
Recommendations to Mitigate Future Hurricane and Flood Damage

The damage, flooding, and loss of life associated with Hurricane Floyd was unprecedented in North Carolina history. The state must not forget the lessons of this great storm. While there is much to admire in both the public and private sector response to human need and suffering, it is also apparent that more needs to be done to prepare for the havoc that a storm of such magnitude can wreak. Indeed, it is imperative that North Carolina take every possible step to assure that the state is as prepared as it can be for the next major storm that hits. That's because prevention is much cheaper than recovery from a disaster—and much safer. With the loss of 52 human lives, the destruction of nearly 8,000 homes, damage to more than 67,000 homes, and the emergency appropriation of \$836 million in *state* disaster recovery funds firmly in mind, the Center offers the following *preventive* recommendations.

(1) The North Carolina General Assembly should appropriate funds in the 2002 session to complete remapping of floodplains within all 17 watersheds in the state and beginning in the 2003 session make annual appropriations to keep the maps up to date. North Carolinians deserve to know where their floodplains are so they can make wise decisions on where to build and live. And if anything is clear from Floyd, it's that floodplains change with time. While many citizens who needed flood insurance didn't have it, it's equally clear that many citizens did not even know they needed flood insurance until they woke up to Floyd's floodwaters. Only 13 percent of homeowners in the Floyd-affected counties had flood insurance on their homes. Out-of-date floodplain maps and ignorance of existing maps and flood insurance regulations are partly to blame for this fiasco. The state has already committed \$23 million, which—combined with \$10 million in federal funds—will cover most of the cost of remapping the six eastern river basins

and putting all the information in digital form. Officials in the State Budget Office estimate that remapping the entire state will cost \$65 million to \$70 million, with an additional appropriation of approximately \$25 million needed from the state. This will enable the remapping of 11 remaining watersheds by 2006. These Digital Flood Insurance Rate Maps will enable state and local governments to speedily update maps and put the information on the Internet. North Carolina is already a national leader in the effort to map floodplains more accurately, and the state must complete the task. Once completed, these maps should be updated on a regular basis.

With digital technology currently available, keeping these maps up to date will not be as onerous in the future as it has been in the past. Accurate floodplain maps are the key to wise land use decisions. These maps must be completed and made readily available to government officials and the public through such means as posting on the Internet. Because hydrology changes as areas are developed, the maps should be updated on a regular basis in developing areas.

(2) The state should provide incentives for local governments to adopt zoning regulations and other hazard mitigation plans above and beyond the minimum required by the Federal Emergency Management Agency. Eligibility for FEMA flood insurance is based on local regulations that require elevating structures above the 100-year floodplain—predicated on a 1 percent annual chance of flooding. The state should institute a carrot-and-stick approach to encourage local governments to participate in this program and go beyond minimum requirements. The carrot should be incentives such as awarding priority points to local governments applying for water and sewer funds. The stick should be a similar deduction of points against applications of local governments that do not participate. Many local governments adopt haz-

ard mitigation plans but don't implement them. Any incentive plan that rewards local governments for adopting hazard mitigation plans also must ensure that these plans are implemented. And thanks to the 2001 General Assembly, local governments now have the added incentive of being required to have a hazard mitigation plan approved and be participating in the National Flood Insurance program to receive state assistance for flood damage in a state-declared, Type I disaster.

(3) The state and its partners in local government should adopt a policy of limiting infrastructure development such as bridges, roads, and sewage treatment plants within 100-year floodplains and design any structures within the floodplain to minimize flooding. Pavement hastens the runoff of stormwater and prevents it from being absorbed into the ground. Bridges and highway embankments can act as dams and dikes, keeping water from flowing downstream and into natural floodplains. Sewage treatment plants can be flooded, causing untreated waste to spill into public waters. Indeed, wastewater treatment plants were flooded following Hurricane Floyd, and many new

wastewater treatment plants are being located outside the floodplain. Infrastructure development should be kept out of floodplains whenever possible, and in the few cases where it is not possible, should be designed to minimize flooding by allowing waters to pass through. Land use planning is one tool local governments can use to prevent inappropriate development in floodplains. Guidelines on structures that should not be allowed in floodplains should be included in local hazard mitigation plans and in comprehensive plans that are designed to guide development.

(4) The Governor and the North Carolina General Assembly should provide the necessary funds to buy out agricultural operations, junkyards, and hazardous chemical storage facilities within the 100-year floodplains. The Clean Water Responsibility/Regulate Swine Operations Act of 1997 bans the construction of new hog farms and hazardous waste facilities in the 100-year floodplains, and the Flood Hazard Prevention Act of 2000 bans hazardous waste facilities in 100-year floodplains. Funds must be provided to buy out existing facilities subject to flooding. The N.C.



John Manuel

—Recommendations, continued

Department of Environment and Natural Resources received applications for buyouts from the owners of 80 hog farms but only had enough Clean Water Management Trust Fund dollars to purchase 14 farms. Media images of hog carcasses borne on the floodwaters of Floyd bear witness to the need for removing these kinds of operations from the state's floodplains, but hog farms are not the only agricultural operations that present a floodplain problem. The state may want to consider adding poultry operations and other kinds of farms that present a contamination threat to the buy-out program.

(5) The Hazard Mitigation Section within the N.C. Department of Crime Control and Public Safety should press ahead with efforts to promote the buyout and removal of frequently flooded residences within the 100-year floodplain. Buyout and removal of oft-flooded structures is cheaper than rescue of occupants and repeating repairs to the same buildings. The Governor and the legislature should assure that funds are available to com-

plete this process. Local governments are learning that it is cheaper to remove buildings from floodplains than to repair or replace them after a storm. When Hurricane Fran hit in 1996, the state began to get serious about the buyout and removal of flood-prone structures. Attention to the problem paid off when Hurricane Floyd hit in 1999, with \$9.2 million in potential losses avoided in the towns of Washington, Belhaven, and Kinston when the same areas flooded by Fran were submerged again. Hazard mitigation efforts got even more aggressive after Floyd, with Kinston expanding its program and cities like Greenville getting in on the act, as the state committed \$139 million to supplement FEMA grants to buy out homes located in the 100-year floodplain. To date, 8,000 homes have been declared eligible for buyouts and FEMA has approved the purchase of 4,377 of these structures. As of Nov. 2, 2001, \$7.8 million of the state's \$836 million approved for Hurricane Floyd relief efforts remained unspent or uncommitted. The remaining funds should be spent to buy and remove more homes from the 100-year floodplain. That money alone, however, is unlikely to solve the problem. Currently, the state receives federal buy-out funds only after a major flood in a boom-or-bust cycle. The state may want to establish a recurring source of revenue to fund these operations.

(6) The North Carolina General Assembly should fully fund the N.C. Clean Water Management Trust Fund with the goal of acquiring floodplains for open space and retaining wooded areas along the riverfronts. Land in floodplains is often ideal for wildlife habitat and/or parkland. Preservation as open space will minimize runoff and allow for flooded rivers to expand and slow. The N.C. Clean Water Management Trust Fund (CWMTF) is an appropriate source of funding for these efforts. Established in 1996, the fund distributes money through a competitive grant process and pays for projects to protect and clean up rivers and coastal waters, including land acquisition. CWMTF officials estimate that more than \$10.5 billion is needed to protect and restore surface water quality in North Carolina. The 2000 Gen-

Keeping Natural Hazards From Becoming Disasters

A Basic Workbook
For Local Governments

Prepared by:



For Additional Copies of this Workbook, Contact:
Hazard Mitigation Planning Section
Hazard Mitigation Section
NC Division of Emergency Management
182048 Tillery Road
Raleigh, NC 27604

Phone (919) 715-8000
Fax (919) 715-9163
Web Site: www.ncem.org



Hazard Mitigation Planning Clinic
Department of City & Regional Planning
The University of North Carolina at Chapel Hill
CB #311.40, Hovell Hall
Chapel Hill, NC 27599-3140

eral Assembly committed to increase appropriations to the Clean Water Management Trust Fund to \$40 million in fiscal year 2001-02, \$70 million in 2002-2003, and \$100 million in fiscal year 2003-04 and future fiscal years. The General Assembly's 2001 budget appropriates the necessary funds to meet this commitment through 2002-03. The legislature should continue this commitment in 2003-04 and beyond.

(7) The N.C. Division of Emergency Management should increase efforts to provide swiftwater rescue training and equipment for appropriate state and local officials. Hurricane Floyd provided difficult challenges for state emergency management officials and also highlighted the need for greater preparation among local fire and rescue departments to safely retrieve stranded residents threatened by rising floodwaters. In addition, there is a need to train and equip state-level law enforcement officials and other personnel who could be deployed in the event of another life-threatening emergency of the magnitude of Hurricane Floyd. Given the tragic loss of 52 lives in the flooding that followed Floyd, and the prospect of more catastrophic flooding in the future, the state must provide adequate equipment and training for state and local rescue workers.

(8) The Governor should establish a task force to develop a policy on when it is appropriate for the state to reimburse nonprofit relief programs for materials used in repairing homes and providing services. The nonprofit N.C. Interfaith Disaster Response should be part of this task force. Nonprofit organizations played a critical role in helping flood victims, especially through their volunteer-led housing repair and reconstruction programs. Where those programs repair housing that would ordinarily be eligible for state or federal funding, the nonprofits should be reimbursed for material costs. There was some confusion as to whether nonprofits would be reimbursed for certain supplies and materials following Hurricane Floyd. Yet nonprofits can mobilize forces to begin recovery efforts much faster than can government working alone. In the future, nonprofits

addressing disaster-related projects that otherwise would be eligible for state or federal grants should not be confronted with confusion. The governor should appoint a task force on this topic with instructions that it report to him with recommendations on appropriate policy by July 1, 2002.

(9) The North Carolina General Assembly should follow Florida's example and create an Emergency Management Trust Fund to pay for hazard mitigation. By virtue of its location on the Atlantic seaboard and a predicted cycle of increasing hurricanes, North Carolina, like Florida, is likely to be hit by devastating hurricanes on a regular basis. Florida has set an example in planning for future disasters by providing funds for hazard mitigation on an annual basis through a surcharge on insurance premiums of \$2 on private residences and \$4 on commercial establishments. This generates \$15 million to \$17 million annually for hazard mitigation. North Carolina should establish its own recurring revenue source for hazard mitigation.

* * *

These nine recommendations will not provide absolute protection against a storm of the magnitude of Hurricane Floyd. Through a confluence of events, that storm produced unprecedented damage from particularly severe flooding. Yet Floyd was not the first to inundate the east with floodwaters. North Carolina had already received a stern reminder of the damage these recurring disasters can do when Hurricane Fran struck in 1996. That warning was not fully heeded and the far-reaching recommendations of the post-Fran Disaster Recovery Task Force were virtually ignored. *The state cannot afford to make that mistake again.* North Carolina must be better prepared. The recommendations outlined above are best described as preventive measures to mitigate against future damages from recurring flooding. Memories of the loss of 52 lives and media images of floating hog carcasses and submerged, flood-ruined homes will fade with time. The real threat of new flooding will not.

—John Manuel and Mike McLaughlin