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The Story of North Carolina Counties

County **QUARTERLY**

M A G A Z I N E

WHERE DOES THE WATER FLOW?

Floodplain Management Expert Shares Insights
and Ways Counties Can Reduce Flood Risk | pg 10



Understanding Flood Risk:

Insights from Floodplain Management Expert, David Key

By Lacy Pate | NCACC Public Relations Manager

High profile disasters like Hurricane Matthew serve as a grim reminder about the devastating toll flooding can inflict on a community. Hurricane Matthew made landfall in North Carolina on October 8, 2016, dumping eight to 15 inches of rain across much of eastern and central North Carolina, causing severe flooding. It killed at least 28 people and the state suffered approximately \$2.8 billion in damage and another \$2 billion in economic loss. The deadly storm displaced thousands of families and damaged an estimated 98,000 homes and over 19,000 businesses.

NCACC discussed flood risk with David Key, who serves as the Chair of the North Carolina chapter of the Association of State Floodplain Managers. He has served as a civil engineer with over 26 years of experience in watershed hydrologic/hydraulic analyses, Flood Insurance Studies and large scale floodplain mapping projects.

His primary focus throughout his career has been FEMA Flood Insurance Studies and he served as project manager for the NC Floodplain Mapping Program since 2000.

David described the lessons learned from Hurricane Matthew and offered suggestions for communities to bolster their defenses against the economic and safety threats caused by flooding. He urged elected officials to raise awareness about flood risk and the need for flood insurance, and to adopt mitigation measures to protect against losses.

Flood Insurance Coverage Gaps in North Carolina

Although flooding is among the most common and costly side effects of any natural disaster, many properties located in high risk flood areas, also known as special flood hazard areas (SFHAs), are not protected by flood

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David Key, Chair of the NC chapter of the Association of State Floodplain Managers and Director of Water Resources/GIS Services at ESP Associates shared his expert insights on flood risk in North Carolina.

insurance. A SFHA is defined by the Federal Emergency Management Agency (FEMA) as “the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood.” In these areas, there is at least a 1 in 4 chance of flooding during a 30-year mortgage. All federally backed mortgages for properties within the special flood hazard area are required to purchase flood insurance. Regular home insurance does not cover flooding, so a separate flood insurance policy must be purchased through the National Flood Insurance Program (NFIP), which is administered by FEMA. Congress established the government-run program in 1968 to fill a void in the private insurance market because flooding was considered an uninsurable risk due to the lack of reliable data to accurately measure risk and other factors. NFIP was created to offer affordable primary flood insurance to properties with significant flood risk, and to reduce flood risk through the adoption of floodplain management standards.

Today, in North Carolina only less than half of properties in the floodplain is protected by flood insurance. This has significant economic implications for counties that derive a substantial portion of their tax base from unprotected homeowners and businesses. Counties may also have additional flood risk exposure for public structures located in the floodplain. While FEMA offers individual assistance for disaster

victims, it is no substitute for flood insurance.

Hurricane Matthew prompted an analysis of flood insurance participation in North Carolina and the findings concerned people in the industry, like David. He explained, “Matthew revealed a few things. Based on the research that we’ve done following Matthew, a significant number of people in North Carolina do not carry any flood insurance...a larger number than you may imagine - just like we’re seeing in Houston and Harris County, Texas.”

FEMA assistance is intended to help cover temporary housing or lodging expenses for those displaced and for certain disaster-related home repair or replacement costs to make the property safely inhabitable. It’s intended to supplement insurance, not to make the property owner whole again. FEMA individual assistance is capped at \$33,300 per household, whereas flood insurance offers coverage for residential building property, up to \$250,000, and personal property (contents) up to \$100,000.

Moreover, FEMA limits individual disaster assistance for property owners in the floodplain, who decide to drop flood insurance coverage. After a disaster, victims located in the floodplain who receive individual assistance from FEMA are required to pick up an insurance policy to protect against future losses. FEMA subsidizes the policy for three



In October 2016, flooding from Hurricane Matthew devastated eastern North Carolina.

years after the disaster. If the property owner decides to drop the policy after the 3-year period, they may become mostly ineligible to receive certain federal disaster assistance in the future.

David recalls how Hurricane Matthew victims were caught off guard in the wake of the disaster, “there are lot of people that need insurance and those people were surprised when they flooded and there wasn’t a lot of umbrella for them. The individual assistance was there, but that’s only enough to get those impacted through the early stages of the disaster and back on their feet.”

In and Around the Floodplain: Know Where the Flood Waters Rise and Flow

David shared his insights on flood risk in North Carolina and discussed ways in which counties can reduce flood risk. First, counties should understand flood risk and share this information with residents and business owners so everyone can do their part to reduce risk.

In 2000, the State of North Carolina took over responsibility for flood mapping after Hurricane Floyd revealed the need for real time flood information throughout the state. The state was designated as the first Cooperating Technical State (CTS) through FEMA’s Cooperating Technical Community partnership initiative. As a CTS, “the state assumes primary ownership and responsibility of the Flood Insurance Rate Maps (FIRMs) for all North Carolina communities as part of the National Flood Insurance Program (NFIP).”

David explained why the state took over flood mapping - to provide better, up-to-date and more accurate flood risk information. He said that since the state has been in the lead, North Carolina now has the most accurate program of mapping in the country. He explained that the state, unlike the federal government, has local knowledge of the topography and environment across North Carolina. And, the State has historically, and

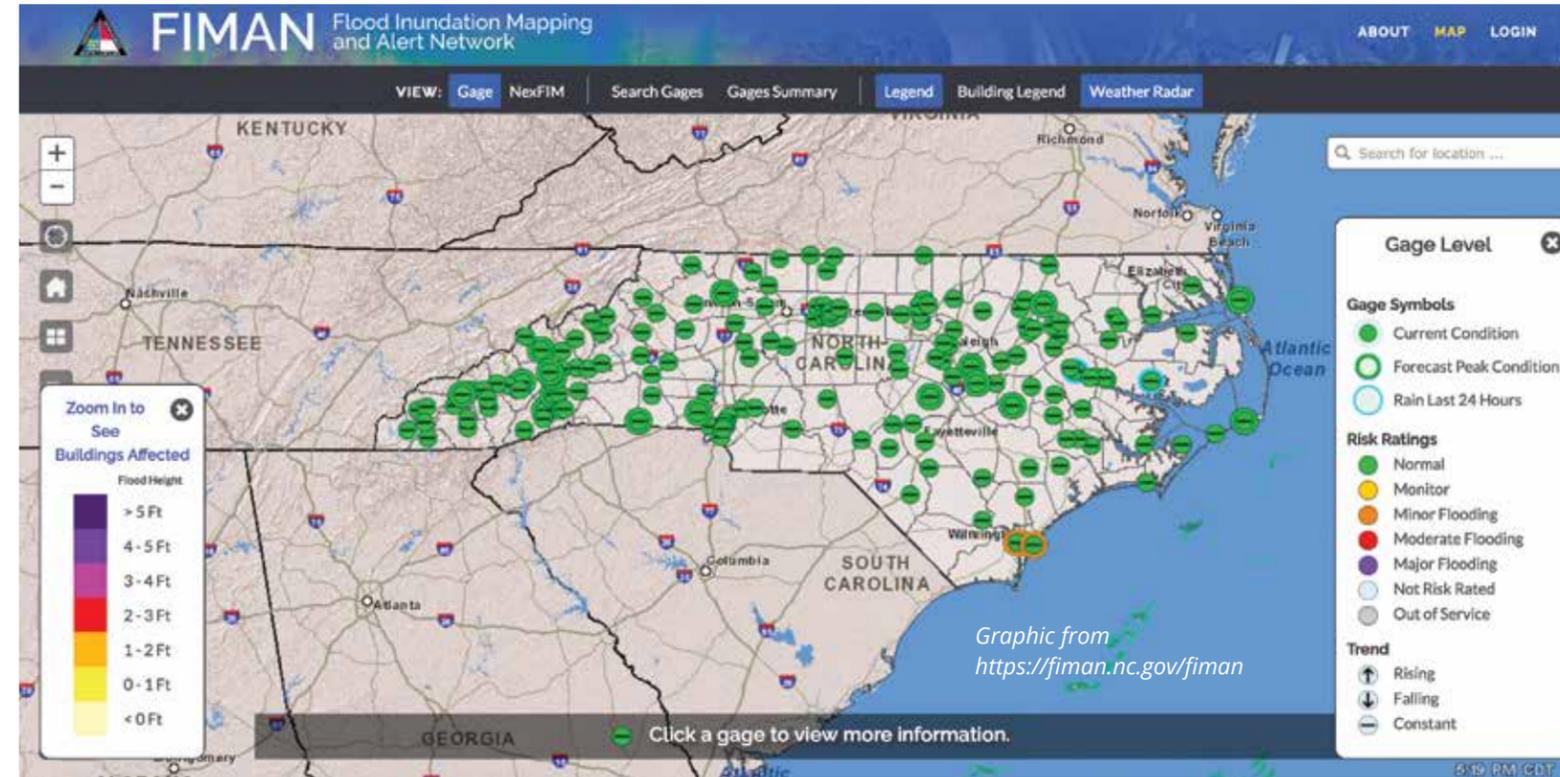
continued to invest in advanced technology, such as Geiger-mode Light Detection and Ranging (LIDAR), to generate digital elevation data. The state’s use of Geiger-mode LIDAR technology allows for the collection of the base topographic data much faster and at 10 times the resolution as traditional LIDAR sensors.

LIDAR works by emitting timed pulses of laser light (typically from an aircraft), and the pulses reflect off objects below. The instrument calculates the time intervals between the emission of the pulses and the reception on the objects. The time intervals are then converted to distance, providing an elevation measurement. This topographic data along with other digital information and field data help analyze flood hazards, and delineate floodplain boundaries for Flood Insurance Rate Maps.

The State of North Carolina provides several web-based resources to inform citizens about flood risk. More information about the NC Flood Mapping program is available at www.ncfloodmaps.com and the site links to the Flood Risk Information System (FRIS), which contains digitally accessible flood hazard data, models, maps, risk assessments and reports that are database driven. The state is currently in the process of revamping the site and developing a new web-based, user-friendly tool, which will allow citizens to easily estimate flood exposure and identify insurance options to mitigate risk.

This tool is important because those who aren’t required to retain flood insurance or those who reside outside a SFHA may not know their individual risk. For example, “if the house has been in the family for years or if the property doesn’t have a mortgage on it, or if it’s a cash transaction, there is no mandatory flood insurance purchase requirement. And, so there is where the outreach needs to happen,” said David.

The public can also access real-time flood information and alerts by visiting the Flood Inundation Mapping and Alert Network (FIMAN) at <https://fiman.nc.gov/fiman/>. Data on



stream elevation, rainfall and weather from over 550 gages across North Carolina, including gages from the U.S. Geological Survey are included in this network. The real-time data helps emergency managers make important, potentially life-saving decisions about evacuations, and implement measures to address flood inundation impacting buildings, roads, and infrastructure.

“The state’s investment in quality data paid off... for the rivers and flooding sources that flooded during Matthew that had had a recent update on them – a modernized study – those proved to be accurate, even for an event like Matthew. “North Carolina flood maps are the best in the country. However, there are still some streams in the state that need mapping,” said David.

To Be, or Not to Be in a Floodplain... Is that the Question?

David is proud of North Carolina’s progress in creating better maps and providing real-time flood inundation information. However, he warned about the unintended consequences of providing better quality data. In some cases, more accurate maps result in certain properties being mapped out of the floodplain, ending their mandatory flood insurance

requirement. He explained that often, these property owners assume they are out of harm’s way because they are no longer located in the highest risk area, so they opt to drop their flood insurance protection to save money.

“Citizens may be getting into this “in-or-out” mentality where the line moves and they think that the line is perfect, that the water will never get past that point. There is a great deal of education that is needed there to say to people...yeah, the good news is you’re not forced to buy it. There is also more good news. It’s not going to be as expensive as it was when you were forced to buy it. So take advantage of being in the safer zone and buy it. When people are moved out, they have got to keep that policy,” said David.

It is important clarify what the maps mean so property owners don’t get a false sense of security. Although they may be out of a SFHA, they may still be exposed to significant flood risk. Tragically, when flooding strikes, many quickly come to regret their decision to let their NFIP coverage lapse. It is also worth noting that some experts believe the flood risk captured in flood maps represents a conservative estimate because FEMA is prohibited from considering sea level rise and climatic change

These photos show the “before and after” images of a risk prone neighborhood on Andriell Terrace in Charlotte, NC, where several homes were purchased through Mecklenburg County’s buy-out program.



projections for the purposes of Flood Insurance Rate Maps.

“A lot of people that flooded should have had insurance but didn’t and even people that could have had a cheap insurance policy...people that were outside the special flood hazard area...they could have purchased a very inexpensive insurance policy that FEMA offers...it’s called a preferred risk policy. There were folks that regret that now and there are folks all over Houston regretting that now.”

Building Better Standards and Safer Communities

Raising awareness about flood risk is only part of the equation. David Key offered some recommendations to help counties reduce their risk by adopting effective floodplain management strategies. Counties can adopt higher flood mitigation standards and building regulations that promote safer development. NC Emergency Management provides a guide for safer development in flood prone areas and has a template counties can use to establish higher standards. Among other things, counties can:

- Require new construction to be elevated above the minimum standards for the Base Flood Elevation (BFE) of a building. FEMA defines the BFE as the computed elevation to which flood waters are anticipated to rise during the base (1-percent-annual-chance) flood event.
- Play an active role in identifying streams prone to flooding and working with NC Emergency Management to determine whether additional stream gages for NC’s flood warning system may be needed in your community.
- Contact NC Emergency Management to request mapping for new area of study.
- Establish mitigation programs to promote flood-proofing for properties in flood-prone areas.
- Move properties out of the floodplain and return the area to open space through FEMA’s

acquisition or “buy-out” program.

To learn about examples of successful, local-led mitigation programs, see the article on page 30, which discusses in detail Mecklenburg County’s buy-out and RetroFIT flood-proofing programs.

Participate in CRS and Receive Discounts on Flood Insurance Premiums

Counties can also support effective floodplain management strategies by participating in FEMA’s Community Rating System (CRS) program. CRS is a voluntary program that provides incentives to reward communities that adopt and enforce higher than minimum regulatory and building standards for reducing flood risk. Communities that participate in CRS are rated according to a class system ranging 1 to 9 (the lower the number, the better) and they get credit for taking steps to reduce flood risk and educate property owners on their individual flood risk. CRS participants receive discounts on flood insurance premiums for property owners in the area. In addition to reducing insurance premiums, the adoption of sustainable

floodplain management practices provides intangible safety benefits for the community.

The Growing Flood Risk in North Carolina

Flooding is not just a problem for communities on the coast. As David Key pointed out, each of the various regions in North Carolina has their own distinct flooding mechanism – river and stream water flow in the Piedmont, storm surge in the coastal plain in the east, and mudslides in the mountains in the west. He notes, “the flood risk is high in North Carolina. It’s one of the higher flood risk states.”

And, it’s expanding. David attributes population growth and development in flood prone areas as factors that exacerbate the risk. “North Carolina has population growth more than many states, so we are putting more people in land that is at a premium. In larger cities that are land-locked land has become at a premium, so developers are targeting the land that’s available and sometimes it’s in the floodplain.”

David also notes that the aging population is

moving closer to the water in their retirement years and communities in flood prone areas are being developed to keep up with that demand. “We also have the baby boomer effect, where you’ve got baby boomers and post-generations of baby boomers that are retiring, and where do they want to move – they want to move to the water, whether that’s around a lake or whether that’s along the riverfront, beach or intracoastal waterway or the low lying areas. I’m guilty, I want to one day retire to Brunswick County myself. So you’ve got a big population moving toward the coast that will build there. And I’m all for it, as long as it’s responsible.”

Be Aware, Stay Engaged, and Take Action

Given the increasing flood risk across the state, it’s important for counties to understand and communicate the risks, demonstrate the benefits of mitigation measures and keep people engaged long after a significant flooding event. The public needs to understand the impact of flooding and they need to see how mitigation investments pay off over time. Smart and sustainable floodplain management strategies can render significant cost savings, cost avoidance and provide invaluable safety benefits.

Flooding can jeopardize lives and economic prosperity of a community with devastating potential. County commissioners and other elected officials play an important role in bringing these issues to light. Local leaders are entrusted to make the right policy decisions to address the unique flood risks in the community and the public will turn to local leaders in times of crisis. It’s important to consult with floodplain management and emergency management professionals and take advantage of the resources available to learn about the impact of flooding in your community and explore the actions you can take to reduce the risk for your constituents. ■