, social science-based path is needed to foster appropriate behaviors.

PART 7. ACTION AGENDA

Among the many actions that need to be taken to establish and implement a national strategy for management of the nation's flood risks and floodplain resources, the Forum recommends these as the highest priority for the coming year.

1. The Forum urges the newly revived Federal Interagency Floodplain Management (FIFM) Task Force to develop and adopt, in cooperation with its state and local partners, (1) a definition of "flood risk and floodplain resources management;" (2) a set of outcomes (such as the five recommended by the Forum) for a nationwide strategy for floodplain management; (3) goal statements for each other outcomes, with the idea that they would be implemented by Executive Branch action; and (4) indicators for each of the outcomes (in a general and/or nationwide sense; recognizing that there may well be localized indicators that take precedence from place to place or region to region).

From there, the FIFM Task Force could move, through a broad collaborative process, to develop a strategy for the nation that incorporates the goals; sets out the legal foundations for action, implementation mechanisms, recommendations for funding, incentives, and the various roles to be played by different levels of government. This could be part of an energized and ambitious Unified National Program.

Lacking progress in the crafting of a comprehensive Unified National Program, the community of non-governmental organizations, including professional organizations, representatives of the insurance industry, environmental groups, and others, should fill the gap by establishing a coalition to ensure that action is taken.

2. There is a need to develop local flood risk management indicators that complement those developed at a national level as part of this forum. The local and national indicators should be aligned, but need not overlap since perspectives will (and should) be different when one considers a national program or a local watershed. The ASFPM Foundation, in cooperation with ASFPM Chapters, is pursuing pilot efforts for 2011 to explore this topic as an adjunct outcome to this forum.

3. Funding and authority for conducting a series of case studies on moderate-sized watersheds should be included in new or existing legislation. These studies would serve to test and refine the metrics and indicators growing out of the symposium on indicators (see recommendation #2, above). Success stories could be publicized. Some results would take a while to develop because change is needed to see if monitoring is working, but design concepts could be fleshed out. We should remember that Gilbert White always advocated a pilot test of the NFIP, which has still not been done. Consequently, flaws in the program took decades to be resolved, and some may never be. This is an opportunity to avoid repeating that mistake.

4. A model needs to be developed or adapted from existing models—perhaps by the FIFM Task Force—for structuring a goal-setting exercise for localities. What indicators could be most significant for certain categories of communities (small, large, growing, coastal, tourism-based, etc.)? The ability to measure progress should be included in the model.

5. The ASFPM should revisit the metrics and language used in its No Adverse Impact Toolkit to reflect messages and findings of the Forum.

6. The ASFPM and the ASFPM Foundation will distribute the findings of the Forum through their chapters and through localities so that they can use the report as a building block.

7. A coalition of agencies, NGOs, practitioners, program leaders, academics, and others should investigate and propose a simple, coherent “thought message” about flood risks and resources in the United States. That suggested message then should be vetted through the latest social science research and marketing know-how, as appropriate.

8. All Agencies and entities that conduct training and messaging about flood risk management and resource protection management (agencies, the Association of State Wetland Managers, the National Wildlife Federation, the ASFPM, and numerous others) need to be on same page. This is an opportunity for all those who are dedicated to the protection of water-related resources and to the reduction of flood damage to sign on to send a strong, cohesive signal that can benefit everyone by truly galvanizing the public’s interest and motivation and understanding. The ASFPM and Federal entities should examine their programs to be sure their approaches to public education, outreach, and training adhere with findings from the social science research and marketing analyses.

9. The incentives and disincentives inherent in existing federal and state programs should be assessed to determine which are supporting and which are undermining comprehensive flood risk management. Previously it was noted that the ASFPM has been exploring a matrix concept to accomplish this evaluation, and the ASFPM is urged to seek funding to more fully initiate and complete this effort. The Federal InterAgency Floodplain Management Task Force has now identified this as their #1 task.

10. Existing research and knowledge about local government decision-making needs to be assembled and translated. Do localities do best with a “local champion”? What makes such champions effective? Are there similarities in the messages they bring to the political bodies? What skills do they bring? Do we have enough information to tell us what works and what doesn’t? If there are gaps, how do we fill them?

APPENDIXES

Appendix A. List of Participants in the 2010 Assembly

2010 ASFPM Foundation Forum III
Gilbert F. White National Flood Policy Forum
“Managing Risk to Humans and Floodplain Resources”
The Marvin Center, George Washington Univ.
Washington, DC
Tuesday, March 9, 2010–Wednesday, March 10, 2010

PARTICIPANT LIST

Dante C. Accurti
Delta Development Group, Inc.
ASFPM Foundation Trustee

Michael Armstrong
International Code Council, Inc.
Sr. VP for Member Services
ASFPM Foundation Trustee

Gregory B. Baecher, Ph.D.
Univ. Maryland
Professor of Civil & Env. Engineering

Debra Ballen
Institute for Bus. & Home Safety
General Counsel & Sr. VP for Public Policy

Douglas A. Bellomo
FEMADivision Director, Risk Analysis Branch

Bruce A. Bender
Bender Consulting Svcs., Inc.
Vice President
ASFPM Flood Insurance Committee Chair & Forum Facilitator

Chad Berginnis, CFM
Michael Baker Jr., Inc.
Senior Specialist, Haz. Mit. & FP Mgmt. ASFPM
Mitigation Policy Coordinator & Forum Facilitator

Kimberly M. Bitters, CFM
Ohio Dept. Natural Resources
Environmental Specialist
ASFPM NAI Committee Co-Chair

Lenwood Brooks
US Senator Roger Wicker Legislative Assistant

Diane Alicia Brown
Association of State Floodplain Mgrs., Inc. Communication & Events Mgr. & ASFPM Foundation Associate

J. William Brown, P.E.
City of Arlington, TX
Stormwater Executive Manager
ASFPM Stormwater Mgmt. Comm. Co-Chair

Michael K. Buckley
Dewberry
Vice President Strategic Initiatives

W. David Canaan
Mecklenburg Cnty., NC
Director of Water & Land Resources

Heidi M. Carlin, CFM
URS Corporation
Strategic Communications Specialist
ASFPM Training Committee Co-Chair

Jon Carson
Council on Environmental Quality
Chief of Staff

Jeanne Christie
Association of State Wetland Mgrs.
Executive Director

Glen Connelly
Chehalis Tribe
Environmental Program Manger

David R. Conrad
National Wildlife Federation
Senior Water Resources Specialist

Vicki Lee Deisner
National Wildlife Federation,
National Water Resources Campaigns Associate
Director

Vincent DiCamillo, CFM
Greenhorne & O'Mara, Inc.
Sr. Vice President
ASFPM Foundation Trustee

Mark C. Dunning, Ph.D.
CDM

Scott K. Edelman, P.E.
AECOM
National Director
ASFPM Foundation President

Andrew Fahlund
American Rivers
Senior Vice President for Conservation

Kristen Fletcher
Coastal States Organization
Executive Director

Efi Foufoula-Georgiou
Univ. Minnesota
Distinguished McKnight University Professor

David C. Fowler, CFM
Milwaukee Metro Sewerage Dist., WI Senior Project
Manager
ASFPM Region 5 Director
Natural & Beneficial Functions Committee Chair

Gale William Fraser, II, P.E.
Clark Cnty., NV
General Mgr./Chief Engineer
National Assn. Flood & Stormwater Mgrs.

Gerald E. Galloway, P.E., Ph.D.
Univ. Maryland
Glenn L. Martin Institute Prof. of Eng. ASFPM
Foundation Trustee & Forum Facilitator

Susan Gilson
National Assn. Flood & Stormwater Mgrs. Executive
Director

John Glover
Natural Resource Conserv. Svc.
Director of Easements Div.

Clive Q. Goodwin
FM Global
Manager, Flood/Wind

David J. Greenwood, P.E.
Michael Baker Jr., Inc.
Executive Vice President

Michael B. Hirsch
Emergency Mgmt. Consultant
Former FEMA, Off. General Counsel

Tom Hirt, CFM
FEMA, Emergency Mgmt. Institute
Training Specialist
ASFPM Certification Board of Regents

Victor T. Hom
NOAA, National Weather Service
Natl. Inundation Mapping Svcs. Leader

Maria G. Honeycutt, Ph.D., CFM
NOAA, Coastal Svcs. Center
Climate & Hazards Policy Analyst

Jo Ann Howard
H2O Partners, Inc.
President
ASFPM Foundation Trustee

Meredith R. Inderfurth
Association of State Floodplain Mgrs., Inc. ASFPM
Washington Liaison

Deborah Ingram
FEMA
Mitigation Risk Reduction Division Chief

Karin M. Jacoby, P.E., Esq.
Mid-America Regional Council
Waterways Coordinator
National Waterways Conference

Rawle O. King
US Congressional Research Service
Analyst in Financial Economics & Risk Assessment

Sandra K. Knight, Ph.D., P.E., D.WRE
FEMA
Deputy Assistant Administrator for Mitigation

Matthew J. Koch, P.E., CFM
AECOM
Assistant Vice President

Howard Kunreuther
Wharton School, Univ. of PA
Professor and Co-director

Jon Kusler, Esq., PhD
Association of State Wetland Mgrs.
Associate Director
ASFPM Foundation Advisor

Douglas W. Lamont
Assistant Secretary of the Army
Dep. Asst. Secy., Project Planning & Review

Matthew Larsen
USGS, Water Resources Div.
Associate Director for Water

Larry A. Larson, P.E., CFM
Association of State Floodplain Mgrs., Inc.
Executive Director
ASFPM Foundation Secretary/Treasurer

Dale A. Lehman, P.E., CFM
URS Corporation
Vice President
ASFPM Foundation Executive Board
ASFPM Training & Outreach Policy Coordinator

Lewis "Ed" Link
Univ. Maryland
Senior Research Engineer

Alan R. Lulloff, P.E., CFM
Association of State Floodplain Mgrs., Inc.
Senior Project Manager

Gregory A. Main, CFM
Indiana Dept. Natural Resources
State Floodplain Manager
ASFPM Chair & Foundation Forum Speaker

Linda Manning
The Council Oak
President
ASFPM Foundation Forum Facilitator

Joe Manous
Office of the Assistant Secretary of the Army (Civil
Works)

Jennifer Marcy, CFM
PBS&J
Sr. Public Information Specialist
ASFPM Training Committee Co-Chair

David I. Maurstad
PBS&J
VP, Nat'l Business Sector Mgr.

John H. McShane
USEPA
NEP Team Leader, Office of Water

Sam Riley Medlock, JD, CFM
Association of State Floodplain Mgrs., Inc.
ASFPM & Policy & Partnerships and ASFPM Foun-
dation Associate

Erwann Michel-Kerjan
Wharton School, Univ. of PA
Managing Dir., Risk Mgmt. & Decision Proc. Ctr.

Dennis S. Mileti
Univ. Colorado
Professor Emeritus
ASFPM Foundation Forum Speaker

Jacquelyn L. Monday
JLM Assoc., Inc.
ASFPM News & Views Editor and Foundation
Associate

David A. Moser
USACE, Institute of Water Resources
Chief Economist

Eric C. Nordman
National Assn. of Insurance Commsnrs.
Director of Research

Frank Nutter
Reinsurance Assoc. of America
President

Mark Ogden, P.E.
Administrator, Levee Committee Chair
Association of Dam Safety Officials

Ricardo S. Pineda, P.E., CFM
California Dept. Water Resources
Supervising Engineer

Doug Plasencia, P.E., CFM
Michael Baker Jr., Inc.
Vice President
ASFPM Foundation Executive Board
Forum Chair and Speaker

Pamela Pogue, CFM
URS Corporation
Emergency Management Specialist
ASFPM Coastal Committee Co-Chair
Foundation Associate & Forum Facilitator

Peter D. Rabbon
USACE
Director, Natl. Flood Risk Mgmt. Prog.

Claire Reiss
Public Entity Risk Institute
Deputy Executive Dir. & General Counsel

George Riedel, CFM
Association of State Floodplain Mgrs., Inc. Deputy
Executive Director

Russell W. Riggs
National Assn. of Realtors
Regulatory Representative

Lawrence H. Roth, P.E., G.E.
American Society of Civil Engineers
Deputy Executive Director

Kyle E. Schilling
EWRI of ASCE
President

Grant M. Smith, P.E., CFM
Dewberry
Vice President
ASFPM Foundation Executive Board

Mark P. Smith
The Nature Conservancy
Director, Eastern US Freshwater Prog.

Judy M. Soutiere, CFM
USACE, Sacramento Dist.
Flood Risk Program Manager

Jennifer M. Sprague
NOAA, National Weather Service
Policy Analyst

Kevin G. Stewart
Urban Drainage & FCD, CO
President, National Hydrologic Warning Council

Steven L. Stockton
USACE
Director of Civil Works

Ann Terranova
URS Corporation
Env. Resources Management Group Leader

Laura M. Tessieri, P.E., CFM
Delaware River Basin Commsn., NJ
Water Resources Engineer
ASFPM Region 2 Director

Edward A. Thomas, Esq.
Michael Baker Jr., Inc.
Attorney-Senior Policy Advisor
ASFPM Region 2 Director & Foundation Associate

Timothy J. Trautman, P.E., CFM
Mecklenburg Cnty., NC
Flood Mitigation Program Manager
ASFPM Mapping & Eng. Committee Co-Chair

Terri L. Turner, AICP, CFM
City of Augusta, GA
Asst. Zoning & Dev. Administrator

Mary Jo Vrem
FEMA
Floodsmart Project Manager

Stephen H. Weinstein
RenaissanceRe Holdings, Ltd.
Senior Vice President

Dov Weitman
USEPA
Chief, Nonpoint Source Control Branch

Donna Wieting
NOAA, Ocean & Coastal Res. Mgmt.
NOAA Ocean Service
Acting Director

Bill Wilen
Chair/Member
US Fish & Wildlife Service
National Wetlands Inventory

Warren Dusty Williams
Riverside Cnty. FC & WCD, CA
General Manager / Chief Engineer
National Assn. Flood & Stormwater Mgrs.

Wallace A. Wilson, P.E., CFM
W.A. Wilson Consulting Svcs., LLC Owner/Consultant
ASFPM Foundation Vice President

Robert Wood
USEPA
Office Wetlands, Oceans & Watersheds

2010 Gilbert F. White National Flood Policy Forum



Photo by: John McShane

Row 1: Diane Brown (ASFPM), Jacki Monday (JLM Assoc.), Gerry Galloway (Univ. MD), Larry Larson (ASFPM), Scott Edelman (AECOM), Doug Plasencia (Michael Baker), Sam Medlock (ASFPM), Dale Lehman (URS Corp.), and Greg Main (ENDR)

Row 2: Matt Koch (AECOM), Dave Fowler (MMSD), John Kusler (ASWM), Victor Hom (NWS), Kimberly Bitters (OH DNR), Jen Marcy (PBSE&I), Mike Buckley (DeWBerry), Grant Smith (DeWBerry), Vince DiCamillo (Greenhorne & O'Mara), Dan Accurti (Delta Dev.)

Row 3: Bruce Bender (Bender Consult.), Kristen Fletcher (CSO), Shana Urdardy (Amer. Rivers), Vicki Deisner (NWF), Bill Cumming (Vacation Lane), Glen Connelley (Chieftais Tribe), Tom Hirt (FEMI), Wally Wilson (Wilson Consult.), Chad Berginmis (Michael Baker), Pete Rabbon (USACE), John Glover (NRCS)

Row 4: Kevin Stewart (UDFCD), Jo Ann Howard (H2O Partners), Robert Wood (EPA), Karin Jacoby (NatL. Waterways Conf.), Donna Wieting (NOAA OCRM), Bill Wilen (FWS), Jeanne Christie (ASWM), Bill DeGroot (UDFCD), Ed Thomas (Michael Baker), David Moser (TWR), Mark Ogden (ASDSO)

Row 5: Mike Hirsch (Former FEMA), Judy Soutiere (USACE), Deborah Ingram (FEMA), Dave Cnaan (Mecklenburg), Alan Lulloff (ASFPM), Joe Manous (Asst. Sec. Army), Doug Bellomo (FEMA), Dave Greenwood (Michael Baker), David Maurstad (PBSE&I), Heidi Carlin (URS Corp.), Claire Reiss (FERI)

Row 6: Cheryl Small (NFDA), Terri Turner (Augusta, GA), Bill Brown (Arlington, TX), Maria Honeycutt (NOAA CSC), Laura Tessier (Delaware RBC), Gale Fraser (NAFSSMA), Tim Trautman (Mecklenburg), Susan Gilson (NAFSSMA), Doug Lamont (Asst. Sec. Army), Dennis Mileti (Univ. CO), Larry Rolfe (ASCE)

Row 7: Ricardo Pineda (CA DWR), Debra Ballen (IBHS), Jennifer Sprague (NWS), Merrie Inderfurth (ASFPM), Efi Foufoulas-Georgiou (Univ. MN), Sandra Knight (FEMA), Dusty Williams (NAFSSMA), Ann Teranova (URS Corp.), Kyle Schilling (EWR)

Not pictured: Mike Armstrong (ICC), Greg Beacher (Univ. MD), Lenwood Brooks (Sen. Wickler), Jon Carson (CEQ), David Conrad (NWF), Margaret Davidson (NOAA CSC), Mark Dunning (CDM), Andrew Fahlund (Amer. Rivers), Howard Kunreuther (Wharton), Matthew Larsen (WRRD), Ed Link (Univ. MD), Linda Manning (Council Oak), John McShane (EPA), Erwann Michel-Kerjan (Wharton), Eric Nordman (NAIC), Frank Nutter (Reinsurance Assoc.), Pam Pogue (URS Corp.), George Riedel (ASFPM), Gregory Shaw (ICDM), Mark Smith (Nature Conserv.), Steven Stockton (USACE), Mary Jo Vrem (FloodSmart), Dov Weitman (EPA)



Flood Risk Management

Appendix B. Agenda of the 2010 Assembly

2010 ASSEMBLY OF THE GILBERT F. WHITE NATIONAL FLOOD POLICY FORUM “Managing Risk to Humans and to Floodplain Resources” Marvin Center, George Washington University

AGENDA

Tuesday, March 9, 2010

- 1:00-1:45 pm** **Welcome and Introductions – 3rd floor Amphitheatre**
Scott Edelman, President, ASFPM Foundation; AECOM
Greg Shaw, Co-Director, Institute for Crisis, Disaster and Risk Management, GWU
Participants (brief self-introductions)
- 1:45-2:15 pm** **Forum Topic and Process: Summary of Symposium 1 on Quantifying Flood Risk and Symposium 2 on Communicating Flood Risk, with conclusions that set the stage for the Forum on Managing Flood Risks and Resources.**
Sam Riley Medlock, Policy & Partnerships Program Manager, ASFPM
- 2:15-4:15 pm** **What must we do to effectively Manage Risk to Humans and to Floodplain Resources?** Three speakers will explore the principal challenges in crafting and implementing a successful strategy for minimizing flood risk and protecting floodplain resources in the future. Questions and discussion by the Assembly.
Moderator: Greg Main, Chair, ASFPM; Indiana State Floodplain Manager
- 2:15-2:45 pm** **Challenges in Managing the Natural Functions and Resources of Floodplains**
Jeanne Christie, Executive Director, Association of State Wetland Managers
- 2:45-3:15 pm** **Break**
- 3:15-3:45 pm** **Behavior Factors and How to Effect Change in Flood Mitigation**
Dennis Mileti, Professor Emeritus, University of Colorado–Boulder
- 3:45-4:15 pm** **Setting the Stage for National Flood Risk & Resources Policy and Strategies**
Doug Plasencia, ASFPM Foundation Trustee; Michael Baker, Jr., Inc.
- 4:15-5:00 pm** **A Vision of the Management of Risks to Humans and to Floodplain Resources**
As a nation, what do we want to accomplish by undertaking a comprehensive strategy for managing flood risks and risks to floodplain resources? What will “success” look like?
The Assembly will brainstorm a vision of successful flood risk and resources management—its possible outcomes, components, and benefits.
Facilitator: Gerry Galloway, University of Maryland
- 5:00-7:00 pm: Networking Reception – Room 310** (around the corner from Amphitheatre)

Wednesday, March 10, 2010

8:30-8:45 am **Group Assembly to Issue Charge for Break-outs – 3rd Floor Amphitheatre**
Doug Plasencia
Based on the vision of a nation in which flood risks to people and also risks to flood plain resources are effectively managed (as envisioned in the final, brainstorming session on the previous day), what challenges are we facing? How do we get from here to there?

8:45-10:15 am **Session One (Break-out): What Indicators should we use to Gage Progress in Managing Flood Risk and Floodplain Resources?** The Assembly will divide into three groups. Each group will (1) identify the most important indicators (perhaps five) of ways in which risk and the status of resources can be monitored and/or measured for purposes of a comprehensive strategy for managing flood risk and resources; (2) list the barriers that are preventing us from already using each indicator; and (3) suggest ways in which the barriers can be overcome.
Facilitators: Bruce Bender, Chad Berginnis, Linda Manning

10:15-10:45 am **Break and transition to Amphitheatre for feedback session**

10:45-11:30 am **Feedback Session #1.** A spokesperson from each group will display the group's dashboard and briefly describe its highlights and any problems encountered. Discussion by the Assembly and consideration of contradictions or challenges, if any.
Facilitator: Gerry Galloway

11:30-12:30 pm **Lunch (participant's choice at 1st floor food court)**

12:30-2:15 pm **Session Two (Break-out): How do we foster the individual, household, organizational, and government behaviors that will cause our dashboard indicators to show improvement?**
Back in the same three small groups, participants will first make adjustments to their dashboards if needed, based on what they heard during Feedback Session #1. Next they will (1) identify the behaviors that are needed from individuals and from organized entities in order to generate a positive change on one or more of the dashboard indicators (these behaviors should be prioritized and separated into two categories: individual/household behavior and institutional/collective behavior); (2) identify the barriers that are keeping these desirable behaviors from taking place; and (3) suggest how those barriers could be overcome with management actions. After discussing the behaviors needed, the groups should reconsider their dashboard indicators to see if additional gages are needed to track changes in behavior.
Facilitator: Same as Break-out Session 1

2:15-2:45 pm **Break and transition to Amphitheatre for feedback session**

2:45-3:15 pm **Feedback Session #2.** Each group's facilitator will present (1) the five highest-priority individual/household behaviors that are needed to make the dashboard indicators show progress; (2) the five highest-priority institutional/collective behaviors that are likewise needed; and (3) a short summary of that group's suggestions for fostering the needed behaviors. Discussion by the Assembly to refine the composite dashboards in light of Breakout Session #2, if needed.

Facilitator: Pamela Pogue, URS Corporation

3:15-4:15 pm **Session Three (Plenary): An Action Plan for Management of Risk to Humans and to Floodplain Resources.** The Assembly will catalog its recommendations for monitoring progress and for better managing floodplain risks and resources under three broad areas: (1) authorities for risk management and resource protection, (2) policy and programs, and (3) research and data.
Facilitator: Doug Plasencia

4:15-4:30 pm **Wrap Up** Next steps to be taken by the ASFPM Foundation, the ASFPM, and others to advance the recommendations made by this Assembly. Discussion of possible topics for the next Assembly of the Forum.
Scott Edelman and Larry Larson

4:30 pm **Adjourn**

Thank you to our Sponsors who enable us to host the Forum at no cost to participants.

AECOM

Bender Consulting Service

CDM

Dewberry

ESP Associates

Greenhorne & O'Mara

H2O Partners

Michael Baker, Jr., Inc.

PBS& J

Stantec

The Council Oak

URS Corporation

**Appendix C. Agenda and List of Participants from Symposium 1, Symposium 2,
and Natural Functions Roundtable**

**ASFPM Foundation - Symposium 1
Defining and Measuring Flood Risks and Floodplain Resources
Wednesday, Sept. 16, 2009, 8:30am-4:30pm
URS Corporation, Gaithersburg, MD**

AGENDA

8:30 – 9:00	Registration, Continental Breakfast, Networking <i>Sponsored by URS Corporation</i>
9:00 – 9:15	Welcome, Introductions <i>Scott Edelman, PE, ASFPM Foundation President; AECOM</i>
9:15 – 9:30	Flood Risks and Floodplain Resources, Session Outcomes Doug Plasencia, PE, CFM, ASFPM Foundation Events Committee Chair; Michael Baker Jr.
9:30 – 10:30	Flood Risk Methods Gregory B. Baecher, Ph.D., PE, Glenn L. Martin Professor, Civil and Environmental Engineering, University of Maryland
10:30 – 10:45	Break <i>Sponsored by URS Corporation</i>
10:45 – 11:45	Panel: Methods for Measuring Flood Risks and Floodplain Resources <i>Panelists – Doug Bellomo, Federal Emergency Management Agency; Maria Honeycutt, NOAA-Coastal Services Center; Victor Hom, National Weather Service; Clive Goodwin, FM Global; Tim Axtman, U.S. Army Corps of Engineers; Greg Baecher, University of Maryland Moderator – Sally McConkey, PE, CFM, Vice-Chair, Association of State Floodplain Managers; Illinois State Water Survey</i>
11:45 – 12:30	Lunch <i>Sponsored by H2O Partners</i>
12:30 – 12:45	Instructions for Afternoon Discussions <i>Doug Plasencia</i>
12:45 – 2:15	Breakout Session – Facilitated Discussion
2:15 – 2:30	Break <i>Sponsored by URS Corporation</i>
2:30 – 4:30	Recommendations and Summation <i>Facilitator – Doug Plasencia Closing Summation – Mike Buckley, Federal Emergency Management Agency (retired)</i>

Thank you to our Ponsors who enable us to host the Symposium and Forum at no cost to participants.

AECOM
Dewberry
ESP Associates
H2O Partners, Inc.
PBS&J
Stantec
Michael Baker
URS Corporation

SYMPOSIUM PARTICIPANTS

Don Armour, P.E.
Stantec Consulting, Inc.
FEMA Program Manager

Michael Armstrong
ASFPM Foundation Trustee
International Code Council, Inc.
Sr. VP for Member Services

Laura Augustine
Disasters Roundtable / National Research Council
Milone & MacBroom, Inc.

Glenn S. Austin
National Hydrologic Warning Council
Executive Director

Timothy Axtman
US Army COE, New Orleans Dist.
Senior Project Manager

Gregory B. Baecher, Ph.D.
Univ. Maryland
Professor of Civil & Env. Engineering

Douglas A. Bellomo
FEMA, HQ
Division Director, Risk Analysis Branch

Kelly A. Bronowicz, CFM
FEMA, HQ, Risk Analysis Div.
Program Specialist

Michael K. Buckley
Retired FEMA

John Buechler
The Polis Center at Indiana Univ.

Scott R. Choquette, CFM
Dewberry
Sr. Associate

David R. Conrad
National Wildlife Federation
Senior Water Resources Specialist

Michael DePue, P.E., D.WRE, CFM
ASFPM Foundation Trustee
PBS&J
Associate Vice President

David Divoky
AECOM
Scientist

Scott K. Edelman, P.E.
ASFPM Foundation President
AECOM
National Director

Christopher T. Emrich
Unv. S. Carolina

Susan Gilson
National Assn. Flood & SW Mgrs.
Executive Director

Clive Q. Goodwin
Insurance Industry
FM Global
Manager, Flood/Wind

Lisa Hair, P.E.
US EPA, HQ, Water (4503-T)
Engineer

Brian Harper
US Army COE, Inst. Water Resources
Regional Economist, Planning & Env. Branch

Victor T. Hom
NOAA, National Weather Service
Natl Inundation Mapping Svcs Leader

Maria G. Honeycutt, Ph.D., CFM
NOAA, Coastal Svcs.Center
Climate & Hazards Policy Analyst

Jo Ann Howard
ASFPM Foundation Trustee
H2O Partners, Inc.
President

Meredith R. Inderfurth
Consultant
ASFPM
ASFPM Washington Liaison

Craig S. Kennedy, CFM
FEMA, HQ
Program Specialist

David Key, P.E., CFM
ESP Assoc., P.A.
Water Resources Dept. Manager

Rawle O. King
US Congressional Research Service
Analyst in Financial Economics & Risk Assessment

Jon Kusler, Esq., PhD
ASFPM Foundation Advisor
Association of State Wetland Mgrs.
Executive Director

Larry A. Larson, P.E., CFM
ASFPM Foundation Secretary/Treasurer
ASFPM
Executive Director

Dale A. Lehman, P.E., CFM
ASFPM Foundation Executive Board
URS Corporation
Vice President

Firas N. Makarem, CFM
ASFPM Foundation Trustee
CDM
Vice President

Linda Manning
The Council Oak
President

Douglas C. Marcy
NOAA, Coastal Svcs.Center
Coastal Hazards Specialist

Sally A. McConkey, P.E., CFM
ASFPM Vice Chair
Illinois DNR, State Water Survey
Water Resources Engineer

Sam Riley Medlock, JD, CFM
ASFPM Foundation Associate
ASFPM
Policy & Partnerships Program Manager

Jacquelyn L. Monday
ASFPM Foundation Associate
JLM Assoc., Inc.
Editor

Michael J. Moyer
ASFPM Foundation Trustee
National Lenders Insur. Council

Eric C. Nordman
National Assn. of Insurance Commsnrs.
Director of Research

William O'Brien, CFM
URS Corporation
Technology Solutions Group Manager

Melissa Osafo-Mensah
ASFPM Foundation Associate
URS Corporation
Executive Assistant

Doug Plasencia, P.E., CFM
ASFPM Foundation Executive Board
Michael Baker Jr., Inc.
Vice President

Peter D. Rabbon
US Army COE
Director, Natl Flood Risk Mgt Prg

Claire Reiss
Public Entity Risk Institute
Deputy Executive Dir. & General Counsel

Joseph R. Remondini, P.E., CFM
US Army COE
FPMS Project Manager

George Riedel, CFM
ASFPM Foundation Associate
ASFPM
Deputy Executive Director

Lawrence H. Roth
American Society of Civil Engineers
Deputy Executive Director

Shabbar Saiffee
FEMA, HQ
Branch Chief, Grant Analysis

Kyle E. Schilling
EWRI of ASCE
President

Leonard Shabman, Ph.D.
Resources for the Future
Virginia Tech

Gavin Smith, Ph.D., AICP
UNC Chapel Hill
Center for Nat. Disasters Coastal Infra.
Executive Director

Gerald Stedje, Ph.D.
Resources for the Future
Abt Assoc., Inc.
Environment & Resources Div.

Jan Surface
USDA, Natural Res. Conserv. Svc.
Acting Watershed & Surveys Planning Prog. Mgr

Wilbert O. Thomas, Jr.
Michael Baker Jr., Inc.
Senior Technical Consultant

Wallace A. Wilson, P.E., CFM
ASFPM Foundation Vice President
W.A. Wilson Consulting Svcs.
Owner/Consultant

Julia Wyman
Coastal States Organization
Policy Analyst

**Meeting of a Work Group on
Creating a National Coalition for Protecting and Restoring
the Natural Functions and Resources of Floodplains**

Tuesday, November 3, 2009

**Pew Conference Center, 10th Floor
901 E St., N.W., Washington, D.C.**

(near Gallery Place Metro Station; building entrance on 9th Street, between E and F Streets. For further directions, contact David Conrad, National Wildlife Federation, at (202) 797-6697 or conrad@nwf.org)

Co-hosted by the Association of State Floodplain Managers, the ASFPM Foundation, the National Wildlife Federation, the Association of State Wetland Managers, and others.

AGENDA

- | | |
|-----------------------|---|
| 1:00-1:30 p.m. | Self-introductions
Overview of Meeting Goals |
| 1:30-2:30 | Setting the Stage <ul style="list-style-type: none">• ASFPM White Paper on Natural and Beneficial Functions and the ASFPM's No Adverse Impact Floodplain Management initiative (Dave Fowler, Milwaukee Metro Sewerage District; Larry Larson, ASFPM; Doug Plasencia, Michael Baker, Inc.)• Water Projects and the Restoration of Natural and Beneficial Functions (David Conrad, National Wildlife Federation)• The Floodplain Management Executive Order and the Principles & Guidelines (Gerry Galloway, University of Maryland)• Levees, Residual Risk, and Natural and Beneficial Functions• "Flood Risk Communication," the 2010 Gilbert F. White National Flood Policy Forum (Doug Plasencia, Michael Baker, Inc.; and Jacquelyn Monday, ASFPM Foundation) |
| 2:30—2:45p.m. | Break |
| 2:45-4:00p.m. | Opportunities for Strengthening Policies and Programs for the Protection and Restoration of Natural Floodplain Functions and Resources <p>This will be a moderated session for general discussion.</p> |
| 4:00-5:00p.m. | Creating a National Coalition and Action Agenda <p>This will be a moderated discussion to develop</p> <ul style="list-style-type: none">• A common understanding, definition, and terminology for "floodplains," "resources," "functions," etc.• Proposed Goals for a National Coalition• Actions to be pursued in near, mid, and long-term• Other |

BACKGROUND

Goals of the Meeting

- To establish a coalition of entities (not-for-profit organizations, states, federal agencies, and others) committed to the protection and restoration of the natural resources and functions of floodplains.
- To identify opportunities—through legislation, policy development, rules and regulations, program implementation, or other means—to raise the status of the natural functions and resources of floodplains so that their protection and restoration are considered to be at least as important as reduction of property damage, economic development, or other agendas that do not consider environmental values.
- Develop an action agenda for such a coalition.

The Need for National Coalition and Action Agenda

Development in flood-prone areas of the United States continues to destroy the natural functions and resources of floodplains (defined as all riparian areas, lake and ocean coastal zones, wetlands, and estuaries). The critical functions and resources of these areas are well-documented, and include flood storage, storm buffering, habitat, water filtration, groundwater recharge, recreation opportunities, carbon sequestration, and others. At the same time, of course, flood losses continue to rise and the National Flood Insurance Program currently faces a debt to the U.S. Treasury of over \$19 billion from Hurricane Katrina and other major floods over the past five years. The onset of climatic changes, accompanying potential for sea level rise, a burgeoning population, and the urbanization of watersheds are stressors that will only exacerbate the degradation of water-related ecosystems in the future.

In this context, the Administration, the Congress, the states, local governments, and interested groups face unprecedented challenges in protecting the environmental resources of the nation's floodprone areas and simultaneously minimizing flood losses.

Although lip service has been paid in national policy to the importance of the “natural and beneficial functions” of floodplains, much more progress is needed to fully incorporate such values into legislation, policy, regulations, and programs, and to make sure that existing and future policies are implemented vigorously. For the future well-being of society, these floodplain attributes must be protected more carefully than in the past and, in many cases, be restored to a healthy condition.

Many existing laws, policies, and programs address in some way the protection of floodplain resources and functions, including the Endangered Species Act, the Clean Water Act, Executive Orders 11988 and 11990, The Water Resources Development Act, the *Unified National Program for Floodplain Management*, the National Environmental Policy Act, the National Flood Insurance Program, Nonpoint Source Pollution Control Act, and many others. Initiatives by professional groups also foster floodplain resource protection to varying degrees, such as the Smart Growth, NAI Floodplain Management, sustainable development, green building, and others. Which of these policies and programs need to be updated to reflect the criticality of protecting floodplain functions and resources? Which (like the Executive Orders, the Principles and Guidelines, and the National Flood Insurance Program) are or soon may be revised and therefore present an opportunity now for stronger protection and restoration language? What form should such changes take in order to provide more protection for natural floodplains? How can implementation be improved so that resources do not suffer further? What new measures are needed?

This proposed national coalition will help the Obama Administration, Congress, federal agencies, states, local governments, and non-governmental organizations determine how to improve the integration of floodplain resource protection with existing floodplain management and flood risk management strategies. It will help apply the lessons learned from the last three decades and help answer the question, What can all levels of government best do with limited dollars to protect and restore natural floodplain functions and resources, especially in conjunction with flood loss reduction efforts?

SYMPOSIUM PARTICIPANTS

Bruce Bender
Bender Consulting Services
Vice President

Jeanne Christie
ASWM
Executive Director

David Conrad
National Wildlife Federation
Sr Water Resources Specialist

Vicki Deisner
National Wildlife Federation
Assoc.Dir., Nat'l Water Res.

Andrew Fahlund
American Rivers
Sr. VP for Conservation

Steve Fitzgerald
Harris County Flood Control
NAFSMA FPM Committee Co-Chair

Dave Fowler
Milwaukee Metro Sewerage Distr.
Senior Project Manager

Eileen Fretz
American Rivers
Gov't Relations Associate

Gerry Galloway
Univ. Maryland
Glenn L. Martin Instit Prof. of Eng.

Susan Gilson
NAFSMA
Executive Director

Mark Gorman
Northeast Midwest Institute
Policy Analyst

Rebecca Hammer
Natural Resources Defense Council
Assoc.Advocate, Water Program

Maria Honeycutt
NOAA-CSC

Merrie Inderfurth
ASFPM
Washington Liaison

Bruce Julian
NRCS
Special Asst. to the Chief

Karen Kabbes
Kabbes Engineering
President

Jon Kusler
Ass'n of State Wetland Mgrs.
Executive Director

Larry Larson
ASFPM
Executive Director

Josh Lott
NOAA

David Maurstad
PBS&J
VP, Nat'l Business Sector Mgr.

Sam Riley Medlock
ASFPM
Policy & Partners Prog Mgr

Christy Miller
TetraTech
Program Manager

Jacki Monday
JLM Associates
ASFPM Editor

Doug Plasencia
Michael Baker, Jr., Inc.
Vice President

Pam Pogue
URS Corporation
Emergency Mgt. Specialist

Heidi Recksiek
NOAA, CSC
Human Dimension Specialist

Ann Riley
Calif. Water Control Board
Watershed & River Rest. Advisor

Lawrence Roth
Amer. Society of Civil Engineers
Deputy Executive Director

Lynda Saul
Montana Dept. Env. Quality
Wetland Program Coordinator

Jim Schwab
American Planning Association
Senior Research Associate

Leonard Shabman
Virg. Tech, Resources for the Future
Director

George Sorvalis
Nat'l Wildlife Federation
Manager, Water Res. Campaigns

Judy Soutiere
US Army COE
Flood Risk Program Mgr. Sac.Dist.

Jane Stanley
Nurture Nature Foundation
Director

David Stout
US Fish & Wildlife Service
Chief, Habitat & Res.Cons.Div.

Terry Sullivan
The Nature Conservancy
Sr. Policy Advisor Water Res.

Gary Taylor
Ass'n of Fish & Wildlife Agencies
Legislative Director

Edward Thomas
Michael Baker, Jr., Inc.
Attorney, Sr. Policy Advisor

Rick Valentine
NWF
SmarterSafer

Andrew Warner
TNC Water Mgt Sustainable
Senior Advisor for Water Mgt.

Dov Weitman
EPA
Chief, Nonpoint Source Control Br.

Mark White
Chehalis Tribe

ASFPM Foundation - Symposium 2
Flood Risk Perception, Communication, and Behavior
Wednesday, November 4, 2009, 8:30 am – 4:30 pm
Pew Charitable Trust Building, Washington, D.C.
901 E Street NW, Washington, D.C. 20004

AGENDA

8:30 – 9:00	Registration, Continental Breakfast, Networking
9:00 – 9:15	Welcome, Introductions <i>Wallace A. Wilson, PE, CFM, ASFPM Foundation Vice President; W.A. Wilson Consulting</i>
9:15 – 9:45	Topic Overview <i>Doug Plasencia, PE, CFM, ASFPM Foundation Events Committee Chair; Michael Baker Jr. Sam Riley Medlock, JD, CFM, ASFPM Policy & Partnerships Program Manager</i>
9:45 – 10:30	“Increasing Public Readiness for Flood Disasters” Recent research <i>Dennis Mileti, Ph.D., Professor Emeritus, University of Colorado at Boulder</i>
10:30 – 10:45	Break
10:45 – 11:45	Relationship of Behaviors to Flood Risk Management Outcomes — Breakout 1 <i>Facilitators – Bruce A. Bender, Bender Consulting Services; Edward A. Thomas, Esq., Michael Baker Jr.; Pam Pogue, CFM, URS Corporation</i>
11:45 – 12:30	Lunch
12:30 – 2:00	Relationship of Risk Communication Methods to Behaviors —Breakout 2 <i>Facilitators – Bruce Bender, Ed Thomas, Pam Pogue</i>
2:00 – 2:15	Break
2:15 – 4:15	Recommendations <i>Facilitator – Doug Plasencia</i>
4:15 – 4:30	Closing Summation <i>Larry A. Larson, PE, CFM, ASFPM Executive Director, ASFPM Foundation Sec’y, Treasurer</i>

Thank you to our Sponsors who enable us to host the Symposium and Forum at no cost to participants.

AECOM	ESP Associates	Stantec
Dewberry	Michael Maker	URS Corporation
	PBS&J	

ASFPM Foundation - Symposium 2
Flood Risk Perception, Communication, and Behavior
Wednesday, November 4, 2009, 8:30 am – 4:30 pm
Pew Charitable Trust Building, Washington, D.C.
901 E Street NW, Washington, D.C. 20004

PARTICIPANT LIST

Michael Armstrong
International Code Council, Inc.
Sr. VP for Member Services

Debra Ballen
Public Policy Institute for Business & Home Safety
General Counsel and SVP

Douglas A. Bellomo
FEMA
Division Director, Risk Analysis Branch

Bruce A. Bender
FACILITATOR
Bender Consulting Svcs., Inc.
Vice President

Catherine A. Brandes, CFM
Nurture Nature Foundation
Environmental Scientist

Diane Alicia Brown
ASFPM
Communication & Events Mgr.

Nicole Carter
US Congressional Research Service
Natural Resources Policy Analyst

David R. Conrad
National Wildlife Federation
Senior Water Resources Specialist

Kamer Davis

Vicki Deisner
National Wildlife Federation
Associate Director

Robin DeMeo
NRCS, Water Resources
Acting Branch Chief

Jennifer Dunn, CFM
US Army COE
Natl. Silver Jackets Program Manager

Scott K. Edelman, P.E.
AECOM
National Director

Kristen Fletcher
Coastal States Organization
Executive Director

David C. Fowler, CFM
Milwaukee Metro Sewerage Dist., WI
Senior Project Manager

Gerald E. Galloway, P.E., Ph.D.
Univ. Maryland, Dept. Civil & Environ. Engineering
Glenn L. Martin Instit Prof. of Eng.

Susan Gilson
National Assn. Flood & SW Mgrs.
Executive Director

Allison Hardin, CFM
City of Myrtle Beach, SC
Planner

Tadd H. Henson, P.E., CFM
Stantec Consulting, Inc.
Project Manager

Rachel Hogan
Nurture Nature Foundation

Victor T. Hom
NOAA, National Weather Service
Natl Inundation Mapping Svcs Leader

Jo Ann Howard
H2O Partners, Inc.
President

Meredith R. Inderfurth
ASFPM
ASFPM Washington Liaison

Deborah Ingram
FEMA
Mitigation Risk Reduction Division Chief

David Key, P.E., CFM
ESP Assoc., P.A.
Water Resources Dept. Manager

Butch Kinerney
FEMA, Mitigation
Communications Chief, Mitigation

Carolyn Kousky
Resources for the Future

Jon Kusler, Esq., PhD
Association of State Wetland Mgrs.
Executive Director

Larry A. Larson, P.E., CFM
ASFPM
Executive Director

Dale A. Lehman, P.E., CFM
URS Corporation
Vice President

Gregory A. Main, CFM
ASFPM Chair
Indiana Dept. Natural Resources
State NFIP Coordinator

Linda Manning
The Council Oak
President

David I. Maurstad
PBS&J
VP, Nat'l Business Sector Mgr.

Sally A. McConkey, P.E., CFM
ASFPM Vice Chair
INRS Illinois State Water Survey
Water Resources Engineer

Timothy McCormick, P.E., CFM
Dewberry
Sr. Vice President

Donald W. McEvoy
PBS&J
Vice President, Sr. Division Mgr.

Sam Riley Medlock, JD, CFM
ASFPM
Policy & Partnerships Program Manager

Dennis S. Mileti
SPEAKER
Univ. Colorado
Professor Emeritus

Jacquelyn L. Monday
JLM Assoc., Inc.
Editor

Michael J. Moye
National Lenders Insur. Council
President

Eric C. Nordman
National Assn. of Insurance Commsnrs.
Director of Research

Alexa Noruk
National Emergency Mgmt. Assn.
Legislative Policy Analyst

William L. Peoples
Nashville District
US Army COE
Public Affairs Specialist

Ezekiel Peters
Univ. Colorado, Natural Haz. Ctr.
Asst. Director, Programs & Outreach

Ricardo S. Pineda, P.E., CFM
California Dept. Water Resources
Supervising Engineer Water Resources

Doug Plasencia, P.E., CFM
Michael Baker Jr., Inc.
Vice President

Pamela Pogue, CFM
FACILITATOR
URS Corporation
Emergency Management Specialist

Peter D. Rabbon
US Army COE
Director, Natl Flood Risk Mgt Prg

Heidi Recksiek
NOAA, Gulf Coast Svcs. Center
Human Dimension Specialist

Claire Reiss
Public Entity Risk Institute
Deputy Executive Dir. & General Counsel

George Riedel, CFM
ASFPM
Deputy Executive Director

Russell W. Riggs
National Assn. of Realtors

Lawrence H. Roth
American Society of Civil Engineer
Deputy Executive Director

Leonard Shabman, Ph.D.
Virginia Tech

Gavin Smith, Ph.D., AICP
Center for Nat. Disasters Coastal Infra.
Executive Director

Grant M. Smith, P.E., CFM
Dewberry
Vice President

Judy M. Soutiere, CFM
US Army COE, Sacramento Dist.
Flood Risk Program Manager, Sacramento Dist.

Jeffrey L. Sparrow, P.E., CFM
Michael Baker Jr., Inc.
Assistant Vice President

Jen M. Sprague
NOAA/NWS
Policy Analyst

Kevin G. Stewart
NHWC President
Urban Drainage & FCD, CO

Edward A. Thomas, Esq.
FACILITATOR
Michael Baker Jr., Inc.
Attorney-Senior Policy Advisor

Mary Jo Vrem
FEMA
Floodsmart Project Manager

JoAnna Wagschal, APR
URS Corporation
Strategic Communications Practice Manager

Ed Wallace
Northwest Hydraulic Consultants, Inc.
Principal

Matthew Watkins
National Assn. of Home Builders
Environmental Policy Analyst

Stephen H. Weinstein
RenaissanceRe Holdings, Ltd.
Senior Vice President

Dov Weitman
US EPA
Chief, Nonpoint Source Control Branch

Wallace A. Wilson, P.E., CFM
W.A. Wilson Consulting Svcs.
Owner/Consultant

Robert Wood
US EPA
Office Wetlands, Oceans & Watersheds

Appendix D. List and Location of Supplemental Materials Published Separately

Background papers for the 2010 Forum

ASFPM Foundation, 2010. *Managing Flood Risks and Floodplain Resources*: Symposium I Background Reading for the Third Assembly of the Gilbert F. White National Flood Policy Forum, March 8–9, 2010. Available at http://www.asfpmfoundation.org/forum/Forum3_Symp_1_Background_material_FINAL.pdf.

ASFPM Foundation, 2010. *Managing Flood Risks and Floodplain Resources*: Symposium II Background Reading for the Third Assembly of the Gilbert F. White National Flood Policy Forum, March 8–9, 2010. Available at http://www.asfpmfoundation.org/forum/Forum3_Symp_2_Background_material_final.pdf.

Presentations at the 2010 Forum

“Challenges in Managing the Natural and Beneficial Resources” (PowerPoint) - *Jeanne Christie, Executive Director, Association of State Wetland Managers*. Available at http://www.asfpmfoundation.org/pdf_ppt/forum/Christie_GFW_2010_Challenges_Managing_Natural_Beneficial_Resources.ppt

“Behavior Factors and How to Effect Change in Flood Mitigation” (PowerPoint) *Dennis Mileti, Professor Emeritus, University of Colorado-Boulder* Available at http://www.asfpmfoundation.org/pdf_ppt/forum/Mileti_GFW_2010_Forum_Behavior_Factors.ppt

“Setting the Stage for National Flood Risk & Resources Policy and Strategies” (PowerPoint) *Doug Plasencia, ASFPM Foundation Trustee; Michael Baker, Jr., Inc.* Available at http://www.asfpmfoundation.org/pdf_ppt/forum/Plasencia_GFW_2010_Forum_Opening.ppt

