



# FlashFlood NEWS

2018 Issue 1

Spring/Summer 2018

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## Hurricane Maria in Puerto Rico – Challenges of Modeling and Mapping the Impacts Of Potential Dam Failures

ED BEADENKOPF, PE, CFM | ATKINS

How does one assess the possible hazards of multiple potential dam failures during a hurricane? Atkins North America and Stantec, under contract to the Federal Emergency Management Agency (FEMA), faced this challenge to produce potential dam failure flood inundation maps for 35 dams in Puerto Rico (PR). **Complicating the challenge, the mapping was needed immediately for emergency management purposes to prioritize dams with the highest potential of consequences resulting from dam failures.**

Atkins and Stantec assessed 35 high hazard dams in PR identified in the National Inventory of Dams. Dam breach modeling and mapping was rapidly performed for these 35 dams in the aftermath of Hurricanes Irma and Maria. The hydrologic and hydraulic engineering work utilized the **Decision Support System for Water Infrastructural Security (DSS-WISE™ Lite)** dam breach modeling and mapping software developed by the National Center for Computational Hydroscience and Engineering (NCCHE) of the University of Mississippi. The US Army Corps of Engineers (USACE) Hydrologic Engineering Center, Hydrologic Modeling System (HEC-HMS) software was used to develop flood hydrographs reflecting projected rainfall events post-Hurricane Maria.

Atkins and Stantec also reviewed the dam safety inspection reports and assessed the

— continued on page 3

Guajataca Dam in Puerto Rico



(Photograph courtesy of FEMA)

# From the Chairman's Desk



AMIT SACHAN, PE, CFM  
NCAFPM CHAIRMAN

My Floodplain Manager friends,

First, let me express my gratitude to all of you for the honor to serve as the chair of this great organization. We now have our 2018-19 board in place, and I would like to welcome all board members, including our new board members, Laura Arnold and Scott Brookhart. I am also excited to have Ken Ashe as vice-chair, Randy Mundt as NCEM representative, Dan Brubaker as NFIP engineer, David Key as at-large member, and John Fullerton in a permanent conference chair role. We have some big shoes to fill, but with your support and encouragement, we will try our best to live up to expectations and most importantly uphold our mission. We have some exciting initiatives in the works, such as community outreach and student scholarships. We are also very excited about the prospect of hosting the National ASFPM Conference back in North Carolina in 2021. Consider getting involved; we need you more than ever!

As NCAFPM is about to complete three decades of meetings and conferences, training and CFM exams, newsletters and networking, we all should feel proud of what we have accomplished as an organization. Throughout our rich history, the NCAFPM has served its members by promoting floodplain management and enhancing cooperation among various entities in the state. We are now close to 450 members strong, including over 350 registered CFMs, making us one of the largest chapters in the country. We certainly have the most involved members, but I may be biased.

We recently held our 29<sup>th</sup> annual conference at a new venue in Wilmington, home of the historic Battleship North Carolina, for which our conference theme "All Hands on Deck" was aptly based. Over 200 community planners, engineers, and emergency managers shared valuable insights at this conference. More about the conference can be found on page 6. For their service and commitment to the association, Lifetime Achievement and Leadership Awards were given to John Fullerton and David Key, respectively. The NCAFPM also unveiled an exciting new logo for the organization. You can read about that on page 15.

We have now officially entered hurricane season and hope that Mother Nature will not be too harsh on us. Regardless, our emergency officials and responders are prepared for the worst, equipped with the sound policies and planning tools that floodplain managers across our state have developed over the years.

After the summer, we have a wonderful gathering planned at the Fall Floodplain Institute in the mountains of Asheville this fall. We are guaranteed to have exciting speakers, hands-on training sessions, and perhaps a second installment of the cornhole tournament! Details are on page 5 and more information will be on the website in late summer. Have a great summer, everyone, and I hope that you will join us in beautiful Asheville in October. ▲



A handwritten signature in blue ink that reads "Amit".

## Dam Failures, from front page

consequences of a dam failure. These assessments focused on population at risk and were prepared for prioritizing dams for additional focus, inspections, and emergency management. The USACE also performed independent condition assessments of dams by inspecting dams for damages. The Atkins and Stantec team rapidly mobilized staff from across the US to perform the modeling and mapping, enabling the team to **provide GIS flood inundation mapping within hours**, continuing until all 35 dams were studied. FEMA Region II provided this information to PR, USACE, the US Bureau of Reclamation (USBR), and the National Weather Service (NWS) teams that were in the field or performing similar dam breach mapping.

For Guajataca Dam, which had a failure of the auxiliary spillway, the team conducted **advanced modeling for various hypothetical rainfall events projected** to occur for up to two weeks after Hurricane Maria exited PR, which continued to influence the island as Hurricane Maria approached the US mainland. The modeling included the influence of USACE pumping operations to lower the lake level as rainfall produced additional inflow into the lake. DSS-WISE Lite is an effective tool for rapid dam breach modeling and mapping, and use of this program enabled Atkins and Stantec to fulfill the challenge in Puerto Rico. ▲

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## Coastal Resilience Rainfall Flood Study

LORA EDDY | NATURE CONSERVANCY

Currituck County obtained grant funding from DCM to perform a Coastal Resilience Rainfall Flood Study to identify areas vulnerable to flooding from rainfall.

Two tasks were completed: 1) delineation of drainage basins using the 2014 NCFMP LiDAR and 2) development of a data-driven statistical model using flood risk factors such as elevation, land slope, and soil drainage type to identify areas vulnerable to rainfall-based flooding.

This data will be combined with a public mapping project led by a Duke University graduate student to identify flood prone areas, which will help the county develop strategies to understand, prioritize, and address this type of flooding risk. It will also be incorporated into The Nature Conservancy's [Coastal Resilience mapping tool](#) (see screenshot below) to enable the county to better visualize flood vulnerability. ▲



## Education & Outreach: Career Fairs, Creek Week, and Webinars

DAN TOMCZAK, CFM | NCAFPM EDUCATION AND OUTREACH COMMITTEE CHAIR

Members of NCAFPM have been active and busy during late 2017 and into early 2018 – reaching out to organizations, communities, and schools and becoming more involved with promoting flood risk education.

### Career Fair

On February 24, Marbles Kids Museum in downtown Raleigh held their 4<sup>th</sup> Annual **Kids Career Fair**. For the second year, volunteers from NCAFPM, including Tammie Tucker, Laura Arnold, Rachit Bhayani, and Kendall Driver (aka Team AECOM), participated in the

fair through demonstrations with the Ward's Flood Model. While working with the model, the kids learned about potential careers in planning, engineering, mitigation, and emergency management. The flood model is a huge favorite with the kids as it is a hands-on experience where they are presented with the challenge of how to safely build communities. The kids can also test new ideas, such as “making it rain” in the model and unleashing a torrential flood. Based on the outcomes of the initial designs by the kids, mitigation efforts occur including elevation, relocation, building dams, and adding wetlands or detention ponds. The kids have the opportunity to see the positive as well as negative effects downstream of their mitigation efforts. Throughout the interactive activities, the volunteers help the kids see the connections between changing land use and the need for stormwater and floodplain management, discuss how our jobs are related to the flood model activities, and stress the importance of flood safety.



Laura Arnold and Rachit Bhayani educating “future floodplain managers” at the 4<sup>th</sup> Annual Kids Career Fair at Marbles Kids Museum in Raleigh in February 2018.

### Creek Week

**Durham Creek Week** was held March 17-24 and this was the first year that NCAFPM members participated. NCAFPM reached out to the NC Central University Department of Environmental, Earth, and Geospatial Sciences in Durham to team with students

on the Creek Week activities. Dan Tomczak and Blaine Lary (a graduate student from NC Central) gave a presentation using the Ward's Flood Model to the 5<sup>th</sup> grade classes at Club Boulevard Elementary School. The students were very engaged with the model and were able to make a connection between the model demonstrations and the high-water levels observed at times in nearby Ellerbe Creek after heavy rain events. In addition, NCAFPM participated in the **Wild Ideas for Clean Creeks Expo** hosted by the Triangle Land Conservancy and held in Durham to raise public awareness on the many ways (floodplain management included) for maintaining healthy watersheds. See the picture and caption on the next page for an idea of what this event was about.

## Webinars/King Tide Project

The North Carolina King Tide project ([nckingtides.web.unc.edu](http://nckingtides.web.unc.edu)) continues to grow through involvement by members of NCAFPM as well as citizen scientist groups. Local officials and the general public are seeing a strong interest by their communities to become actively involved with monitoring high tidal water and nuisance flooding and have reached out to the UNC Institute of Marine Sciences (UNC-IMS) about having gauges set up to collect water level measurements. Monitoring stations with staff gauges have now been constructed by UNC-IMS at locations within coastal communities spanning from Carolina Beach to Oriental to Edenton. Citizens collecting the water level measurements can submit their data using the "What's Your Water Level?" web-app hosted by NOAA.

In efforts to better promote the NC King Tide Project, a 1-hour webinar, "Community Involvement in Monitoring King Tide Events," hosted by NCAFPM on May 10 with speakers Marygrace Rowe (UNC-IMS), Professor Derek Loftis (Virginia Institute of Marine Sciences), and Jeremy Hardison (Town of Carolina Beach). The webinar was well attended and the viewers learned about different ways communities are becoming more engaged in water level monitoring and how their efforts can help improve flood risk planning. If you are interested in learning more about the NC King Tide project, the webinar can be viewed at [youtu.be/x1M3\\_vhlr7E](https://youtu.be/x1M3_vhlr7E).

There are many other outreach opportunities for members to become more involved with NCAFPM, including the High Water Mark Initiative, NFIP, community workshops, and the Catawba River STEM Festival. If you are interested in becoming involved in outreach for NCAFPM or potentially using the Ward's flood model for an upcoming event, please feel free to contact me at [daniel.tomczak@jacobs.com](mailto:daniel.tomczak@jacobs.com). ▲



Flyer from the Community Involvement in Monitoring King Tide Events webinar in May 2018.



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[www.DurhamCreekWeek.org](http://www.DurhamCreekWeek.org)



Blaine Lary, a graduate student from NC Central University, worked with NCAFPM on demonstrations using the flood model at Club Boulevard Elementary School as part of Durham Creek Week in March 2018.

# NCAFPM Chapter News

## 2018 NCAFPM Spring Annual Conference REPORT

AMIT SACHAN, PE, CFM  
NCAFPM CHAIR



NCAFPM chose a new venue this year for our 2018 Annual Conference. Over 200 of the floodplain managers descended into the serene city of Wilmington at the banks of the Cape Fear River. The conference theme was chosen to be All Hands on Deck due to a beautiful and inspiring backdrop of the Battleship North Carolina. The newly renovated Hotel Ballast was our host.

### Conference highlights

A warm welcome address was given by Mayor Bill Saffo to the conference attendees followed by an engaging keynote address by District Judge James Faison on the importance of relationships (see next page for a summary). Over thirty presentations were combined with networking opportunities as well as social time. Eleven corporate sponsors assured the financial success of the conference including Platinum Sponsors **Atkins, Dewberry, ESP, Freese & Nichols**, and **SURDEX**. Program Chair David Goode, PE, CFM organized a varied and instructional program which included CRS updates as well as a CFM exam refresher. Several new potential NC CFMs took the exam Wednesday morning.

An informative field trip to the Anne McClary Park was led by the City of Wilmington stormwater staff. The highlight of the networking time was the Thursday evening taxi boat rides on the Cape Fear River providing breathtaking view of the sunset over the battleship. The attendees enjoyed live music by the bluegrass band Folkstone String band along with assortment of hors d'oeuvres and beverages.

### A Note from John Fullerton

NCAFPM Members & Board,

Thank you friends and well wishers for the recognition in Wilmington at our Annual Conference. Many of you have assisted me during my tenure with NCAFPM, both in thought and deed. You have been mentors, friends, peers, and confidants and have offered me kindness, trust, and prayers. I am very humbled by your recognition and appreciate the opportunity to serve you and the association. Jane and I thank you for your kindness and good will. To God be the glory and may He continue to bless you all.

Sincerely, John

John was given the Lifetime Achievement award at the 2018 Annual Conference.

### Silent Auction

Board members along with THC, Inc., volunteers Aimee Davis, Aimee Saito, and Anne Regan planned and conducted the 5<sup>th</sup> NCAFPM Silent Auction. This year's auction was another success and will provide scholarships for future NCAFPM conference attendees as well as support for ASFPM Foundation.

### Presentations Available

The presentations from our speakers have been posted on our Conference webpage ([ncafpm.org/conference.html](http://ncafpm.org/conference.html)). Please send a note to [Kelly Keesling](#) if you have any trouble obtaining a presentation.

### Continuing Education Certificates

The credits from the conference are currently being processed and attendees should expect to receive their certificates via email in mid- to late June. Contact [Kelly Keesling](#) if you have any questions. ▲

# Why Build Relationships?

JOHN W. FULLERTON | NCAFPMP CONFERENCE CHAIR

Judge James H. Faison, keynote speaker at the 2018 Annual Conference in April, gave a “bakers dozen” of attributes needed for building **RELATIONSHIPS: Relatable, Esteem, Listen, Affirm, Trust, Interest, Objective, Negotiate, Support, Humility, Integrity, Patience, and Share.** Judge Faison went on to explain the importance of each of these attributes in building strong and lasting relationships. He supplemented his thoughts with authoritative and poignant quotes from the Bible, Epictetus, Stephen Covey, and Billy Graham, to name a few.

Floodplain management as well as most, if not all, other fields of endeavor is dependent on relationships. The quality of the relationship is directly proportional to the quality of the endeavor. Relationships, of course, are between people. And good relationships are “win-win” situations. What if good relationships actually protected your brain? That is one of the findings of an ongoing Harvard study now in its 80<sup>th</sup> year. The study reported that “in addition to positively affecting your physical and emotional health, good relationships have the power to sharpen your memory.” (See [health.harvard.edu/staying-healthy/the-pursuit-of-happiness](http://health.harvard.edu/staying-healthy/the-pursuit-of-happiness).)

The study went on to find that social connections are “really good” for you and that “when it comes to relationships, pick quality over quantity.”

As an association, NCAFPMP has in its bylaws and constitution a goal of “Enhancing cooperation and exchange of information among various related private organizations; individuals; and local, state, and federal agencies.” Through conferences, newsletters, training opportunities, and mentoring, NCAFPMP provides an opportunity for members to build relationships that enhance your career and yourself. ▲

Notes from the Spring 2018 NCAFPMP Annual Conference keynote address by Judge James H. Faison.

## 13<sup>th</sup> Annual Fall Floodplain Institute (FFI) Returns to Asheville

The newly renovated [Crowne Plaza Resort Asheville](#) will be the site for our 2018 fall conference (FFI) on **October 16-19**. The Crown Plaza hosted our 2<sup>nd</sup> and 4<sup>th</sup> Fall Floodplain Institute in 2007 and 2009 respectively. Located one mile from downtown Asheville, the resort offers tennis, golf, and a fitness center along with restaurant and lounge facilities. The beauty of the fall colors surround this venue and provides a spectacular backdrop for our conference.

The NCAFPMP Fall Floodplain Institutes have been averaging about 150 attendees with a program designed to offer required CEU's for engineers and floodplain managers. In addition, the conference attempts to be relevant for all levels of experience in floodplain management and provide valuable networking time.

**Save the dates – October 16-19, 2018 – and plan on attending!**

# City of Elizabeth City – Waterfront Plan and Charles Creek Flood Mitigation

ALLISON BRYAN | MOFFATT & NICHOL – WATER RESOURCES GROUP

Nestled along the banks of the Pasquotank River, Elizabeth City's location played an important role in its history as a thriving seafood, timber and shipping regional hub. The City's direct link to the water provides the foundation for its growth and evolution. From commerce and culture to open space and institution, cityscapes and landscapes co-mingle along Charles Creek and the Pasquotank River, creating the "Harbor of Hospitality" as a robust and quaint experience.



*City of Elizabeth City  
waterfront*

Elizabeth City is located within the lower portion of the Charles Creek watershed and much of the city is situated just a few feet above sea level, making the area prone to flooding due to local rainfall, coastal storms, and wind tide events. The City of Elizabeth City received a grant through the North Carolina Division of Coastal Management's Planning and Management Grants Program to create a plan to mitigate flooding and improve flood resilience. Moffatt & Nichol (M&N) was selected by the City to complete the Charles Creek Flood Mitigation Plan.

In the preparation of the plan, a one-dimensional/two-dimensional

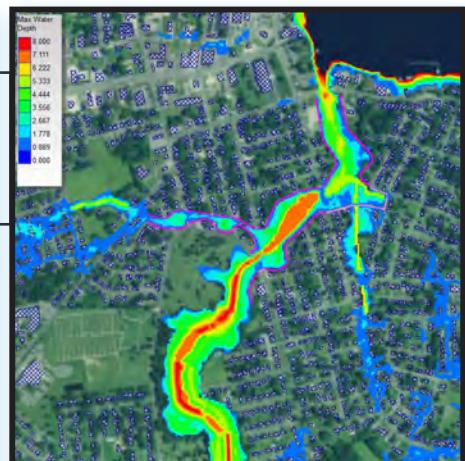
hydrodynamic XPSWMM model was developed to analyze flooding in Charles Creek. One-dimensional model elements were created to represent stormwater infrastructure and natural channels in the study area. These elements were linked to a two-dimensional surface created using topographical data to model overland flow. Additional parameters including rainfall hydrographs, soil and land use information, and water level data were utilized in XPSWMM. The model was used to evaluate existing flood behavior in Charles Creek and develop a suite of potential flood mitigation options to improve resilience.

— continued on next page

*Existing conditions – maximum water depth, 25-year storm event (left)*



*With protective berms – maximum water depth, 25-year storm event (right)*



Mitigation options included a variety of engineered infrastructure alternatives, as well as non-infrastructure solutions. Among the engineered alternatives were protective earthen berms, a flood gate and pump system, and green infrastructure. Non-infrastructure alternatives such as property buyouts and the elevation or relocation of structures were considered. Each of the investigated solutions provided increased flood protection against local rainfall and wind tide surges, but select alternatives were favorable from cost-benefit, environmental permitting, and city planning perspectives.

The recommended flood mitigation alternatives for further study in Charles Creek are the use of protective berms, the elevation or relocation of structures, or a combination of these solutions. The elevation of flood-prone structures is the most cost effective alternative, followed by the relocation of structures. However, the implementation of protective earthen berms provides ancillary neighborhood connectivity and recreational benefits. Green infrastructure serves as a recommended add-on to more robust flood mitigation solutions to improve the behavior of Elizabeth City's existing stormwater system. Rain gardens, bioswales, streetscape improvements, and other forms of low impact development help protect and restore the natural water cycle within the built environment.

The City of Elizabeth City's Waterfront Master Plan, completed by M&N in coordination with the Charles Creek Flood Mitigation effort, targets the Charles Creek area for renewal. In addition to the existing Charles Creek Park, the plan proposes the creation of a greenway trail and recreational fishing piers in the area, designs which could be integrated with protective berms. Vegetated earthen berms fuse landscape architecture and stormwater mitigation, protecting nearby properties from flooding with attractive landscaping.



A variety of funding sources have been identified to assist the city in creating a strategy to enact the measures outlined in the Charles Creek and Waterfront plans. The combination of resilient coastal engineering and urban waterfront planning that came as a result of the concurrent flood mitigation and waterfront planning efforts will allow Elizabeth City to promote sustainability and resilience while ensuring the betterment of the City's development future. ▲

For more information on this project, please feel free to contact Allison Bryan at [abryan@moffattnichol.com](mailto:abryan@moffattnichol.com).

# From the NCAFPM Executive Director



**Bill Tingle, PG, CFM**  
**NCAFPM Executive**  
**Director**

As I write this, western North Carolina is recovering from the impacts of T.S. Alberto which caused flooding and land/mud slides in several counties. The unique regions of our state make it a beautiful place to live and work but also provide for a variety of natural hazard risks, from flash flooding and mudslides in the west to storm surge and sea level rise along the coast.

This year's annual conference in Wilmington included great presentations, field trips and social events. It also provided for some changes to the NCAFPM board of directors. The board approved the addition of three permanent positions to the board of directors. Two of the positions are from the NC Floodplain Mapping program (currently filled by Dan Brubaker and Randy Mundt). The third new position is the conference chairperson which is currently filled by John Fullerton. Our board members and their contact information is on pages 14 and 15 of this issue of *FlashFlood*.

Board elections were held at the annual membership meeting and resulted in some fresh faces on the board, as well as existing board members moving to other positions. Amit Sachan was elected as chair and Ken Ashe was elected vice-chair. David Key was elected as an at-large representative. New board members include Laura Arnold (AECOM) as corporate liaison, and Scott Brookhart (McCormick-Taylor) as Region B representative. Laura and Scott, thank you both for your willingness to serve — and welcome to the NCAFPM board.

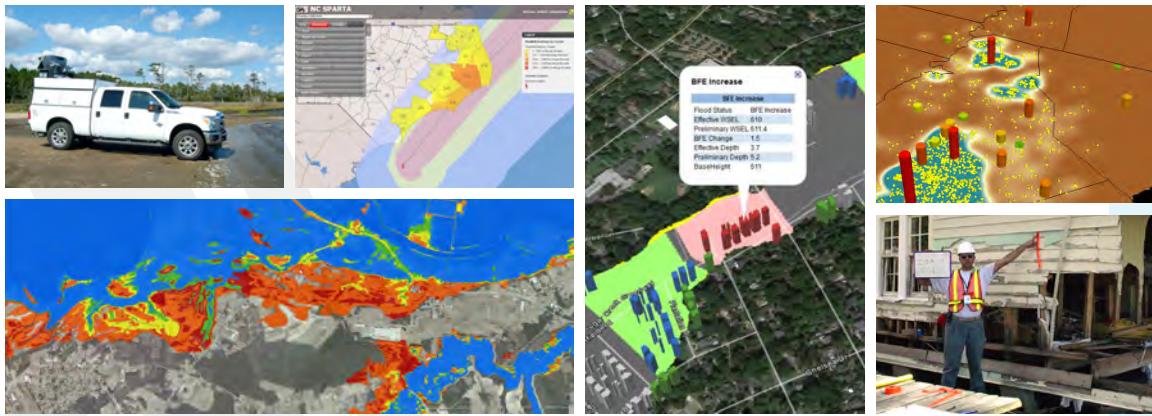
The conference also provided for two of our best to be recognized for their tireless efforts in support of NCAFPM. John Fullerton received the Lifetime Achievement Award, recognizing him for his 15+ years as a board member and conference chair — and all around super guy. David Key was awarded for his outstanding service as chair of the association and for being a pretty super guy as well. Much deserved congratulations, John and David!

The North Carolina Board for the Licensing of Geologists (NCBLG) recently adopted continuing education requirements as a condition for license renewal. Entities offering continuing education must be pre-approved by NCBLG. I am happy to announce that NCAFPM was recently accepted as a pre-approved CE Provider. ASFPM was recently approved as well.

Have a great summer and I look forward to seeing everyone at the Fall Floodplain Institute in Asheville in October. ▲

*Bill*

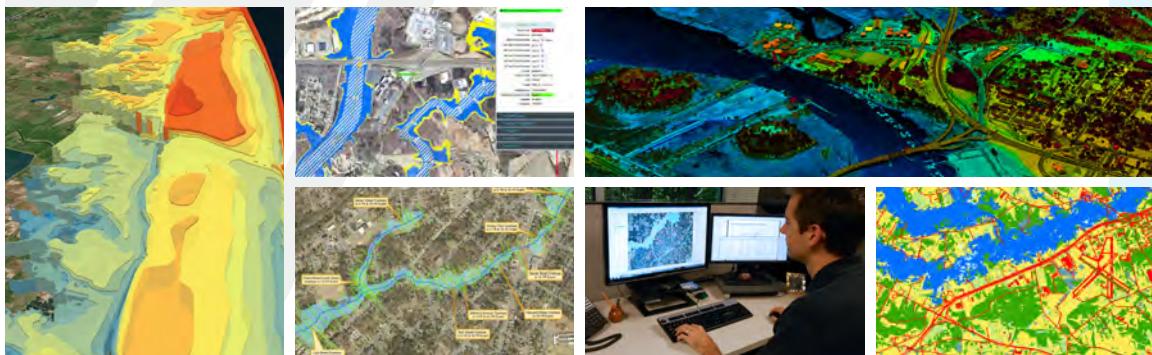
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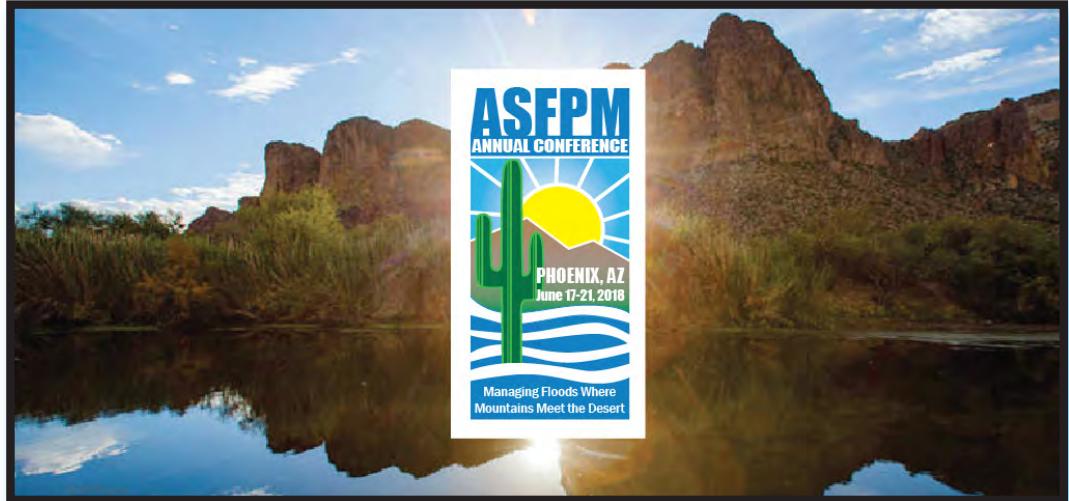
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### Upcoming ASFPM Annual Conferences

Phoenix, Arizona  
June 17-21, 2018

Cleveland, Ohio  
May 19-24, 2019

Fort Worth, Texas  
June 7-12, 2020



## ASFPM 2018 Annual Conference

**June 17-21 | Phoenix, Arizona**

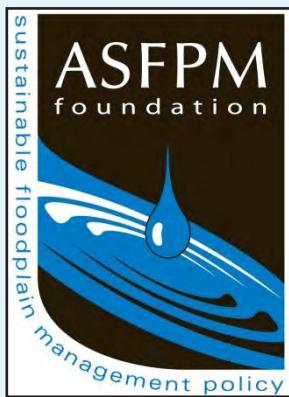
The Association of State Floodplain Managers will convene the world's largest and most comprehensive floodplain management conference – their 42<sup>nd</sup> annual gathering, June 17-21, 2018 at the Phoenix Convention Center in downtown Phoenix, Arizona. You are invited to share your experiences with local, state, regional, tribal and federal officials, industry leaders, consultants and a wide variety of subject matter experts from diverse fields who will give presentations relevant to the theme, "Managing Floods Where Mountains Meet the Desert."

The conference is conducted by the Association of State Floodplain Managers, the world's leading voice for sound floodplain management, with 18,000+ practitioners, 10,000 Certified Floodplain Managers, 36 chapters, and 73 corporate and agency partners world-wide.

This national conference includes concurrent session presentations that are 30 minutes long including time for Q&A and fit within the standard conference agenda. Concurrent session attendance is included with conference registration. In addition, 2-4 hour workshops which are courses including a syllabus, course objectives, and exercises. Workshops are targeted at offering continuing education for floodplain management professionals. An additional fee is required for attending these workshops. The CFM exam is also offered during the conference — please submit your application as explained on the NCAFPM website's Certification page.

**New this year:** ASFPM Foundation supporters who have donated at least \$100 between July 1, 2017 and June 1, 2018, will receive an invitation to the Donors Recognition Reception and Live Auction at ASFPM's annual national conference in Phoenix. However, after June 1, the donation amount to qualify for an invitation to the reception is at least \$125. Donations will be accepted at the conference, but if you want to beat that deadline, email [suzanne@floods.org](mailto:suzanne@floods.org). Please note that silent auction purchases do not qualify.

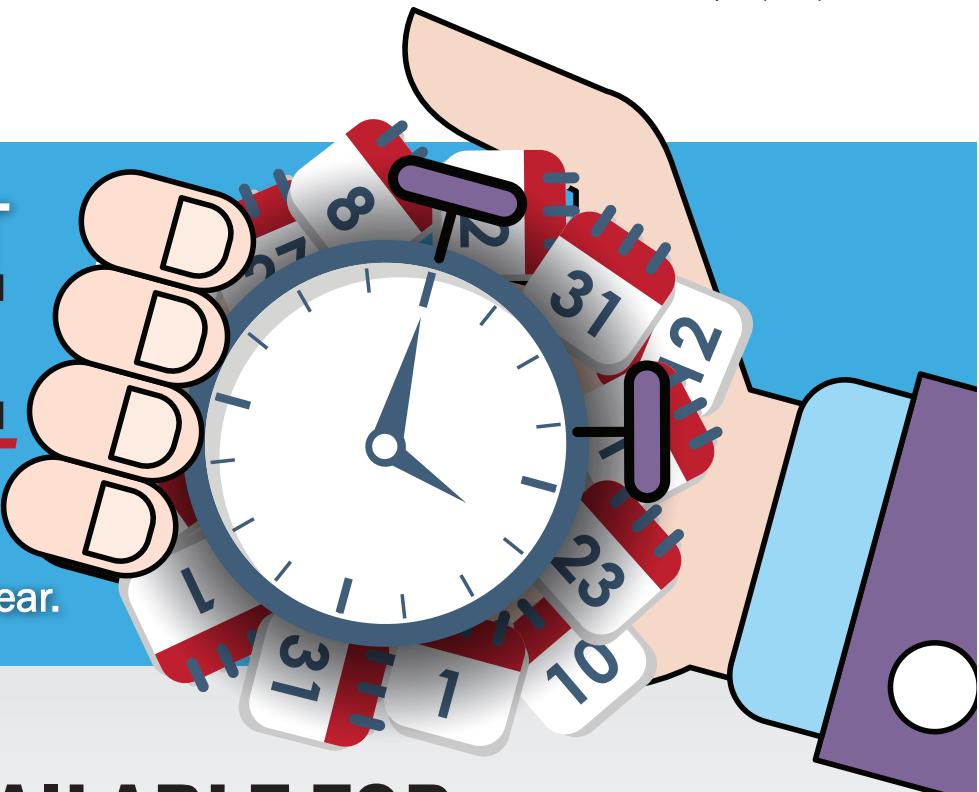
For more information, go to [asfpmconference.org](http://asfpmconference.org).





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laura.arnold@aecom.com

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910.341.3247  
nchalfbacks.jf@gmail.com

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# DCM Assists Local Communities to Become More Resilient

MONICA GREGORY | DIVISION OF COASTAL MANAGEMENT

In 2016, the Division of Coastal Management (DCM) commenced a five-year project to create a comprehensive resilience-building guide or online portal for coastal North Carolina. During the first two years of the process, DCM hired a NOAA coastal management fellow to build case studies through a pilot project called “Resilience Evaluations and Needs Assessments” (RENA). The pilot project focused on advancing the conversation on resiliency planning and creating a replicable planning process through surveying and interviews, asset mapping, community engagement, and flood-related modeling. The NOAA fellow worked with five communities which will serve as case studies to inform DCM on common coastal hazards, common needs to address impacts from coastal hazards, best practices in community engagement, and next steps between DCM and its partners.

## The Process

In the first part of the RENA project, town staff and local leaders mapped important community assets with DCM staff. Assets included government facilities such as town halls, critical facilities such as hospitals, recreation areas, and cultural resources, among others. Town staff and local leaders had full control over the assets they wanted to include on their maps. In addition to mapping assets, town staff marked areas where they experienced drainage issues or repetitive flooding. Staff identified the source of flooding in many cases, be it from heavy precipitation, nor'easters, or past hurricanes.

The next step focused on community workshops. DCM, town staff, and local-level organizations encouraged residents from across each community to participate in asset mapping. The staff-created map served as the baseline during community workshops. Residents were able to verify, revise, and add to maps as well as record their knowledge of past and current flooding issues in their neighborhoods and towns. During the workshop process, DCM collected additional information such as residents' top concerns related to coastal hazards and stories related to flooding and other impacts. Finally, DCM and The Nature Conservancy (TNC) worked to put the asset maps online through TNC's Coastal Resilience Mapping Tool so both staff and residents could visualize flood impacts to their most valued resources, pinpoint “hotspots” — areas where they want to focus mitigation or adaptation projects — and communicate their needs to both residents and potential grant funders.



The Division of Coastal Management works to protect, conserve and manage North Carolina's coastal resources through an integrated program of planning, permitting, education and research. DCM carries out the state's Coastal Area Management Act, the Dredge and Fill Law and the federal Coastal Zone Management Act of 1972 in the 20 coastal counties, using rules and policies of the NC Coastal Resources Commission, known as the CRC. The division serves as staff to the CRC.

## The Communities

Five communities participated in the RENA process to varying degrees. The Towns of Edenton, Oriental, and Pine Knoll Shores participated in asset mapping exercises with town staff and community workshops. The Town of Duck and Hatteras Village participated in asset mapping exercises with town staff or local leaders but did not hold community workshops. All five communities will receive a

final report with results from surveying, asset mapping exercises, community workshops (where possible), recommendations from residents (where possible) and DCM, and funding opportunities. The final reports will be hosted on an in-progress web page on DCM's website.

## What's Next?

In the coming year, DCM is working directly with The Nature Conservancy, Sea Grant, and the Coastal Federation to better understand best practices that emerged from the process. The collaboration between DCM and its partners will aim to expand the type of work done through the RENA process, as well as include practices from a process promoted by North Carolina Sea Grant – Vulnerability, Consequences, and Adaptation Planning Scenarios (VCAPs) – to assist communities in a deep dive of assets or systems identified by town staff and residents, when appropriate. Communities participating in the pilot project will have continual access to expertise from DCM, TNC, Sea Grant, and the Coastal Federation, ranging from policy implementation to project identification to grant-writing assistance.

DCM hopes this process can be replicated or utilized to help other communities identify assets important to the town and residents for cultural, economic, and environmental reasons. With that information, town staff can identify areas to focus mitigation or adaptation efforts, apply for grant funding with the data produced through the process, and begin implementing resilience practices in local ordinances, land use plans, or through other means. ▲

## NCAFPM's Logo Gets a Fresh New Look!

AMIT SACHAN | NCAFPM CHAIRMAN

The original North Carolina Association of Floodplain Managers (NCAFPM) logo has been used since our inception in 1989, over 29 years ago. While this classic logo did a great

job representing our organization, members felt it was time to revamp the classic logo with a more modern look, color scheme, and feel. The NCAFPM represents floodplain managers across the state and the new logo needed to represent the hard work, passion, and dedication of each and every

member of the association from Appalachia to the Outer Banks.

In the search to update our logo, talented graphic designers from our partners accepted the challenge, coming up with six great options. After a thorough voting process, the NCAFPM Board selected a version which they felt adequately portrays our organization and captures the essence of the great State of North Carolina, from majestic mountains to a magnificent coastline. The new logo is beautifully simple, and we are excited to have it represent our organization. ▲



Original NCAFPM logo



New NCAFPM logo

## North Carolina Association of Floodplain Managers Board of Directors 2018-2019

### Regional Representatives

#### Region A

Holly White, AICP, CFM  
Town of Nags Head  
252.232.6028  
[holly.white@nagsheadnc.gov](mailto:holly.white@nagsheadnc.gov)

#### Region B

Scott Brookhart, PE, CFM  
McCormick Taylor  
919.233.8965  
[sbrookhart@mccormicktaylor.com](mailto:sbrookhart@mccormicktaylor.com)

#### Region C

Jeremy Hardison, czo, CFM  
Town of Carolina Beach  
910.458.2991  
[jeremy.hardison@carolinabeach.org](mailto:jeremy.hardison@carolinabeach.org)

#### Region D

Terry Kuneff, PE, CFM  
City of High Point  
336.883.8583  
[terry.kuneff@highpointnc.gov](mailto:terry.kuneff@highpointnc.gov)

#### Region E

David Goode, PE, CFM  
Mecklenburg County  
704.432.3087  
[david.goode@mecklenburgcountync.gov](mailto:david.goode@mecklenburgcountync.gov)

#### Region F

Nathan Pennington, CFM  
Buncombe County  
828.250.4856  
[nathan.pennington@buncombecounty.org](mailto:nathan.pennington@buncombecounty.org)

### At-Large Representatives

Stephen E. Smith, CFM  
Town of Ayden  
252.481.5827  
[ssmith@ayden.com](mailto:ssmith@ayden.com)

David Key, PE, CFM  
ESP Associates  
919.678.1070  
[dkey@espassociates.com](mailto:dkey@espassociates.com)

### NCEM Representatives

Randy Mundt, CFM  
NC Floodplain Mapping Program  
919.825.2300  
[randy.mundt@ncdps.gov](mailto:randy.mundt@ncdps.gov)

Dan Brubaker, PE, CFM  
NC Floodplain Mapping Program  
919.825.2339  
[dan.brubaker@ncdps.gov](mailto:dan.brubaker@ncdps.gov)

# The Flood Risk Evaluator

TOM LITTLE, CFM, CGP | SMART VENT PRODUCTS INC.

In October 2012, Hurricane Sandy devastated the northeast leaving thousands with the need to rebuild or elevate. At the same time, Biggert-Waters was just starting to be implemented, driving National Flood Insurance Program reform. This one-two punch led Smart Vent Products, Inc. to come up with a complimentary service they call the Flood

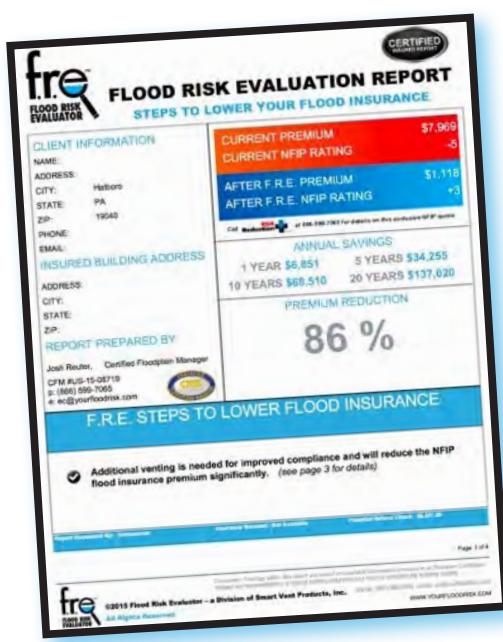
Risk Evaluator (F.R.E.)®. Since its inception, the F.R.E. program has reviewed over 4,000 elevation certificates and reported back to owners over \$7.9 million dollars in flood insurance savings. 37% of those reductions fall into the “good case” category, which includes reasonable mitigation such as adding compliant flood vents, cleaning up misratings, and grandfathering. Owners are experiencing an average of \$1,966 in savings per year for these good cases.

What started off as a tool to help homeowners dealing with increasing flood insurance costs now has found designers, realtors, and floodplain managers from all around the country. Surveyors appreciate how the F.R.E. team provides a quality assurance check on the elevation certificates they are complet-

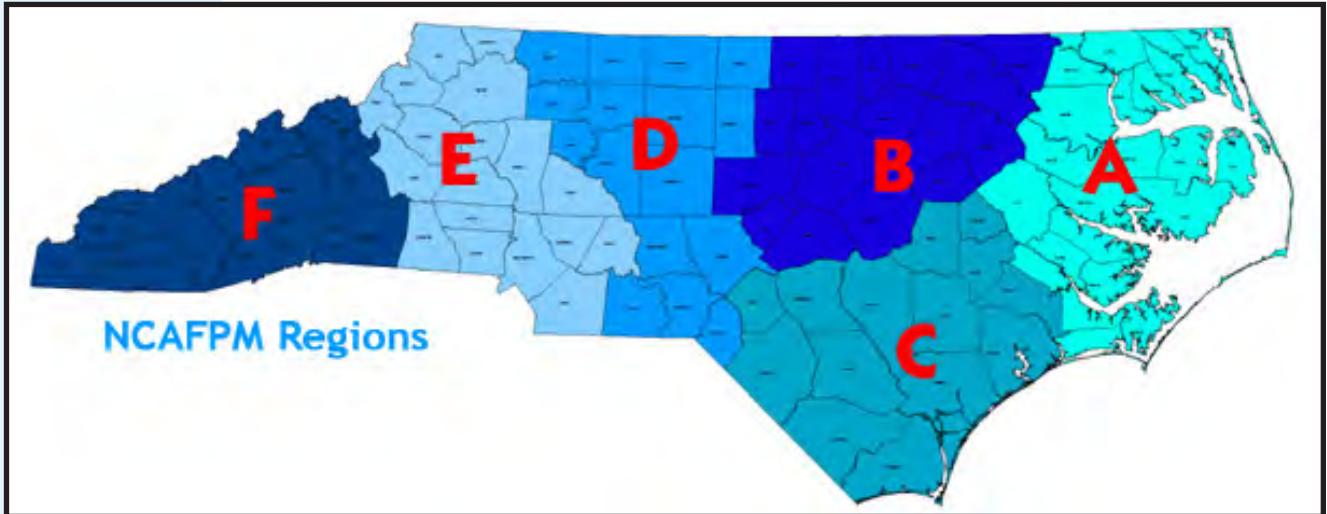
ing. They also share the F.R.E. reports with their clients to add value to the services they are providing. Architects appreciate how F.R.E. sheds a light on how their design influences insurance rates. They now can showcase to their customers how adding 4' of freeboard to the design will be paid back in the form of insurance reductions. Designers also share the reports to showcase an NFIP compliant design and that they did their job to the best of their ability. Realtors include F.R.E. reports for listings as well as for the buyers so that they can truly see what they may be getting into from a flood insurance standpoint. The buyer will also be aware of what steps may be needed to reduce their premium. Floodplain managers and officials find that F.R.E. provides a direct visual for residents to become more resilient and save money at the same time.

Lately, F.R.E. reports have been supporting grant programs to help support cost-benefit analysis. Reports are able to showcase what the premium will look like in five years if the home is not elevated and then compare it to what the premium will look like if it's elevated one to four feet above the base flood elevation. Annual savings are displayed over a 1, 5, 10, and 20-year period making it easy to track the return on investment.

For more information about the F.R.E. program, please contact Tyler Ardon, VP of Risk Reduction Plus Group, at [tardron@riskreductionplus.com](mailto:tardron@riskreductionplus.com) or 866-599-7066 ext. 105 or go to [smartvent.com](http://smartvent.com). ▲



# NCAFPM Regional Reports



## Regional Representatives

**Region A** | Holly White, AICP, CFM — [holly.white@nagsheadnc.gov](mailto:holly.white@nagsheadnc.gov)

**Region B** | Scott Brookhart, PE, CFM — [swbrookhart@mccormicktaylor.com](mailto:swbrookhart@mccormicktaylor.com)

**Region C** | Jeremy Hardison, CZO, CFM — [jeremy.hardison@carolinabeach.org](mailto:jeremy.hardison@carolinabeach.org)

**Region D** | Terry Kuneff, PE, CFM — [terry.kuneff@highpointnc.gov](mailto:terry.kuneff@highpointnc.gov)

**Region E** | David Goode, PE, CFM — [david.goode@mecklenburgcountync.gov](mailto:david.goode@mecklenburgcountync.gov)

**Region F** | Nathan Pennington, CFM — [nathan.pennington@buncombecounty.org](mailto:nathan.pennington@buncombecounty.org)

North Carolina is divided into six NCAFPM regions. Our Regional Representatives give NCAFPM members in each region a “voice” on our board. Flood plain administrators in these regions can contact their representative who can bring regional issues to the board’s attention (ex. coastal erosion, flash flooding and landslides in the mountains, etc.). The map above shows the regions in a graphical format, and below is a list of the counties in each region.

**Region A** | Beaufort, Bertie, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hertford, Hyde, Martin, Pamlico, Pasquotank, Perquimans, Pitt, Tyrrell, and Washington

**Region B** | Chatham, Durham, Edgecombe, Franklin, Granville, Halifax, Harnett, Johnston, Lee, Nash, Northampton, Orange, Person, Vance, Wake, Warren, and Wilson

**Region C** | Bladen, Brunswick, Columbus, Cumberland, Duplin, Greene, Hoke, Jones, Lenoir, New Hanover, Onslow, Pender, Robeson, Sampson, and Wayne

**Region D** | Alamance, Anson, Caswell, Davidson, Davie, Forsyth, Guilford, Montgomery, Moore, Randolph, Richmond, Rockingham, Scotland, Stokes, Surry, and Yadkin

**Region E** | Alexander, Alleghany, Ashe, Avery, Burke, Cabarrus, Caldwell, Catawba, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly, Union, Watauga, and Wilkes

**Region F** | Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, and Yancey

## Region A

Holly White, AICP, CFM

### Regional Reports (*from previous page*)

There has been a plethora of activity, planning, and engineering in Region A this spring. From rainfall studies to CRS to flood mitigation, it's happening in Region A. NCAFPM offers kudos to the staff and elected officials in this region for their hard work!

### Division of Coastal Management

The Division of Coastal Management staff are working in five coastal communities on a Resiliency Evaluations and Needs Assessment (RENA). This is part of a five-year project to create a comprehensive resilience-building guide or online portal for coastal North Carolina. For more information on this pilot project see the article on page 14, "Resiliency Evaluations and Needs Assessments" (RENA) by the Division of Coastal Management.

### Various Municipalities in Region A

Communities throughout Region A are participating in the King Tides project. For more information, visit [nckingtides.web.unc.edu](http://nckingtides.web.unc.edu).

### Currituck County

Currituck County has partnered with The Nature Conservancy and students from Duke University to delineate drainage basins and develop a data driven model to identify areas vulnerable to rainfall based flooding. For more information on this project, reference the more in-depth article on page 3 of this newsletter.

### Dare County

Dare County and the Towns of Manteo, Nags Head, Kill Devil Hills, Kitty Hawk, Southern Shores, and Duck have joined efforts to develop consistent messaging about the risks associated in X and Shaded X zones. The group embraced the motto, "Low Risk is Not No Risk" and has developed a brochure to explain the importance of carrying flood insurance, even in an X flood zone. For more information on this project, see "Dare County Governments Join Efforts in CRS Outreach Activities" on page 19.

### City of Elizabeth City

The City of Elizabeth City received a grant through the NC Division of Coastal Management's Planning and Management Grants Program to create a plan to mitigate flooding and improve flood resilience. Moffatt & Nichol (M&N) was selected by the City to complete the Charles Creek Flood Mitigation Plan. In tandem with the Flood Mitigation Plan, Planning Director Matthew Schelly is also overseeing a Waterfront Master Plan that looks at how to capitalize and enhance the waterfront and floodplains while at the same time mitigating against future flooding. For more information on this project, see the article on page 8 "City of Elizabeth City – Waterfront Plan and Charles Creek Flood Mitigation."

## Region C

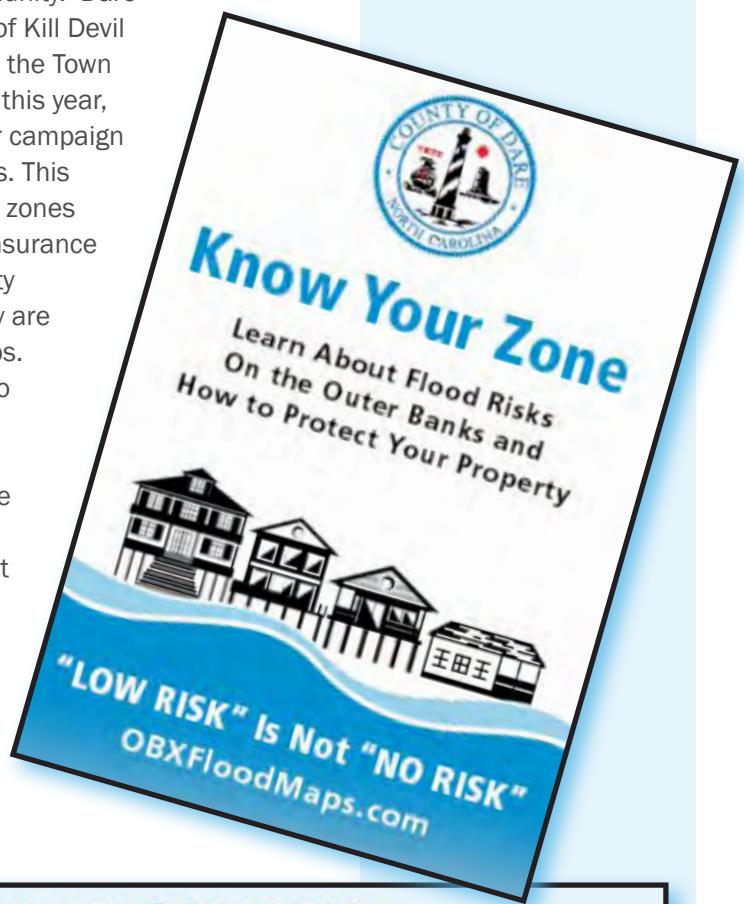
Jeremy Hardison, CZO, CFM

Brunswick, Pender, New Hanover, and Onslow counties have teamed up and created the first Community Rating System (CRS) User Group in North Carolina. Named the Southeast North Carolina CRS User Group, it consists of local communities that meet regularly to provide a forum about the National Flood Insurance Program's voluntary program, the Community Rating System, and other floodplain management issues. Meetings include informational presentations and group discussions to transfer knowledge and troubleshoot difficult floodplain management issues. Non-participating communities attend these meetings to ask questions and learn from the discussions and presentations as they contemplate joining the program. The user group also is a great opportunity to build a network of floodplain contacts and to keep CRS efforts top of mind. ▲

# Dare County Governments Join Efforts in CRS Outreach Activities

DONNA CREEF, CFM | DARE COUNTY

In an effort to increase the effectiveness of CRS outreach activities, the seven local governments in Dare County, North Carolina, have joined efforts to raise awareness about flood risks and the importance of flood insurance in their community. Dare County, the Town of Manteo, the Town of Nags Head, the Town of Kill Devil Hills, the Town of Kitty Hawk, the Town of Southern Shores, and the Town of Duck all participate in the Community Rating System. Earlier this year, the group chose the slogan “Low Risk” is Not “No Risk” for their campaign and designed a brochure for use in their CRS outreach activities. This slogan was selected to emphasize awareness of flood risks in X zones and Shaded X zones and to stress the need to maintain flood insurance coverage in these zones. Preliminary flood maps for Dare County have been released by FEMA and many properties in the county are reclassified as X zones and Shaded X zones on the revised maps. Local officials are concerned that property owners will choose to drop their flood insurance coverage once the preliminary maps are adopted next year. The group has asked local realtors and insurance agents to distribute the brochures to their clients. The brochure will also be used by the local governments in their annual mailings and other outreach activities conducted as part of the CRS program. “This collaborative effort and use of the “Low Risk” is Not “No Risk” slogan will have a greater impact since we are all relaying the same message to the property owners of Dare County regardless of our respective political boundaries.” stated Donna Creef, Dare County Planning Director. ▲



## FLOODING IN DARE COUNTY

Even homes on higher ground are vulnerable. 25% of flood losses occur in low-risk flood zones.

Hurricanes and tropical storms generate heavy rainfall.

Strong winds combined with saturated soils from excessive rainfall can result in downed trees.



Storm surge from storms can be several feet above average high tide.

High Tide

Low Tide

Rain and surface runoff cause stormwater systems to overflow. High storm surge also hinders drainage.

Beach dunes can be overtapped, exposing properties behind the protective barrier of the dunes.

Flooding and beach erosion destroy sand dunes and dune vegetation.

# NFIP Coordinator's Corner

Dan Brubaker, PE, CFM  
NFIP State Coordinator  
**919-825-2300**  
[dan.brubaker@ncdps.gov](mailto:dan.brubaker@ncdps.gov)  
[www.ncfloodmaps.com](http://www.ncfloodmaps.com)



Hello, everyone, and I hope you are enjoying this issue of the *FlashFlood News*. I recently finished my own version of “March Madness”: One week at EMI for the Hazard Mitigation Conference, one week teaching L-273, and one week at FEMA meetings in Atlanta. I’m either learning what’s new or passing along what’s been established. We are in a changing environment and the NFIP is no exception.

When I started as the NFIP Engineer seven years ago, I thought the solution to flood disasters could be solved following two simple rules. 1) Don’t build in the flood hazard area if you can help it, and 2) If you have to build in the flood hazard area, protect what you build. I still think that following these two rules is the solution, at least a part of it, but I realize now the monumental task of following them.

I think that the folks who created the NFIP in 1968 were probably as naïve as I was, thinking that their framework provided a sensible, logical solution to flood disasters. And it did, on an individual basis. However, it did not account for the fact that we humans are not always prone to respond with sense and logic, especially (and understandably) where costs are concerned. Which leads to two lines of thought:

- “I could elevate, but it’s a lot cheaper not to, and there’s no guarantee that another flood will happen.” Its corollary is, “We had a 100-year flood in 2016. We’re not going to have another one for decades!” (Yes, I still hear this.)
- The other phrase I hear is that flood insurance costs money. Uh-huh. “Why should I pay for something that might not happen?” To which I don’t have a great answer, since everyone’s situation is different. From my perspective (growing up in a working class suburban environment), many of the arguments I hear don’t make sense. That doesn’t mean they’re wrong.

It seems no solution tried to date is fair, equitable, sustainable, and just. Not that we’ve given up. I have a friend who grew up in a house that flooded regularly, and eventually asked, “Can’t we do something about this?” Now she is. She’s determined that flood disasters are not going to happen in her corner of the world, and is doing a great job making progress.

**You Are Pre-Disaster Mitigation.** That was a phrase I heard at the Hazard Mitigation Conference that really stuck with me. Everyone reading this has a role in pre-disaster mitigation. Whether you are an administrator enforcing the regulations of your ordinance and resisting variances, an elected official supporting your staff, a legislator considering adding or restoring resilience elements in the building code, or an engineer building infrastructure, you ALL have a role making your corner of the world resilient to flood disasters. The staff with NC Emergency Management will do whatever we can to help you achieve this.

## Obligatory Or Necessary?

I saw a recent article on the Rand website on why Houstonians did not buy flood insurance. Their conclusion: They weren’t required to. Considering 8% of the U.S. population was affected by floods in 2017, have we reached a turning point where disaster considerations,

— continued on next page

and specifically flood considerations, are considered in our daily decisions? The article is at [rand.org/blog/2017/09/why-houstonians-didnt-buy-flood-insurance.html#](http://rand.org/blog/2017/09/why-houstonians-didnt-buy-flood-insurance.html#)

I wonder what more effective outreach might accomplish. High water mark signs, especially in public places, provide a great reminder of the risk of flooding. If your community suffers from flood disasters and your citizens and elected officials seem to suffer from “disaster amnesia,” High-water mark signs provide a great reminder of why flood protection is so important, and how bad it can get. And you get CRS points for them!

## Coordinator's Award

Congratulations to Chip Crumpler of Wayne County. Chip was the well-deserved recipient of the 2018 Coordinator's Award. From the award text: *Presented on this day, April 17, 2018, to Chip Crumpler from the North Carolina Division of Emergency Management, in recognition of your diligent efforts on behalf of Wayne County to prevent damage due to flooding, for effectively and consistently applying the County's development review and approval process to assure compliance with National Flood Insurance Program regulations; for devoting 18 years to resilient planning within Wayne County through the innovative use of Geographic Information Systems; for enthusiastically supporting regulations that promote sound floodplain management practices and policies to protect the natural and beneficial functions of floodplains; and most notably through flood hazard recovery efforts from Hurricanes Fran and Floyd as a Planner I and then through Hurricane Matthew as the Planning Director. Thank you for your distinguished service to the citizens of Wayne County and the State of North Carolina.*

## Quick Points

Following Hurricane Harvey, flood insurance paid, on average, \$110,000 per policy. Individual assistance paid, on average, \$4,000 per household.

**Mitigation Saves!** Whatever the risk, spending money on mitigation now means saving money down the road: [fema.gov/media-library/assets/documents/156979](https://fema.gov/media-library/assets/documents/156979).

Dry floodproofing was performed poorly during Hurricane Harvey. More information will be forthcoming with the Harvey Mitigation Assessment Team Report from FEMA. In the meantime, I encourage you to think carefully and long-term about flood measures that require human intervention or that may be prone to settlement, displacement, or modifications over time.

## Flood NC

The [flood.nc.gov](http://flood.nc.gov) website has been up and running for a few months now. You can find information on flood risk, mapping status, insurance, and training, as well as record documents and guidance. Go online, take a look, and let us know if you have any questions or suggestions. ▲

## NFIP Coordinator's Corner



National Benefit-Cost Ratio (BCR) Per Peril <small>*BCR numbers in this study have been rounded</small>		Beyond Code Requirements	Federally Funded
Overall Hazard Benefit-Cost Ratio		\$4:1	\$6:1
	Riverine Flood	\$5:1	\$7:1
	Hurricane Surge	\$7:1	Too few grants
	Wind	\$5:1	\$5:1
	Earthquake	\$4:1	\$3:1
	Wildland-Urban Interface Fire	\$4:1	\$3:1

See the article on page 23 for more details about the recently republished website.

# North Carolina Floodplain Mapping Program UPDATE

Randy Mundt, AICP, CFM  
Outreach Coordinator  
Risk Management  
Section

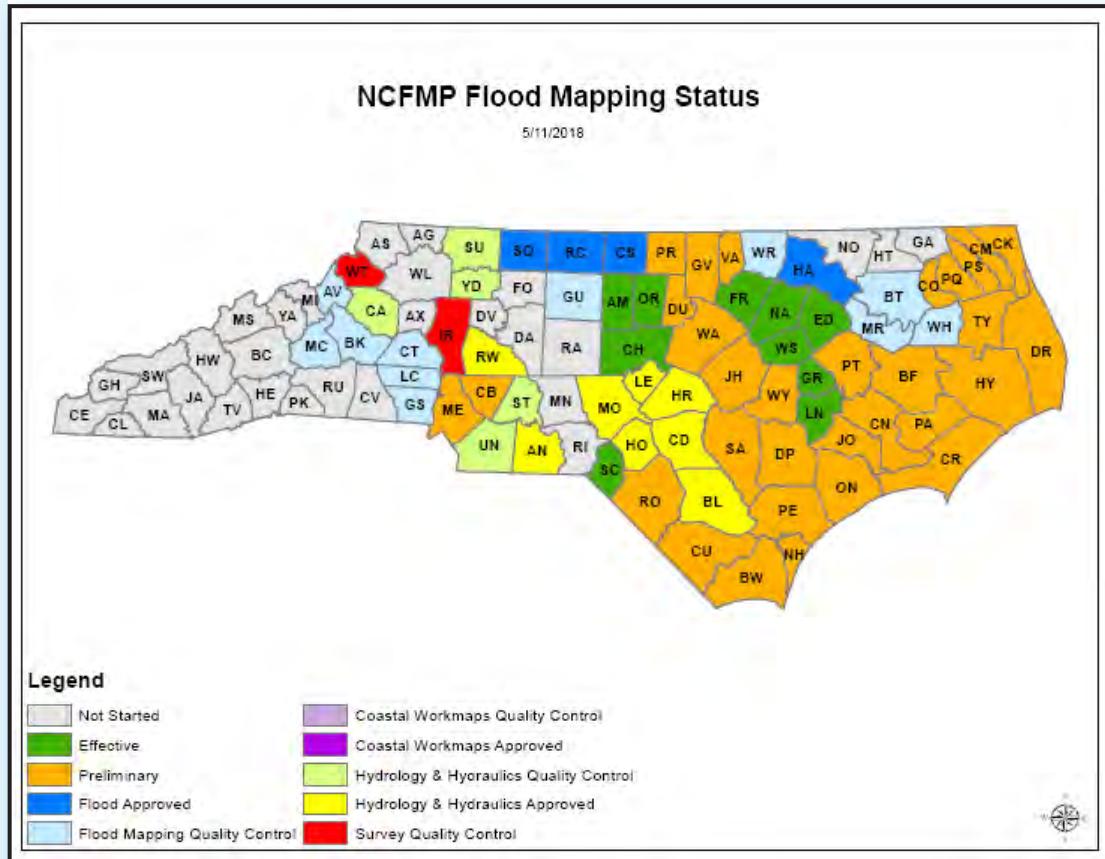
919-825-2339  
[randy.mundt@ncdps.gov](mailto:randy.mundt@ncdps.gov)  
[www.ncfloodmaps.com](http://www.ncfloodmaps.com)



*Plan. Prepare. Stay informed.*  
Download the ReadyNC app  
– it's free!

[www.readync.org](http://www.readync.org)

Since November 2017 when Alamance, Chatham, and Orange were the first counties in the US to have their updated FIS and FIRMs go all-digital, we've moved forward with four more groups of counties to get their letter of final determination (LFD). The first group includes Duplin, Johnston, Sampson, and Wayne Counties, and they received their LFDs December 20, 2017 ("Effective" date June 20). Then on February 28, Brunswick and New Hanover became the first coastal counties to get their LFDs (August 28 "Effective" date). On April 19, Durham County issued their LFD (October 19 "Effective" date). And Cabarrus and Mecklenburg Counties had an LFD issued on May 16 (their "Effective" will be November 16). The forecast is for the northeast five counties (Chowan, Perquimans, Pasquotank, Camden, and Currituck) to receive an LFD on June 21, which makes December 21 an early Christmas present of new "Effective" data to administer. Not including these counties, there are presently seventeen counties in the post-preliminary process which are working their way through the post-preliminary process; several have submitted appeals/comments which will necessitate providing revised preliminary data. We have shared our DRAFT revisions with communities of Wake, Pender, Jones, Beaufort, Craven, and Pitt Counties, and the changes have been accepted. The next step is to provide the revised preliminary mapping within the next six months. Based on the complexity of the revisions, some will get a new 90-day appeal period, but others will only have a 30-day review period. We are coordinating with FEMA on developing the schedule for LFDs for those remaining in the post-preliminary process, as well as working through the next several rounds of preliminary FIS/FIRM issuance, which may not occur until the end of 2018 or early 2019.



## flood.NC.gov is now Online

Since the beginning of this year, there is a new website for flood data tailored to millennials: [flood.nc.gov/ncflood](http://flood.nc.gov/ncflood).

The site was developed to provide quick access to a host of floodplain-related information with a minimum of clicks. The website provides easy access (and in many cases critical links) to property risk information (more typically found in greater depth at the NC FRIS website), status updates on the NC Floodplain Mapping Program, access to myriad NFIP-related documents and guidance, information on NFIP-related upcoming events and trainings, quick information on floodplain management standards and safer development practices, processing of Letters of Map Change (LOMCs), flood hazard mitigation information, and flood warning access through the NC Flood Inundation Mapping Alert Network (FIMAN). The new website allows users to enter an address to get a snapshot of that properties flood risk profile. The profile can provide a basic “high,” “medium,” or “low” for the flood hazard of that property, as well as provide an estimate of the cost of a flood’s impact on a building, an estimate of insurance premiums, options for flood mitigation, and how to monitor flood warnings from nearby stream gages.

The website is set up so that different types of users — real estate agents, insurance agents, professional engineers and/or surveyors, and community officials — have a wealth of information they typically need already assembled for their perusal. It is hoped that community floodplain administrators will continue to refer to the NC FRIS website for their determinations of flood risk related to local floodplain administration, but other users should benefit from the new platform for floodplain-related data and information with Flood.NC.Gov.

## The NFIP in North Carolina

MILTON CARPENTER, CFM | NC DEPARTMENT OF PUBLIC SAFETY

We welcome the towns of **Parkton** in Robeson County (6/1/2017), **Lake Santeetlah** in Graham County (9/12/17), **Lawndale** in Cleveland County (1/16/2018) and **Waco** also in Cleveland County (3/15/2018) into the National Flood Insurance Program. These additions raises the number of Participating Communities in North Carolina to 584. North Carolina has the largest number of NFIP Participating Communities in FEMA Region IV.

In North Carolina, we have a total of 134,167 policies representing \$33,516,627,400 in insurance coverage. 5,763 of these policies are V-Zone or coastal policies, while 77,472 are A-Zone policies, the remaining 50,932 would be X-Zone policies.

CRS participation in North Carolina saves the average policyholder \$101 for a total savings of \$11,136,081. We are pleased to note CRS participating communities now includes **Brunswick County** and the **City of Gastonia**, with a total policy count of 3,740.▲

# flood.NC.gov



# 2018 Training

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Emergency  
Management  
Institute



FEMA

[Click here](#) for information on how to apply for these courses.

[Click here](#) when you are ready to fill out the application.

## Emergency Management Institute 2018 Summer Courses with a Floodplain Management and/or Mitigation Focus

June 25-28	E0278 NFIP/Community Rating System
June 25-26	E0213 HMA: Application Review and Evaluation
June 27-28	E0214 HMA: Project Implementation and Program Closeout
July 9-12	E0194 Advanced Floodplain Management Concepts 1. NFIP Floodplain Rules and Regulations in Depth (1 day) 2. LOMC - Procedures for Applying and FPM Implications (1 day) 3. Roles and Responsibilities of the Local Floodplain Manager (1 day) 4. Preparing for Post-Disaster Responsibilities (1 day)
July 30-Aug 2	E0282 Advanced Floodplain Management Concepts II 1. Higher Standards in Floodplain Management (1 day) 2. Manufactured Homes and RVs in the Floodplain (1 day) 3. NFIP Flood Insurance Principles for the Floodplain Manager (1 day) 4. Hydrology and Hydraulics for the FPM (1 day)
Aug 13-16	E0386 Residential Coastal Construction
Aug 27-30	E0273 Managing Floodplain Development through the NFIP



Summer Workshop course registration and information is available on [TERMS](#).

## North Carolina NFIP Training

August 1-2	Western Summer Workshop, Hendersonville
August 15-16	Central Summer Workshop, Carthage
Sept. 19-20	Eastern Summer Workshop, Washington

We are also offering a Certified Floodplain Surveyor Training Class and Exam on October 31-November 3 (more information at [ncsurveyors.com](#)).

# 2018 Conferences & Events

The NCAFPM helps to advertise other floodplain management-related conferences and events but we do not have any involvement in planning these events, nor do we handle registration. Please see individual announcements for details. Dates and links are also located on the back page of this newsletter.

NC State University Stream Restoration Program sponsors this biennial conference. With preserving, enhancing, and restoring the entire riparian ecosystem in mind, EcoStream is the preeminent conference that focuses on stream restoration for the southeast region of the US. This well-attended event facilitates discussions among restoration practitioners, managers and scientists towards advancing ecological restoration to better achieve functional inter-connectedness of wetlands, streams, hydrology, riparian corridors and the biologic communities they support. For more information, [click here](#).



**August 13-16**  
**Asheville, NC**

The APWA-NC Stormwater Management Division Conference will be held this year in Winston-Salem on September 17-18 at the Benton Convention Center – Twin City Quarter (301 W. 5th St, Winston-Salem, NC). Issues and concerns related to water quality and stormwater management continue to play a significant role in the world of public works, shaping technical focus and policy throughout government and private industry. Join us as we once again provide a variety of learning opportunities in a fun and friendly atmosphere. Registration opens in early June. More information: [northcarolina.apwa.net](http://northcarolina.apwa.net).



**September 17-18**  
**Winston, Salem, NC**

The 13<sup>th</sup> Annual Regional Stormwater Conference will be held at the Hilton Head Marriott Resort & Spa in Hilton Head on October 3-5. It's the only regional conference focused solely on stormwater education and challenges that confront stormwater professionals in the public and private sectors. Attendees can select from diverse topics in two educational tracks and will be eligible for up to 16 continuing education credits. This is also another great networking opportunity with other stormwater professionals in the southeast. More information at [seswa.org](http://seswa.org).



**October 3-5**  
**Hilton Head, SC**

# Calendar

DETAILS FOR MANY OF THE CONFERENCES listed below are available throughout this newsletter for NCAFPM events and on page 25 for other conferences and events.

## June 17-21, 2018

ASFPM ANNUAL CONFERENCE  
Phoenix, AZ  
[ASFPMconference.org](http://ASFPMconference.org)

## August 13-16, 2018

ECOSTREAM: STREAM ECOLOGY & RESTORATION CONFERENCE  
Asheville, NC  
[bae.ncsu.edu](http://bae.ncsu.edu)

## Sept. 17-18, 2018

APWA-NC STORMWATER MANAGEMENT DIVISION CONFERENCE  
Winston-Salem, NC  
[northcarolina.apwa.net](http://northcarolina.apwa.net)

## October 3-5, 2018

SESWA ANNUAL CONFERENCE  
Hilton Head, SC  
[seswa.org](http://seswa.org)

## October 16-19, 2018

NCAFPM FALL FLOODPLAIN INSTITUTE  
Asheville, NC  
[ncafpm.org](http://ncafpm.org)

# Floodplain Management Resources

updated spring 2018

## Technical Assistance (State)

### NC Emergency Management

#### National Flood Insurance Program

**NFIP State Coordinator:** Dan Brubaker, PE, CFM  
[dan.brubaker@ncdps.gov](mailto:dan.brubaker@ncdps.gov) | 919-825-2300

#### NFIP Planners

**Central Area:** Milton Carpenter, CFM  
[milton.carpenter@ncdps.gov](mailto:milton.carpenter@ncdps.gov) | 919-825-2302

#### Eastern Branch: (OPEN)

**Western Branch:** Terry Foxx, CFM  
[terry.foxx@ncdps.gov](mailto:terry.foxx@ncdps.gov) | 828-228-8526

### NC CLOMR/LOMR Submittals

[www.ncfloodmaps.com/mt-2\\_forms.htm](http://www.ncfloodmaps.com/mt-2_forms.htm)

#### LOMC Manager/Community Development

**Planner:** Steve Garrett, CFM  
[steve.garrett@ncdps.gov](mailto:steve.garrett@ncdps.gov) | 919-825-2316

## Maps & Flood Insurance Studies

### FEMA Map Information eXchange (FMIX)

1-877-336-2627 (1-877-FEMA-MAP)

### Mecklenburg County CLOMR/LOMR Submittals

Technical assistance, LOMA/LOMR Requests  
877-336-2627 (877-FEMA-MAP) (toll free)

### NC Floodplain Mapping Program

919-715-5711

[www.ncfloodmaps.com](http://www.ncfloodmaps.com)

[flood.nc.gov](http://flood.nc.gov) (coming soon!)

**Program Manager:** Tonda Shelton, CFM  
[tonda.shelton@ncdps.gov](mailto:tonda.shelton@ncdps.gov) | 919-825-2345

**Outreach Coordinator:** Randy Mundt, AICP, CFM  
[randy.mundt@ncdps.gov](mailto:randy.mundt@ncdps.gov) | 919-825-2339

#### Community Development Planner II:

Stacey Fuller Bobbitt, CFM  
[stacey.bobbitt@ncdps.gov](mailto:stacey.bobbitt@ncdps.gov) | 919-825-2315

## Technical Assistance (FEMA)

### National Flood Insurance Program Floodplain Management and Insurance Branch: FEMA Region IV

[fema.gov/region-iv-al-fl-ga-ky-ms-nc-sc-tn](http://fema.gov/region-iv-al-fl-ga-ky-ms-nc-sc-tn)

**Branch Chief:** Jason Hunter

[jason.hunter@fema.dhs.gov](mailto:jason.hunter@fema.dhs.gov) | 770-220-5471

**Natural Hazards Program Specialist**

Tamara Hansen  
[tamara.hansen@fema.dhs.gov](mailto:tamara.hansen@fema.dhs.gov) | 770-220-5288

**FEMA Region IV Insurance Specialist**

Janice Mitchell  
[janice.mitchell@dhs.gov](mailto:janice.mitchell@dhs.gov) | 770-220-5441

## Individual Lot LOMA/LOMR

FEMA LOMA DEPOT

3601 Eisenhower Avenue  
Alexandria, VA 22304-6425  
Attn: LOMA Manager

## Flood Insurance Policy Issues

**Regional Manager:** Janice Mitchell  
[janice.mitchell@dhs.gov](mailto:janice.mitchell@dhs.gov) | 770-220-5441

**Regional Liaison:** David Clukie, CFM  
[dclukie@ostglobal.com](mailto:dclukie@ostglobal.com) | 770-893-1480

## Websites

NCAFPM.....[ncafpm.org](http://ncafpm.org)

ASFPM .....[floods.org](http://floods.org)

FEMA.....[fema.gov](http://fema.gov)

NFIP.....[floodsmart.gov](http://floodsmart.gov)

NCEM .....[ncdps.gov/Our-Organization/  
Emergency-Management](http://ncdps.gov/Our-Organization/Emergency-Management)

NC Maps .....[ncfloodmaps.com](http://ncfloodmaps.com)  
[flood.nc.gov](http://flood.nc.gov)

FRIS .....[fris.nc.gov/fris](http://fris.nc.gov/fris)

FIMAN .....[fiman.nc.gov/fiman](http://fiman.nc.gov/fiman)

**FlashFlood NEWS** is a semi-annual online publication which offers information and education on topics that are of current interest in the field of floodplain management and the National Flood Insurance Program.

Information and opinions do not necessarily reflect the views of the North Carolina Association of Floodplain Managers.

All inquiries and article ideas should be directed to Kelly Keesling at [kgkeesling@carolina.rr.com](mailto:kgkeesling@carolina.rr.com).

For more information about the North Carolina Association of Floodplain Managers, see our website at [ncafpm.org](http://ncafpm.org).

## SPONSORS

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## MEMBERSHIP

For more information about becoming a member of NCAFPM or for a membership application, go to [ncafpm.org/membership](http://ncafpm.org/membership).

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## EDITOR & CREATIVE DIRECTOR

Kelly Keesling  
[kgkeesling@carolina.rr.com](mailto:kgkeesling@carolina.rr.com)