

Flood Damage Mitigation Since the Great Midwest Flood of 1993: Issue Introduction

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It has been slightly more than ten years since the U.S. Interagency Task Force on Floodplain Management's report, *Sharing the Challenge: Floodplain Management into the 21st Century* was published. This report, more commonly known as the "Galloway Report," was commissioned to determine the major causes of the Great Midwestern Flood of 1993 and to make recommendations for policy and programmatic improvements to "achieve risk reduction, economic efficiency, and environmental enhancement in the floodplain and related watersheds" (Glauthier, et al. 1994). The interagency committee assembled by General Gerald Galloway (at that time the Dean of Students at the U.S. Military Academy, West Point) extensively studied the flood, its impact, and the institutional apparatuses in place for anticipating, managing, and responding to the flood. The committee presented a series of sweeping recommendations for improving the nation's approach to floodplain management – proposing in the Committee's words:

A better way to manage floodplains [that] begins by establishing that all levels of government, all businesses and all citizens have a stake in properly managing the floodplain. All of those who support risky behavior, either directly or indirectly, must share in floodplain management and the costs of reducing that risk... The Review Committee supports a floodplain management strategy of sequentially, avoiding inappropriate use of the floodplain, minimizing vulnerability to damage through both structural and nonstructural means, and mitigating flood damages when they do occur... By controlling runoff, managing

ecosystems for all their benefits, planning the use of the land and identifying those areas at risk many hazards can be avoided. Where the risk cannot be avoided, damage minimization approaches, such as elevation and relocation of buildings or construction of reservoirs for flood protection structures, are used only when they can be integrated into a systems approach to flood damage reduction in the basin. When floods occur, impacts on individuals and communities can be mitigated with a flood insurance program that is funded by those who are protected. Full disaster support for those in the floodplain is contingent on their participation in these self-help mitigation programs... The Review Committee proposes legislation to develop and fund a national Floodplain Management Program... It also proposes revitalization of the federal Water Resources Council to better coordinate federal activities, limited restoration of some basin commissions for basin-wide planning, and issuance of a Presidential Executive Order requiring federal agencies to follow floodplain management principles in the execution of their programs (Interagency Floodplain Management Review Committee 1994).

What has happened in the intervening decade? How has the nation responded to the bold blueprint for change laid out in the Galloway report? These were the basic questions that generated this issue of the *Journal of Contemporary Water Research & Education*. The editors have assembled a number of papers that approach these questions from a variety of perspectives. Gerry Galloway, now

retired from the Army, but still much involved with water resources, notes in his reflections on the ten years that changes achieved have been more evolutionary than revolutionary. Broad national legislation for a national floodplain management policy and National Floodplain Management Act as proposed by the Review Committee has not come about. However, agencies that have the responsibility for flood damage reduction planning and mitigation have modified their programs in the direction of the balanced approach to floodplain management advocated in the Galloway report.

The Corps of Engineers' national responsibilities in flood damage reduction date from the 1936 Flood Control Act – itself the product of devastating floods in the Mississippi Basin and the northeastern United States. Corps specialists author four of the papers in this issue. Two papers focus on the estimation of flood damages. Jim Comiskey focuses on the estimates of flood damages prevented by Corps structural flood damage prevention measures – dams and reservoirs, levees, floodwalls – that are widely quoted in post-flood assessments. His paper provides a description of the procedures used to develop the estimates, notes issues in the calculation of damage estimates assisting interpretation, and offers ideas on how this important estimation procedure could be improved.

Lauren Cartwright, formerly with the Corps and now with the Natural Resources Conservation Service, points out that gaining a better understanding of flood damage trends is a basic building block in developing improved policy responses to flooding. Yet surprisingly, Cartwright points out that there is still much we do not know about flood damages. In particular, lack of standardization of flood damage categories complicates the effort to reach clear conclusions about flood damage trends. Cartwright calls for improvements in flood damage data collection standards and categories.

While the Corps of Engineers has most often been associated with structural flood damage prevention measures, Larry Buss points out that the Corps has long been active in non-structural flood damage prevention as well. In the period since the 1993 flood, non-structural measures have been used routinely to address flood problems. Buss highlights four projects that illustrate the balanced approach to flood damage reduction practiced by the Corps today. As Buss points out, this balanced approach

considers both structural and non-structural measures equally and approaches problem solving from a perspective that emphasizes the concepts of sustainability and ecosystem restoration.

Underscoring Gerry Galloway's conclusions that the greatest movement toward the the Review Committee's recommendations is being made by agencies as they carry out their authorized responsibilities, Rich Astrack, the project manager for the Upper Mississippi River Basin Comprehensive Study, indicates that the most noteworthy aspect of this study is that Congress, in its authorization for the study, stipulated that the plan developed for flood damage reduction in the basin should achieve systemic flood damage reduction through an integrated approach of structural and non-structural means.

Norbert Schwartz describes the Federal Emergency Management Agency's (FEMA) efforts in the ten years since the Galloway report. FEMA has launched new programs and initiatives to reduce flood impacts through prevention, pre- and post-disaster planning and mitigation, and improvements in floodplain maps. Additionally, FEMA is actively working in partnership with other agencies and citizens to promote these programs.

Dennis Knobloch, former mayor of Valmeyer, Illinois, presents a case study of the relocation of the town as a result of the 1993 flood. His instructive paper calls attention to the maze of sometimes conflicting federal and state requirements that must be negotiated and that the Galloway report noted needed to be better coordinated and integrated. Mayor Knobloch also calls attention to the importance of citizen involvement in creating a workable plan for relocation.

Robert Yowell makes similar points in his paper about a successful flood damage reduction project on the Susquehanna River. Yowell's paper underscores the potential for success when there is a cooperative effort in putting a mitigation plan together and seeing it through to implementation. The success of the Lock Haven project was evident in the enormous damage reduction from the remnants of Hurricane Ivan.

In discussing floods and flood damage prevention, it is important not to lose sight of the personal dimensions of flooding. Graham Tobin's paper shows that the personal stresses following a flood event produce symptoms similar to those of post-traumatic

stress syndrome. Since stress symptoms seem to correlate with socio-economic status, sex, as well as situation variables, intervention strategies need to be tailored rather than be “one-size fits all.”

Marshall Frech’s article calls attention to the uses of public education efforts to affect public behavior and response to flood risk. Public education strategies represent an underutilized and inexpensive non-structural flood damage reduction measure. Frech illustrates how flood hazards are commonly misunderstood and underestimated, and how education can be important in making wiser development decisions and taking action at the time of flooding.

These papers illustrate Gerry Galloway’s conclusion that progress in achieving the more balanced, integrated approach to floodplain management called for in the 1994 Review Committee report has been evolutionary. There have been solid achievements to be sure, but few home runs. Stanley Changnon also makes this point in his thoughtful commentary on post-flood issues. In Professor Changnon’s view, the presence of conflicting goals and objectives among the multiple stakeholders affected by floodplain management policies prevents the type of consensus needed for broad policy changes. Instead, what might be termed a process of “muddling through” has been achieved:

In the ten years since the flood of 1993, some of the lessons have been learned and policies changed. Changes were made in 1994 to the National Flood Insurance Program Act and the Federal Crop Insurance Program, both leading to increased sales and better coverage, and less reliance on relief payments. Considerable funding has been spent on restoring damaged levees, but little devoted to comprehensive floodplain management practices that had been recommended. The federal program involving buyouts of flooded properties has been successfully employed in over 160 projects. Needed equipment for better flood monitoring has been installed and flood prediction models improved (Changnon 2005).

It has become clear over the years that Americans respond most often to threats of natural disaster only after a crisis. The 1936 Flood Control Act authorized a nationwide federal program following major floods that got the nation’s attention. Since then, Army Corps of Engineer flood damage reduction projects

and FEMA Hazard Mitigation Grants have been sparked by the occurrence of more flood disasters. *Sharing the Challenge* gave some deliberate assessment of how many years America had to face the challenge of continuing a serious flood risk. As General Galloway pointed out in the report, some of the most serious flood disasters in U.S. history—such as the Red River flooding Grand Forks, North Dakota and Tropical Storm Allison in Houston, Texas—have occurred since the 1993 flood. A deluge of Hurricanes in 2004 brought about a considerable amount of coastal and inland flooding. These events are a powerful reminder of the need to face the challenges discussed in the 1994 report.

The title of the Galloway report highlighted the need for a “shared,” coordinated effort to address the nation’s flooding problem. As this issue includes perspectives from people working at local, state, federal, academic, and non-governmental organizations perspectives, there is a need to work together in the future to address the flooding challenge. In 1966, President Johnson’s Task Force on Federal Flood Control Policy issued the report, *A Unified National Program for Managing Flood Losses*. While that report caught the nation’s attention and led to the creation of the National Flood Insurance Program, there is still no unified effort to address the nation’s flood problems.

The 9/11 Commission Report gave an extreme example of the failure from lack of programmatic coordination. Failure to share information, program objectives, and coordinate activities can also be costly in responding to the threat of flooding and other natural disasters. Mechanisms for achieving that coordination need to be pursued. A logical place to begin would be at the watershed level, where the full effects of actions to mitigate flood damages can be balanced with economic development and environmental sustainability. Institutional mechanisms for cooperation need to be explored along with ways of promoting a new culture of cooperation.

Sharing the Challenge offered many recommendations, too many to be adequately discussed in this issue. Since 1994, there have been increasing challenges from decaying locally and privately-maintained flood protection infrastructure, the increasing level of coastal storm damage and flooding, and development that continues in the floodplain just outside the one-percent flood risk zone.

This would be an excellent time to convene a forum to assess the progress of implementing the recommendations of the Galloway Commission.

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References

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As the floods recede and the damages can be more accurately assessed, the ultimate cost could be much higher. The scope of the flooding in the Midwest has reopened the discussion concerning the difficult policy issues of the role of the Federal Government in providing flood control and in the area of Federal, State, and local management of floodplains generally. Thousands of Americans had their lives changed forever by the great flood of 1993. Today's hearing will look at the role Federal programs and policies played in mitigating and in some cases contributing to the damages caused by the rising waters of the Mississippi. What flood mitigation measures must absolutely be taken before next spring? The paper summarizes the flood experience and provides lessons in five categories: urban drainage and flood control, risk management, mitigation, flood response, and public involvement. Read more.

Article. The purpose of flood control is to eliminate or reduce damage caused by the flooding of areas adjacent to rivers, or by the overtopping of engineering structures like dams, embankments or bridges. [Show full abstract] Flood control may be accomplished by means of the following general types of hydraulic structures: 1. Reservoirs where part of the flood waters can be temporarily retained to help reduce the flood peak, and the passage of water masses is stretched over a longer period of time at a reduced flow rate; or 2. Levees built along rivers to protect. The Great Flood of 1993 (or Great Mississippi and Missouri Rivers Flood of 1993) was a flood that occurred in the Midwestern United States, along the Mississippi and Missouri rivers and their tributaries, from April to October 1993. The flood was among the most costly and devastating to ever occur in the United States, with \$15 billion in damages (approx. Over 1,000 flood warnings and statements, five times the normal, were issued to notify the public and need-to-know officials of river levels. In such places as St. Louis, river levels were nearly 20 feet (6 m) above flood stage, the highest ever recorded there in 228 years.[5] The 52-foot (16 m)-high St. Louis Floodwall, built to handle the volume of the 1844 flood, was able to keep the 1993 flood out with just over two feet (0.6 m) to spare.[6].