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## Fall Floodplain Institute October 21-23, 2015 Cherokee, NC

This year will be the 10th anniversary of NCAFPM's Fall Floodplain Institute (FFI). It will be held Wednesday, October 21 through Friday, October 23 at Harrah's Resort and Conference Center in Cherokee, NC.

Our fall conference provides an opportunity to attend workshops and presentations, take the Certified Floodplain Manager exam, and mingle with your fellow floodplain managers.

Registration is \$240 for NCAFPM members (\$300 for non-members) and includes plenary session, conference presentations, break refreshments, Thursday lunch and evening social. One day rates are also available. Register online at [ncafpm.org/FFI](http://ncafpm.org/FFI).

## Sponsorships

At this year's FFI, we are offering sponsorships for companies to provide support for what has become an annual fall training event in scenic western North Carolina. See [ncafpm.org/FFI](http://ncafpm.org/FFI) for information about our sponsorship opportunities.

Thank you to the companies who have already sponsored this conference: ESP, Freese and Nichols, THC, Atkins, Alpha & Omega Group, and Smart Vent.

## CFM Exam

The Certified Floodplain Manager (CFM) exam will be offered on Friday, October 23. Note: Application must be approved prior to taking the exam. The exam fee is not included in conference registration. See the [NCAFPM Certification webpage](#) for more information and to apply to take the exam.

## Golf Tournament

A golf outing will take place on Wednesday, October 21 at Sequoyah National Golf Club. The cost to play is \$55 per person and includes greens fee, cart, and range balls. For more information, contact John Fullerton at [nchalfbacks@aol.com](mailto:nchalfbacks@aol.com) or 910-686-5640. Register with John or include your golf fee when you register for the conference. ▲

The conference program is available on the [Fall Floodplain Institute webpage](#).

**Register at [ncafpm.org/FFI](http://ncafpm.org/FFI)**

## From the Chairman's Desk



DAVID KEY, PE, CFM  
NCAFPM CHAIRMAN

Greetings North Carolina Floodplain Managers and industry thought leaders! I am writing you this afternoon while most of North Carolina has been experiencing what my mother used to call a “gully washer.” As I watch the rain outside and the radar on my laptop today (see the graphic below), I am reminded how thankful I am to live in a state with such proactive emergency management

and floodplain managers. I may be a little biased but our state has the “model for the nation” in floodplain mapping and risk communication. We also have one of the most active, dedicated, and talented chapters in the nation. For that, I am proud to call you all friends and colleagues.

Just about every September, my thoughts turn away from summers, beaches, lakes, and BBQ and turn toward getting back into the “groove” of work and kids in school. It is also great to have those first crisp mornings that remind us that colder weather is on its way. However, every September my thoughts also turn back to some “not so nice” Septembers when our state was facing damaging flooding from hurricanes and tropical storms. Just 16 years ago this week, the eastern half of our state was still recovering from Hurricane Floyd. As I tweeted this week about this anniversary, “while we pray it may never happen again, we must prepare like it will.” Never forget.

There is a lot going on in our industry and in our state, and some of this is covered in this edition of *FlashFlood News*. Highlights include the recent ASFPM Gilbert White Flood Policy Forum which was held in Washington, D.C. last week, the Fall Floodplain Institute next month, and the exciting ASFPM State Symposium on Flood Risk hosted by our chapter in spring 2016!

I sincerely hope ya’ll are have a wonderful fall season and I thank you for your dedication to protecting property and lives in this state. I look forward to seeing you all in Cherokee!

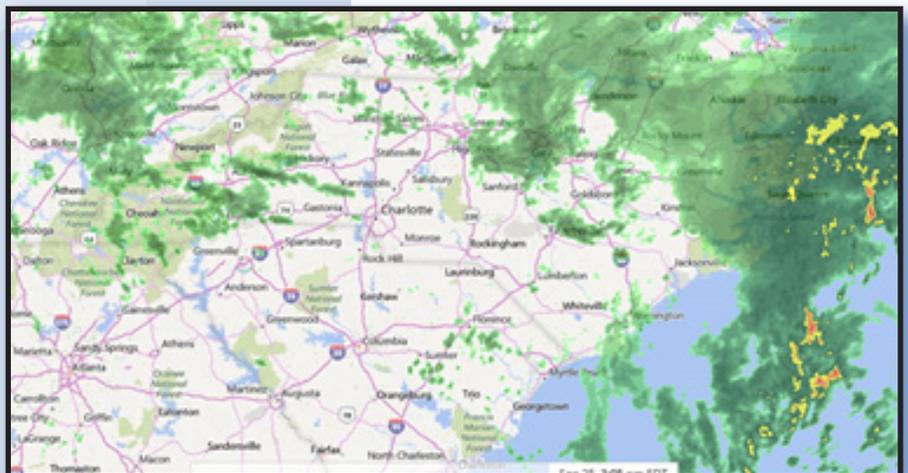
A blue ink handwritten signature that reads "David".

## Thank you to our newsletter sponsors!

*FlashFlood News* is funded by sponsorships from consultants and vendors. Please see the [Media Kit](#) on our website with details about the newsletter, sponsorship options, and deadlines for submittal. If you are interested in sponsoring or would like more information, contact Kelly Keesling at [kgkeesling@carolina.rr.com](mailto:kgkeesling@carolina.rr.com).



ALPHA & OMEGA GROUP  
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# Flood Model Update

Earlier this year, NCAFPM received a Ward's Flood Model and custom case for use in flood risk education. Our members can engage with the public on our Association's missions and goals by using this ready-to-use tool that visually demonstrates the impact that our built environment can have on flooding events. We introduced the Flood Model at our annual conference in April. Since then, we have been working on logistics to help organize, plan, and execute E&O events with the flood model.

The general workflow of checking out the Flood Model for use will look like this:



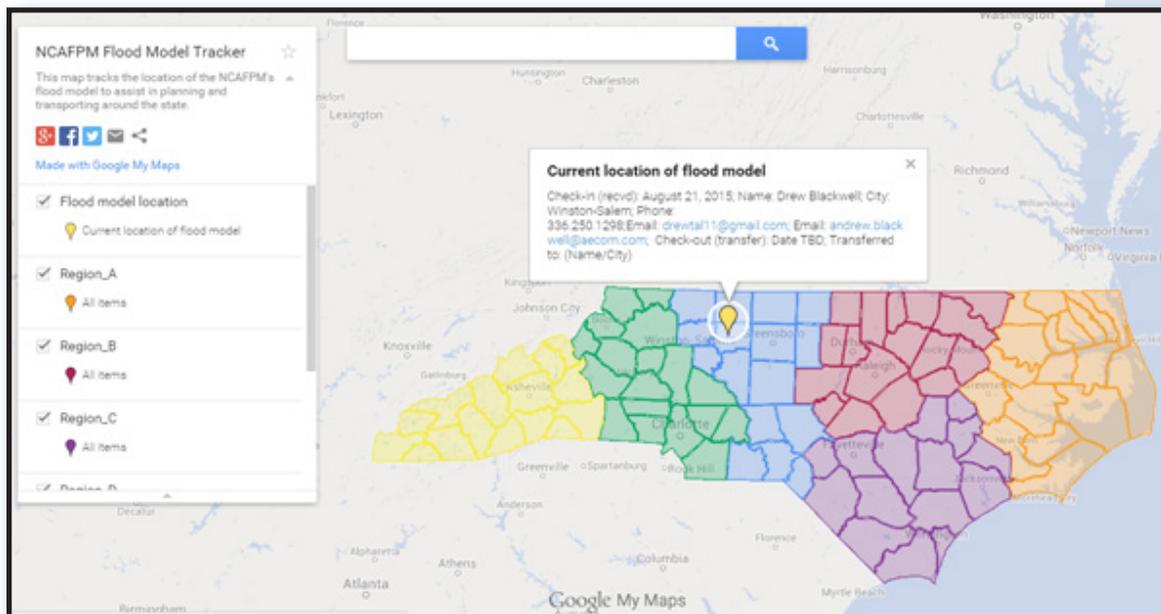
We have created a Google Map to assist with both scheduling and keeping track of the model: NCAFPM Flood Model Tracker. This basic map, available on the Resources page of the NCAFPM website, will let you know when the model is in your region/area for ease of obtaining and to help move it along after an event. Let us know what you think. If a more efficient way comes to mind and/or you have the time and resources to develop something that fits along this same vision, we'd be interested in hearing about it.

Also available on the NCAFPM Resources webpage are a manual and supplemental worksheets for the flood model.

The Flood Model will be displayed at the Fall Floodplain Institute in Cherokee next month. Attendees will be able to view the model and ask questions.

For more information, including a demo video and supplemental resources, go to the Flood Model page of our website [ncafpm.org/resources/flood-model](http://ncafpm.org/resources/flood-model). ▲

*Not sure who your regional representative is? You can find them at [ncafpm.org/regions.html](http://ncafpm.org/regions.html).*



## 2016 NCAFPM/SCAHM Joint Conference April 10-14 in Myrtle Beach, SC

Plans are moving forward for our joint conference between NCAFPM and SCAHM in April of 2016. The joint conference will be in lieu of each association's annual conference. Joint conferences with our South Carolina friends occurred in 2006 (Myrtle Beach) and 2011 (North Charleston). The 2016 event will be held April 10-14 at the Embassy Suites in Myrtle Beach (9800 Queensway Blvd., 29572). Members from both associations have begun contracting with the hotel and are in the early stages of formulating a program. Watch for future news and announcements and be sure to let any current board member know if you are interested in working with us on the planning and implementation of the joint conference. ▲



## 2016 Membership Renewals

Our annual renewal period opens in December for the 2016 membership year. Current NCAFPM members will get an e-mail in mid-December for renewing membership. The e-mail will provide a link to our online membership form. 2016 renewals are due by January 31, 2016. If you do not receive a renewal invoice or have a question about your membership status, please contact Kelly Keesling at [kgkeesling@carolina.rr.com](mailto:kgkeesling@carolina.rr.com).

As a reminder, NCAFPM's annual membership fees have been **increased** from \$40 to \$60 following a vote at the membership meeting on April 28, 2015 at the annual conference in New Bern. The fee increase was recommended by the Finance Committee as a means to prevent the steady decline in NCAFPM's bank account that had been occurring over the past few years. The account decline was caused because conference, administrative, and other costs were increasing at a greater rate than income from annual membership and conference registration fees. ▲

## Membership Level Proposal

In recent years, we have had an increase in NCAFPM Full (individual) memberships and a significant decrease in Corporate and Agency memberships. In fact, there have been no memberships in those two categories for at least two years. This is likely attributed to the benefits that Individual/Full members receive with their CFM certification.

At our 2015 Fall Floodplain Institute in October, we will have a vote to eliminate the Corporate and Agency membership categories. ▲



# NCAFPM Selected to Host 2016 State Flood Risk Symposium

BILL TINGLE, PG, CFM, NCAFPM EXECUTIVE DIRECTOR

I am excited to announce that NCAFPM has been selected by the ASFPM Foundation to host a state Flood Risk Symposium in May of 2016. The symposium is a one-day event that will bring together 60-100 professionals from a variety of backgrounds to contribute toward productive discussions concerning future flood risk and potential solutions in North Carolina. Invited attendees will represent leaders and experts from local, state, and federal government; academia; and other public and private agencies and corporations. The symposium will be facilitated by the ASFPM Foundation which will provide a facilitator and speakers, augmented by local presenters.

The goal of the symposium is to discuss specific flood risk challenges facing our state and determine recommendations for future actions to deal with these challenges. The challenges and solutions should incorporate the multifaceted interests of a wide range of potential stakeholders. Another goal is to promote the creation of partnerships from the diverse group of attendees which hopefully will continue into the future. A comprehensive report will be published and made available to interested parties following the event.

The event will be held at the Wake Tech Conference Center located at their main campus on Fayetteville Road in Raleigh. The exact date is yet to be determined, but it will be on a Tuesday or Thursday around the middle of May. If you are interested in assisting with the event please contact me at [wtingle@carolina.rr.com](mailto:wtingle@carolina.rr.com). ▲

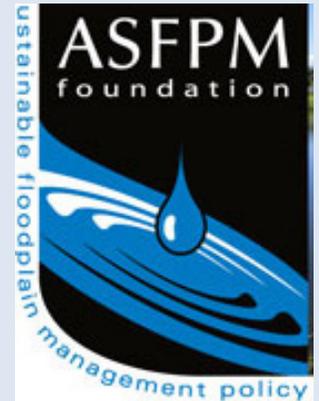
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## Gilbert F. White National Flood Policy Forum

A fundamental goal of the ASFPM Foundation is to foster research and education to support efforts to reduce flood losses and improve floodplain management in the United States. The Gilbert F. White National Flood Policy Forum thus was initiated by the Foundation in order to periodically convene experts in floodplain management to explore pressing issues in the field and set out ideas for resolving them.

On September 17, 2015, the ASFPM Foundation hosted an invitation-only policy forum at George Washington University in Washington, D.C. One hundred of the nation's leading experts from federal, state, and local agencies; private practitioners; and academia, met together to articulate the three broad categories of what "climate-informed sciences" means to policy and budget, practitioner implementation, and research. NCAFPM chair, David Key, attended the forum.

In breakout sessions, participants evaluated and proposed recommendations to the Administration on actions necessary to achieve the use of climate-informed science. The goals are to have methodologies that are reasonable and repeatable, and to the extent possible, promote consistency in applications by agencies and practitioners. The decisions made now are critical to our nation's ability to manage flood risk, recover from flooding and ensure we have properly invested in our structural and nonstructural defenses due to a changing climate. ▲



In 1996, the Association of State Floodplain Managers (ASFPM) established a 501(c)(3) tax exempt nonprofit foundation, whose vision is to be the recognized leader in developing and advancing knowledge that promotes sound floodplain management policy and practice. The ASFPM Foundation mission is to be an incubator for research and education that promotes wise floodplain management.

The foundation seeks and directs funds to help the ASFPM meet its goals. While the missions of both are interlocked, the foundation is a separate corporate body with its own board of trustees and bylaws.

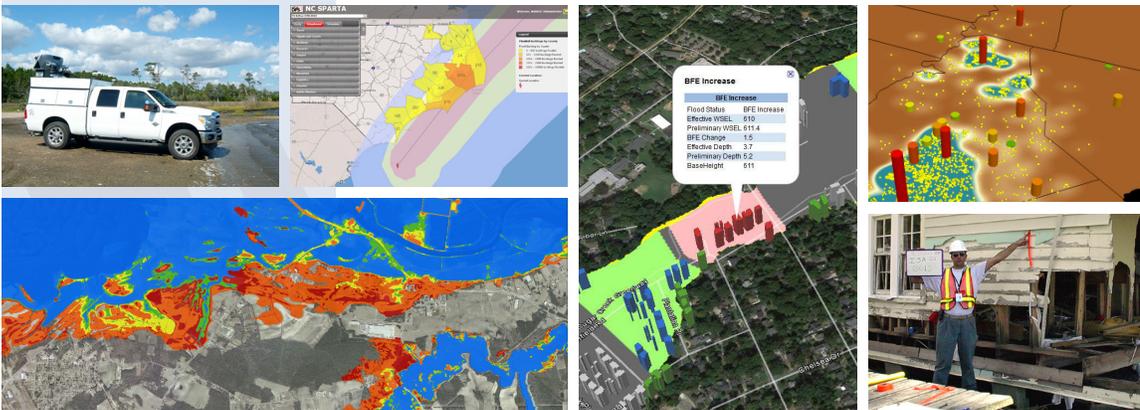
# NCAAFPM Chapter News



## Member Spotlight: Dan Tomczak, CFM

### Education & Outreach Committee Co-chair

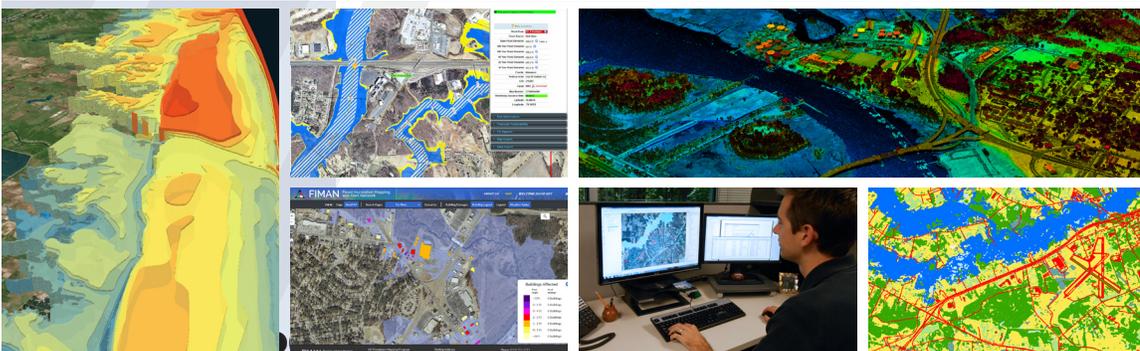
Dan Tomczak lives in Cary with his wife Deb and three boys (Noah, Joshua, and Greyson). He is currently a project manager with the consulting firm CH2M in Raleigh and has worked on projects involving groundwater and surface water quality, sediment dredging, and water resources, as well as being part of the FEMA Public Assistance Technical Assistance team. Dan has been a Certified Floodplain Manager since 2012. He really enjoys biking, especially doing the Durham Habitat for Humanity Bull Moon night time ride each July with his son. His interests in E&O (education and outreach) activities started when he had the opportunity to bring his “sands from around the world” collection into his son’s classroom to give a short talk while the class was discussing earth sciences. Dan is looking forward to becoming more involved with NCAAFPM by helping out with the education and outreach opportunities. ▲



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**Mitigation On My Mind**  
ATLANTA  May 31 - June 5

## ASFPM Annual Conference REPORT

JOHN FULLERTON, CFM  
NCAFPM AT-LARGE REP.

May 31-June 5, 2015, were the dates for ASFPM's 39th Annual National Conference, "Mitigation On My Mind," held at the Hyatt Regency in downtown Atlanta, Georgia.

The ASFPM annual conferences are recognized as the most important floodplain conferences in the United States year after year. With more than 120 speakers and over 1,200 participants, they are

the national conferences all community, state, and federal floodplain managers plan to attend. Because of that, many of the most important consulting firms and product vendors associated with floodplain management attend.

North Carolina figured prominently in the proceedings with both presenters, attendees, and sponsorships. NCEM's John Dorman was a keynote presenter at the opening plenary session, speaking with the attendees about our State's Floodplain Mapping Program. Thirty-nine (39) other participants from our state attended, including NCAFPM board members David Key, Randy Mundt, Bill Tingle, and John Fullerton.

The 2016 ASFPM Conference location was announced for Grand Rapids, MI. More information on the 2016 ASFPM Annual Conference is on page 9. ▲

### ASFPM 2015 Chapter Meeting Report

Twelve of the 36 state chapters have more members than North Carolina, but only three have more CFMs. North Carolina's numbers as of May 1, 2015, were 361 members and 428 CFMs.

North Carolina is one of six Charter Chapters, meaning that we were a state chapter along with five others that existed prior to ASFPM.

These statistics and others were presented at the ASFPM 2015 Chapter Meeting held at the annual conference in Atlanta and attended by NCAFPM Executive Director Bill Tingle and board member John Fullerton.

Also discussed at the meeting were insurance for non-profits, record retention, annual awards, flood risk symposia, and outreach process partners.

It was presented to attendees that ASFPM will store copies of chapter documents in order to meet record retention best practices if that is an issue for individual chapters.

Oklahoma was announced as the 2015 Chapter Award winner, a competition that NCAFPM had submitted an application for consideration.

It was at this meeting that details were presented regarding State Flood Risk Symposia, precipitating NCAFPM's decision to move in that direction. (See page 5 in this issue of *FlashFlood* for more information.)

North Carolina Association of  
Floodplain Managers  
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2015-2016**

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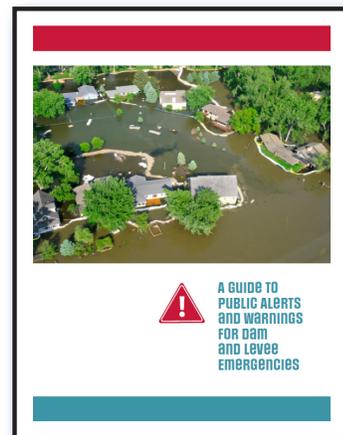
Amit Sachan, PE, CFM  
Alpha & Omega Group  
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asachan@aogroup.com

*continued on next page*

**NOW AVAILABLE:**

## **New Guide to Public Alerts and Warnings for Dam and Levee Emergencies**

Risk reduction can be achieved through various means, including improved approaches to flood warning and emergency management. The USACE Dam and Levee Safety Programs have recently engaged with renowned social scientists Dennis Mileti and John Sorensen in the areas of warning and evacuation to better understand what motivates people to take protective actions during an emergency event. “A Guide to Public Alerts and Warnings for Dam and Levee Emergencies” (pdf, 2.22 MB) summarizes the results of that effort. It is targeted at anyone involved in the emergency management process, including emergency management officials, public affairs personnel (public information officers, public affairs officers), emergency first responders (incident commanders, police and fire personnel), dam and levee owners and operators, radio and television broadcasters, public elected officials, and other people or organizations involved with or interested in local emergency management. ▲



## **Reducing Losses through Higher Regulatory Standards: 2013 Colorado Floods Case Study**

### **New FEMA Publication (FEMA-DR-4145-CO)**

In September 2013, an unprecedented rainfall event occurred along Colorado’s Front Range of the Rocky Mountains, resulting in catastrophic flooding that impacted 18 Colorado counties and 132 jurisdictions. After an event of this magnitude, FEMA would typically conduct a loss avoidance study (LAS) to assess the cost-effectiveness of mitigation measures such as acquisition of properties in the floodplain and implementing flood control measures. However, the September 2013 floods provided a unique opportunity to evaluate the losses avoided through a non-traditional approach. While the Community Rating System (CRS) concepts of adopting higher regulatory standards and floodplain management principles are advocated as best practices, there is little empirical data to demonstrate the return on investment for these regulatory or policy actions. The goal of the study was to quantify these benefits and demonstrate what types of regulations and policies could have the most substantial impact on reducing future damages.

This study evaluated scenarios including regulating freeboard, restricting building of residences and critical facilities in regulatory floodplains, and controlling development in erosion zones. In addition to regulations, the study investigated how the adoption of regulations over time affected losses, and how CRS scores affected NFIP claims and policies.

The conclusive results of this study continue to demonstrate that higher floodplain regulations result in benefits reflected by a reduction in flood-related losses. Furthermore, jurisdictions not implementing higher regulatory standards may observe substantial increases in future flood losses. This information, in addition to traditional Executive Summary mitigation actions, can be used by floodplain managers and community officials to support the case for implementing higher regulatory standards for flood mitigation and protection.

Download a copy of the study, *Reducing Losses through Higher Regulatory Standards* from FEMA at [fema.gov/media-library/assets/documents/105543](http://fema.gov/media-library/assets/documents/105543). ▲



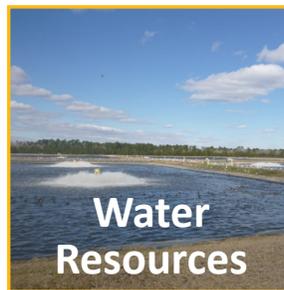
## ASFPM 2016 National Conference

The Association of State Floodplain Managers will convene the world's largest and most comprehensive floodplain management conference – the 40th annual gathering – the week of June 19-24, 2016, at DeVos Place Convention Center in downtown Grand Rapids, Michigan.

Our theme for the 2016 conference — “Great Lakes, Grand Partners” — is a focus on partnership. PARTNER is defined as a person (or entity) who engages in an undertaking with another or others, especially in a business or company with shared risks and profits; being united with others in an activity or sphere of common interest. The State of Michigan has long been a strong partner and leader in the Midwest with innovative mitigation tools and regulations to protect its people and environment.

### Call for Presentations

Share your experiences with local, state, regional, tribal and federal officials, industry leaders, consultants, and a wide variety of subject matter experts from a vast diversity of fields by giving a presentation relevant to the theme, “Great Lakes, Grand Partners.” This Call for Presenters seeks a broad range of professionals to address the many issues associated with managing flood risk, making communities more sustainable, and protecting floodplain and fragile natural resources. Go to the conference website [asfpmconference.org](http://asfpmconference.org) and follow the directions for the online submission. Submissions are due by October 31. ▲



## ALPHA & OMEGA GROUP

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Water Resources Principal  
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Region F

**(VACANT)**

Please see Region F report on page 19 for information.

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# Enhanced Capability for Documenting Storm-Tide Inundation in North Carolina

STEPHEN L. HARDEN AND JEANNE C. ROBBINS, USGS,  
SOUTH ATLANTIC WATER SCIENCE CENTER – RALEIGH, NC OFFICE

The collection and dissemination of timely data documenting the extent and magnitude of storm-tide inundation from landfalling hurricanes provides emergency managers and responders with critical information for tracking flood-impacted areas, assessing flood damage, and providing necessary assistance to impacted communities.

Historically, hurricane-induced storm tides have been documented through analysis of structural or vegetative damage and high-water marks left behind by flood waters. However, these sources are not always reliable or accurate and rarely provide quantitative data about the timing or duration of the flooding, the different pathways by which the storm-surge waters arrived, or the magnitude of waves and wave run-up. Additionally, information from high-water marks typically is not immediately available to help guide storm-response efforts because it may take weeks to months to identify, survey, and document high-water mark elevations following a storm.

In response to these deficiencies, the U.S. Geological Survey (USGS) developed a mobile storm-tide network to provide detailed time-series data for selected landfalling hurricanes. As part of this program, water-level and barometric-pressure monitors were deployed to areas of forecasted hurricane landfall, resulting in a concentrated network of temporary tide sensors placed along water channels and nearby overland features such as beaches, wetlands, and constructed environments. The USGS storm-tide networks have been successfully deployed for eight hurricanes, including Rita (2005), Wilma (2005), Gustav (2008), Ike (2008), Earl (2010), Irene (2011), Isaac (2012), and Sandy (2012). Data were collected at opportunistic locations as frequently as every two seconds for 1-2 days prior to landfall and for as much as two weeks afterward. Following the storm, the elevations of the sensors were surveyed as they were retrieved so the recorded water-level data could be processed and reported relative to the North American Vertical Datum of 1988 (NAVD 88). The data subsequently were made publicly available through a web-based map interface.

In the wake of Hurricane Sandy, the USGS has implemented an overland Surge, Wave, and Tide Hydrodynamics (SWaTH) Network along the Northeastern Atlantic Coast from North Carolina to Maine. The SWaTH Network features the integration of long-term tide gage networks with real-time rapid-deployment gages (RDG) and mobile storm-tide sensors (STS). The network consists of pre-selected sites where fixed brackets, used to temporarily mount the storm-tide monitoring equipment, have been installed and surveyed to NAVD 88. This will permit rapid deployment in advance of a storm and recovery of instrumentation and data dissemination in the days immediately following a storm-tide event.

The STS sites can be used to collect data at sub-second or longer intervals for use in determining timing, depth, and extent of storm tide throughout an event, the height and frequency of storm-driven waves, the change in water levels during a storm, and the time for the water to recede. These data can be retrieved, processed, and disseminated after the storm. During the storm, storm-tide data at the RDG sites can be collected at six-minute intervals and retrieved through satellite telemetry every twelve minutes so the data will be

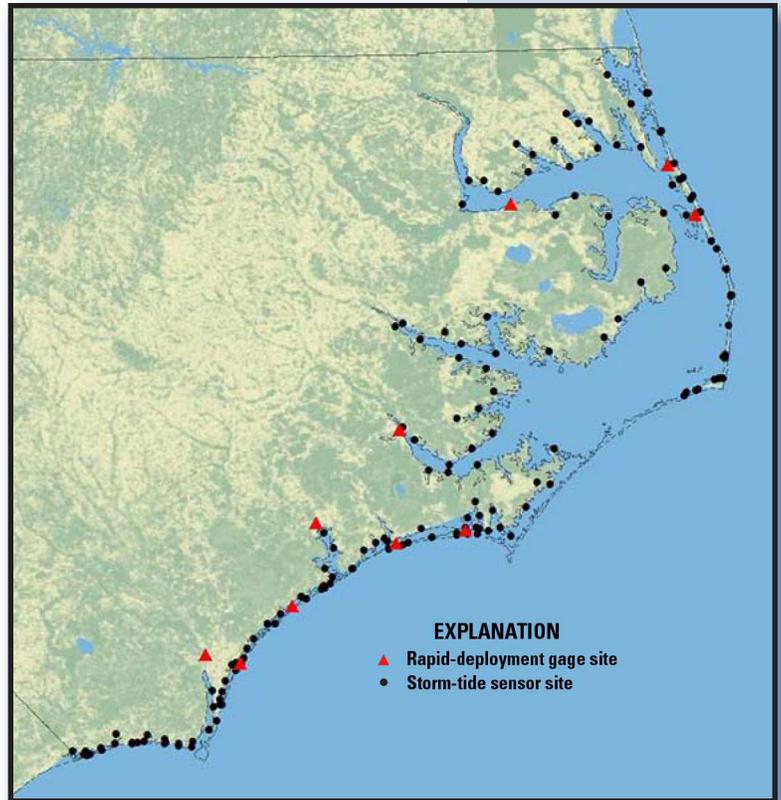
## Storm-Tide Inundation (continued)

immediately available via the Web. RDG sites will measure water level, wind speed and direction, air temperature, relative humidity, barometric pressure, and precipitation.

The SWaTH Network established in North Carolina includes as many as 165 STS sites and ten RDG sites along the barrier islands and both the inner and outer sounds where monitoring equipment can be temporarily deployed to collect storm-tide data before, during, and after landfalling hurricanes and other coastal storms, such as nor'easters.

The USGS's decision to respond to a storm with potential impacts for North Carolina, including how many of the available STS and RDG sites would be used, will be influenced by various factors, such as partner's needs, funding availability, and the projected track and strength of the storm.

The information collected using the SWaTH network is not only of immediate use to emergency agencies responding to storm surge and coastal flooding, it also helps scientists develop more accurate storm-tide models, leading to better predictions of flooding ahead of storms and better simulations of long-term, future flood patterns and trends. The SWaTH initiative includes development of a web application portal ([water.usgs.gov/floods/FEV](http://water.usgs.gov/floods/FEV)) for providing timely and easily accessible storm-related water-level data collected during targeted events. ▲



## New Certified Floodplain Managers

Jennifer Baptiste, Gates County  
Stefani Barlow, W.K. Dickson  
Jonathan Beller, Mecklenburg County  
William Brooks, Kerr-Tar Council of Governments  
Elisabeth Brown, Town of Hope Mills  
Erin Burke, Town of Manteo  
Donald Ceccarelli, Mecklenburg County  
Charles Cranford, City of Asheville  
Ryan Eaves, Durham County  
Perry Eubanks, Mecklenburg County  
Sharon Geelen, Village of Walnut Creek  
McKenzie Gentry, City of Raleigh  
Dean Goodison, Atkins North America  
James Haddock, City of Fayetteville  
Justin Harcum, City of Raleigh

David Kroening, Mecklenburg County  
Brian Lannon, Camden County  
James Locklear, Robeson County  
Eric Martin, Randolph County  
Jenny Maybin, Henderson County  
John Mello, NC DEM  
Franklin Merritt, Jones County  
David Parks, Camden County  
Byron Reeves, City of Fayetteville  
Chris Roberts, Durham County  
Stephanie Roberts, Mecklenburg County  
Giselle Rodriguez-Villanueva, City of Fayetteville  
Thomas Tufts, Stantec, Inc.  
Andrew Vance, Dewberry  
Lauren Witherspoon, City of Raleigh



Congratulations to these people who passed the North Carolina CFM exam this calendar year.

The CFM exam will be offered at the Fall Floodplain Institute in October. Application must be submitted at least two weeks before the test. Information, including the application packet, is on the [NCAFPM Certification webpage](#). ▲

# HEC-RAS 5.0 (Beta) Update



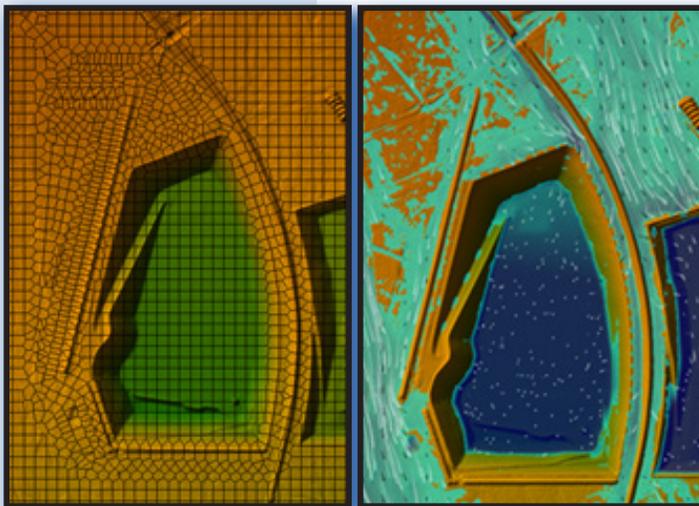
DAVID R. MARKWOOD, P.E.  
WATER RESOURCES  
ENGINEER, AECOM

The USACE Hydrologic Engineering Center continues to enhance modeling, analysis, and mapping utilities of HEC-RAS 5.0 (Beta), as well as HEC-HMS, with its recent release of version 4.1. Many enhancements to the HEC-RAS software were discussed in the previous FlashFlood newsletter, though there have been numerous improvements since. In addition to resolving a number of bugs and issues users have experienced with previous beta versions, the RAS development team has added powerful functionality to the program.

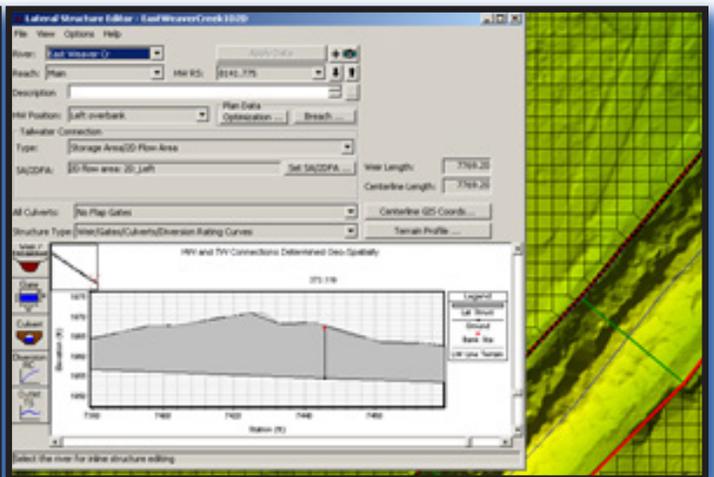
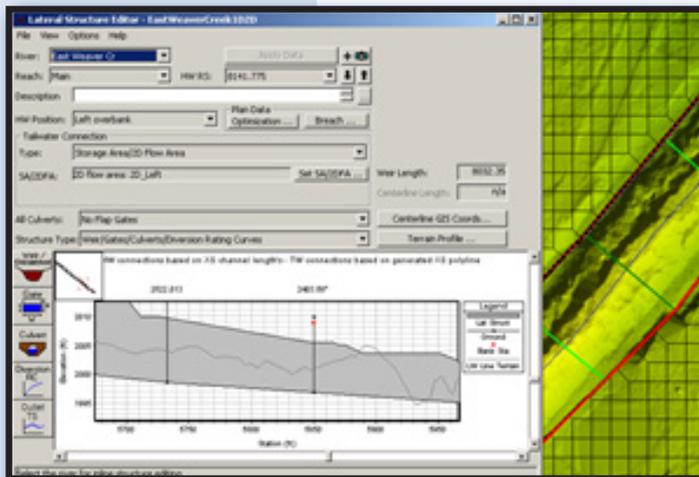
Some of the new utilities include greater flexibility in defining and modifying 2D meshes via user-defined break lines, georeferencing lateral structures for simplified, yet enhanced, combined 1D-2D modeling connections, viewing terrain profiles of cross-sections alongside user-defined cross-sections and cutting cross-sections directly from terrain, and a precipitation boundary condition for 2D-only rain-on-grid functionality.

Break lines can be used to improve the resolution of a 2D mesh at pertinent features, while maintaining an overall nominal (and orthogonal) cell size elsewhere. Not only does this utility allow for targeted resolution enhancement for areas of particular interest, but it also generally maintains computational speed for the entire 2D mesh.

Lateral structures along 1D channel banks or overbanks are often used for combining 1D and 2D modeling. Previously, the terrain model associated with a geometry was not displayed behind user-defined station-elevation data, nor was an associated terrain model directly viewable within the Geometry Editor. With recent enhancements, a lateral structure can be laid out directly within the Geometry Editor, and set as georeferenced, simplifying the process of connecting such a structure to a 2D



← Targeted refinement of a levee feature protecting a quarry.  
Terrain profile view behind user-defined lateral structure geometry (without georeferencing or using terrain takeoff, left, and georeferenced with filtered terrain takeoff, right).



## HEC-RAS 5.0 (Beta) Update *(continued)*

mesh. There is also the option of copying the terrain profile takeoff of the lateral structure and filtering of points (a lateral structure is limited to 500 station-elevation points), which also simplifies the combination of 1D and 2D model features.



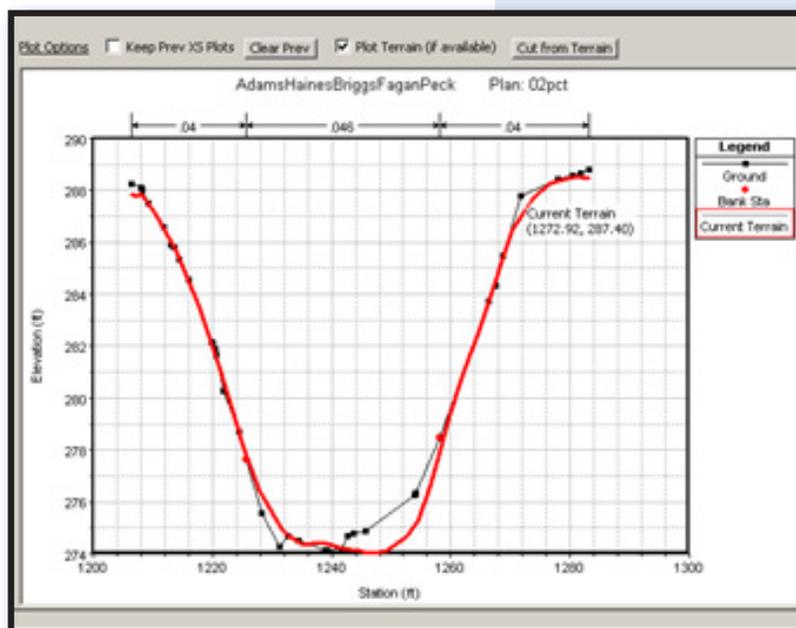
*Combined 1D-2D model containing five 1D reaches and six 2D meshes, connected by lateral structures (left) and detailed particle tracing mapping (right).*

Simplifying the process of connecting 1D geometry with 2D mesh elements has proven to greatly enhance the efficiency of developing such connections, particularly for models containing numerous 1D reaches 2D meshes.

Similar to terrain takeoffs for lateral structures, cross-section geometry can be cut directly from terrain, or simply viewed behind user-defined (perhaps surveyed) station-elevation data. The ability to associate a terrain model with a geometry, and providing the aforementioned features, brings HEC-RAS ever closer to being a standalone software useful for complex riverine modeling, as well as pre- and post-processing. In short, a terrain model is all that is required to perform complex modeling and mapping using HEC-RAS 5.0.

The addition of a “Precipitation” boundary condition for a 2D mesh provides the user with rain-on-grid modeling and mapping capabilities. The software currently does not include rainfall losses in a simulation, though this is to be added in the future, so the user should consider whether and how a storm should be applied using excess rainfall. Using the Precipitation boundary condition applies the user-specified rainfall to all cells within a mesh, and because the software performs well utilizing detailed terrain even for large nominal mesh cell sizes, this modeling can be performed efficiently for small and large watersheds alike (while not relying on GPU processing, virtually required for efficient rain-on-grid modeling using many other commercially available

*Terrain profile view (red) behind user-defined cross-section station-elevation data.*

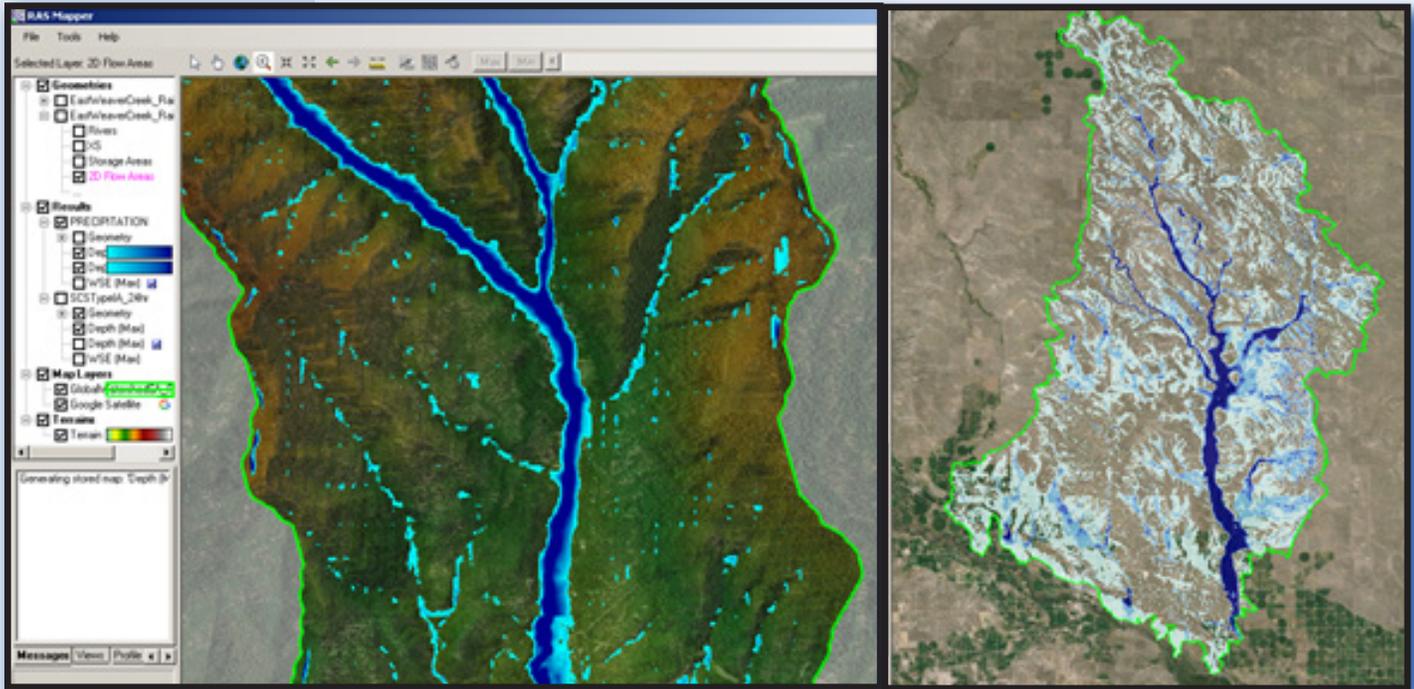


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## HEC-RAS 5.0 (Beta) Update (continued)

Rainfall-Runoff mapping for 14 square mile (left) and 380 square mile (right) watersheds.

software). In fact, using a 200' nominal mesh cell size for a 380 square mile watershed required less than an hour of simulation time. Similarly, a 14 square mile drainage area was modeled in about 10 minutes, despite highly-detailed terrain.



For more information, the reader is encouraged to reference the manuals provided with the latest install of HEC-RAS 5.0 Beta (August 2015). ▲

## FEMA Announces Policy Updates to Flood Risk Analysis and Mapping Standards

*Reprinted from August 15th FEMA Daily Digest Bulletin*

FEMA has announced the revision of eight Risk Mapping, Assessment, and Planning (RiskMAP) standards as part of the semi-annual maintenance process. The revised standards add letters of map revision (LOMR) to the standards addressing use of preliminary data, and update and clarify requirements for letters of map amendment (LOMA) in V Zones. The changes also clarify requirements for “lettered” mapped cross sections on maps and profiles, and set the requirements for Key Decision Points during the mapping process.

Section 22 of the Homeowners Insurance Affordability Act of 2014 allows fee exemptions for Map Change Requests for habitat restoration projects. FEMA has issued a mapping standard to fully implement this provision of the law. In addition, Sections 217 and 218 of Biggert Waters Reform Act of 2012 (BW-12) specified changes to FEMA’s map appeals process and Scientific Resolution Panel. With this issuance of updated appeal guidance and a new standard regarding the Scientific Resolution Panel, FEMA has fully implemented these two provisions of BW-12.

As part of this maintenance cycle, FEMA also issued new guidance documents for RiskMAP and updating the related technical reference documents that define specific requirements for flood risk project deliverables. The policy, guidance, related documents and information about the process are available at [fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping](http://fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping).



# NFIP Coordinator's Corner

John Gerber, PE, CFM  
NFIP State Coordinator  
919-825-2317  
[john.gerber@ncdps.gov](mailto:john.gerber@ncdps.gov)  
[www.ncfloodmaps.com](http://www.ncfloodmaps.com)



## Elevation Certificate Update

The current elevation certificate (EC) expired July 31, 2015. Since then, the Office of Management and Budget (OMB) has extended the expiration date month by month with the latest extension until October 31, 2015. The new EC is currently under review at the OMB and until this process is complete, the existing EC form should be used. There are minor modifications proposed with the exception of a new diagram number 2B. This new diagram is a basement situation like the current diagram 2 (which will be labeled 2A) but where there is an area “dug out” on one side to provide outside access to the basement. Once the EC is revised, I will send it out to those on my email distribution list and include any additional guidance from FEMA.

Now that we are on the EC topic, I would like to highlight a few areas that we are finding discrepancies and request you develop a good review process when they are submitted to your office.

Common areas of concern when we review the EC's during a Community Assistance Visit (CAV):

### Section A

**A4.** Building use is not completed or correctly identifying the type of structure. Additions should be circled with further explanation in the Comments Section D as to where the elevations were shot (addition only or in combination with the existing structure).

**A7.** Verify the correct building diagram is used. It may have huge implications on the insurance rate.

**A8 and A9.** Verify there are the correct number of permanent openings within 1.0 foot above adjacent grade and the proper NET AREA is calculated if Diagrams 1A, 3, 6, 7, 8 and 9 are used and the lower enclosure is below your regulatory flood protection elevation (RFPE). If engineered, please keep this certification with the EC on file. Note: Vents for Diagram 6 are only required in the AE Zone. Even if the requirement for vents do not apply or there is not an attached garage, make sure N/A is included in the blanks. ISO will be conducting an automated review of the EC's annually for those communities participating in the CRS and if left blank they will be noted as a deficiency.

### Section B

Verify information is correct in B1 – B9. This can be confirmed using the NC Flood Risk Information System (FRIS) at [ncfloodmaps.com](http://ncfloodmaps.com). We sometimes find that the panel or Index dates are incorrect.

— continued on next page

# NFIP Coordinator's Corner

John sends out periodic updates on NFIP issues and training opportunities to those on his email distribution list. If you are not currently receiving these emails and would like to be kept informed, please email [john.gerber@ncdps.gov](mailto:john.gerber@ncdps.gov).

**B10.** There has been some confusion from the FEMA reviewers when the EC is used to support a LOMA or LOMR-F. Since the reviewers are out of state, they are not familiar with the North Carolina FRIS and may question its validity. Rather than checking “Other” as the source of BFE and noting it is from the FRIS, we suggest checking FIS profile. The profiles will not be available for new studies because the FRIS contains the profile data in a digital format, therefore, checking the FIS profile is appropriate.

## Section C

**C1.** The “finished construction” EC should not be submitted until all mechanical equipment and final grading is complete per the EC instructions. Make sure it is maintained in your files forever.

**C2.** Check to make sure the benchmark utilized references the PID or other unique identifier as explained in the instructions. We have recently found some that included “GPS,” “USGS,” “Private,” and others were left blank or had “N/A.” If you have any questions, please call our office for support. Contact information is on the last page of this newsletter.

**C2a-h.** Make sure you state N/A if the elevation does not apply for that section.

**C2e.** Please read the instructions on the bottom of page 4 of the EC instructions. While the NC Building Code, the NFIP regulations, and your local ordinance require the ductwork to be elevated or protected to your RFPE, it is encouraged this elevation be noted in the comment section and not in C2e. The EC instructions list the items that would be included in C2e on the EC so it can be used for proper insurance rating. The instructions continue to explain that local floodplain management officials may require the inclusion of ductwork for regulatory purposes. This should be noted in the comment section so the property owner will not be penalized on their flood insurance rate if the ductwork is lower than the other mechanical equipment.

Also, please make sure the type and location of the equipment is included in Comments.

## Section D

**D.** There should always be comments in this section. The more explanation the better.

## Section G

**G.** PLEASE use this section to document the items noted and include comments. This information can be very useful to you as staff changes allowing their assumptions or decisions to be tracked and documented. It also helps in our review during a CAV when the EC is reviewed and approved by a previous staff member that is no longer available.

Don't forget the photographs. They are required for insurance rating, but should be mandatory for permitting. They are valuable for documentation of what was there when you signed off on the permit so if future conversions are made without your knowledge, you have an accurate reference.

## NCFMP's Preliminaries Status

The North Carolina Floodplain Mapping Program is scheduling a variety of releases of new flood hazard data for the remainder of 2015.

Revised Preliminary flood hazard data (i.e., Flood Insurance Study and Flood Insurance Rate Maps) will be issued October 29th for eighteen panels in Alamance, Chatham, and Orange Counties; this data will be provided a 30 day review/comment period. The 90-day appeal period for the Preliminary data for Brunswick, Columbus, New Hanover, Pender, and Robeson Counties will begin October 29th; the Preliminary issuance for these counties was in August, 2014. Also on this date (10/29/2015) the even longer-awaited 90-day appeal period for Duplin and Sampson Counties will also for the Preliminary flood hazard data that was issued in April 2014. The delay in establishing the 90-day appeal period is due to changes in documentation and processing changes with FEMA and the Federal Register.

The Preliminary data issued to Durham, Granville, Person, Vance, and Wake Counties on March 31st is set to receive their 90-day appeal period in late-November/December 2015.

The next round of issuance of Preliminary flood hazard data will November 30th for the 5 counties bordering the Albemarle Sound: Chowan, Perquimans, Pasquotank, Camden, and Currituck Counties.

It is anticipated that in March Preliminary flood hazard data will be issued for the lower Neuse River Basin counties of Craven, Jones, Pamlico, as well as the White Oak River Basin's Carteret and Onslow Counties. As the date for issuance becomes clearer, the NCFMP will be coordinating with communities' floodplain administrators to schedule meetings with local officials and staff to clarify the post-preliminary process, and explain the changes since the last FIRMs. ▲

### What do YOU do when you don't know what to do?

Here are some tips to consider:

- "Your word is a lamp to my feet and a light for my path." - Psalm 119:104
- Talk to people you trust and can be honest with.
- Read more.
- Use the word "yet" as in "This isn't working - yet" or "I don't have the resources - yet."
- Let go of your pride.
- Get a coach or a mentor (NCAFFPM's Mentoring Program, perhaps).
- Do something to get moving and then assess and evaluate.
- Spend time in honest self evaluation.
- Study the lives of others (mentors, heroes, etc.).
- Don't beat yourself up.

Remember the line "this too shall pass"? How about "This too shall prepare me."

*Paraphrased with permission from an article by Tim Conner, speaker and author and past NCAFFPM presenter.*



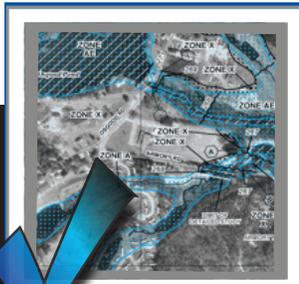
**TRUSTED** Floodplain Specialists  
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We have **Certified Floodplain Managers** dedicated to reviewing **Elevation Certificates** to determine non-compliance issues and the measures necessary to retrofit a building into compliance.

**WE MAKE IT EASY** By offering a variety of **Complimentary Services**, such as: Community Seminars for CRS points, on-the-spot Mitigation Reports, and adjusted Flood Insurance quotes.

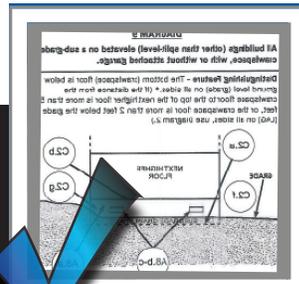
**F.R.E.** offers assistance to **GET THE JOB DONE**



**DETERMINE**  
the Flood Zone



**INSTALL**  
FEMA and Building  
Code Compliant Vents



**ELIMINATE**  
Subgrade Areas

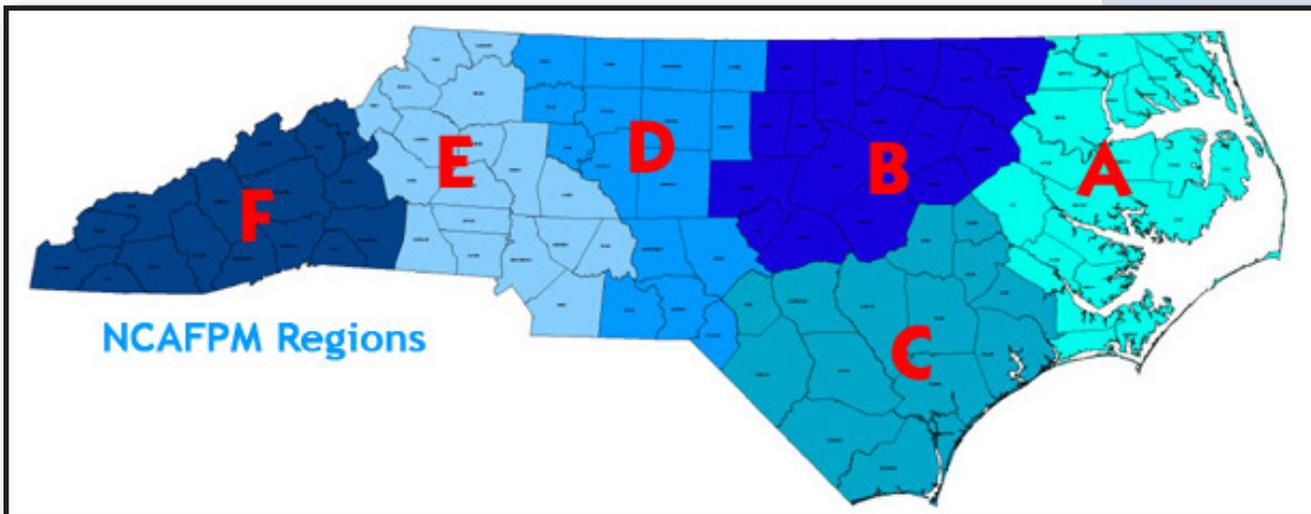


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# NCAFPM Regional Reports



## Regional Representatives

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

**Region B** | Randy Mundt, CFM — [randy.mundt@ncdps.gov](mailto:randy.mundt@ncdps.gov)

**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** | Melonee Brock, CFM — [melonee.brock@mecklenburgcountync.gov](mailto:melonee.brock@mecklenburgcountync.gov)

**Region F** | VACANT

First of all I want to express my gratitude for the privilege of being a part of this organization. I only hope I'm able to represent this region as well as my coworker Robert Billings has. His wealth of knowledge and expertise make him a hard act to follow. I'm looking forward to getting reacquainted with all members and participants of NCAFPM. This organization is a great resource for sharing information and processes from other communities. I am especially interested in hearing the thoughts, concerns, ideas and suggestions of those in Region E. Thank you for this opportunity!

So many changes have taken place here in Mecklenburg County this past year. We said goodbye to our Floodplain Administrator, Bill Tingle. Bill has been an excellent teacher and role model. I came to work for him during a major remapping project in 2001. It was an exciting time because we were getting our first digital flood maps! It was working through that process that taught me the value of a great team. I could not have asked for a better or more talented group of people to work with. With the variety of projects from planning and emergency management to regulation enforcement, I had the flexibility to be a part of it all in some capacity or another and for that I am truly grateful.

Along with Bill's departure, the entire Water and Land Resources Department reorganized. Robert Billings moved into the Water Quality Department; Tim Ruane and I joined the Permitting and Compliance Department. Don Ceccarelli left Water Quality and became Mecklenburg County's new Flood Administrator.

## Region E

*Melonee Brock,  
CFM*

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# NCAFPM Regional Reports

Don Ceccarelli is a program manager for Charlotte-Mecklenburg Storm Water Services in the Permitting and Compliance Program. He graduated from Virginia Tech with a bachelor's degree in chemical engineering, is a registered Professional Engineer in North Carolina and a Certified Floodplain Manager. Don has worked for Storm Water Services since 2004, administering Phase II Storm Water Permit requirements for seven jurisdictions in Mecklenburg County. Before joining Storm Water Services, Don worked for more than thirteen years in the private sector providing environmental and storm water consulting services to private industry. He will be joining us at the fall conference. I hope everyone will take the time to welcome him and get to know him.

In light of all these changes, no matter what our program is called — Building Standards, County Engineering, Land Use & Environmental Services Agency, Water & Land Resources, Storm Water Planning, Flood Mitigation, Land Development/Permitting and Compliance — we will strive as always to provide quality service to our community. ▲

## Region F

(VACANT)

Once again, greetings to everyone from the “pointy” end of the state. Region F is represented by two guest columnists this time around: the lovely and brilliant Cynthia Barcklow, the recent past chair of our organization, and the not-so-attractive and punkin-headed former Region F Representative, Brad Burton.

Pearls before swine so take it away, Cynthia!

*Thank you, Brad! For the big news in our area, in June our region began the process of collecting information related to any issues with our current floodplain maps. We identified our areas of highest growth and development, and specific sites for new subdivisions, schools, and industry. We were visited by Randy Mundt and others from the NC Floodplain Mapping Program who outlined the process and allowed us to relay our priorities for the remapping efforts. We are geared up and ready!*

*Brad, I always appreciated you representing our region on the NCAFPM Board — willing to get up at the crack of dawn to help set up audio-visual equipment in the conference facilities, meeting with hotel staff to discuss the flow for the day, or checking people in at the registration table. (Aside: There is absolutely no one better at “greeting” than Brad Burton, providing direction and an earnest welcome, even at 7:30 in the morning!) You contributed greatly to the Board as a Region F representative, and your commitment to the NCAFPM is still strong.*

*Our region is unique, interesting, challenging, and full of character. We have many parcels that share both steep slopes and low-lying floodplain areas. Matching our topography, we have had some flamboyant – though solid – regional representatives serving in multiple capacities on the board. We have had the pleasure of Susan Frady (Hendersonville) working effectively for the NCAFPM as its treasurer, and Bill Tingle (flamboyant Asheville native) leading us as our Executive Director. With Brad having stepped down as the Region F Representative, there is opportunity for one of our region's characters to fill this role. I cannot wait to see who will step up and represent us, and I am excited for him/her to be so fortunate to have the opportunity to serve on this NCAFPM Board, with NC's finest representing the best.*

[Brad is up on his soapbox]

OK, ladies and gents, Region F consists of the following Old North State counties: Mitchell, McDowell, Rutherford, Polk, Yancey, Madison, Buncombe, Henderson,

— continued on next page

# NCAFPM Regional Reports

Transylvania, Haywood, Jackson, Swain, Macon, Graham, Clay, and Cherokee.

And we currently don't have anyone that is filling the Region F representative position. You guessed it — this is an unabashed recruitment effort that is also going to involve some finger shaking at you FPAs (or those similarly designated) in the Region F counties.

Here's what everyone on the NCAFPM Board understands:

1. Your job is crazy.
2. You are doing more now in your position as planner, building inspector, or land development administrator than you ever have — with less resources.

Here's what I know, that some on the NCAFPM Board understand, but is foreign to many folks “down east” that have acclimated to the NFIP and the political acceptance of a strict FDPO:

1. The state of North Carolina ends at the Gaston County line.
2. Raleigh is the sun and any land past Gaston County is considered the “far reaches” of our solar system and as such does not get continuous, warm, sustaining sunshine (yes, I've said all this before).
3. It “ain't never flooded here like it says on them maps” anywhere in your county.
4. Your department is not only underfunded and understaffed as a whole but resources for program maintenance as mandated by The Feds on your locally hated FDPO are not funded at all. But you're still on the hook as the individual that Mr. Foxx and his crew from the Bright Sun will be holding accountable for compliance.
5. You really feel alone and unloved as the FPA for your area you secretly hate having to “deal with it” and wish you could get some help or a shoulder to cry on...or both.

So, if you are reading this and saying to yourself, “Self, he KNOWS what I am going through!” Then you need to reach out, Western North Carolina Brothers and Sisters, reach out for the extended hand that is membership on the NCAFPM Board as a Regional Representative for Area F. Rename us “F-Troop,” if that helps (showing my age here).

Make life better for yourself and those you serve by joining this board. See what others are up against. Get to personally know some exceptionally sharp people that are in the know as to national and local policy concerning all that is the NFIP, state floodplain mapping and other ancillary programs and be comfortable calling them as an instant resource.

And most importantly, have a chance to make a difference, even if it's just an itty-bitty bit, for you and others working in the field. STEP UP! You'll be amazed just how doggone important your presence will be to relate your experiences and knowledge. I would offer that instead of trying to figure out just how to make it happen (“How much time will it take?” “My boss is weird about stuff like this.” “There's no money available to let me travel.”), you just take a leap of faith and COMMIT. Your “FPA woe-factor” will drop and you can entirely justify your participation to anyone that asks just as soon as you see what all the Association has to offer.

STEP UP!! ▲

# Upcoming Training Opportunities



## Green Streets for Stormwater Treatment November 17, 2015 • Fayetteville, NC

What happens when you combine stormwater control measures and the transportation right-of-way into a holistic treatment corridor? Innovative green streets! This technical workshop has the unique privilege of taking place just minutes away from an in-progress full two-block green street construction project. Material covered includes the design, construction, and multi-faceted benefits of green infrastructure and stormwater BMPs in the transportation corridor. We will explore the multiple angles of design and implementation--from transportation and vehicular safety to aesthetics and water quality improvements. This is the first green street workshop of its kind in the state of North Carolina. For more information and to register online, go to [bae.ncsu.edu/stormwater/training/greenstreets.html](http://bae.ncsu.edu/stormwater/training/greenstreets.html).

## Surface Water Identification Training & Certification November 17-20, 2015 • Raleigh, NC

The Surface Water Identification Training and Certification (SWITC) Course is offered by the North Carolina Division of Water Resources (DWR) and NC State University (NC SU) to comply with N.C. General Statute 143-214.25A. This statute requires DWR to train and certify staff of the North Carolina Forest Service (NCFS), the Division of Water Resources (DWR), and local delegated programs.

Certification from this training course is required in order to make a legal determination of stream origins and identify surface waters subject to buffer rules enacted by the NC Environmental Management Commission. Staff within NCFS (who are also Registered Foresters), DWR, or local delegated programs who take the course and pass both the written and field tests will be certified to make determinations of stream origins subject to the buffer rules.

Individuals other than those authorized for certification who take the course and pass both the written and field tests will receive a "Certificate of Training" for having successfully completed the course.

For more information and to register online, go to [bae.ncsu.edu/workshops/switc](http://bae.ncsu.edu/workshops/switc).

**STEWARDS  
OF THE  
FUTURE**

**WATER FOR A GROWING WORLD**

## Stewards of the Future

November 2, 2015 • Raleigh, NC

STEWARDS OF THE FUTURE: Water for a Growing World, hosted by NC State's College of Agriculture and Life Sciences, will provide international, national and state level perspectives on issues of water quantity and quality. Participants will explore how North

Carolina and its global partners can provide leadership toward the goal of ensuring water resiliency for North Carolina and a growing world. More information and registration at [cals.ncsu.edu/stewardsofthefuture](http://cals.ncsu.edu/stewardsofthefuture).

## Upcoming NFIP Training

### Eastern Branch Summer Workshop (Re-scheduled)

Course	Date	Location
NCFIP01	Oct. 28-29 8:30 AM - 5 PM	Craven County Community College 801 College Ct, New Bern NC 28562

The North Carolina Division of Emergency Management Floodplain Management staff will provide training on both the basic roles/duties of a floodplain administrator as well as the regulatory context of the NFIP regulations (to include discussion of the Elevation Certificate), to allow for the safe development in floodplains. These workshops will also address Coastal re-mapping processes, the new website Flood Risk Information System (FRIS), information on how Flood Insurance Reform Act of 2012 and the Home Owners Affordability Act of 2014 will affect property owners and communities, and include basic information on the Community Rating System (CRS) of the NFIP. The Course is designed to provide in-depth training and generate class discussions on topics in greater detail than a basic course.

This 2-day workshop will cover the following topics:

- Floodplain administrator's duties and responsibilities
- NC building code and the NFIP
- Compliance with V-zone's standards
- Post-disaster duties
- Insurance update – BW-12, HFIAA
- FRIS

A registration fee of \$50 per participant will be collected at the workshop. Please make check out to NCAFP (Federal ID #56-1802736).

## Upcoming Conferences & Events

### Hazus Conference 2015

December 9-11, 2015 • Atlanta, GA

The 8th Annual Hazus User Conference will be from December 9–11, 2015 in Atlanta, Georgia at the Conference Center of the Centers for Disease Control and Prevention (CDC). This year's theme is "Hazus and the Emergency Management Life Cycle: From Practice to Policy." The Georgia Hazus User Group (GAHUG) sponsored event brings Hazus users together and provides an information sharing platform for success stories, best practices, lessons learned, recent research, workshops and discussions on Hazus topics of interest. Check out the Hazus Conference website ([hazusconference.com](http://hazusconference.com)) for more information.

#### Registration

Registration is free and open to the public. Space is limited to 350 attendees. The deadline for registration is December 4, 2015. A confirmation is sent to you 7 to 10 days after your completed registration form is received. Check your confirmation for accuracy. Although registration is free, if you are unable to attend, you are encouraged to cancel your registration to open space for other potential attendees. If you are covered under the provisions of the Americans with Disabilities Act (ADA), or have any special needs, please contact Terry Jackson at [ylt8@cdc.gov](mailto:ylt8@cdc.gov).



For more details about these courses, go to the NCEM TERMS site ([terms.ncem.org/TRS/home.do](http://terms.ncem.org/TRS/home.do)).



# Calendar

**October 21-23, 2015**  
NCAFPM FALL FLOODPLAIN  
INSTITUTE  
Cherokee, NC  
[ncafpm.org](http://ncafpm.org)

**October 28-29, 2015**  
EASTERN BRANCH  
SUMMER WORKSHOP  
New Bern NC  
[ncem.org](http://ncem.org)

**December 9-11, 2015**  
HAZUS USER CONFERENCE  
Atlanta, GA  
[hazusconference.com](http://hazusconference.com)

**April 10-14, 2016**  
NCAFPM/SCAHM JOINT  
ANNUAL CONFERENCE  
Myrtle Beach, SC  
[ncafpm.org](http://ncafpm.org)

**June 19-24, 2016**  
ASFPM NATIONAL  
CONFERENCE  
Grand Rapids, MI  
[floods.org](http://floods.org)

# Floodplain Management Resources

## Technical Assistance (State)

### NC Emergency Management National Flood Insurance Program

**NFIP State Coordinator:** John Gerber, PE, CFM  
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**NFIP Engineer:** Dan Brubaker, PE, CFM  
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**NFIP Planners**  
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**Eastern Area:** Heather Keefer, CFM  
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**Western Area:** Terry Foxx  
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[www.ncfloodmaps.com/mt-2\\_forms.htm](http://www.ncfloodmaps.com/mt-2_forms.htm)  
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## Maps & Flood Insurance Studies

### FEMA Map Information eXchange (FMIX)

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

### NC Floodplain Mapping Program

919-715-5711  
[www.ncfloodmaps.com](http://www.ncfloodmaps.com)

## Technical Assistance (FEMA)

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

[www.fema.gov/about/regions/regioniv/](http://www.fema.gov/about/regions/regioniv/)

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NCAFPM..... [www.ncafpm.org](http://www.ncafpm.org)  
ASFPM ..... [www.floods.org](http://www.floods.org)  
FEMA..... [www.fema.gov](http://www.fema.gov)  
NFIP..... [www.floodsmart.gov](http://www.floodsmart.gov)  
NCEM ..... [www.nccrimecontrol.org/nfip](http://www.nccrimecontrol.org/nfip)  
NC Maps ..... [www.ncfloodmaps.com](http://www.ncfloodmaps.com)

**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.

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