National Association of Flood and Stormwater Management Agencies
1301 K Street, NW, 8th Floor East Tower, Washington, DC 20005
Telephone (202) 218-4133 Facsimile (202) 478-1734

Testimony of the National Association of Flood And Stormwater Management Agencies

Presented by Steve Fitzgerald
Chief Engineer
Harris County Flood Control District
Houston, Texas

Climate Change and Energy Independence: Transportation and Infrastructure Issues

U.S. House of Representatives
Transportation and Infrastructure Committee
Rep. James Oberstar, Chairman

Water Resources and Environment Subcommittee
Rep. Eddie Bernice Johnson, Chairwoman

May 16, 2007

The National Association of Flood and Stormwater Management Agencies (NAFSMA) is pleased to present this testimony concerning climate change and the related infrastructure energy independence issues of importance to our members and their constituents.

NAFSMA

NAFSMA is a national organization based in the nation's capital that represents more than 100 local and state flood and stormwater management agencies. Its members serve a total of more than 76 million citizens. Formed in 1979, NAFSMA works closely with the United States Army Corps of Engineers (USACE), as well as the Federal Emergency Management Agency (FEMA) and the U.S. Environmental Protection Agency (EPA) to carry out its mission.

The mission of the Association is to advocate public policy relating to flood protection, stormwater and floodplain management in order to enhance the ability of its members to protect lives, property, and economic activity from the adverse impacts of storm and flood waters. Many of NAFSMA's members are currently non-federal partners with the U.S. Army Corps of Engineers in water resources projects, including flood damage reduction and environmental restoration projects.

NAFSMA members are on the front line protecting their communities from loss of life and property. Our membership is keenly aware that flood risk management is a necessary investment required first to prevent loss of life and ensure the safety of our citizens and secondly, to reduce the risk of damages to peoples' homes and businesses and protect them from economic disruption. Flood management has proven to be a wise investment that pays for itself by preserving life and property, and reducing the probability of repeat requests for federal disaster assistance.

We appreciate the committee's interest in the voice and experience of NAFSMA and its members relative to the design, construction, and operation of our nation's stormwater management and flood protection systems.

The Role and Function of NAFSMA Members

NAFSMA members are responsible for, or directly influence, the design, construction, operation, maintenance, environmental compliance, financing and public education about the nation's stormwater management and flood control infrastructure.

The systems designed, constructed and operated by these state and local entities include a wide range of infrastructure from road culverts to streets, canals to levees, wetlands to reservoirs, drainage channels to detention basins, and water pipelines to dams.

Neither NAFSMA nor its members gather climatological, meteorological, or hydrological information for scientific analysis and interpretation, instead relying on sources such as the National Oceanic and Atmospheric Administration (NOAA) and the United States Geological Survey (USGS) for this function. However, the data assembled in the historical climatological and meteorological record is of foundational importance to stormwater and flood control systems design and operations, providing the most basic component of the design and operational decisions made by our members.

Designing Stormwater and Flood Control Systems for a Defined Risk

All stormwater and flood protection systems are designed, constructed and operated to protect people and property from a "defined risk". That risk is defined by public policy based on several categorical factors. These include among others, lives at risk, damages avoided, residual risk, environmental impacts, costs, willingness (or ability) to pay and political prioritizations.

This "defined risk" for which a stormwater or flood protection system is designed is most often expressed as a level of protection related to the probability of occurrence of an event of a particular size or intensity (ie. the 100-year event, having a 1% chance of occurring, in any given year). The calculation to determine the size or character of that defined risk event and the related level of protection is based on the data in the historical climatological/meteorlogical record.

For a particular project, community or state/federal program, it is prudent to also establish or identify a residual risk from which the community is not protected. A levee or channel designed for the 100-year event does not protect against the 200-year event, though if structurally sound, it will significantly reduce the damages which would otherwise have been produced by the 200-year event.

Actually obtaining the selected level of protection against the defined risk requires taxpayers (through direct vote) and/or their representatives (through legislative action) or federal agency action (for smaller flood management projects) to affirm the plan and provide the necessary legal empowerment and financial resources. Only then may the selected structural and/or non-structural protective measures be implemented, and the desired level of protection against the defined risk be secured.

Current Stormwater and Flood Protection System Designs

Stormwater and flood protection systems currently in place or under construction have their designs based on risk as defined from the existing historic record of climatological and hydrological data and events. From this data the public policy process determines the level of protection to be afforded various locales. For example, levees designed to protect various agricultural lands may be designed for a 25 or 50-year event while a protective structure for a large urban area typically may be designed for 100-year protection.

Many urban areas, however, currently have far less than 100-year protection. In addition, the accepted or minimum level of protection, established for certain locales or situations can vary among agencies (ie., Corps, FEMA, EPA, USFWS, states, locals). Similarly, the manner in which levels of protection are calculated or prioritized can also vary.

It is important to note that even under the current system of defining risk, establishing acceptable levels of protection and prioritizing projects, flood protection agencies have neither the fiscal resources, nor the priority empowerment to fully meet the nation's current flood protection risks. In the week prior to this hearing significant flood flows

along the Missouri River and its tributaries overtopped many levees and flooded substantial areas.

In that regard, the Hurricane Katrina experience raised a number of questions, among them: "Was the project approval, funding and construction process so onerous as to contribute to its failure?" Secondly, "Was the selected level of protection adequate, based on the historical record?" and third, "Can the design and construction be sufficiently robust so as not to fail in an event which might exceed the design?" Clearly, a 100-year event structure which is overtopped, but which does not fail in a 200-year event, is far preferable to a 200-year event structure which fails in the designed 200-year event.

Considerations Raised by Climate Change

The consideration of climate change as a potential design factor for stormwater and flood protection systems raises many questions requiring resolution in order to enable the public policy process to establish an implementable defined risk and level of protection.

While current risk definitions and levels of protection are built on known historic climatological and hydrological data, risk definitions and levels of protection built on climate change projections are built on events which have not yet occurred, or on events which might occur in some unknown time frame, or events which might not occur at all. The weight of this design challenge is seen in the climate change discussions which suggest some areas might receive more rainfall, or more intense rainfall, and others less. Some might see fuller, more erosive streams, some less so. Some might see more snow fall and snow melt runoff, others less. Some might see higher stage receiving water, others less.

Clearly, the question of climate change as a stormwater and flood protection system design factor produces a factor of design uncertainty that reaches deeply into the infrastructure planning of every community, impacting every system feature from the smallest road culvert to the largest pipelines, dams and levees.

Examples of important design questions needing resolution are as follows: If the selected level of protection is, for example, the 100-year event, what is the appropriate data base from which to calculate storm or flood flow and to design the control structure? How much of the calculation is built on historical data, and how much on future climate projections. Lastly, how is the future climate projection factor determined for each local community or watershed?

Recommendations

In view of the significance of a decision to include, or exclude, climate change as a factor in defining risk and determining an appropriate level of protection for stormwater and flood protection systems, NAFSMA respectfully submits the following recommendations for the Committee's consideration.

1. The federal government should develop and implement a unified targeted research initiative, pursuing the science requisite for the necessary public policy enactments. The wrong public policy concerning this matter could result in massive misdirected or unnecessary expenditures, or in enormous damages and losses otherwise avoidable.
   - The research initiative must address the question of climate change as to each hydrologic region.
   - The research must determine within a reasonable confidence level the impact on the previously documented hydrologic regime and climatological record.
   - The research must help develop new or alternative means of defining risk and calculating levels of protection, and the associated degree of uncertainty.
   - NAFSMA supports the research initiatives outlined in the testimony of the Honorable John Paul Woodley, Jr. of May 11, 2007.

2. Currently active projects should be allowed to proceed under existing flood protection program policy and design parameters. In many areas of the country, unprotected or under protected communities are at great risk under current known conditions. Allowing projects to proceed with definitive protection today, instead of awaiting a pending future climate condition yet to be determined, is in the public health and safety interest.

3. Maximize the effectiveness of the current federal/state/local stormwater management and flood protection system. Improvement in interagency coordination, unified flood protection policies and standards, improving project approval and completion processes, improving design and construction standards, and improving project operations and maintenance procedures will produce robust projects which will perform well in design events.
   - Develop in conjunction with state and local interests, a functional definition of "residual risk".
   - Update the current project evaluation process to give public safety equal standing with the national economic development standard.
   - Strengthen the utilization of non-structural and other options to maximize risk reduction and mitigation techniques.
   - NAFSMA strongly supports the streamlined or facilitated permitting for flood protection systems operations and maintenance activities.
   - NAFSMA strongly supports the aggressive funding of Corps of Engineers flood damage reduction studies and projects.

4. Ensure that the project approval, administration, and funding processes will implement the policies ultimately adopted to define the risk and calculate the level of protection, thus guaranteeing timely construction of the projects approved consistent with that policy. By the mid-1980's the time required to move a Corps project from congressional authorization to construction was 25 years or more. In the 1990's, the goal was to reduce that time to ten years. These timelines don't include construction, and much progress is still needed.
   - Policies should be developed on the basis of the results of the research and science initiatives; project designs, construction and operation standards and practices would then be based on those clear policies.
   - Ensure that the level of protection selected is commensurate with the defined risk.
   - Policies should define the means by which risk and design uncertainties are recognized and taken into account.

- NAFSMA supports efforts to reduce the time to identify projects and reduce redundancies and unnecessary steps, such as the Lean Six Sigma Process recently initiated by the Corps.
- NASFMA supports the establishment of a national levee safety commission to be charged with the development of a national levee safety policy and program, with state, regional and local participation in this effort.
- NAFSMA supports the national levee inventory program initiative of the Corps and FEMA.

5. Include state and local expertise in the climate change research and policy initiatives. All of the impact and much of the cost of any decision to incorporate, or not incorporate, climate change as a stormwater and flood protection design factor will be borne by state and local entities. Their expertise and interest will be valuable.

6. NAFSMA urges strong interagency coordination among the federal agencies, as well as their state, regional and local counterparts on this critical issue. Since August 2005, the Federal Emergency Management Agency and the U.S. Army Corps of Engineers have set an example that should be followed by other federal agencies. Their joint efforts, which began prior to Hurricanes Katrina and Rita have helped to lay the groundwork for a National Flood Risk Management Strategy. This work needs to reach even further to include leadership of other federal agencies, such as the EPA, the U.S. Geological Survey, the Bureau of Reclamation, the National Weather Service/NOAA, and others. In addition, the programs supported by these agencies are critical elements to increasing our preparedness to address climate change issues.

7. NAFSMA urges Congress to provide adequate funding for the federal programs needed for federal, state and local agencies to sufficiently equip them to respond and adapt to climate change issues. In this regard, NAFSMA supports the following:

   - NAFSMA strongly supports full funding of the U.S. Geological Survey's streamgaging programs. NAFSMA urges Congress to provide appropriations of $78 million for the Cooperative Water Program (CWP) and $34 million for the National Streamflow Information Program (NSIP) in FY 2008. This request has

been supported by NAFSMA and 26 other national organizations in testimony submitted to the House Interior and Environment Appropriations Subcommittee.

- Full funding of FEMA's Map Modernization Program through at least 2012.
- NAFSMA urges aggressive funding to address aging infrastructure issues in this country. NAFSMA applauds the House, and especially this Committee under its past and current leadership, for its efforts to approve water quality financing legislation earlier this year. Within EPA's existing programs, adequate funding is needed for EPA's State and Tribal Assistance Grants Program, Cooperative Water Quality Grants and research programs to address aging infrastructure and climate change issues.
- Approval of a Water Resources Development Act every two years.
- NAFSMA supports the NOAA & NWS efforts.

Thank you for the opportunity to submit these comments, and for your consideration of our recommendations.