

# The Tarheel SURVEYOR

SPRING 2019 | No. 19.1



**2019 CONFERENCE  
HIGHLIGHTS**  
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**IMPLIED EASEMENTS**  
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**THE NIGHT OF THE FLOOD**  
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# The Tarheel SURVEYOR Spring 2019

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### ABOUT NCSS:

- Founded January 31, 1939
- Second oldest professional surveying organization in the United States
- Only professional surveying organization in NC
- Affiliated with the National Society of Professional Surveyors and, therefore, all Professional Members are also accounted as members of NSPS as of July 1, 2013

### OUR MISSION:

"A society of professional surveyors and their associates dedicated to enhancing professionalism, improving legislative awareness and promoting the profession of surveying."



*Cover Image: Jordan Schoff, winner of the RTV Grand Prize Drawing & Tim Bowes, NCSS President, at the 2019 Conference & Trade Show.*



# WHO WE ARE

**NCSS PRESIDENT**

Tim Bowes  
tbowes@vhb.com

**NCSS PRESIDENT-ELECT**

James I. Jeffreys III  
james.jeffreys.3@gmail.com

**NCSS VICE PRESIDENT**

Peter J. Brennan, Jr.  
peter.brennan@wilmingtonnc.gov

**NCSS PAST PRESIDENT**

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**NCSS SECRETARY/TREASURER**

Dale L. McGowan  
dmcgowan@ch-engr.com

**NSPS NC DIRECTOR**

Randy S. Rambeau, Sr.  
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**ALBEMARLE CHAPTER PRESIDENT**

Eddie Hyman  
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**CAPE FEAR CHAPTER PRESIDENT**

Michael J. Adams  
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**NCSS EXECUTIVE DIRECTOR**

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**CENTRAL CHAPTER PRESIDENT**

Jerry C. Callicutt  
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**COASTAL CHAPTER PRESIDENT**

John A. Odom  
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**EASTERN CHAPTER PRESIDENT**

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bstu33@hotmail.com

**FOOTHILLS CHAPTER PRESIDENT**

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doug@suttlessurvey.com

**GUILFORD CHAPTER PRESIDENT**

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**JOHNSTON COUNTY CHAPTER PRESIDENT**

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**MECKLENBURG CHAPTER PRESIDENT**

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**NCSS OFFICE MANAGER**

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mkenny@ncsurveyors.com

**NE PIEDMONT CHAPTER PRESIDENT**

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pls3010@aol.com

**NORTHWEST CHAPTER PRESIDENT**

Scott Church  
scott@scottchurchsurveying.com

**PIEDMONT CHAPTER PRESIDENT**

David J. O'Brien  
dobnc60@gmail.com

**SOUTHEASTERN CHAPTER PRESIDENT**

Benjamin C. Brown  
benjyb@bellsouth.net

**SW PIEDMONT CHAPTER PRESIDENT**

Gabriel D. Brown  
gabriel.brown@duke-energy.com

**TRIANGLE CHAPTER PRESIDENT**

Troy C. Clayton, Sr.  
ctroyclayton@gmail.com

**WESTERN CHAPTER PRESIDENT**

Jared R. Ownbey  
jaredownbey@abtech.edu

**YADKIN VALLEY CHAPTER PRESIDENT**

David L. Haywood, Jr.  
davidhaywood@cesicgs.com

**MARKETING & MEMBERSHIP DEVELOPMENT**

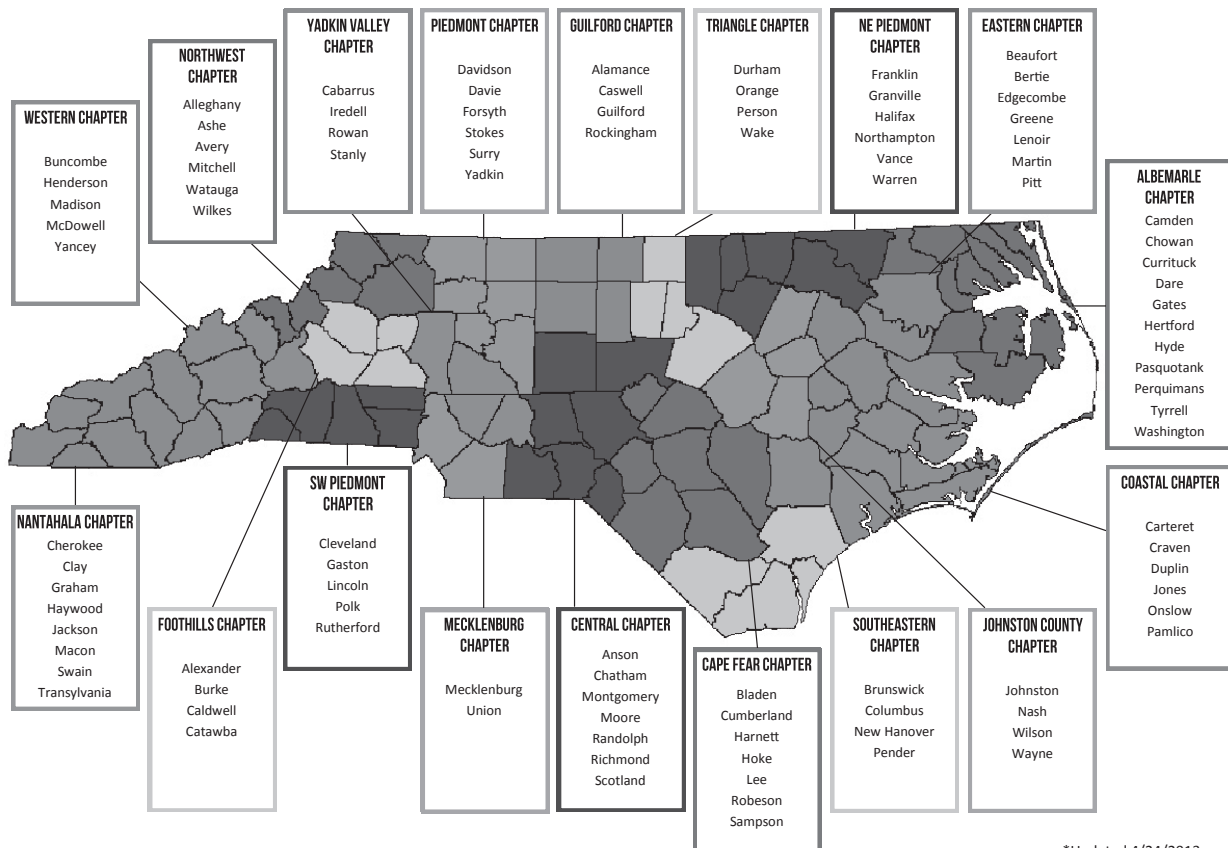
Sherri L. Barron  
sbarron@ncsurveyors.com

## CHAPTER MEETINGS

CHAPTER	DATE & TIME	LOCATION
Albemarle	3rd Tuesday   6:30 pm	Cypress Creek Grill, Elizabeth City
Cape Fear	Last Tuesday   6:30 pm	Various Locations, Fayetteville
Central	Last Tuesday   7:00 pm	Blake's B-Que, Candor
Coastal	Last Monday   6:30 pm	Texas Steakhouse, Morehead City
Eastern	2nd Monday   6:30 pm	Parker's BBQ, Greenville
Foothills	2nd Tuesday, 7:00 pm	Timberwoods, Morganton
Guilford	3rd Wednesday   6:00 pm	Various Locations in Greensboro
Johnston County	2nd Tuesday   6:00 pm *no meeting Jun-Aug	Holt Lake BBQ, Smithfield
Mecklenburg	1st Tuesday   6:00 pm *no meeting Jul-Aug	Dilworth Grille, Charlotte
Nantahala	3rd Tuesday   6:30 pm *no meeting Jun-Aug	Bogart's, Sylva
NE Piedmont	Last Tuesday   7:00 pm	Various Locations, Louisburg
Northwest	3rd Tuesday   6:00 pm	Various Locations, Boone & Wilkesboro
Piedmont	4th Tuesday   6:00 pm	Various Locations, Winston-Salem
Southeastern	Last Wednesday   7:00 pm	Carolina BBQ, Wilmington
SW Piedmont	2nd Thursday   6:30 pm	Dragon Palace, Spindale
Triangle	3rd Tuesday   6:30 pm	Peddler Steakhouse, Raleigh
Western	2nd Tuesday   6:30 pm	Cornerstone Restaurant, Asheville
Yadkin Valley	2nd Wednesday   6:30 pm	Pancho Villa's, Salisbury



## NCSS Local Chapters



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# DIRECTOR'S NOTES



**W**e are thriving! As your Director, it is often easy to focus on the problems that are typical with any professional association. After all, I rightly serve as the “buck stops here” person when it

comes to daily management issues. But I do not think we celebrate our successes like we should. I recently pinned a quote on my Pinterest Motivational Board. (If you don't know what that is, ask your wife or daughter.) Charles Spurgeon the famous 19th century preacher said, “We are too prone to engrave our trials in marble and write our blessings in sand.” Therefore, I will take a few minutes to communicate my personal analysis of five values that lead to our success.

## Value of Communication

When the Society began in 1939, the communication of information was its primary function. A surveyor couldn't access the calendar online for upcoming events, fulfill those last two hours of continuing education or search for a new job all while never leaving his/her desk. Instead, chapter meetings were widely attended and notes from the Board of Directors meetings were passed and discussed which built relationships and comradery. Now we are more concerned with social media avenues to reach our members through their favorite applications. Between email, Twitter, Facebook and Instagram we usually find a way to communicate upcoming events or important issues. If you aren't receiving the emails from NCSS, your company has probably caught them in their more sophisticated spam filters. You may have to ask your IT specialist to help you allow our emails to get through. Communication is no longer one-dimensional which leads to my next point and the one I'm most passionate about.

## Value of Service

Service is the heart of my management style. I believe that this is the most important value in an age where communication is no longer the primary function of association management. I believe to have a thriving society we must provide services for our members. You may not always be aware of those services, but hopefully as the need arises, you'll know where to turn. First and foremost, we answer the phone when you call. Not a computer where your choice of options isn't quite defined.

A real live person answers the phone. On the rare occasion that all three of us are out of the office, we return calls as quickly as we can. If you have a question or need help with anything, call us. If we don't know the answer, we'll try to direct you to one who does. This is how we know and hear from our membership personally and your calls are extremely valuable to us.

Education is another service that we work hard to provide. Our seminars take place across the state and our online classes are available to those who can't travel or run out of time. We desire to be your first option for continuing education each year.

Legislative advocacy is a huge part of what we do as a service to NCSS members. More than likely this service also benefits non-members. McGuireWoods Consulting constantly monitors legislative issues that affect surveyors. Their work on our behalf is invaluable even if you hate politics.

We also serve you by hosting events that are simply fun; a chance for you to meet others. I remember after our 2014 golf tournament in May, I asked a Board member if they had fun and he said yes, because he met someone who quickly became a friend. This relationship led to a \$500,000 job referral because the other company didn't have crews in that region of the state. He exclaimed, “It was the best \$100 ever spent!”

## Value of Stewardship

Even with close to 1100 members, NCSS is considered a small non-profit so being a good steward of your valuable resources is very important to us. Michelle Kenny was an auditor in a chemical lab before NCSS somehow landed her.



Jeff Todd  
President

jeff@imcipls.com  
Mobile: 704-500-6887  
Direct: 704-997-2719

No detail escapes her! She is meticulous with the financial details and all three of us are frugal with resources. Every time we purchase a product or service and with every booking of an event, we are conscious that your money will be used to pay for it. There is no extravagance in the office. Please stop by and we'll give you a tour and invite you to look at the ways we try to save money.

### Value of Time

Next, I believe part of our success is in realizing that your time is valuable. I hate meetings that are a waste of time! We often try to host events that fall on consecutive days so that one trip to Raleigh or one hotel room night will cover both events. This isn't always convenient for everyone, but I assure you that convenience for the most members possible is our primary focus. I want to praise our committee chairmen for their efforts to make meetings manageable for the participants. The more efficient we are, the more successful we will be.

### Value of People

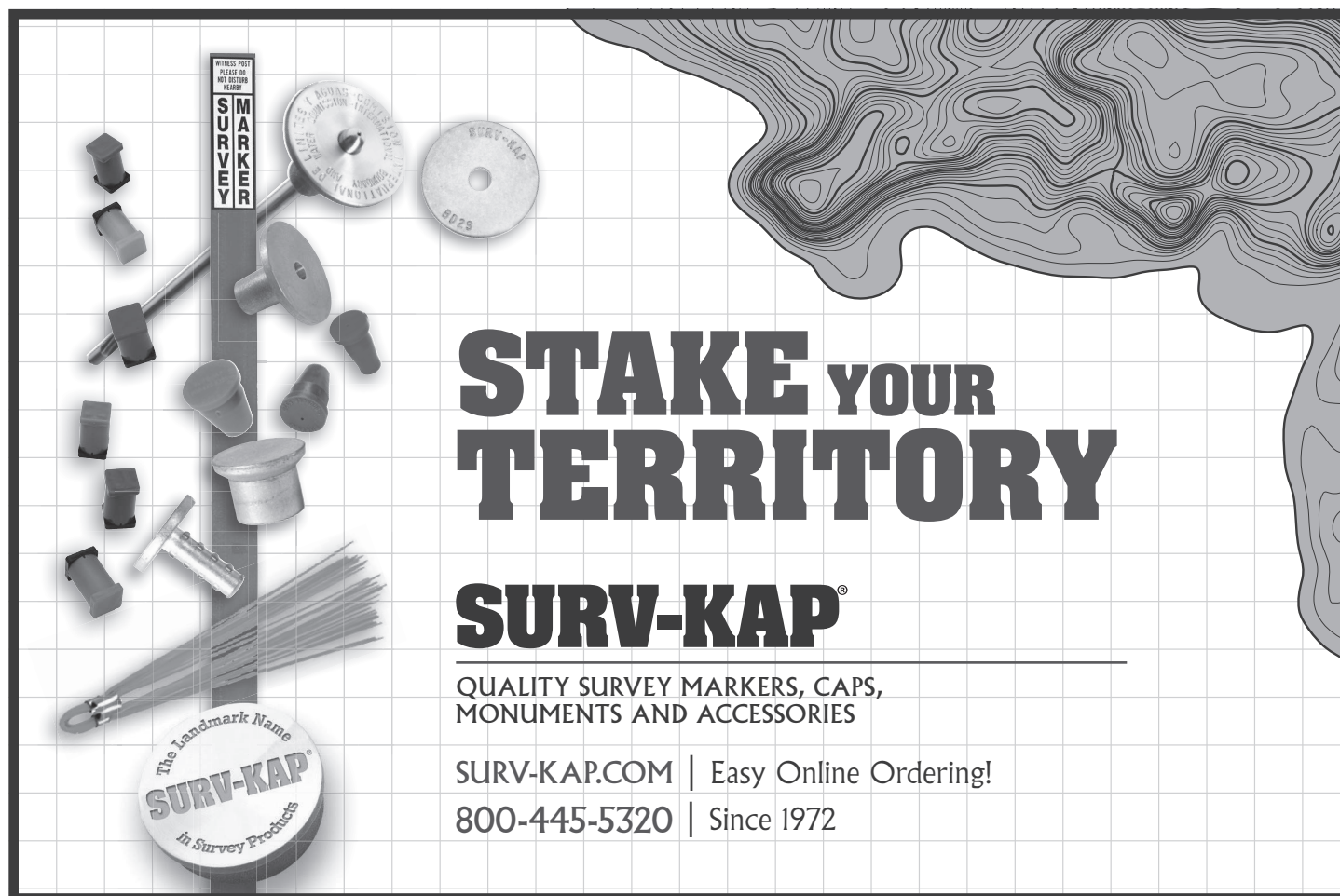
I saved the greatest value until the last. It's you! Your

willingness to serve on committees, attend meetings at the legislature, give us wisdom, host classes in your area, discuss difficult issues without losing your professional countenance are the most valuable assets the Society has. If it weren't for you, there would be no need for us. When the right person takes over a committee in an area that they feel passionate about, it is like a puzzle piece that you have been looking for slipping into place.

During the editing process, I kept adding services such as our MAPS database, and NC Railroad maps, etc. All of these are important and valuable, but I don't have room for a three-page article, nor do you have the time (Value #4) to read it. Come, thrive with us. If you are looking for ways to become more involved, let us know. We'll find a place for you and your gifts.

*Christy C. Davis*

Christy C. Davis, Executive Director



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# LETTER FROM THE PRESIDENT



**G**reetings from your new President. Hopefully by the time this is in print, spring is in full bloom and the heavens will have stopped weeping more days than not and we have some sunshine and drier weather to work with. I would like to thank Jamie for his leadership last year and continue to keep him and his family in our prayers on the loss of his dad. I also want to thank Leland again for filling in for Jamie during the Annual Conference and Trade Show. It was not the selfie I was anticipating but having a fellow Wolfpacker on the podium was great!

Thanks to our membership, chapters and especially our vendors for making the Conference a huge success. I know of at least one happy surveyor that left the Conference this year. Congratulations again to Jordan Schoff on winning our first ever 4-wheeler grand prize giveaway. This will be a trend that we would like to continue because our membership is growing, for more reasons than the economy.

Speaking of growing membership and to follow my theme of "Building Our Future," NCSS is 80 years old this year. We passed the 1000-member mark in 2018. We have built a strong foundation, now let's build a stronger and unified society. If we could increase our membership by 50% or at least get more than 50% of our membership actively involved with our profession at the local and state level, imagine what that would look like and the impact we could have. What would it be like with 90%? I challenge each member to make an effort by recruiting new members and volunteering with their local chapter at least one time this year and each year following. Perhaps you should consider taking a more active role both locally and at the state society level. The direction of our profession as well as mentoring the next generation of surveyors rests solely on our shoulders. We can make a difference together!

I look forward to working for you this year and feel blessed and honored to serve. The footsteps that have been left by those who have served before me are plain. With your help, we can continue to follow them and make footprints of our own.

Tim Bowes, PLS  
NCSS President 2019-2020



Zack Hayes, Libby Bowes, Betty Bowes, Tim Bowes, Jacob Bowes & Heather Bowes



## Schedule at a GLANCE

**APRIL 12, 2019**

### Coastal Chapter Partnership

8:00am-4:30pm

7.5 PDHs

Craven County Agriculture  
Extension Office  
New Bern, NC

**APRIL 26, 2019**

### Triangle Chapter Partnership

8:00am-4:30pm

7.5 PDHs

NCSS Office  
Wake Forest, NC

**APRIL 26, 2019**

### Mecklenburg Chapter Partnership

8:00am-4:30pm

7.5 PDHs

Mecklenburg County Land  
Use and Environmental Services  
Charlotte, NC

**MAY 3, 2019**

### Albemarle Surveyor Workshop

8:00 am-4:30 pm

7.5 PDHs

College of The Albemarle  
Elizabeth City, NC

**JUNE 5-6, 2019**

### Basic Photogrammetry (Photogrammetry Competency Course, Sect 2)

8:00am-5:00pm

16 PDHs

NC A&T State University  
Greensboro, NC

**JUNE 7, 2019**

### Aerial Image Processing (Photogrammetry Competency Course, Sect 3)

8:00am-5:00pm

8 PDHs

NC A&T State University  
Greensboro, NC



# Education Foundation

by Gary Thompson

*Education Foundation President*



**T**hank you for giving me the opportunity to serve on the North Carolina Society of Surveyors (NCSS) Education Foundation. I look forward to serving on the Foundation and

working to promote education opportunities for future Professional Surveyors. The Foundation's mission statement is "To support, raise awareness and provide financial aid for the Education Foundation's vision." Objectives of the Foundation are to increase the amount of funds in the endowment, develop a funding mechanism to support North Carolina's four-year Geomatics program at NC A&T State University and award scholarships.

The 2019 Foundation board members are: Gary Thompson, President; John Furmage, Treasurer; David Lee, Vice President; Mike Adams, Secretary; Doug Suttles, Gale Brown, Jamie Watkins, and Shane Strickland replaces Lora Younts. Lora has had to resign her position on the board due to her husband, Pepper's, cancer diagnosis. We wish him well as he fights the good fight. I would like to thank the Education Foundation members Chris Witherspoon, Jim Davis, and Billy DiGiacomo, who recently completed their Foundation terms, for their dedicated efforts to support NCSS, the Foundation, and our profession. The Education Foundation meets quarterly prior to the NCSS Board of Directors meeting.

As I write this article, the endowment balance is \$284,205.067 with \$27,609.61 in a contingency fund. One of the Foundation's objectives is to increase the balance of the endowment. We will continue to explore new opportunities that will assist the Foundation to increase the endowment balance and increase our ability to provide scholarships to students enrolled in Geomatics programs.

We had a successful raffle at the 2019 NCSS Annual Conference which resulted in \$7,000 in revenue for scholarships. As in past years, all one hundred (100) tickets were sold. I would like to thank everyone that assisted with selling tickets and for the PLS's, chapters and other

individuals that purchased raffle tickets.

## The 2019 Foundation Raffle winners were:

- First ticket out - Susan Schall (\$500)
- Next to last ticket out - Leland Strother (\$500)
- Grand Prize - Chris Witherspoon (\$2000)

Revenue from the 2019 Foundation Raffle will be used to provide scholarships to students enrolled in two-year and four-year degree programs in North Carolina. In 2018, the Foundation awarded \$12,500 in scholarships.

During my drive to and from work, I routinely see NCSS specialty license plates on vehicles. Currently we have 500+ active NCSS specialty license plates. If you don't currently have a NCSS specialty plate, we encourage you to obtain one the next time your license plate is up for renewal. The Foundation receives \$15 each year for each NCSS specialty plate. Thanks to you, the Foundation received \$9,345 in 2018 from the Department of Motor Vehicles (DMV). Specialty plates may be ordered online at [www.ncdot.gov/dmv/title-registration/license-plates/Pages/specialty-plates.aspx](http://www.ncdot.gov/dmv/title-registration/license-plates/Pages/specialty-plates.aspx), by downloading and mailing an order form (see link below) or in person at any NCDMV license plate agency. <https://www.ncdot.gov/dmv/title-registration/license-plates/Documents/MVR-27LS.pdf>



## Wouldn't this tag look great on your vehicle?

The Foundation encourages NCSS Chapters to sponsor a Trig-Star program at a high school (s) located in your Chapter area. With your help, we can increase the number of North Carolina high schools that participate in the Trig-Star program. If you or your Chapter are interested in becoming a Trig-Star sponsor, contact the NC Trig-Star Coordinator (Benjy Brown, [benjyb@bellsouth.net](mailto:benjyb@bellsouth.net)). For more detailed information about the program go to this link: <https://www.nsps.us.com/page/TrigStar>.

At the May 2019 Foundation meeting, I plan to make a presentation on how the Foundation and NCSS can assist high schools to create a Geomatics Career and Technical Education (CTE) program. CTE programs are designed for middle and high school students. Some of the CTE focus is

on Science, Technology, Engineering and Math (STEM). A Geomatics CTE program fits well in the STEM curriculum.

If you would like to attend a meeting, provide feedback, or have a suggestion for funding opportunities or programs that will support North Carolina's two- and four-year Geomatics programs, you can contact me or any Foundation member.

**My challenge to NCSS members:**

- ✓ Make a contribution to the Foundation
- ✓ Support NC's two- and four-year Geomatics programs
- ✓ In 2019, increase the number of NCSS specialty plates by 100
- ✓ Increase Chapter participation in the Trig-Star program

- ✓ Take part in a career day at your local high schools (Use National Council for Engineering and Surveying (NCEES) speakers kit link: <https://ncees.org/education/ncees-speakers-link-and-speakers-kit/>)



*Gary has held a professional license as a Professional Land Surveyor (PLS) in NC since 1980. He has served as president of both NCSS & NSPS. He most recently served as treasurer of NCEES, chair of the North Carolina Boundary Commission, and an emeritus member of NCBEES.*

## Welcome New Licensees

Brian T. Buzard

J. Eric Clemmer

Andrew C. Coore

Linwood T. Downs, III

Benjamin D. Fasig

Patrick S. Finn

Dwayne A. Hall

Shaun F. Higgins

John M. Kotila

Theodore E. Landis, Jr.

Christopher L. Lewis

Ronald G. Petersen

Jeffrey M. Rader

Justin C. Rains

Matthew T. Roberts

Michael E. Ross

Joshua A. Sizemore

Jake E. Stephens

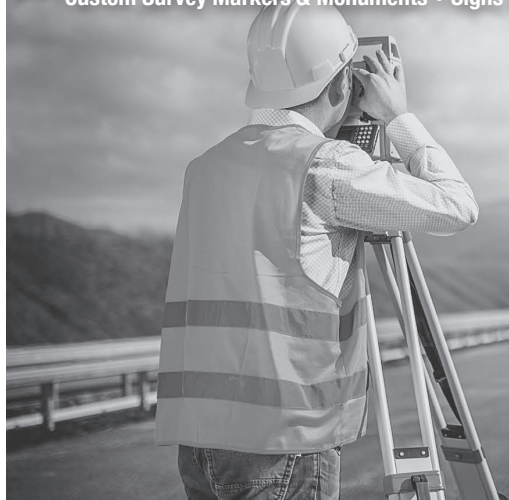
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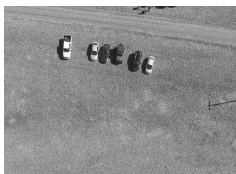
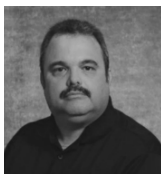
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# Extraordinary

by Peggy Fersner, PE

Our senior class can only be described as extraordinary. We have six students including four Professional Land Surveyors, one Professional Engineer, and one Certified Photogrammetrist, and of course the alphabet soup of certifications following many of their names. All of them embarked on this degree path for multiple reasons and will tell you that they are extremely happy to have the end in sight. This semester they are working on a residential design for an area at the NC A&T University farm. This project is a continuation of the legal boundary research done in the fall. They came together for the first Friday and Saturday in February to complete the boundary survey and to fly the property in order to create the surface for their design. Together they are collaboratively completing the tasks even though they live across the state and in Florida.



Pictured from left to right on a cold day, they are:

**Pete Brennan, PLS, CFEDS, CFS** graduated from Wake Technical Community College with an AAS in Surveying Technology and has worked in both the private and public sectors. He is the City Surveyor for Wilmington, NC. One interesting fact about Peter is that he is a Bureau of Land Management Certified Federal Surveyor.

**Adam Canoy, PLS** is earning his degree in Geomatics (May 2019) and it will be his second as his first degree was in Mathematics from Lees-McRae College. While working on this current degree, he successfully passed the Fundamentals of Surveying (FS) Exam and obtained

his professional licensure for North Carolina. He is currently working as the Subsurface Utility Engineering (SUE) Manager for Wood E&IS's Durham office.

**Serena Moody** has worked in both the private and public sectors and previously obtained her AAS degree in Surveying Technology from Southwestern Community College. She is currently employed by SEPI Engineering and Construction out of Charlotte. A little-known fact about Serena is that she is a whiz with MicroStation.

**Jeff Jones, PE, PLS** is currently employed by the City of Charlotte using all of his experiences to inventory, upgrade and institute monitoring of their entire water metering system. Obviously, his GIS expertise is driving this job. Jeff has a previous degree in Mechanical Engineering and became a PLS through "GIS Grandfathering." He will tell you that he is in the program to master the areas of Geomatics he was missing.

We all know **Jerry Nave, PLS, Ed.D** – the instructor for the senior capstone courses.

**Tyrus Jackson** came to our program with his AAS in Civil Engineering Technology from Fayetteville Technical Community College. He is one of our few campus students and consequently has to interact with Jerry, Leila, and me on a routine basis. He is currently interning with Guilford County GIS as a GIS Analyst.

**Tim Schall, PLS, CP** is currently employed by the US Army Corps of Engineers, Jacksonville District and was unfortunately unable to make the trek for the two days of fieldwork. Since Tim is an American Society of Photogrammetry and Remote Sensing (ASPRS) Certified Photogrammetrist he is responsible for the data processing of our aerial imager. Tim received his AAS in Surveying Technology from Guilford Technical Community College and will receive his BS in Geomatics in May.

Our capstone projects emphasize the benefit of our online degree program by bringing together individuals from across the state to work as a team applying all that they have learned. This group of young professionals has been able to broaden their knowledge, skills and credentials while still earning a living. Congratulations to them all for a job well done!



*Peggy Fersner is the Geomatics Coordinator at NC A&T State University in Greensboro. She has been on staff since 1993, teaching surveying, GIS, and hydrology courses. She has earned both her BS and MS in Civil Engineering.*

  
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# The Next Generation of Surveyors

by Michelle Kenny, NCSS Office Manager

What do you think of when you think of the next generation? With two children from Generation Z (“Gen Z”), I find myself being critical because they operate differently than my generation, especially in the area of technology. Isn’t that always the case though, from one generation to the next? However, I’m learning that the generation gap isn’t such a bad thing. In addition, I’m reminded that this tech-savvy Gen Z is the next generation of workers and we, as a Society, need them to choose surveying. This age group is where the newly dubbed NCSS Career Ambassadors can make a difference.

To address the increasing average age of surveyors, NCSS organized the above-mentioned group to encourage surveyors to engage their local communities in order to raise awareness of the importance of surveying, especially to the next generation. Christy Davis, NCSS Executive Director, introduced and honored the Career Ambassador group at the General Membership Meeting at the 2019 Annual Conference and Trade Show in February. She also asked for more volunteers. We were thrilled with the number

of people who signed up to become a Career Ambassador and enjoyed hearing the stories from those of you who are already reaching out to local schools and various organizations, such as Scouts, to promote surveying.

Secondly, we want to equip you to educate the next generation about the versatile profession of surveying which incorporates two of our education system’s favorite subjects-math and technology. With the help of NSPS, we can supply you with materials such as pamphlets and posters to give to the students and teachers when you visit a school or schools. The “Get Kids into Survey” tab on the [beasurveyor.com](http://beasurveyor.com) website is also a wonderful resource, especially for elementary and

middle school students. NSPS’s website has a Surveyors Week Volunteer Kit that can be used year-round. Based on feedback from our ambassadors, we are also hoping to provide career fair presentation training in the future.



NCSS Career Ambassador Jeff Allen with Allen Geomatics had this to say about his recent experience at Davie County Early College’s Career Breakout Session: *“Our profession needs surveyors that can relate to a younger generation to let them know that being a Professional*

*Land Surveyor can be a very fulfilling career. Although there could be some direct impact to my business, I do it for the profession as a whole. Out of the 80 or so kids I spoke to, I’d assume from their reaction that maybe 3 or 4 of them were sincerely interested in pursuing it as a career. I call that a win-win. If 10 Career Ambassadors spoke to 200 kids per year and we realized a rate of return of 2%, that’s FORTY 18-year-old kids either entering the workforce to learn about surveying or entering college to pursue a professional career. I think this is a reasonable expectation to achieve.”*

We hope these words from a fellow surveyor will spur you on to take time out of your schedule, even if it’s just once a year, to attend your local school’s career fair event or help a Scout earn the Surveying Merit Badge. Please call the office at 919-556-9848 if you are interested in participating or if you need resources to attend a local event. Thanks to everyone who has volunteered already and who signed up at the conference to volunteer in the future. We will be in touch. Let’s work together to continue the never-ending job of inspiring Generation Z and others to choose surveying just as you did.





# PHOTOGRAMMETRY COMPETENCY COURSE

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## 2019 Schedule

June 5th & 6th - Section 2

June 7th - Section 3

August 8th & 9th - Section 4

ADDITIONAL DETAILS ON BACK

With the integration of UAVs into many companies, the base knowledge of photogrammetry and error analysis has been bypassed. Technology has enabled simple flight planning, flying and post processing of the data without the underlying knowledge of photogrammetry. Completing coursework covering a specific area and gaining experience under a qualified professional are two methods of obtaining competency.

## 1 SECTION 1

### FAA Part 107 (24 PDHs)

This course will consist of training and exercises in preparation for the FAA Part 107 Remote Pilot Knowledge exam. This course is for future UAS Commercial Operators, Surveyors, Construction Managers, UAS Managers, and Safety Managers. Attendees should have a basic familiarity with Unmanned Aerial Systems and capabilities.

## 2 SECTION 2

### Basic Photogrammetry (16 PDHs)

In this section, attendees will look at the history of photogrammetry as well as gain a working understanding of the components and terminology. Information covered will lead to a greater understanding and appreciation of aerial mapping using UAVs.

## 3 SECTION 3

### Aerial Image Processing (8 PDHs)

The third section will look at a variety of sUAV image processing softwares. A survey of existing softwares and their capabilities will be discussed focusing on surveying and mapping capabilities.

*Prerequisite: Section 2 - call to register.*

## 4 SECTION 4

### UAV Field to Finish (16 PDHs)

The final section in the UAS series will introduce the fundamental components of small unmanned aerial systems (sUAS) and how they function together to produce high resolution, spatially accurate planimetric maps and 3D models of terrain.

*Prerequisite: Section 2 & 3 - call to register.*



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You are sitting on monument B having SPC of N 704,317.57 sft, E1,352,814.92 sft and back sighting monument A having SPC of N 703,633.49 sft, E 1,350,748.17 sft. NAD 83(2011).

Sitting on mon. B and back sighting mon. A. What angle would you turn and what distance would you measure to look for a monument set in July 1842? The following data is given in an old field book. The line was run on a magnetic bearing of N 70 ½ E degrees. The distance was measured along the ground using a chain 1/8 of a link to long. 2 chains 1 pole 23 ½ links down a 4% slope; 4 chains 3 poles 20 links up a 6% slope; 7 chains 3 poles 4 ½ links. Set a stone near a box face pine; marked a dogwood and 2 Spanish oak pointers.

## PROBLEM CORNER

by John Furmage, PLS



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# It's Mine – No, It's Jordan's

*Christy C. Davis, NCSS Executive Director*



**T**he 2019 Annual Conference and Trade Show took place on February 21-23 at the Hilton Raleigh North Hills, Raleigh, North Carolina. Excellent attendance, a nationally recognized speaker, various educational opportunities and a grand prize drawing were all reasons that the week was a great success as North Carolina surveyors lived out this year's theme, Building Our Future.

It was an exciting year for attendees entered in a drawing for a Kubota RTV400Ci. The name of each full conference registrant was entered twice into the drawing and each partial conference registrant was entered once. The odds of winning were pretty good. The drawing took place Friday afternoon as a culmination to the time attendees had to tour the Exhibit Hall. Just about everyone hoped to win the RTV with most people forming some type of claim on the practical piece before the drawing occurred. The NCSS staff heard a hundred times over the course of the event, "It's mine!" For one surveyor that was true. PLS, Jordan

Schoff, who has been licensed since 2009 and works for Stewart, won the Kubota when Peggy Fersner clicked the remote, halting the PowerPoint slide show rotating with registrants' names on individual slides. Jordan's time away from the office was well worth the price of admission.

Earning 14 PDHs also made the price of admission well worth time away from the office. This year our primary instructor on Thursday was Don Wilson, PLS. Many surveyors were very excited to see Don for the first time or perhaps for the first time in years. He has written or collaborated on many textbooks that are used in geomatics classrooms today. He has tremendous knowledge and experience through his years as a surveyor. Short Courses on Friday included Randy Rambeau presenting the framework of the CST program and why it is beneficial for companies to grow their employees through the program. Mark White presented how grid and ground coordinates affect measurements. David Bowers shared how On-Site Registration (OSR) enables 3D scan data to be wirelessly



transmitted directly to an on-site computer workstation/PC while performing field activities. Chad Howard rounded out the morning with a round table discussion concerning the ways surveyors deal with discrepancies. His class was so well-received that NCSS will offer it again in Elizabeth City on May 3rd. On Friday afternoon, we hosted Dale Burton with NCDOT Location and Surveys Unit. He and his co-presenters discussed the role in the development of a typical State Transportation Improvement Program project.

Friday evening the 2019 Board of Directors was sworn in with six new members. Peter Brennan will serve as the new Vice President, Royce Lambert will represent the Johnston County Chapter, Tim Guisewhite will represent the Mecklenburg Chapter, Gabe Brown will represent the SW Piedmont Chapter, David Haywood will represent the Yadkin Valley Chapter and Troy Clayton, who didn't wait until Friday evening to get involved, will represent the Triangle Chapter.

Troy made his debut as Chapter President to emcee the Plat Award Ceremony on Thursday evening. This year's Best Overall winner was Jeffrey Hazzan who works for Donaldson, Garrett & Associates in Charlotte. He entered an As-built Commercial ALTA plat prepared for EMC Engineering Services. John Story accepted \$100 and a plaque on his behalf. His plat will be entered in the National Plat Competition with the National Society of Professional Surveyors (NSPS). Other first-place winners included Jared Ownbey, Boundary and Subdivision; Cory Carpenter, Topographic; Brian Winters, As-built Residential; Neil Shepherd, ALTA. Congratulations to all our plat winners for 2018.

During the Friday evening Presidential Banquet, other award winners were recognized by outgoing President, Jamie Watkins. This year was unusual because Jamie was not able to attend the conference due to his father's illness. Leland Strother, who stepped in to emcee the week, read a heartfelt letter from Jamie as the award winners were named. The Shining Star Award is typically given to someone who has recently entered a leadership role and been successful. This year's winner was Shane Strickland who took over the Political Action Committee. He successfully completed the PAC raffle and oversaw the distribution of funds to the campaigns of Representatives and Senators who continue to be helpful to the legislative agenda promoted by NCSS. The Polaris Award was given to John Story who took over the Education Committee in 2018. This committee is a huge commitment taking a great deal of time and effort. John worked diligently advising on classes, partnerships and the Institute in his first busy



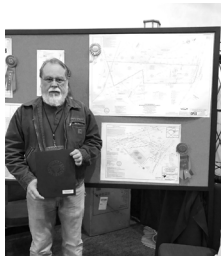


year. Finally, the President's Award was given to incoming President, Tim Bowes for the help he provided Jamie over the course of the year.

The Presidential Awards Banquet culminated with two very special winners. Sullivan Gibbs from the Johnston County Chapter was awarded the Young Surveyor of the Year award. "Sully" was nominated by the Johnston County Chapter and voted on by the NCSS Board of Directors. His service and integrity were noted by many during the presentation. His wife Jasmine and two children, Evelyn and John were in attendance to receive the honor with him. They were very proud of his accomplishments. The final

award of the evening was the coveted Surveyor of the Year which went to Joel Johnson of the Nantahala Chapter. His wife Marcia, daughter Lauren and her husband, Ryan were on hand to celebrate with all members of NCSS. Joel has done so much for NCSS through the years that it would be difficult to write down his accomplishments. Suffice it to say, he probably has more miles on his vehicle between Sylva and Raleigh than any other living surveyor.

Please join us February 5-8, 2020, at the Hilton Charlotte University Place for another exciting time to grow in knowledge and professionalism and perhaps you will be able to say, "It's mine!"



See page 28 for more photos.

# The Night of the Flood

by Peter J. Brennan, Jr., PLS, CFEDS, CFS

On Friday, September 14th, Hurricane Florence made landfall near Wrightsville Beach, North Carolina. Hurricane Florence brought record-breaking storm surges and rainfall totals between 20 and 30 inches. (National Weather Service, Sept 12-15, 2018). Elizabethtown and Swansboro had the highest single rainfall totals of 35.93 inches and 34.00 inches, respectively. Although the storm weakened relatively quickly, the devastating rainfall had severe impacts on coastal and inland areas. As a result of the massive rainfalls, the City of Wilmington, North Carolina was isolated due to flooding of all the major roads in and out of the city. As the floodwaters receded, the citizens began the process of recovery.

Immediately after the winds subsided, City of Wilmington Engineering personnel were dispatched throughout the city to assess the damage. This assessment was comprised of a block by block inspection of every building in the city to estimate damage from wind, fallen trees and flooding. During this time, over half of the city was without power and many roads were washed out or impassable. 37 people had lost their lives (CBS/AP, Sept 19, 2018). By the following Tuesday, the entire city had been canvassed and the employees began leaving for home to deal with their personal losses.

Before the surveyors had left, an email came into the City Engineer. The Emergency Management Staff had notified the City Manager's Office of a major concern. The National Weather Service had started trying to determine the day and time that the Cape Fear River would crest. The riverfront is a prominent feature of downtown Wilmington and some of the most valuable real estate and infrastructure is located within proximity of the river.

Although the National Weather Service had not yet issued a formal prediction, there was discussion of the river reaching the record-high crest seen during Hurricane Matthew in October 2016 (National Weather Service, October 8, 2016). Matthew was extremely devastating, killing 25 people in North Carolina and causing an estimated 1.5 billion in flood damage. All of this flood damage was from a storm that delivered 12 inches of rainfall, less than half of the rainfall that we had just received in Florence.

While the damage totals were still being added up, the inland river levels were continuing to rise. Interstate 40 and NC Highway 421 flooded, Wilmington was isolated, and the peak crest had not occurred yet. There was concern that the flooding would be catastrophic. This belief was fueled by a report run on the FIMAN (Flood Inundation Mapping and Alert Network) website that indicated flooding would be almost 3 feet above the lowest building's thresholds. The FIMAN website is maintained by the North Carolina Department of Public Safety Emergency Management. North Carolina Geodetic Survey is also in Emergency Management.

City Emergency Management Personnel were anxious to get information out to the citizens and building owners. The buildings along Water Street were of concern. Water Street is the first road east of the river and is subject to flooding even during lunar high tides. Business owners

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were being advised to sandbag their entrances. Emergency personnel began alerting the tenants and owners downtown. The locals began questioning the data. Many of them had been through multiple flooding events and had never seen the extent of flooding that was being predicted.

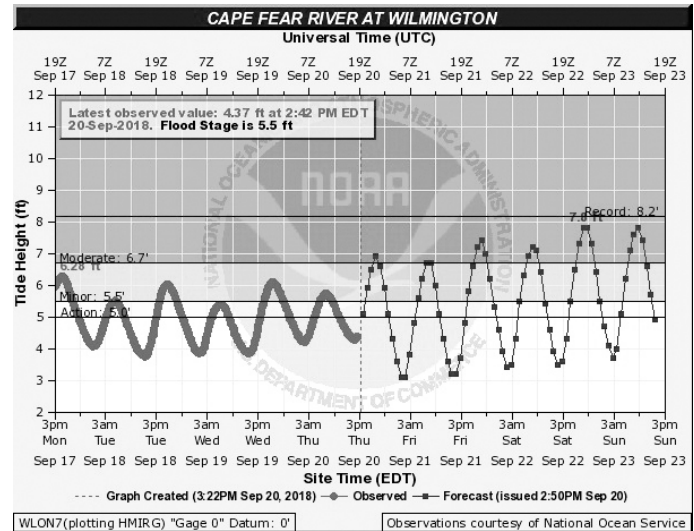
The City Manager's office needed verification and tasked the Engineering Department to analyze the data. The City Engineer asked the survey section to estimate the potential impacts of the coming flood event. At the crest of Matthew, the river gage reading was 8.2 feet and that was the value that had been entered into the FIMAN report. The first question that the survey team had to address was the river gage. What datum did the gage represent? Through a series of emails and studying, it was determined that the river gage datum was actually 2.6 feet below North American Vertical Datum 88 (NAVD88).

The next step was to verify the difference in datums. Survey Project Manager, Ed Ashworth decided that the best place to monitor an incoming high tide would be at Dram Tree boat launch. Dram Tree is located south of downtown within site of the Isabel Homes bridge. Ed stayed late Tuesday night marking the high waterline every 15 minutes for an hour before and after the high tide. The next day, the survey crew used the North Carolina Geodetic Survey Virtual Reference Station (VRS) network to verify the elevations of the waterline marks that had been observed. The VRS network allows a Global Positioning System Receiver (GPSR) to provide the user with corrected coordinates by accessing correction data over a MiFi or cell phone internet connection and provides this information to the user in real time. Comparing these elevations and knowing the exact time they were marked allowed the surveyors to compare the actual field observations to the time-stamped river gage data.



*Forrest Ashley and Ed Ashworth verifying the high waterline marks. The debris line from high tide is visible.*

With the difference in datums confirmed, the crew visited several locations downtown and made marks that represented the projected extents of the flooding. It appeared that the impacts would not nearly be as bad as originally feared. All that was left to do was to wait until the night of the river crest and hope the National Weather Service was correct with the 8.2 feet river gage prediction.



### *National Weather Service Tide Prediction for Thursday, September 20, 2018.*

On the day of the river crest, it was decided that it would be a good idea to make some more projected high-water marks along Water Street. After days without power, the crews had to use manual equipment to run differential levels from a benchmark. The benchmark chosen was conveniently located in the face of the Federal Courthouse right in the intersection of Water Street and Market Street. To make things even easier, there was already an elevation stamped



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into the disk! Having used this disk several times in the past, the surveyors knew that the elevation stamped in the disk was not NAVD88, nor was it National Geodetic Vertical Datum of 1929. The disk is stamped as a tidal benchmark, set by the U.S. Coast and Geodetic Survey in 1917. This disk predated the national datum by 12 years! Using the NAVD88 value for the disk from prior field notes, the surveyors were able to run a small series of levels from the disk to several structures and points of interest.



*Tidal benchmark at Federal Courthouse  
(NAVD88 elevation is 7.57 feet).*

The night of the river crest, September 24, I headed downtown. When I arrived at the Market Street and Water Street intersection, I was surprised to find that there were quite a few people already there. There were a few members of the Cajun Navy. The Cajun Navy is a group of volunteers who use their own time and equipment to rescue those in need (Cajun Navy Relief, undated). I also met local historians, news reporters and professional photographers. There were even small children in pajamas, whose parents brought them down to see the event.

Fortunately, the estimated river crest was even less than the U.S. Weather Service initially predicted. The extent of damage was minor and the local businesses were prepared. Most had seen this type of flood event before and had ingenious methods of sandbagging and floodproofing using heavy duty plastic and spray foam insulation. Much of the concern was brought about by not understanding datums. Because City Survey staff understood datums and were able to utilize available tools such as the National Geodetic Survey (NGS) benchmarks, Global Navigation Satellite System (GNSS) and VRS networks, the FIMAN



*Intersection of Water Street & Market Street on  
September 24, 2018 10:30 P.M.*

website and conventional survey instruments, we were able to address serious concerns that could potentially impact people's livelihoods and major investments. The datum will change again in 2020. As professionals, we will be looked upon to help safeguard the public.

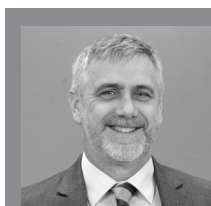
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National Weather Service, Sept 12-15, 2018, Historical Hurricane Florence: September 12-15, 2018, retrieved from: <https://www.weather.gov/mhx/Florence2018>

National Weather Service, October 8, 2016, Hurricane Matthew in the Carolinas: September 12-15, 2018, retrieved from: <https://www.weather.gov/ilm/matthew>

CBS/AP, September 19, 2018, Florence Gone But its Flooding a Crisis in Parts of North Carolina, retrieved from: <https://www.cbsnews.com/live-news/hurricane-florence-aftermath-weather-flooding-power-outage-death-toll-fema-latest-forecast-live/>

Cajun Navy Relief, undated, About the Cajun Navy Relief, retrieved from: <https://www.cajunnavyrelief.com/about-us-2/>



*Peter Brennan graduated from Wake Technical Community College with an A.A.S. degree in Surveying Technology, while working for NCDOT. He has been the City Surveyor in Wilmington, North Carolina since 2011.*



# What Did I Use in the Field?

by Ken Mills, PLS

**O**n January 2, 2019, I celebrated my 50th year in the land surveying profession. I've been a licensed Professional Land Surveyor for 44 years, and recently, I've been thinking of the things I used when I first began my surveying career. What a difference!

I still have the first plumb bob I purchased. It is an 18 ounce beauty. Looking at it closely you can see small circular dings all around the upper portion of the bob. At the time, all the field crew members I knew used their plumb bobs as a survey tack hammer. The bob was perfect for the job of placing a survey tack in the top of a wooden stake or hub. Also, we didn't have the gammon reel. It hadn't been invented yet. The string was carried around your neck during the survey. At the end of the day or the job, you would wrap the string around the neck of the bob. This was done by making a small loop and holding it under the thumb on the side of the bob. Then the remainder of the string was wound around the neck. When you got to the end of the string you would make another loop, which was pushed through the first loop. The first loop was pulled tight by pulling the string portion at the top of the bob until the second loop was held tight against the string wound around the neck. To unwind the string all you had to do was to pull the end of the string out of the first loop and the entire length of string would fall free. Simple!!!

I had a leather pouch that held the plumb bob, a wooden 6" ruler marked in tenths and hundredths of a foot and a mechanical pencil. The pencil held rather large diameter lead, which we used for marking on stakes, concrete, walls, trees, etc. I still have the leather pouch somewhere in my house. I stopped using it a number of years ago because

one of the slots for the belt was almost worn through.

The ruler was used to make short measurements or to draw lines on the stakes. It could also be used as a short stadia measuring tool for distances up to 50 feet from the instrument.

We had an engineer's transit before we got a technological wonder, the Wild T-16. Both instruments had stadia hairs. Looking through the scope you would see the cross hairs. A shorter hair was above and below the cross hairs and also to the right and left of the cross hair. The location of the stadia hairs was designed so that when you looked at a level rod and put the lower stadia hair on one foot mark the upper stadia hair was on the next foot mark above. At this point, the level rod was 100 feet from the instrument. All of the mapping was located using the stadia hairs and the level rod. The traverse and corner markers were located using the chain.

Accurate measuring was done using either a hundred-foot or two hundred-foot steel tape, which was referred to as a chain. This term was a holdover from when surveyors used the Gunter's chain. One end of the chain was marked in hundredths of a foot. The rest of the chain was only marked every foot. To measure on level ground, the tape was laid flat on the ground. If you had to measure over something or up the side of a mountain, the plumb bob was used to raise the tape to a level position. Another technique would be to hold the tape along the side of the instrument at the pivot point of the scope and the instrument operator would sight the end of the tape on the ground or at the top of the plumb bob string as it is hanging over the tape. The slope distance was recorded along with the vertical angle. This data was converted to horizontal distance at a later time in the office.

For measuring angles at long distances from the instrument, we used a wooden range rod, which was about 8 feet tall. The rod was tapered from the point at the bottom up to the top of the rod. It was also painted in alternating red and white stripes. The stripes were one foot long. The bottom of the rod had a metal point which could be placed in the small cup of a survey tack, on a PK nail, a concrete nail, in the ground or on anything else. It also made a dandy spear, which we were not supposed to throw. Boys will be boys. An odd thing was the hook screwed in the top of the rod.

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I never knew what the hook was for. Does anyone? Let me know.

A Tension Handle was used to hold the correct tension on the chain to help reduce the error in measurements. It had a handle on one end, which was attached to the body of the unit. You held onto this while pulling against the scale, which was inside the body. The scale had a coil spring on the inside of the body and wrapped around the scale shaft. A pointer, attached to the shaft, extended from the inside of the body to a scale on the outside of the body. On the end of the shaft, protruding from the end of the body was a hook, which was hooked into the loop on the end of the chain. The normal pull on the chain was 20 pounds.

The instrument we used was called an Engineer's Transit. It had four leveling screws to level the instrument and was mounted on a solid leg tripod. I think it was an art to get the tripod over the point and get the top of the tripod as level as possible at the same time. The legs were anchored into the ground before the instrument was screwed to the top of the legs. The large screw on the bottom of the instrument was designed so once the instrument was

leveled the instrument could be slid around on top of the screw to get the instrument exactly over the point. Under the instrument was a hook for attaching the plumb bob string so the plumb bob was just above the point at ground level. I always used a 24 ounce plumb bob because of the resistance to any breeze, but the best instrument man I ever worked with used a 12 ounce plumb bob. I was never that good.

The business portion of the instrument was the top part. There was a horizontal circle marked to 20 minutes of arc with an 8-inch compass mounted in the center of the circle. Outside the circle and mounted on the frame were two vernier scales 180 degrees apart. Two standards mounted on opposite sides of the frame supported a telescope and a vertical circle. The vertical circle had only one vernier and was not as accurate as the larger horizontal one.

Accurate angles were turned by a method called winding up the angle. This was done by locking the circle to the upper frame and using the vernier to adjust the circle to zero degrees. Then the scope was pointed at the back sight  
*continued on page 28*





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# Implied Easements

by Kristopher M. Kline, PLS, GSI

There are obvious advantages to easements created by express dedication, grant, or reservation as contrasted with the more problematic alternatives. If properly recorded, documents describing these rights are accessible to the public, provide a dependable source for later retracement and generally are less vulnerable to legal challenges.

However, many legitimate easements in North Carolina are based on more doubtful antecedents, including – but not limited to – inconclusive descriptions and unrecorded plats. This problem is largely due to the historically poor treatment afforded to easements by the courts, landowners and attorneys. While current laws and standards favor the creation of new servitudes by clear descriptions in duly recorded documents, easements created in years past continue to create headaches for the professional.

Implied easements can be particularly problematic, in part because they come in several different variations. Easements may be implied by prior use, by necessity, by plat, or by common scheme. All implied easements require a common grantor, but each variant has a distinct set of rules that are not interchangeable. Claims involving implied easements often fail because the parties don't understand the distinctions between the various types of implied easements.

The one requirement in common to all private implied easements is the need for a common grantor. Most courts consider implied easements to be an extension of the original intent of the grantor and grantee at the time of separation of a parent tract into two or more smaller parcels. As landlocked parcels of land generally do not serve the public welfare or the interests of the individual landowner, some courts also describe implied easements as a mechanism to address a legitimate public policy issue.

## Easement Implied by Prior Use

Easements implied by prior use require just that – an existing use (the “quasi-easement”) of one part of the parent tract (the “quasi-servient” estate) for the benefit of the other part (the “quasi-dominant” estate). Many visible and permanent driveways are actually potential quasi-easements. However, while the parent tract is under single ownership, no actual easement can exist. As noted in *Edwards v. Hill*: 208 N.C. App. 178 (2010): “It is axiomatic

*in property law that one may not have an easement in his or her own land. ... Ordinarily the doctrine of merger would apply and extinguish the easement[.]”* Subsequent division of the parent tract omitting any mention of an easement may result in judicial recognition of the existence of an easement implied by the apparent and permanent use that existed prior to the division.

*McFayden v. Olive*: 89 N.C. App. 545: (1988) describes the elements necessary to prove an easement by prior use: “An easement implied from prior use is generally established by proof: (1) that there was common ownership of the dominant and servient parcels and a transfer which separates that ownership; (2) that, before the transfer, the owner used part of the tract for the benefit of the other part, and that this use was apparent, continuous and permanent; and (3) that the claimed easement is “necessary” to the use and enjoyment of the claimant's land.” The necessity required for this variant is not absolute – only a reasonable necessity is required.

## Easement Implied by Necessity

Easements by necessity are often confused with easements implied by prior use, but each has a distinct list of requirements. Easement by necessity is generally invoked when the dominant tract is entirely surrounded by remaining lands of the grantor, but may also be applied to situations where sale of part of the parent tract results in a grantee with no legal access. In this scenario, the easement is implied by a near-absolute necessity, rather than by any existing prior use, and can be claimed only over the remaining lands of the grantor.

The recent decision *Jernigan v. McLamb*: 192 N.C. App. 523 (2008) reiterates long-established requirements: “To satisfy the elements of an easement by necessity, the claimant must prove that: ‘(i) the claimed dominant tract and the claimed subservient tract were once held in common ownership that was severed by a conveyance and (ii) the necessity for the easement arose out of the conveyance.’” It is the division by the common grantor, thereby creating the necessity, that proves the intent by the grantor to include an easement for access.

The easement by necessity need not be claimed immediately. Most courts agree that the easement may be claimed years later provided that all common law requirements were met at the time of the original division, and that necessity still exists. While the level



of necessity required is high, it does not preclude a claim where a theoretical alternative access exists but is a practical impossibility. Permissive access to the problem parcel will not negate an easement implied by necessity, because the permission could be revoked at any time at the whim of the servient owner.

### Easement Implied by Plat

Recent surveys that comply with modern subdivision rules and state statutes should include the limits of any proposed easements along with specific language indicating intent to dedicate. However, surveyors routinely deal with easements based on plats from decades or centuries past where no such clarity is found.

Recording a plat showing proposed parcels and associated roads is generally sufficient to prove an implied dedication to the public, but may result only in a private easement, depending on the circumstances of the case. At common law, conveyance of individual lots identified by reference to a plat is considered acceptance of the dedication by plat and results in a private easement. Lot sales based on a plat showing access roads immediately create private rights of access for the lot purchasers, regardless of whether the roads are ultimately accepted by the public. Even where roads are later accepted by a public entity, a separate private right of access still exists for lot owners, but is submerged within the public right. Later abandonment of the public right does not always serve to extinguish the previously existing private right.

Easements implied by reference to a plat include all roads shown on the plat, even if those roads are never accepted by the public, as described in *Janicki v. Lorek*: 255 N.C. 53 (1961): “Where lots are sold and conveyed by reference to a map or plat which represents a division of a tract of land into sub-divisions of streets and lots ... the purchaser of a lot or lots acquires a right to have all and each of the streets kept open; and it makes no difference whether the streets be in fact opened or accepted” by the public. “There is a dedication, and if they are not actually opened at the time of the sale they must be at all times free to be opened as occasion may require.”

Even where express language is lacking, early plats may still be the basis of an implied dedication, as seen in *Woody v. Clayton*: 162 S.E.2d 132 (1968): “The authorities cited by defendants amply support the general proposition that ‘a dedication may be by express language, reservation, or by conduct showing an intention to dedicate; such conduct may operate as an express dedication, as where a plat is made showing streets, alleys, or parks, and the land is sold, either

*by express reference to such plat or by showing that the plat was used and referred to in the negotiations.*”

Recording modern subdivision plats in North Carolina is a routine occurrence, but the previous quotation demonstrates that this rule is equally applicable even if a map is unrecorded. It should also be noted that this principle predates modern subdivision standards and is traceable in North Carolina at least as far back as *Tise v. Whitaker*, 146 N.C. 374; (1907).

### Easement Implied by Common Scheme

Easements can be implied based on a common scheme or plan presented by the developer to prospective purchasers. A common scheme may be derived from a subdivision plat but can also arise in other situations where the developer creates a general plan that is advertised to and acted upon by purchasers.

In *Gaither v. Albermarle Hospital*: 70 S.E.2d 680 (1952): The court applies a broad interpretation to determine what rights are created for the purchasers and which roads they have the right to use: “It is not only those who buy lands or lots abutting on a street or road laid out on a map or plat that have a right to insist upon the opening of a street or road, but, where streets and roads are marked on a plat, and lots are bought and sold with reference to the map or plat, all who buy with reference to the general plan or scheme disclosed by the plat or map acquire a right to all the public ways designated thereon, and may enforce the dedication. The plan or scheme indicated on the map or plat is regarded as a unity, and it is presumed, as well it may be, that all the public ways add value to all lots embraced in the general plan or scheme.”

Space limitations preclude a comprehensive consideration of these issues and much more can be said on the topic, but this overview should provide a window into the universe of implied easements.

**Note: neither the author nor publisher of this article intend it to be considered a source of legal advice. The law can change over time and differs in various jurisdictions. The best source of legal counsel is an attorney admitted to the Bar in your state.**



Kristopher Kline is an educator, consultant, land surveyor and author living in Alexander, North Carolina. Kris has published three books relating to legal aspects of boundary retracement and writes the bi-monthly column “Unmistakable Marks” for Point of Beginning Magazine. Follow his new blog posts at [www.2Point.net](http://www.2Point.net)



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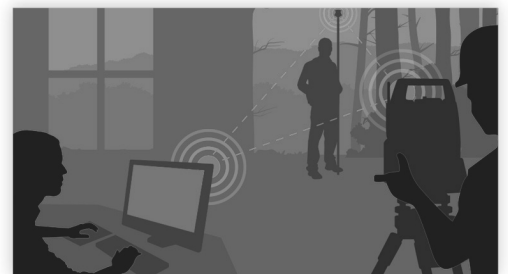


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*continued from page 23*

and the lower motion locked down. The upper motion was unlocked and the scope pointed at the foresight and locked down. The lower vernier was used to read the angle, which was recorded in the field book. The lower motion was loosened and the scope pointed at the back sight. This kept the circle and upper motion locked together. Then the upper was loosened and the scope pointed to the foresight and the scale read again. The second reading would be close to double the first reading. We would wind up the circle four times, divide the angle by four and get a more accurate angle than just by turning the angle one time. It really helped improve the mathematical closure of the traverse loop.

The parchment book, also known as the surveyor's field book, was the most important part of the surveyor's field equipment. The data in the field book was used by the surveyor to calculate the traverse closure and to add the improvements, located on the property, to the survey map. All notes and numbers had to be very neat and easy to read.

The writing had to be printed and in capital letters. The pencil was the only instrument used to write in the field book. If an error was made, the error was crossed out with one line through the error and the correct number or word was added beside or below the one in error. The marked out number or word had to be able to be read clearly. Erasing in the field book was forbidden. I remember changing the way I wrote the 2, 4 and 9, which helped make the numbers clearer.

I hope this has sparked some memories for some. I'm also sure I have missed a number of things we used in the field such as the level rod for pole vaulting over ditches or fences and reading distances to objects. But that's another story.



*Ken Mills became a PLS in 1975. He has been an active member of NCSS, serving three terms as the Western Chapter President. He served as the NCSS President in 1998. Mills co-authored Following in their Footsteps with Otis A. Jones. He has written for American Surveyor Magazine and is a columnist for Madison County's News-Record & Sentinel newspaper.*

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## MEMBER PROFILE

### Peter J. Brennan, Jr.



#### **Favorite Movie**

High Noon- a 1952 western that is widely considered one of the best of the genre. It is a great lesson in courage and honoring your duty even when it may come at a great personal cost. It's a wonderful film, very tense and a great life lesson.

#### **Favorite Food**

My wife gave me a Traeger smoker for Christmas. I'm having fun learning to cook on it, so my favorite is anything that comes off the smoker. I also like fish tacos when I (rarely) catch fresh fish.

#### **What is your favorite surveying equipment?**

Robotic total stations are high on the list. I like GPS systems okay, but only use it to establish control. The new "flying machines" are promising, and the innovation in photogrammetry software is amazing.

#### **What was your most recent purchase?**

Funny enough, my last two purchases were surveying related. At the conference this year, I purchased Donald Wilson's book *Boundary Retracement Processes and Procedures*. I have several of his books, but I didn't have this one. Donald Wilson's books played a

major role in developing my interest in studying boundary law and helped me pass the surveying exams.

My second purchase was a pair of snake boots, because I work in southeastern North Carolina in the summer.

#### **What was your childhood ambition?**

To remain a child, I'm doing pretty good with my goal.

#### **Fun Facts**

Chris Witherspoon didn't ask me if I had a surveyors tag on my truck at the conference this year. I made sure I ordered it, in case he asks next year.

I've never been on national television.

Professional Land Surveyor, Peter J. Brennan, Jr. has been licensed since 1995. He has been married to Kathy Brennan for 29 years. Many of you will agree with Peter's praise of Kathy when you think about your own spouse.

"There's something special about this surveyor's wife. She has put up with the long hours. She worked with me side by side and supported me through the highs and lows of owning my own business. But most importantly, she is by far the best friend I will ever have. She is amazing!"

They love to camp in their retro camper, enjoying the outdoors whenever they have the chance. Although he loves boating and fishing, he perhaps should stick to his day job. Between his boat, fishing license and expenses, he admits spending over \$1,800.00 per pound for fresh fish last year.

Peter and Kathy have four children: Daniel is following in his father's footsteps and works for Trueline Surveying in Clayton, Kayleigh is a UNCW Graduate, Mackenzie

is currently attending Cape Fear Community College and hopes to graduate with a degree in nursing. High school junior Alexis is a gifted artist attending Hoggard High School in Wilmington.

Peter is currently licensed in five states. He has an impressive list of credentials, including Certified Federal Surveyor (CFedS) and Certified Floodplain Surveyor (CFS). His surveying career began as a part-time drafter and field technician at 19 years old. Peter reflects, "The first day that I worked in the field, I knew that I wanted to be a surveyor." That epiphany was over 30 years ago. Since then, he has worked in New York and North Carolina including working for the NC Department of Transportation. He owned his own business from 1996-2011 first in Sayville, New York and then in Selma, North Carolina. He has been Wilmington's City Surveyor since 2011.



Peter has been involved with NCSS for quite some time. Excellence is the word that comes to mind whenever Peter is involved. He is a Past President of the Johnston County Chapter and

currently serves as Vice President of NCSS. He has presented seminars for the Southeastern Chapter, Johnston County Chapter and State Society. Peter believes in the importance of involvement in professional and charitable organizations. Peter believes that the obvious benefits of supporting your community, whether that community is local, state or national, is overshadowed by the personal benefits for those who volunteer.



“Through my involvement with the Society, I have met so many great people. When I run into surveying or business issues, I can almost always think of someone that I have met through NCSS who can give me guidance or additional information that can help me on my way. The friendships are by far the best benefit. There are many, many people that I really look forward to seeing at the meetings and the conference every year.”

When Peter was asked which surveying project he was most proud of, the answer perfectly reflects his principles above. “I surveyed and created a family cemetery for my friend and neighbor, Tom. Tom’s dying wish was to be buried on his farm. The survey wasn’t anything special, but Tom was, and it was a privilege to do this for him.”

In the future, Peter hopes to complete two final classes to be awarded his Bachelor’s Degree in Geomatics from

NC A&T State University. It is a proud accomplishment. When Peter was asked to share one piece of wisdom with a young surveyor just starting his/her career, his quote echoes his love for learning,

“No matter how much you’ve learned about this profession, there is always someone who is more knowledgeable, has more experience, or is just plain smarter than you. Seek that person out, ask questions and listen. If you do, you will never stop learning. Learning will most likely keep you out of trouble!”

Peter hopes to use his degree completion to instruct and encourage others to pursue education and excellence in the profession. One way he makes a difference is by joining Benjy Brown and Andy Green as they administer the Trig-Star exam in New Hanover County each year to several of the local high schools. Which is one more piece of evidence that the membership voted correctly when they chose Peter for leadership in NCSS.

  
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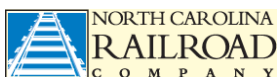
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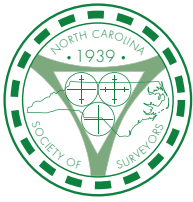


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