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Before the

Subcommittee on Water Resources and the Environment

of the

House Committee on Transportation and Infrastructure

U. S. House of Representatives

For hearings on

Recommendations of the National Committee on Levee Safety

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Good afternoon, Chairwoman Johnson, Ranking Member Boozman and Members of the Subcommittee. I am David R. Conrad, Senior Water Resources Specialist for the National Wildlife Federation, the nation's largest conservation education and advocacy organization with our more than four million members and supporters and affiliate conservation organizations in 47 states and territories. The National Wildlife Federation greatly appreciates the opportunity to share our views on the proposal for a National Levee Safety Program developed by the National Levee Safety Committee (" NLS Committee") established by Title IX of WRDA 2007. The Federation has a long history of active involvement and concern regarding the nation's flood damage reduction and floodplain management programs. It is critical to note the choices our nation makes at this juncture and from here forward regarding how we approach levee safety are of immense importance and consequence. We greatly appreciate the Subcommittee's decision to hold hearings on this important subject today.

The Federation wishes to compliment the prodigious work of the NLS Committee in assembling this Report on a very compressed time schedule. This is a very broad subject. The Report provides many important contributions and insights as to the conditions confronted by the nation, states and communities faced with reliance on aging and in some cases poorly constructed levees. Yet we are also concerned that the Report fails in critical ways to adequately approach current and future risks associated with levees.

History and Context of Using Levees for Flood Damage Reduction

As the NLS Committee notes, we are now at a critical point in history – we are witnessing "burgeoning growth of risk to people and infrastructure as a result of more than 100 years of inattention to levee infrastructure combined with an economy and a social fabric that are in a particularly vulnerable state."

The Committee's report notes that over this hundred-year period there have been waves of levee construction with differing philosophies and regulatory and professional viewpoints regarding levees' construction and uses. In the early 20th Century many levees were built especially for lower-risk agricultural uses. This was often accompanied with greater public recognition of the likelihood of failures. In the 30's through the 60's the

nation launched a binge of large levee building on rivers and in coastal environments that placed high faith in our abilities to engineer water systems. This also induced large populations and property development into floodplains and placed them at risk of flooding in the event of structural failure or overtopping from large floods. In addition, many communities began to convert older agricultural levees to levees for urban use. Many communities were led to believe levees were fail-safe solutions to flooding and they could be fully relied upon. In addition, the levee binge was accompanied by huge environmental alteration and damage, cutting off and draining large amounts of natural floodplains, riparian lands and wetland habitats, adversely affecting many of the major wildlife resources of the nation, and with what we now recognize as all too often having devastating and lasting environmental effects.

The Committee's report touches on the extremely unfortunate and peculiar interplay between the standards and requirements of the National Flood Insurance Program (NFIP) and the Corps of Engineers flood control financing -- and we would add project planning procedures -- that added up to conditions particularly since the 1960's that fostered an explosive level of growth in heightened-risk floodplain development, and where many communities sought levees with only the minimum 100-year (1% annual chance) levels of flood protection in order to avoid the mandatory flood insurance purchase requirements for their residents and requirements for land use and building controls for floodplain-located construction. There are many other examples where programs' interactions have fostered unwise and risky growth in flood prone areas.

When combined with the growing risks associated with global warming and climate change, changes in snow pack and runoff, more frequent and more severe storms, increasing sea-levels and erosion along our coasts, and population increases and major and ongoing changes in intensifying land uses and urbanization that are also increasing flooding risks, it is clear that the risks and costs of flooding to many communities and to society as a whole are rising alarmingly. Certainly where many levees are involved, a wide range of problems for now and for the future must be seriously addressed.

National Wildlife Federation Concerns Regarding Proposed National Levee Safety Program

Madam Chairwoman, at the broadest level our concerns with the current Levee Safety Committee proposal fall in three categories –

- the scope of levee safety is too narrowly defined to assure flood risk reduction over the long term;

- protection and restoration of the environment and implications of changing climate, sea-level rise and changes in watersheds are given too little recognition; and,

- too great an emphasis is placed on the federal government to resolve problems that should properly be led by state and local entities.

We strongly agree with the Levee Committee's emphasis on completing a national inventory and assessment of levees, providing for vigorous public education on risks and public involvement in mitigating risks, establishing and improving standards, development of a National Levee Safety Code, and developing and distributing technical materials and training for states, community officials and the private sector. Regardless of what mechanism is chosen to lead a national levee safety program, these are critical elements that are well defined in the proposal and need to be done.

We urge the Subcommitee to give additional attention to the following concerns in the event it may wish to proceed with a response to the Levee Committee's recommendations:

Scope of Levee Safety is too narrowly defined. As the Federation reads it, the NLS Committee has largely defined the focus of levee safety to assessing and managing the condition of the levees themselves, rather than placing them in the full context of the floodplains in which they are located. We believe it is unwise to approach the nation's levees as divorced from what is happening in their floodplains. The Federation believes, and we and other Reviewers raised these concerns repeatedly as the Committee began to lay out its proposals, that absent viewing levees in their full context, the narrow focus may lead to compounding costs and increasing risks rather than the opposite. It is essential to assess and understand the long-term risk management and cost implications of whatever choices are made to manage and reduce risks associated with levees. The Report acknowledges that most levees are destined toward degradation over time and the costs of

maintenance and rehabilitation are often extremely high. So if anything, every levee should be viewed from the standpoint of what its role should be among the range of risk reduction strategies available and in the context of all relevant factors in management of the floodplains involved. For instance, we now know much more clearly that New Orleans levees cannot and should not be viewed outside the context of what is happening to Louisiana coastal wetlands that are seriously degrading and now resulting in increased storm surge risk from increasingly intense hurricanes. Levees must clearly be viewed within the context of long-term development trends and how these will or should be managed in their floodplains and in their larger watersheds.

Failure to acknowledge or address levees' impacts on environment. Another key concern is the failure of the Committee's proposal to clearly include among the responsibilities of the Levee Safety Commission and requirements of States to identify and consider environmental factors in developing levee safety plans. Congress gave important new directions regarding water resources development in Section 2031(a) of WRDA 2007 by setting a new "National Water Resources Policy" that states:

"It is the policy of the United States that all water resources projects should reflect national priorities, encourage economic development and protect the environment by –

- ***Seeking to maximize sustainable economic development;***

- ***Seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and***

- ***Protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems."***

By emphasizing investments supporting sustainable conditions, avoiding unwise use of floodplains, minimizing adverse impacts and vulnerabilities, and protecting and restoring functions of natural systems and mitigating impacts to natural systems, Congress has added critical new criteria and considerations that would be relevant in many instances to levee safety planning, yet these are essentially not reflected in the Committee's proposed Levee Safety program. These are serious omissions that undermine the

potential effectiveness of a Levee Safety program. Certainly there are many ways through inventories, consultations with a broad range of agencies, coordination of programs, and establishment of incentives and disincentives, where such policies could be implemented effectively through a well-designed Levee Safety program, but thus far we believe the proposal falls far short of the mark.

Without question enormous ecological damage has been caused by excessive reliance on levees as the primary and sometimes only flood damage control strategy in many areas. In some regions millions of acres of wetlands, riparian and floodplain lands have been cut-off, drained and divorced by levees from their natural connection with rivers and estuaries. As a result we are now witnessing not only enormous adverse environmental effects, but also growing flood risks and costs from the losses of natural flood control systems. The NLS Committee's Report itself acknowledges:

> "What we can do with confidence is to show that continued development in the floodplain and within watersheds increases runoff and decreases flood carrying capacity of waterways, thus yielding more frequent and higher flood stages. We can also now conclude that effects of climate change are likely to increase the intensity of coastal and riverine storm events, and thus increase the chance of higher flood stages. In general, we can expect more frequent and higher flood stages in the future to increase the overall risk profile behind levees." (NLS Committee Report, p. 20)

After the 1993 Great Midwest Flood, Congress made substantial funding available for successful buyouts of floodplain lands damaged by levee failures. These voluntary purchases of frequently flooded levee districts were much applauded and improved both environment and public safety conditions. We believe an effective Levee Safety program should be equally designed to seek out where such multiple public benefits can be accomplished by bringing together environmental, public safety and other critical objectives, such as dealing with increased threats from climate change, yet the proposal thus far fails to clearly and affirmatively make these necessary connections.

Effectiveness of a National Levee Safety Commission would be limited without support of a strengthened, coordinated federal approach to water resources.

We are concerned that the effectiveness of a National Levee Safety Commission or the efforts of any agency that might be assigned the key leadership in developing a National Levee Safety program would be limited without establishment of an overall strengthened and coordinated federal approach to water resources that would be built on regional and watershed-based concepts. The NLS Committee recognized this concern, but offered no basic proposal to address it:

> "In presenting this plan, the Committee believes it is important for the reader to understand that while the safety of levees is a significant component of the Nation's approach to flood risk management, it is just that, a component. A National Levee Safety Program will be most effective only when coupled with an overall national flood risk management strategy. The Committee recommends that Congress give strong consideration to the development of an overall National Flood Risk Management Strategy, of which the National Levee Safety Program would be an integral part." (Committee Report, p. 23)

There is a strong question whether a National Levee Safety Commission or an individual federal agency could cause the called-for substantial alignments and realignments of existing federal flood, hazard mitigation and environmental programs sufficient to serve as a major motivation for States to develop strong Levee Safety programs of their own.

The National Wildlife Federation and a number of other members of the NLS Committee Review Team made strong recommendations that revitalization of a cabinet-level U.S. Water Resources Council could be the best means to help focus the resources of the numerous federal water resources-related programs to convince states to actively engage not only in levee safety but also in a desperately needed effort to reduce flood risks through a full range of tools and risk-reduction means across the nation. We were disappointed that the Committee did not directly address these concerns. Developing a Levee Safety Program could be a direct project of a revitalized Water Resources Council or the Council could become a principal federal support for researching, developing and implementing key recommendations of a National Levee Safety Commission.

Other key concerns for a Levee Safety Program.

Responsibility for levee safety must be directed principally to those benefiting from the structural projects themselves. It is premature to recommend a high Federal cost-share program for levee rehabilitation.

As we have stated, the Federation strongly supports recommendations for continuation and expansion of levee inventories, public education, updated assessments, development and implementation of standards, and implementation of incentives and disincentives to promote levee safety and promoting strong state levee safety programs. We are concerned, however, that the NLS Committee has recommended the federal government should essentially presume responsibility for much of the rehabilitation costs for urban levees by recommending a 65 percent Federal, 35 percent non-Federal cost share. This is without knowing what the total costs may be and without fully exploring the range of cost-share and financing options that may be available. We believe it is premature to make such a recommendation. It would be critical to first estimate the potential cost of this program because once established, such a cost-share would likely become the standard, expected approach for levee rehabilitation in the future. We believe it would also be critical to consider what other sources of funding could be made available to fund such projects. For instance, there has recently been considerable private-sector interest shown in rehabilitation projects. The Federation further believes this type of investment would be particularly appropriate for establishing a sliding-scale type cost-sharing arrangement, based upon a range of other flood risk-reduction methods and plans that are employed by communities as part of a larger risk-reduction plan.

Waivers of liability should not be granted.

The Federation would be opposed to granting of waivers of liability associated with levee inspection and construction. Any levee structures carry with them potential for major damage and loss of life, and it is critical that all those involved with their construction and management carry out their responsibilities with utmost care. The Federation believes development and implementation of rigorous professional codes, standards and procedures would be the best means of managing liability issues responsibly.

Mandatory risk-based flood insurance and establishment of basic land use and building code requirements should be required for all residual risk properties behind levees and below dams.

We strongly applaud the NLS Committee's recommendations that the National Flood Insurance Program's mandatory flood insurance purchase requirements and appropriate land use and building code requirements should be developed and implemented in natural floodplains behind levees and below dams. Recent history has made abundantly clear that levees do not eliminate risk of flooding and the failure in the past to require risk-based flood insurance is a major contributor to devastation of communities and large and increasing disaster assistance costs. Stronger standards should also be established to protect critical facilities such as hospitals, schools, public buildings, wastewater treatment facilities, and critical transportation systems as part of levee safety planning. NFIP flood hazard mapping should be expanded to much better communicate potential risk and to include identification of natural and beneficial functions of floodplains to support broader floodplain management planning.

Urge full review and updating of the P.L. 84-99 program. The Federation also strongly agrees that a number of current federal flood-related programs should be reviewed and better aligned to avoid promoting high-risk floodplain development and reduced levee safety. Among the programs listed by the Committee, the National Wildlife Federation believes it is long overdue for Congress and the Administration to review the P.L. 84-99 program, particularly regarding levee rehabilitation, to assure consistency with modern policies and programs.

National Levee Safety Committee Review Team Comments. During the Review Team meetings and in subsequent written comments a range of entities made comments similar to those of the National Wildlife Federation. We have appended this testimony with the Federation's December comments on the Draft Report. The comments describe in further depth our concerns and the rationale for our recommendations. We would suggest the Transportation and Infrastructure Committee may wish to request and review the Review Team comments as an additional background source for its deliberations on these matters.

Conclusion.

Again, we greatly appreciate the opportunity to present the views of the National Wildlife Federation regarding the recommendations of the National Levee Safety Committee. The Committee has made a number of important findings and recommendations which deserve serious consideration. We

believe, however, that the Committee has fallen short in a number of key areas that need critical attention, which, if not addressed would greatly hamper the effectiveness of moving forward with improving levee safety. We hope the Committee on Transportation will give attention to these additional concerns as it considers any further action on these important matters. Thank you for your consideration of our views.

National Committee on Levee Safety (NCLS)
Review Team Feedback Form

DIRECTIONS: The Committee would like your feedback on their draft recommendations. The associated Review Team compilation document and presentations from the Dec. 12, 2008 meeting provide more detailed information. **Please send your responses to terry.r.zien@usace.army.mil (and copy laura_sneeringer@sra.com) by December 22, 2008.** Since the NCLS is working on a very quick-turnaround time, a quicker response is appreciated. The Committee will take your feedback into consideration, but due to the limited timeframe, responses will not be provided.

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Initial Overall Comments:

The National Wildlife Federation appreciates the opportunity to comment on the National Committee on Levee Safety's proposed Outline and December 12, 2008, Draft recommendations for a National Levee Safety Program (NLSP). We applaud the Committee for the major effort made thus far to begin to address these difficult national issues.

We are concerned, however, that thus far the Draft is not incorporating elements and perspectives the Federation believes will be crucial to the ultimate success of a NLSP. In particular, our concerns about the report include:

- the need to considerably broaden the viewpoint of the Draft from a focus principally on levee structures to a viewpoint that includes the full context of the affected floodplains and present and future land uses that must be managed in these areas;

- the need to recognize and respond to the ongoing environmental impacts of many levee systems, the external changes affecting levee systems, and the need for creative responses to these impacts and changes. Plans should include expanded use of non-structural approaches to floodplain management and flood damage reduction, application of the best available climate science and up-to-date science of sea-level rise, expanded use of voluntary buyouts and relocations and increasing elevations of flood prone properties, active restoration of natural floodplains, wildlife corridors and fish and wildlife habitat, expanded use of open-space floodplain zoning, and planning based upon reasonably foreseeable "future conditions," including future impacts of land use changes and watershed developments on floodplain functions. The report must better recognize the growing need for environmental management and ecosystem restoration, which, in many cases have become major and increasing concerns related to levees and other structural flood control systems;

- the need for a much stronger system of incentives and disincentives for the States to engage in a levee safety program and for levee owners and affected communities to become much more involved in levee safety, flood hazard mitigation and wise floodplain management. This will require significant adjustment and modification of a range of current national flood damage reduction, floodplain management, disaster assistance, hazard mitigation, levee repair, natural resources management, ecosystem restoration and other programs. While we appreciate the Draft's listing of potential areas of adjustment, the Federation urges the Committee to develop a set of specific recommendations that taken together will provide the necessary encouragement for states and local communities in to engage in much more serious actions to improve levee safety, wise floodplain management, protection and restoration of important natural resource values, and to protect people and property by truly reducing flooding risks and costs;

- the need for a governance structure that can address levee safety and floodplain management-related issues in a multi-agency and multi-Departmental water resources policy framework. The Federation believes either a National Levee Safety Commission or a single lead agency approach may fall short of bringing the necessary engagement and broader focus of federal programs needed to address these issues. The Federation urges the Committee and the new Administration to further consider providing funding for the U.S. Water Resources Council or similar body, working with stakeholders, as an alternative structure to address levee safety issues in the necessarily broader context we have described above. This was raised by several commenters in the December 12th Review Team session.

- the need for greater clarity of responsibilities for levees. Those who construct and own levees should be responsible for them. While the Corps of Engineers can serve as a center to inventory the nation's levees, levee owners must be responsible for the more costly and detailed geotechnical assessments by professionals qualified to conduct them. The Federation would not support waivers of liability or granting immunity from liability for levees. Waiving potential liabilities is not the way to "incentivize" wise, safe and prudent behavior.

Other General Comments:

The Federation is quite concerned with a statement in the Draft Outline for a Plan for a National Levee Safety Program, which defines the *vision* of the National Levee Safety Program as *"An informed public and reliable levee systems working as part of an integrated approach to protect people and property from floods"* and then narrows the focus of the Committee's plan and recommendations (paraphrased) to: 1) technical issues related to levees, 2) public education and awareness of levee risks, 3) development of levee safety programs that emphasize protection of human life, and 4) implementing governance solutions and incentives that encourage and sustain effective levee safety programs at all levels of government.

The Outline then goes on to say: *"In order to achieve our stated purposes, the above four aspects of Levee Safety were the Committee's primary focus. The Committee explored other goals and connectivity with related flood risk mitigation elements such as insurance, floodplain management, evacuation, and building codes;* ***and while the Committee believes it is critical that such elements be considered in the larger context of a systems approach they are beyond the scope set out in the Levee Safety Act."*** (emphasis added)

Such a statement of intention largely excludes one of the most critical problems facing the nation as it relates to growing flood risk and confronting the problem of having failed in many instances to properly consider the larger implications of the use of levees in natural floodplains and, over time, failure to manage the mounting risk associated with land uses associated with a poorly identified and often inadequately regulated inventory of deteriorating levees. Further, the scoping of this exercise largely ignores the already large and mounting set of environmental problems increasingly identified with traditional "flood control" strategies where the use of levees and other structures has divorced water resources from their floodplains with costly ecosystem impacts and losses of ecologically and economically important natural functions that we are finding to be enormously expensive to restore or replace.

At the October 31 Review Team workshop the Federation raised our serious concerns associated with viewing development of the National Levee Safety Program with such a narrow scope, and we particularly noted in our oral comments to the Review Team and Committee members that we believed failure to fully incorporate the new *National Water Resources Planning Policy* spelled out by Congress in Section 2031(a) of WRDA 2007 would make it considerably more difficult later in the process to shape a modern levee safety strategy. Others also expressed concerns on the narrow scoping.

We also raised our concerns that current science has identified with high probability that global warming will be accompanied with more intense storms and floods, wider variations in hydrologic patterns, and accelerating sea level rise, and that these factors need to be accounted for up front in any longer-focused national levee safety program strategy.

Congress' new policy states: ***"National Water Resources Planning Policy. It is the policy of the United States that all water resources projects should reflect national priorities, encourage economic development, and protect the environment by – (1) seeking to maximize sustainable economic development; (2) seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and (3) protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems."*** (Section 2031(a), WRDA 2007)

This is a broad policy that should be used to guide development of a new National Levee Safety Program as well as other projects and programs now and in the future. Direction for the NLSP guidance should not be limited only to Title IX. We believe that at present, the

draft proposal is focused almost entirely on levee structures and is failing to adequately consider and incorporate related lands, waters and natural resources in a broader strategy of reducing risks and vulnerabilities of existing and future development and properly protecting and restoring functions of natural systems and mitigating unavoidable damages to natural systems.

For the above reasons and others discussed in the following answers to questions posed by the Committee, **we would recommend that the National Levee Safety Committee <u>request additional time</u> to broaden the scope of the Committee's proposal to align it more closely with the new national policy, to incorporate consideration of climate change and sea-level rise factors and broaden the view of floodplain management as critical elements of the Plan. Further refinement is needed in developing meaningful recommendations that will engage States, local governments, levee owners and the public in actively managing levee systems and associated lands to better protect the public and the environment.**

NWF Responses to Committee Questions:

<u>Components of a National Levee Safety Program</u>
Which is preferable: fewer, but stronger, state programs or requirements for every state to have a levee safety program?

Ultimately, a national levee safety program should be designed to be delegated to the States, with the assistance of national data collection, aggregation and assessment, development of federal standards and establishment of incentives and disincentives to promote appropriate public safety and wise environmental management. The States are probably in the best position to effectively direct overall improvement of the safety of levees, while also educating the public about flooding risk and managing and reducing the growth of flood-related risk from unwise development in floodplains.

The delegated programs should be strong programs, well-incentivized through substantial linkages with a range of federal programs for disaster assistance, flood insurance, and flood-related infrastructure, and potentially others, particularly focusing on linkages with a) the minimum requirements and standards necessary for federal program participation, and b) a sliding-scale of levels of federal cost-sharing for the benefits of federal programs, based on ratings of states' and communities' efforts to control, manage and reduce flooding risks.

State programs should be designed to increase public safety to a high level in the long-term, as well as the short term, and to protect and increase the quality of the nation's environment and to take fully into account longer-term factors, such as impacts of global warming, climate change, sea-level rise, and land-use development and other changes in watersheds that may affect flood-related and ecological safety.

Finally, the direction of a National Levee Safety Program and implementation by delegated State programs should be aimed at actually, and in aggregate, reducing flood risks and damages and the devastating human-related impacts from present-day levels, locally, regionally and nationally. It should not simply be aimed at dampening the rate of increase of

damages and casualties. This we believe unfortunately appears to characterize most current flood-related programs.

Are minimum qualification requirements reasonable compared to benefits/incentives?

No, NWF believes the minimum requirements outlined in the 12-12-08 draft will not be sufficient nor will the benefits/incentives proposed will be sufficiently compelling to motivate most States, local governments and levee owners to address many critical levee and flood-risk-related problems in a timely fashion. Nor will most be motivated to take significantly greater responsibility for managing flood-related risks of ongoing and future floodplain development. NWF, first, believes that basic requirements should include substantial floodplain management planning, and participation in the NFIP. Second, as we stated above, there must be greater and more meaningful linkages with other current flood-related programs to result in positive consequences for embarking on improvements in flood-risk safety and wise floodplain management efforts and substantial and motivating negative consequences for failure to do so.

Are the lists of incentives and disincentives meaningful? Are there any incentives or disincentives you would add or remove?

Establishing a system of effective incentives and disincentives that engage the key constituencies involved with levee systems and floodplain development must be central to the Committee's efforts. However, the 12-12-08 draft fails to develop and recommend a proposed set of meaningful federal program changes to create and strengthen incentives and disincentives to motivate the involvement of States, local governments, levee owners and present or prospective floodplain residents toward risk management and wiser floodplain management. *This is a key and major weakness in the NLSP, so far.* NWF appreciates that the Committee has attempted to identify a number of the possibilities, but we believe the document is seriously lacking for substance here.

The Table on page 31 speaks volumes as to why federal programs have generally failed to turn around the explosive levels of growth of risk-prone floodplain development, especially in urbanizing and high-growth areas. The Table shows that as currently structured, the CRS incentives are principally aimed the benefiting <u>only property owners in the NFIP community</u> (i.e. reducing the *flood insurance rates* for homeowners or businesses located in regulated floodplain areas). Other than requiring the most basic (and generally <u>too low</u>) minimum standards for community NFIP participation and providing modest compliance and repetitive-loss mitigation assistance, the NFIP does not for the most part aim its incentives or disincentives at levee owners, local communities, regional-level governments or the States. Thus, local governments or States, *who actually hold the legal powers and responsibilities to control where and under what conditions building can take place in floodprone areas*, have little stake in exercising those controls for flood safety purposes or for environmentally-wise floodplain management. This is especially the case for lower-probability, high-consequence flooding events such as avoiding or managing risk associated with levees. The NFIP-CRS benefits only go to individuals, which is generally not motivating to local elected officials, or motivating only to the extent the measures chosen are easy to implement (e.g. maintaining flood-related information on file at the local library, for instance). There is not enough

consequence for many communities to take on the more difficult jobs of careful floodplain management or management of flood risk in areas behind levees or below dams, such as flood-risk avoidance, establishment of permanent open space, strict zoning, significant restrictions on fill, or more strict building elevation requirements.

At present, from the perspective of local and State governments, the benefits of most Federal disaster assistance and flood-related programs generally promote, rather than discourage development or redevelopment in and around floodplains, and they are blind as to whether the governments involved are lax or vigilant regarding levee safety and floodplain management. The benefits flow to local governments and states at the same levels (often extraordinarily high levels -- ranging from 65 to 100 percent federal cost-shares), whether or not they engage in wise floodplain management, risk-reducing building practices above minimum levels, or levee safety management.

The NFIP-CRS, again, encourages mitigation, but its direct monetary benefits flow almost entirely to individuals. The Community rating system (the actual rating of communities' actions for planning and implementing risk management measures), which is *potentially an extremely important risk-mitigation and floodplain management tool*, only affects individual premium flood insurance rates, and currently does not apply to any other federal mitigation programs that are important to States and communities. So the CRS's potential for motivating communities located behind levees or communities facing floodplain development pressures, to take meaningful actions, is mostly unrealized.

The Federal disaster assistance and other mitigation-related programs, in addition, are not aligned with wise flood plain management or levee safety. Public Assistance (PA), Individual and Family Assistance (IFG), Hazard Mitigation Grants (HMGP), Mitigation Planning grants, Flood Mitigation Assistance Grants (FMA), Severe Repetitive Loss grants (SRL), Pre-Disaster Mitigation Grants (PDM), various federal agencies' disaster loan programs, and the Agriculture Department crop insurance program should be reviewed for the means of alignment with levee safety and floodplain management. Making availability of the benefits of these programs contingent on State adoption of a levee safety program and other hazard mitigation measures would be a key incentive for risk management.

Among the most critical programs that should be reviewed for alignment is FEMA's **Stafford Act Public Assistance Program**. Because this program provides major disaster assistance for public infrastructure impacted by natural disasters, the management of which, in turn, can have major impacts on community development and redevelopment and therefore existing and future flood-related risks, the Federation urges the Levee Safety Committee to explore how thoughtful modifications in this area could serve to motivate greater levee safety and floodplain management actions at the local and state levels. Establishment of a sliding scale of federal cost-shares for disaster aid, based on community rating principles and with even modest steps, based on community achievement in flood risk management could make a major difference in risk reduction and future costs of disasters. A similar analysis should be made on how to best align the **Corps of Engineers flood control and flood damage reduction programs**, first, potentially by requiring state adoption of levee safety program responsibilities as a basic eligibility requirement, and, second, establishment at the federal

level of a sliding-scale system for flood control project cost-shares, based on community rating of flood risk and floodplain management measures implemented.

Critical in addition, we strongly urge the Committee to **carefully review the Corps of Engineers P.L. 84-99 program for modifications and to make recommendations** for updating the program in light of current conditions and experience and to align this program with levee safety principles, the evolving National Flood Insurance Program and new national floodplain management policies, including WRDA 2007. This 1946 program generally assumes that damaged levees should be immediately repaired to their pre-flood condition, generally at 80-100 percent federal expense. In light of the growing problems of climate change, changes in watershed land uses and hydrologic conditions, changing growth patterns and increasing urbanization impacts on flood-related problems, and the importance of emphasizing local responsibility, **there is no current flood-related program in greater need of review and updating than P.L. 84-99**.

Particularly in light of the need to conduct further analysis and make concrete recommendations in this area, we would strongly urge the **Committee to request additional time beyond the 15th of January target date** to identify, further review and make recommendations for key areas and programs to better align incentives and disincentives for improving levee safety and floodplain management in any ultimate proposal made to Congress.

Do changes to the NFIP, CRS and other federal programs dilute the effectiveness of those programs? Is the return on modification positive?

As described in the previous answers, NWF believes there is much room for greater program alignment among the flood damage reduction, disaster assistance, natural resources management and hazard mitigation programs. We strongly support the NFIP reform to **accurately map and require risk-based, actuarially-sound flood insurance in floodplains for all structures located behind levees and canals and below dams**. Additionally these areas should be **subject to floodplain management ordinances to manage future risks**. Such mapping should also be required to **use best available climate science and incorporate reasonably foreseeable future conditions within watersheds to improve the accuracy of floodplain maps**. Ideally, maps should also include identification of **estimated 10, 20, 50, 100, 200 and 500-year flood zones, as well, to give residents a clearer picture of the relative risks they may be facing**. NWF also believes some **CRS-creditable practices should be considered for addition to basic community participation requirements** – essentially a strengthening of the basic NFIP mitigation program.

We have serious doubts that using NFIP surcharges or manipulating CRS credits to help fund levee safety activities would be successful, and could actually be harmful to the purposes of these programs, particularly if they are perceived as inequitable among the policy holders. As we have discussed above, we believe that **aligning a number of other federal aid programs, through a combination of eligibility thresholds, community rating and using sliding cost-shares has much greater potential to create the right**

combination of incentives and disincentives to encourage States and communities to join in an effective levee safety and broader flood-risk and floodplain management program.

Are there other federal programs with which the National Levee Safety Program should align?

Besides the programs we have listed in comments above, we would urge the NLSP to explore aligning with the Army Corps of Engineers **aquatic ecosystem restoration programs**, greater use of **non-structural flood damage reduction** through a number of existing authorities, and a **range of federal and state environmental programs** that could be used to assist in improving levee safety in a variety of ways. Examples are: **Coastal Louisiana** – it is increasingly apparent that maintaining and restoring coastal wetlands and marshes seaward of urban levees is a key element in protecting urban levee integrity from erosion from storm surge during hurricanes. A national levee safety strategy needs to consider where changing conditions surrounding levees may be reducing their reliability. Similar, but less dramatic, situations exist around a number of the nation's bays and estuaries. In Vermont, the Agency of Natural Resources is developing **fluvial process-based river management standards** to manage erosion rates using increased understanding of natural stream processes. Such standards could assist in developing future national levee reconstruction standards to reduce costs of maintenance and rehabilitation from erosion impacts. More research is also needed to help States and communities decide where and under what conditions **levee setback strategies** should be employed, particularly after disasters or when levee failures occur, to improve public safety, environmental conditions and, in some cases, create public recreational and other amenities. After the 1993 Mississippi River Floods, **a combination of federal authorities was used to buyout a number of frequently flooded agricultural levee districts where levee systems were removed and lands restored to wetlands, reforested bottomlands and to provide natural floodplain functions**. Just as studies have been conducted regarding NFIP repetitive loss properties, it may useful to evaluate **"repetitive loss levees"** to help identify where cost-effective mitigation efforts might be focused.

Do you have any substantial improvements or considerations for the Committee on the components of a National Levee Safety Program?

Two comments. **First, a much greater and more explicit environmental focus regarding levees and levee systems is needed.** The Federation urges the NLS Committee to view and discuss the safety of the stock of levees from a broader perspective than we are seeing in the December 12th draft. **The draft's only discussion of environmental factors at this point is potential changes in procedures to approach and streamline environmental permitting and levee maintenance. This is a woefully narrow viewpoint.** It fails to recognize a much larger set of environmental problems associated with levees (in fact, a major reason that permitting has become so complicated and at times contentious). That is how the extensive past use of levees, dams, drainage of wetlands, channelizations, and other structural manipulations in a large number of watersheds has so altered and degraded the healthy functioning of aquatic-based ecosystems that we are now seeing large-scale ecosystem deterioration and failures, increasing numbers of species sinking into threatened and endangered status and a growing

need for large-scale and costly ecosystem restoration projects. The environmental damage has been so great that these projects are now identified as among the leading reasons why North America's freshwater species are disappearing at rates five times faster than land based species, and as quickly as rainforest species.[1] Again, we can often trace many of the basic causes of these ecological failures to the development of the levees in the first place. Besides the safety related aspects, a National Levee Safety Program has to incorporate procedures for evaluation of a) the continuing need for, b) future prospects for, and c) the environmental as well as economic costs and benefits associated with each levee and each levee system that must be reviewed and evaluated, and what other alternatives may be available and achievable if the existing levee cannot meet the safety and environmental performance requirements that should be expected.

Second, and this is something of a corollary to the above, a new National Levee Safety Program must be designed to assist residents, levee owners, local and state governments and the federal government to consider levees *within their geographic context*, not simply as structures existing apart from their surroundings. The common joke is that there are two kinds of levees, those that have failed and those that are going to fail. By their nature, levees are virtually always in the process of deteriorating and degrading. If a large number of levees in the long run are indeed likely to fail, and if, at the same time they are likely to continue to require substantial reinvestment even just to extend their original expected capability, then developing and extending public awareness of the myriad of factors, equities and responsibilities which accompany the occupation and use of natural floodplains must be at the heart of the Levee Safety Program. Also at the heart of the program must be strategies to halt and reverse increases in risks associated with existing levees. In a number of instances, simply making levees "safer" may not be enough to avoid large-scale catastrophic losses or tragic failures that result in deaths. Long-term costs and benefits to society of the use of levees must be carefully evaluated case-by-case to determine the best investments that should be made going forward to protect public safety and the environment. There is a cascade of new information regarding likely future impacts of climate change and sea-level rise, for instance, which must be fully incorporated in levee and floodplain-related planning and decisionmaking.[2] The Federation believes the Draft fails to adequately capture these broader viewpoints and thus far focuses too exclusively on the physical structures themselves.

Common Set of Standards

Do you have any substantial improvements or considerations regarding the common set of standards?

The Federation agrees with the idea that, overall, a Hazard Potential classification system should be relatively simple to be useful and understandable by the public. A three level

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[1] Ricciardi, Anthony and Rasmussen, Joseph B., "Extinction Rates of North American Freshwater Fauna"; *Conservation Biology*; 13 (5), October 1999, at 1220.

[2] National Wildlife Federation, "Heavy Rainfall and Increased Flooding Risk: Global Warming's Wake-up Call for the Central United States", 2008. see also National Wildlife Federation, Increasing Vulnerability to Hurricanes: Global Warming's Wake-up Call for the U.S. Gulf and Atlantic Coasts, 2008, summarizing recent science reports of IPCC, CCSP and others re increasing flooding risk from climate change factors.

system may make sense. At the same time, we are troubled to consider flooding of up to a thousand people as a 'Low Hazard Potential' situation, even if only at less than three feet.

Other considerations in establishing a classification system should include the extent and likelihood that critical life-safety infrastructure would be impacted (this is noted on page 14), whether other critical facilities would be impacted (such as schools, public buildings, utilities, critical transportation arteries), situations where evacuations are difficult, where economically critical impacts would be felt (e.g. major employment disruptions), whether the flooding might involve flowing water (instead of primarily stationary -- e.g. flashfloods or high levees or canal structures, which also might complicate rescue efforts), where flooding could occur under cold conditions with elevated human exposure and hypothermia risk, or where considerable time might elapse before a flood would subside (through pumping or runoff).

The Federation supports the idea in assembling data for the national levee and canal inventory database ("NLD") to collect data on past performance of levees and canal structures, the historic consequences of failures and records and costs of flood fighting, repairs and rehabilitations. It is possible that a Levee Hazard Potential classification could take into account some elements of a levee's past history or predictable trends, as well (e.g. history of multiple failures, chronic seepage problems, dangerous river bends or known weak points, known likelihood of imminent or future land use changes and urbanization, etc.).

The Federation does not support the idea of establishing national "tolerable risk guidelines." At this stage most of the nation's flood-related programs have the effect of shifting the burden of risk from those who take the risks to those who are not taking the risk. Even the NFIP includes significant subsidies and cross-subsidies that have this same effect. This shifting of the burdens of risk has had the further effect of encouraging more and more people to enter into risky situations, such as building in floodplains with minimum or no mitigation and relying on flood control structures to "protect" them. While a vigorous discussion of such risks is both long overdue and absolutely necessary, the focus needs to be on adjusting our national flood damage reduction, floodplain management, disaster assistance, hazard mitigation, levee repair and natural resources management programs to better control the risk and to direct the responsibilities for and costs associated with the risks towards those that are benefiting from taking the risks. Unless and until we make the significant set of adjustments that are needed in the present system, it is entirely premature to attempt to identify a justification scheme for "tolerable risks." We urge that this recommendation be excluded from the Committee's final report.

Communicating Risk

What would best inform our discussion about how to change behavior regarding residual risk?

As discussed in the previous answer, the best way to change behaviors is to make sure the responsibilities and costs of locating development in floodplains are clearly placed on those who benefit from locating there. While it is important to develop more and better tools to help people understand the risks and to make wise and informed decisions (including much more informative and accessible flood hazard maps; mandatory, risk-based, actuarially-sound flood insurance requirements for residual risk areas; stronger land-use and building controls

standards that people can understand; levee hazard potential classifications; targeted public education; etc.), it is every bit as important to place the responsibilities in all the related programs where they properly set the incentives and disincentives that encourage the most responsible behaviors.

Do you have any substantial improvements or considerations regarding the communications and outreach program for governments and affected communities?

Generally, see our answer above. We urge the Committee to emphasize the importance of an active and accelerated effort to develop the national levee inventory and an accelerated and expanded national flood hazard map modernization effort that includes the mapping of residual risk areas below dams and behind levees and canals (as well as other flood risk areas). These are foundational tools for insurance, flood hazard mitigation and informing the public regarding flood and levee-related risks. While we believe the Committee fully recognizes these programs' importance, it is critical for the Report that everyone recognize that these tools still have far to go before they can realize their huge potential to help the public.

Governance Model

Would creating an independent commission have advantages over embedding a National Levee Safety Program in an existing federal agency?

This will be an important and possibly complicated decision for Congress and the Administration to make. The Federation can see good reasons to propose a governance body with a broader perspective. A disadvantage of locating the National Levee Safety Program in a single federal agency clearly would be that there are a substantial number of other federal agencies that have important stakes in the Program and there would be inevitable difficulties of bringing the broader focus and perspectives to bear from a single agency.

As expressed in our previous answers to the Committee's questions, the view of the National Wildlife Federation is that the perspective of the National Levee Safety Program reflected in the 12-12 Draft must be substantially broadened beyond a focus primarily on safety of structures to include floodplain management considerations, land use and building controls affecting future risks, disaster assistance and post-disaster recovery policies, considerations of climate change and future conditions, and protection and restoration of the environment.

We urge the Committee, in addition, to consider an option, mentioned in the December 12th Review Team workshop, that in the event the Administration or Congress should seek to fund and reactivate the U.S. Water Resources Council, this would be an appropriate body to help coordinate and manage development of the National Levee Safety Program. Each of the key agencies and Departments with programs bearing on levee-related issues has membership in the Council. In addition, numerous public and professional reports have recommended its revival. Such a body would have the stature and capability to bring numerous elements together to address complicated levee safety issues, along with broader policy concerns such as floodplain management, coastal policies, science and research needs, climate change and sea-level rise considerations, hazard mitigation,

infrastructure policies, disaster assistance and environmental protection and restoration.

What are the benefits of combining a National Levee Safety Program with a dam safety program under a single governance structure? If it is beneficial, why?

While these two programs need to be coordinated, the Federation views the tasks associated with levees as considerably broader and therefore believes it would appear to complicate, rather than simplify the tasks to place them within the same structure.

Are there other programmatic structures or ideas to consider?

Do you have any substantial improvements or considerations regarding the governance model?

Liability

Do you have any substantial improvements or considerations regarding the Committee's recommendations on liability protections?

The Federation would not support waivers of liability or granting immunity from liability for levees. We do not believe waiving potential liabilities is the way to "incentivize" wise, safe and prudent behavior. We would support the concept of establishment of Standards of Care for engineering services by professionals and changing nomenclature in the NFIP from "certification" to "compliance determination" for levees. These could potentially improve overall performance and increase public awareness of risks and responsibilities.

Levee Rehabilitation Act

Do you have any substantial improvements or considerations regarding the Committee's recommendations on establishing a National Rehabilitation, Improvement and Flood Mitigation Act?

The Federation does not support this recommendation. As our comments indicate above, the Federation believes the Committee's proposal, thus far, is too narrowly scoped and fails to address hazard mitigation and risk reduction, land use issues, floodplain management more broadly, incorporation of climate change and sea-level rise factors, increased need for environmental protection and ecosystem restoration, and other key factors. We are concerned with the notion of generically authorizing potentially enormously costly measures that could ultimately run into the hundreds of billions of dollars with an assumed 65 percent federal cost-share. Much more consideration must be given as to defining and evaluating the problems involved before deciding the responsibilities in this manner.

Strategic Implementation Timeline

Do you have any substantial improvements or considerations regarding the Committee's strategic implementation timeline?

As we stated elsewhere in these comments, we urge that the Committee seek additional time to address the broader set of issues that we have described in these comments and to be in

a position to make recommendations to Congress and the new Administration that can further refine options and approaches to address these issues. The Federation looks forward to continuing to work with the Committee on these matters in the future.

Attachment 2 NWF
Testimony 5-18-09

FOURTH NATIONAL WATER POLICY DIALOGUE

In September 2008 the American Water Resources Association (AWRA), the Environment and Water Resources Institute of the American Society of Civil Engineers (EWRI/ASCE), and the National Wildlife Federation (NWF) brought together water resource experts from the public and private sector, congressional staff, and federal agencies to review the results of three National Water Policy Dialogues conducted by AWRA in 2002, 2005, and 2007 at the request of 10 federal water resource agencies. The purpose of the September Dialogue was to identify the challenges that would be faced by the incoming Administration and the 111th Congress when they took office in 2009.

Attached for your information are the summary of the September Water Policy Dialogue and a copy of the letter sent to the President, all governors, and key leaders in Congress following the 2007 National Water Policy Dialogue.

If you have questions concerning the September dialogue or the previous dialogues, please feel free to contact Dr. Gerry Galloway (gegallo@umd.edu , 571-334-2103): Mr. Richard Engberg (dick@awra.or, (540) 687-8390); Mr. Brian Parsons (BParsons@ASCE.org, (703)-295-6071); or Mr. David Conrad (conrad@nwf.org ; (202) 797-6697).

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Summary

Fourth National Water Resources Policy Dialogue

September, 2008
Washington, DC

The United States faces severe water resource challenges today and in the decades ahead. The Nation must deal with significant drought, floods, growing threats to its water quality, continuing loss of wetlands and the impact of these losses on the natural and beneficial functions of floodplains and estuaries, and a water resources infrastructure that is aging, in need of revitalization and whose collapse would threaten our economic vitality. The potential impacts of climate change that could increase the intensity of floods, severity of droughts and change or weaken the health and stability of many ecosystems only adds to the challenge. These challenges were highlighted in the reports of three earlier water resource policy dialogues sponsored by the American Water Resources Association at the request of federal water agencies.

On September 22, 2008, 56 US water experts met in the Rayburn House Office Building in Washington, DC to discuss what actions should be taken by the new Administration and the Congress when they take office in 2009 and are forced to face these water challenges. The participants in this dialogue, building on the work of the earlier dialogues, concluded that:

- There is an immediate need for an assessment of the Nation's water resources to include the current status of the resource, the future needs for water and identification of gaps that exist in fulfilling these needs.

- The federal government, in cooperation with state and local agencies, needs to develop a national vision and overarching principles to guide water resources development activities supported by the federal government.

- There is increasing need for mechanisms that will better coordinate the water related activities of federal agencies and among congressional committees. The absence of effective coordination is apparent in the conflicts and overlaps that exist in legislation, programs, and agency activities.

- The relationship among the federal government, states and local communities is changing and must be addressed. The federal government's role in water resources, long seen to be a driving force, must be reevaluated in light of growing state attention and direction of water resource activities.

- Federal actions with regard to water resources must be taken in a watershed context where the underlying planning is conducted in partnership with the states and local entities.

These conclusions are discussed in greater detail in subsequent paragraphs.

The fourth dialogue was sponsored by the AWRA, the Environment and Water Resources Institute of the American Society of Civil Engineers, and the National Wildlife Federation. It built on the results of the three previous dialogues held in Washington DC in 2002, Tucson, AZ in 2005, and Arlington, VA in 2007. The participants in the fourth dialogue represented congressional staffs, federal agencies, and various government and nongovernmental organizations from across the country. The earlier dialogues identified the need for development of a national [not federal] water vision; formulation of policy principles for translating the vision into action; establishment of a mechanism to ensure appropriate coordination and cooperation among federal agencies and with other levels of government; creation of watershed organizations with the involvement and support of federal water agencies; use of incentives to encourage local watershed organization's grass-root involvement in water issue solutions; reconciliation of a myriad of laws, executive orders and Congressional guidance that have created a disjointed, ad-hoc and too often contradictory national water policy; and utilizing the Nation's superb scientific capabilities and cutting edge information technologies to support water-related decision making. In a letter to the President, Congressional leaders, and governors, the co-chairs of the third policy dialogue indicated that, "Stewardship of the Nation's water resources is being neglected and the manner in which we deal with water issues is dysfunctional."

The call for a national assessment stems from concern over the piecemeal approach being taken in examining current water vulnerabilities. Water quality and water quantity are sometimes examined together, but more often are reviewed within the context of a single focus program. We continue to witness the decline in the health and function of many important aquatic ecosystems, both biologically and physically, from a variety of stressors that many scientists say are likely to be further degraded and impacted from the effects of climate changes. Decisions on how to deal with flooding are made in the context of information that does not link actions taken in the floodplain to those in the upland areas generating the floods. The establishment of the National Drought Information System deals with the shortage of water but fails to link it with other aspects of water use and water quality. The last comprehensive assessment that looked across the varying uses of water was accomplished in 1975 by the U.S. Water Resources Council. It developed a comprehensive nationally consistent data base for the 21 water resources regions of the United States. Many would argue that the degree of planning and coordination at the Federal and state level in that and an earlier assessment along with water quantity development for future needs and a concurrent shift to a regulatory paradigm for water quality served the Nation well for many years. However, since 1975, the water picture has changed considerably and both demand and availability have changed in magnitude and in geographic location. Increasing populations, growing urbanization, changing climate and sea level rise, and demographic trends that are increasingly concentrating growth in areas that are further straining water resource health and capacities are presenting critical new challenges that must be addressed in a holistic fashion. In addition, water quality needs have often become more site or condition specific and exhibit more complex linkages to other water resources needs than can be addressed easily or cost effectively by a regulatory approach alone. Conduct of a fixed-term national water assessment would provide the information needed by leaders at all levels to carry out critical water activities.

This assessment of the Nation's water status is needed immediately. It must include the current status of the resource, the contemporary and likely future trends, needs and directions for water management and identification of gaps that exist in fulfilling these needs in a sustainable manner. Such an assessment should deal with not only water quantity and quality but also with use of water for

transportation, recreation, and energy as well as the impacts of water through floods and other weather events.

Actions taken at the federal level in water resources are inconsistent and are guided by ad hoc approaches to water resources needs and long-term challenges. A national vision and overarching principles to guide water resources development activities supported by the federal government are needed. For example, there are no national guidelines regarding the level of support for flood risk reduction that may be practicable within a 21st-century context. Each project is treated on its own without reference to any systems context or its impact on other water sectors. Actions within the agricultural sector that impact water quality are ignored in the development of agricultural support policies. Programs are supported on a sector basis rather than within a watershed context and do not recognize the geographic differences that exist across the Nation. The federal and state governments, working together, should develop principles that would guide both actions within the federal government and the state governments with respect to water resources development and regulation.

Since the shutdown of the federal Water Resources Council in 1983, there is no central water coordinating body at the federal level, and overlaps, inefficiencies and conflicts among federal agencies and their programs have grown. Continuing congressional actions taken within the context of committee jurisdictions have also limited the coordination among major federal water programs and their execution. State and local governments find this lack of coordination a roadblock to successful comprehensive planning and action on critical water resource issues. Reports to the Federal Government by independent bodies continue to point out the need for strong leadership within the executive branch and a new, coordinated approach within the congressional committee system that would provide for needed coordination of actions.

The roles of federal, state, and local governments with respect to water resources is in evolution. While there will always be a need for federally derived standards and federal funding of certain programs, the initiative to address emerging water issues is shifting to the state and regional level. For example, the Texas Water Plan represents a bottoms-up approach to dealing with the myriad water issues faced by that state. California's recent passage of a $5 billion bond issue to support levee repairs, in the absence of federal support, highlights the trend towards state impatience with a lack of consistency and action in federal programs. Federal agencies and the Congress, in close cooperation with the states, need to look at the impact of this trend on current and future water programs.

Lastly, the dialogue found that more attention must be paid to supporting water resource actions in a watershed context where cross-sector needs can be evaluated and plans developed to address issues in a comprehensive manner rather than on a stove pipe basis. The effective work of the Delaware River Basin Commission in bringing together the actions of its constituent states to concurrently deal with the contrasting needs for flood risk reduction and water storage, represent a step forward in cooperative watershed planning. In dealing with watershed activities, the federal government should serve as a facilitator or partner rather than the leader so that the unique differences such as the geographic heterogeneity of this Nation and the diverse social, economic, and cultural needs of its citizens can be properly addressed.

For further information, contact Dr Gerald Galloway, University of Maryland (gegallo@umd.edu), Co-chair, National Water Policy Dialogues, or Richard Engberg (dick@awra.org), Technical Director, American Water Resources Association.