

W A T E R R E S O U R C E S

IMPACT

January 2014 | Volume 16 | Number 1

**AWRA AT 50:
THE FUTURE OF
WATER RESOURCES IN
THE UNITED STATES**



50th Anniversary
AWRA

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Community, Conversation, Connections

AMERICAN WATER RESOURCES ASSOCIATION

maintain this strong foundation, while keeping up with a changing climate.

CONCLUSION

There's an entire body of law that may soon feel the effects of climate change, because it is so strongly dependent on and defined by hydrologic conditions. These hydrologic conditions are changing and will continue to change, requiring the law to keep pace.

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WATER RESOURCES IMPACT

CAN WE KEEP THE PUBLIC SAFE FROM FLOODS?

Don T. Riley

Flood plains have always been good places to live and work. Our earliest natives and settlers commonly used the rivers for water and food supply, arable land, and water-borne transportation, and as well established their villages and towns at the most advantageous locations, which were often at the confluence of two rivers. Notwithstanding the aesthetic advantages of rivers, this trend continues today.

Many citizens across the United States have experienced flooding of their properties. Moreover, there are progressively greater protective structures, monetary losses due to flood damages are increasing, most likely due to increased population working and living in the floodplains in addition to upstream development that increases runoff. We read of increasing number of floods but isn't that notion mostly due to increased use of flood-prone areas? Remember the age-old question, "If a tree falls in the forest and no one hears it, does it make noise?" Similarly, if high water occurs in unoccupied lowland, is it a flood?

It is much too late in our nation's growth to empty all floodplains of our infrastructure. But many citizens, if not most, look to their governments (Federal, state, and local) to protect their homes and businesses from floods. Can governments do that? Other than building higher and more resilient structures and relocating relatively small numbers of people from the most at-risk flood zones, how do we ensure the safety of the public? The future of floodplain management is changing.

FLOOD PLAINS ARE NOT ALL THE SAME

Like the variable and uncertain climate, geography varies and changes over time as well. Some flood zones are very wide (the Mississippi flood of 1927 was more than 100 miles wide at one point) and some are very nar-

row (the narrow canyons in the recent Colorado floods for example). Additionally, most of the time officials can provide days or possibly weeks of warning for major flood plains but only minutes in the case of flash flood-prone canyons. Some floods may be largely confined and involve only local authorities. When, however, we experience floods from the likes of the Ohio, Missouri, and Mississippi Rivers the effects are multistate and immediately become national problems. Furthermore, considering some forecasts of changing climate with varying rainfall patterns and amounts potentially increasing, our future national policy must include approaches to adapt.

Because of this diversity, governments have chosen, for varied reasons, to address flooding challenge differently, depending on the area. For instance, subsequent to the massive 12-state Mississippi River flood of 1927 Congress recognized a national role in combating floods. It also recognized the significance of this particular flood plain because it accommodated activities critical to the national economy, primarily agriculture and aquaculture. Thus, Congress passed the Flood Control Act of 1928 that essentially established a unique, "never again" standard for flood protection for the lower Mississippi valley. In other regions of the country, however, efforts to address flooding are varied with diverse sets of measures to limit flood damages.

REDUCING RISKS

In New Orleans after the terrible devastation of Hurricane Katrina, while I was commanding the Army Corps of Engineers' (Corps) emergency operations, I was told that some of our people in the Corps heard from citizens, "You told us we were protected." I did not doubt that report but it did give me pause to ask, can the Federal government "protect" its citizens from floods, especially in a

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city so vulnerable to storms and flooding? As partners with FEMA on the Interagency Flood Risk Management Committee (IFRMC) we deliberated this very thought. Not wanting any more American citizens to experience the destruction we personally witnessed in New Orleans, we needed to develop a flood policy to take us in to the future.

Our citizens clearly depend heavily on government action. In many cases, the Federal government funds flood infrastructure (although funding for this is always problematic) as well as provides lower cost flood insurance. State governments establish building codes for structures at risk of flooding. Local governments develop zoning restrictions that impact what can be built in flood-prone areas and can provide for evacuation. In addition to governments, though, industry acts to protect and insure their infrastructure as well as their workers; and finally, individual citizens take steps to protect their lives and property and reduce their own risks.

The distinct conclusion of the IFRMC was that governments should be in the business of assuring the safety of their citizens by helping them reduce the risk of floods, not promising to protect them from all flood damages. Notwithstanding the substantial infrastructure along the nationally significant lower Mississippi River Valley (that proved to work most successfully during the great flood of 2011 in which more water than ever flowed down the Mississippi), full "protection" is an unrealistic standard for governments to strive for. Through concerted and coordinated action governments, affected businesses and people can markedly reduce the risk of flooding, greatly decrease the potential for flood damages, and assure no loss of life. In the end, though, there will always be a residual risk that everyone must remain alert to and prepare to respond to. The IFRMC developed this simple schematic below to help us describe the policy:

SHARED RESPONSIBILITY

Government action can certainly control floodwaters to a certain point. But fully securing the safety of the public can only happen if everyone involved in managing floods, especially the individuals who live and work in the flood plains, contribute to reducing risk. Governments can only do so much; and it must be a shared responsibility.

The key to successful flood risk reduction in the future is public awareness. The Corps, FEMA, NOAA, and others have developed sophisticated models that can help estimate flood risk. Following Hurricane Katrina, the Independent Performance Evaluation Task Force (IPET) established by the Secretary of the Army collected an enormous amount of data, built and ran storm and flood models, developed maps to convey the risk, and helped the Corps and FEMA inform the public as to their flood risk then and in the future as the infrastructure was improved over time. But New Orleans is the only city that has had this complex, state-of-the-art work accomplished; other flood-prone locations are left with less advanced but still beneficial flood forecasting tools.

As we look to the future, in order to assure public safety, citizens and businesses need to know their risks and have plans, tools, and help in place when flooding is forecasted. Local governments should have warning systems sufficient to move allow people to relocate away from the high risk areas. State governments must prepare transportation and housing support plans and the Federal government can help with warnings and reinforce the efforts of states and local governments with response and recovery assistance. In this way, everyone involved contributes to assuring life safety and reducing risk to property.

BOTTOM LINE: PUBLIC SAFETY

The entire intent of this national policy is to protect life and reduce damages due to flooding, both presently and in the future. With all floodplain stakeholders informed and decisively engaged they can contribute in a synergistic fashion to reducing their risk, limiting property loss, and ensuring their personal safety.

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