The Tarheel
SURVEYOR

SPRING 2022 No. 22.1

CONFERENCE HIGHLIGHTS
P. 15

REAL-TIME NETWORK VALUE
P. 18

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The Tarheel SURVEYOR

Spring 2022

In This Issue...

2 Who We Are
Chapter Meetings

3 NCSS Local Chapters

4 Director's Notes
Schedule at a Glance

6 Letter from the President

7 Schedule at a Glance

10 Education Foundation
New Licensees

11 It's Hard to Believe

13 NSPS North Carolina Report

15 FEATURE ARTICLE:
2022 Annual Conference & Trade Show

16 Educating & Training
Survey Technicians

17 Problem Corner

18 Real-Time Network Value

20 Envision

22 Time-Dependent Coordinates in the New Modernized NSRS

26 Member Profile

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."

Who We Are

NCSS PRESIDENT
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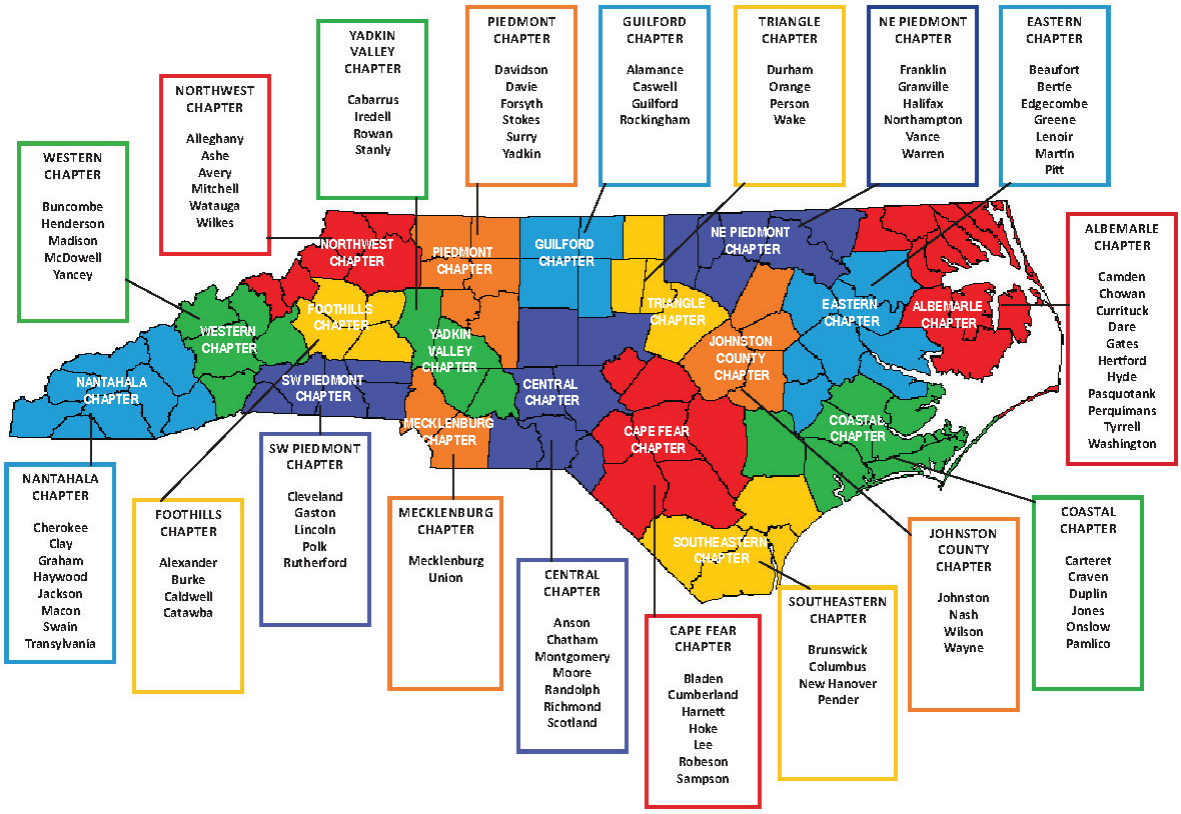
Sherri L. Barron
sbarron@ncsurveyors.com

CHAPTER MEETINGS

CHAPTER	DATE & TIME	LOCATION
Albemarle	4th Tuesday | 6:30 pm	Various Locations, NE Counties
Cape Fear	Last Tuesday | 6:30 pm	Various Locations, Fayetteville
Central	Last Tuesday | 6:00 pm	Blake's B-Que, Candor
Coastal	Last Monday | 6:30 pm	Sagebrush Steakhouse, Morehead City
Eastern	2nd Monday | 6:30 pm	Parker's BBQ, Greenville
Foothills	2nd Tuesday, 7:00 pm	Timberwoods, Morganton
Guilford	3rd Tuesday | 6:00 pm	Cooper's Ale House, Greensboro
Johnston County	2nd Tuesday | 6:00 pm *no meeting Jun-Aug	Various Locations, Smithfield
Mecklenburg	1st Tuesday | 6:00 pm *no meeting Jul-Aug	Dilworth Grille, Charlotte
Nantahala	3rd Tuesday | 6:30 pm *no meeting Jun-Aug	Various Locations, Sylva
NE Piedmont	4th Tuesday | 7:00 pm	Johnny Bulls, Louisburg
Northwest	3rd Tuesday | 6:00 pm	Various Locations, Boone & Wilkesboro
Piedmont	4th Tuesday | 6:00 pm	Foothills Brewpub, Winston-Salem
Southeastern	Last Wednesday | 7:00 pm	Various Locations, Wilmington
SW Piedmont	2nd Thursday | 6:30 pm	Olive Tree, Rutherfordton
Triangle	3rd Tuesday | 6:30 pm	Wilsons Eatery, Raleigh
Western	2nd Tuesday | 6:00 pm	Various Locations, Asheville
Yadkin Valley	2nd Wednesday | 6:30 pm	Pancho Villa's, Salisbury

Please contact chapter president to confirm meeting details before attending.

NCSS Local Chapters



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Director's Notes

The leadership of the North Carolina Society of Surveyors (NCSS) changes each year during the annual Conference. Although I am typically sorry to see the current President become the Past President, I still find change exciting. During my decade with NCSS, I have worked for some excellent leaders. Case in point, Peter Brennan navigated a difficult legislative year with wisdom and professionalism. His example coupled with our recent change of leadership causes me to think about the qualities that make a good leader. Evaluating our performance is a worthwhile process for all professionals.

While I was in high school, I was fortunate to work at Crabtree Valley Mall for a retail manager named Anne Smith. By example, she taught me a great deal about leadership. She once told me something I will never forget. When I asked her one day why she spent so much time with me knowing that I would soon be leaving for college, she answered, "We all become more successful as those around us succeed." She was right. The more you support those whom you lead, the more successful you become.

Many of our members are stepping into new roles in 2022. I was encouraged to meet some of our new licensees recently, who have genuine interest in the success of NCSS. I can already see in them four leadership traits which make a difference to others.

I believe the most important trait of leadership is service, because it inspires others. My husband has an expression he uses for a great employee. He'll say, "they'll run through a wall for me." What makes that trait in an employee or volunteer? I would make the argument for servant leadership. Usually, if you are carrying a heavy load, someone lends a hand. If a leader stands and watches others carry the load, they miss the opportunity to accomplish a goal together. Service motivates others to join the team!

A servant leader remembers to focus on the vision of the organization. NCSS servant leaders remember that our goals are promoting the profession and protecting the public. I'm inspired when raffle money won by chapters is donated back to the Education Foundation for scholarships. Volunteers such as Dennis Lee, Eddie Hyman and Kristian Forslin have spent time scanning, sorting, and delivering old maps to archive our history. I met past Treasurer, Dale McGowan, when he hung shelves for us in the office. James Jeffreys came to the aid of a young lady helping us during the conference by changing her tire and giving wise advice when I couldn't be there. These are just a few examples. There are so many others, but I can say, I want these gentlemen on my team, and I may even run through a wall for them.

The second trait I find inspiring is encouragement. If two leaders are equally capable of accomplishing the tasks set before them, would you rather work alongside the person who encourages you or one who completely ignores, or worse, undermines your contributions. We ALL like to be encouraged! I have to say that the NCSS Board of Directors has been a great example of this over the years. They are individually and collectively very encouraging to our staff. We appreciate you!

Encouraging leaders share two qualities in my experience. They are thankful and they share credit! UCLA Hall of Fame coach, John Wooden, once said, "There is no limit to what can be accomplished if it doesn't matter who gets the credit." Encouraging leaders never worry about the credit that may come their way. They know to surround themselves with people who are more skilled in areas where they may be weak. They also make a point to thank those around them for their contributions. Here, I can't help but think of Sherri Barron our Marketing Director. She brings such specific skills to NCSS. Her ability to design marketing materials, t-shirts, hats, and magazine layout elevates our entire Society. Let me just say publicly – I am thankful for Sherri. She makes me more successful.

The third trait I think is so important for leadership is follow-through. My daughter-in-law is a general contractor for a commercial construction firm. She has one surveyor that she likes to use on most of her projects. When I asked her why she liked using his services, she said that she had used several "good" surveyors, but this particular PLS not only does quality work, but follows through until the last details are completed. Follow-through causes the cream to rise to the top. It begins with returning emails and

phone calls even if all you have time to respond is that you don't have time to respond. Follow-through reduces stress levels and makes others pleased to serve with you on projects. This trait builds trust and commitment both professionally and personally, which leads me to the final trait, trust.

Trust is so important. We are all aware of relationships damaged because trust was broken. Humans are fallible. Even the most well-intentioned adults sometimes let you down. Our responses to mistakes or disappointments wield the power to build or break trust. Three important tools will help us all succeed.

First, communicate clearly and honestly your expectations whether you are the employee or employer. Effective communication makes it easier for co-workers to forgive when necessary. Second, resist trying to embarrass anyone into greater productivity. Embarrassment among professional peers has serious effects. It reduces confidence leading to less participation and it forms anger with no outlet, which brings bitterness. Finally, never go for the jugular when angry. Most everyone has worked with someone like this. You may make a light-hearted comment about a small mistake on the last project, and they return the comment with a tongue-lashing about your overall ineffectiveness to complete the job. Personal attacks leave scars and scars fade but never completely heal. Without trust, there is no growth.

I work with fantastic leaders. As NCSS begins the new year, I look forward to serving North Carolina surveyors, following-through on the tasks you assign me, and continuing to build your trust.

Christy C. Davis
NCSS Executive Director

Letter from the President

As the new president of the North Carolina Society of Surveyors (NCSS) and as we move forward into the post-conference year, I wanted to reach out to all the members of NCSS to explain my goals for the coming year and to clarify for those who could not make the luncheon on Friday, February 25th in Pinehurst, the remarks made by members of the North Carolina Board of Examiners for Engineers and Surveyors (NCBEES) concerning Senate Bill 219 (SB 219). The goals that I am establishing for this year may seem lofty and broad, but I feel we must reach for the stars sometimes in order to move in a forward direction.

In recent years we have had many legislative successes. These successes were due to our being on the offense and being proactive in writing legislation, such as the NCGS 47-30 rewrite. However, last year we were forced on the defense regarding SB 219, due in part to not having more allies in the General Assembly. President Brennan and the NCSS staff did an excellent job countering this attack and countering with a proposal that prevented a complete watering down of the requirements for licensure in North Carolina. This year is referred to as the short session for the General Assembly. With that in mind, I have asked Christy Davis and our staff to explore establishing ties with more state representatives and senators who we can educate on how surveyors protect the public. I hope to build new alliances that will benefit the Society in the future. Of course, the staff alone cannot accomplish this task and that is why I am asking the membership to help. If you personally know a lawmaker in your area or someone running for office that you feel would be a help to our profession, please send their name to either Ms. Davis or myself so that we can reach out to these individuals.

Another task that we must perform this year is recommending to Governor Cooper a replacement for Mike Benton on NCBEES. This is a task that can and will affect every surveyor in the State of North Carolina. Mr. Benton has reached the statutory limits of his service to the Board and I would like to thank Mr. Benton for his years of excellent service to the profession and the citizens of North Carolina. North Carolina General Statute 89C-3 states that "All of the members shall be appointed by the Governor. Appointments of the engineer and land surveyor members shall preferably, but not necessarily, be made from a list of nominees submitted by the professional societies for engineers and land surveyors in this State." As you can see, it is one of the duties of NCSS to put forward a candidate to the Governor's office. My personal feelings are that this person should be an active member of NCSS for a number of years and should have demonstrated leadership skills in the past with high ethical and professional standards.

The Policy Manual of NCSS states that "the North Carolina Society of Surveyors limits the issuance of congratulatory letters and recommendations as a benefit to active members of the organization." With this in mind, I have asked Chapter Presidents of NCSS to bring up the issue at their next chapter meetings and to report back during the Spring Board of Directors Meeting on May 14, 2022. The Board of Directors will then extend an invitation to the qualified individuals to make a presentation to the Board and the general membership at the Summer Board of Directors meeting on August 6, 2022. If you know someone who you feel would make an excellent candidate, or if you yourself wish to serve on the licensing board, contact your local Chapter and arrange a meeting with the members to present your candidate. The Board of Directors will vote on a single candidate to recommend to the Governor at the Summer Board of Directors meeting.

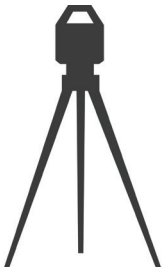
Membership in the local Chapters has been on the decline over the past few years and our isolation due to COVID-19 has not helped these numbers. This is especially true amongst our younger demographics. Membership

is an important function of being a professional as it gives you a voice directing the Society's leadership. In the coming year, I will be asking the staff to help me send out a questionnaire to all resident surveyors in North Carolina where we will explore questions on how to improve membership in the local chapters and at the state level. We will evaluate all data received, taking into account what the younger surveyors need and how local chapters can assist them. I will also ask some of our newly licensed surveyors to serve on a committee that will review the data and present recommendations that may help the local chapters and the Society to understand how to reach out and bring this younger demographic into our meetings.

Lastly, I wish to address and explain the recent presentation by NCBEES to the general membership at the luncheon on Friday the 25th of February during the NCSS Conference at Pinehurst. As many of you know, Senate Bill 219 (SB 219) was passed by the North Carolina General Assembly (NCGA) and signed by the Governor on January 26, 2022. This bill will become effective on July 1, 2022, changing the requirements for licensure as a surveyor in North Carolina. This bill was not put forth by the Society. However, it did require that we respond quickly and to work with our ally, Representative Dean Arp, in damage control. As a result, the years of experience for licensure were changed in some categories and a new category of high school diploma with an apprenticeship was created. On a positive note, we were able to change the requirement so that all experience must now be under a professional licensed surveyor. The chart on page 8 gives you a breakdown of the new requirements. As a requirement of the new law, NCBEES must establish the apprenticeship requirements. At the luncheon, Mike Benton, John Logsdon, and Executive Director, Andrew Ritter presented the recommendation for apprenticeship. They are asking the membership of NCSS to review this recommendation and to suggest other avenues to accomplish the requirements of the new category. I will attempt to explain the new category and the current suggestions.

Senate Bill 219's main goal was to lower the requirements of experience for a high school-only candidate. The original requirement was sixteen years and by working closely with Representative Arp, the Society was able to negotiate a reduction to nine years and to create a new category of apprenticeship with seven years. The idea of the apprenticeship was to create an avenue whereby a candidate could obtain a certain amount of formal education without completing a degree or they may obtain certain certifications to reduce the experience from nine to seven years. As defined in S219 by the NCGA a land surveyor apprenticeship is "a program of on-the-job learning that allows individuals to prepare for the land surveying profession through supervised experience combined with land surveyor related classroom instruction as approved by the Board." To this end, a candidate can obtain the necessary requirements by one of three proposed methods.

The first method is by obtaining certification through the Certified Survey Technician program (CST) of the National Society of Surveyors (NSPS). The candidate would be required to obtain levels I through IV of the CST. The second method can be obtained by becoming a certified "Technologist" through the Certification Program of the American Society for Photogrammetry and Remote Sensing (ASPRS). The final proposed method to reduce your experience requirement from 9 to 7 years is by obtaining a certain amount of formal education. As proposed by NCBEES, they would use the National Council of Examiners for Engineers and Surveyors (NCEES) recommendation of college courses and semester credit hours, to require the following



Schedule at a GLANCE

APRIL 29, 2022
CFS Update
12:00pm-4:00pm
4 PDHs
NCSS Office
331 S White St.
Wake Forest, NC

MAY 4, 2022
CST Exams
8:00am
NCSS Office
331 S White St.
Wake Forest, NC

MAY 13, 2022
NCSS Spring Golf Tournament
10:00am
Asheboro Country Club
5105 Old Lexington Rd
Asheboro, NC

MAY 14, 2022
NCSS Spring Board Meeting
8:00am
Asheboro Zoo
Stedman Education Center
4401 Zoo Parkway, Asheboro
NC 27205

39 hours of college-level courses. These courses could be obtained without completing a formal degree. The following is the recommended list:

12 hours in mathematics beyond basic mathematics, but the credits include college algebra or higher mathematics. These courses must emphasize mathematical concepts and principles rather than computation. Mathematics courses may include college algebra, trigonometry, analytic geometry, differential and integral calculus, linear algebra, numerical analysis, probability and statistics, and advanced calculus.

27 college semester credit hours of surveying science and surveying practice Courses shall be taught by qualified surveying faculty. Examples of surveying courses are: basic surveying, route surveying, geodesy, geographic information systems, land development design and planning, global positioning systems, photogrammetry, mapping, legal principles of land surveying, boundary law, professional surveying and mapping, and remote sensing. Graduate-level surveying courses can be included to fulfill curricular requirements in this area.

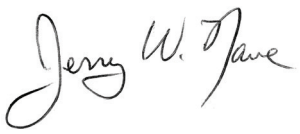
Professional Land Surveyor (PLS) License
Surveying Experience Requirements

EDUCATION	TOTAL YEARS OF EXPERIENCE REQUIRED FOR PLS LICENSE (under direct supervision of a PLS)
BS Degree in Surveying or Equivalent Curriculum (Min. of 45 semester hours of surveying or surveying related courses)	2
AAS Degree in Surveying Technology (Min. of 20 semester hours of surveying or surveying related courses)	5
High School Diploma or Equivalent & Completion of Land Surveyor Apprenticeship (Course requirement Rules being developed by the Board)	7
High School Diploma or Equivalent	9

Per Board Rule 21 NCAC 5.0601(b), the Board can consider experience that was not under the direct supervision of a practicing PLS.

NCBEES is asking the surveying community for additional ideas or comments on the proposed requirements for the apprenticeship. Again, I have asked the Chapter Presidents to return to their respective chapters to present this information and discuss the requirements. As this must be completed before July 1st, 2022, this discussion needs to occur quickly. Please address all recommendations and critiques to both me and Andrew Ritter at NCBEES.

In closing, I would like to thank the membership for your trust in electing me President. I hope to work hard on these goals and to accomplish the many tasks required of this office. I believe that we must work together as professionals to protect our profession and by result, the public at large. Please feel free to contact me at any time with your concerns and issues in the coming year.



Dr. Jerry W. Nave, EdD, PLS
NCSS President 2022

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ASHEVILLE, NC	3018 US 70 HWY, BLACK MOUNTAIN, NC 28711	828.686.4433
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Education Foundation

by J. David Lee, PLS
Education Foundation President

It was so great to see everyone at the Conference this year!! The North Carolina Society of Surveyors (NCSS) Education Foundation would like to thank everyone who took part in the 2022 Cash Raffle and American Surveyor Rifle Raffle. In addition to the support of the individuals who purchased tickets, the NCSS Education Foundation would also like to thank all the Chapters for the financial support of both raffles with a special thank you going out to the Foothills Chapter for donating their winnings back to the Foundation.

Cash Raffle Winners

- Winner – John Odom - $2000.00
- 2nd Place – Vic Cowan - $500.00
- 3rd Place – Foothills Chapter - $500.00
- Winning Ticket Seller – John Odom- $100.00

American Surveyor Rifle winner

- Jerry Nave

Proceeds from both raffles will be used to support scholarships for students enrolled in the NC A&T State University Geomatics program and North Carolina (NC) Community College Geomatics programs. In 2021, we issued $15,000.00 in scholarships, $5,000.00 going to NC A&T to help all their students with tuition needs and the remaining $10,000.00 to the following Students.

Candidate	Scholarship Recommendation	Currently Attending
Keller Guisewhite	$1,500.00	CPCC
William McLamb	$1,250.00	Wake Tech
Carson Witherspoon	$1,500.00	Sandhills
Patrick Stevens	$1,500.00	NC A&T
Samuel Dunbar	$1,250.00	NC A&T
Caleb Brown	$1,500.00	NC A&T
John Langevin	$1,500.00	NC A&T

Purchasing a specialized license plate is an additional way you can support the NCSS Education Foundation and geomatics students in North Carolina:

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- Order your tag using the form found at http://www.ncsseducationfoundation.com/images/License_Plate/ApplicationMVR-27PPA.pdf

- Or order when renewing online: https://www.ncdot.gov/dmv/title-registration/license-plates/Pages/specialty-plates.aspx

WELCOME NEW LICENSEES

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Scott A. Jones
Joseph R. Jones
Alfred J. Kesler
Joshua B. Leonard
Fabien Lukeba
Wayne A. Moore
Hugh R. Rogers III
Daniel E. Schilling
Neil C. Shultz
Shawn W. Sipes
John M. Stewart
Dylan W. Stutts
Nicolas H. Vann
Tyler F. Wiethorn
Andrew M. Wolfe
Adam Yascavage

It's Hard to Believe

by Peggy Fersner, PE

It is hard to believe how long I have been involved with surveying in this state. I started teaching basic surveying at North Carolina A&T in 1994. Since that was the only surveying class on campus, I was summoned to a meeting with some upper-level administrators, as well as John Furmage and Larry Greene representing NCSS. From what I heard at the conference, there may have been meetings prior to this. They had approached NC A&T about starting a four-year program and since I was the lone representative of this remarkable profession, the rest became history. It was not without its bumps and roadblocks along the way, that much is for certain. But we are still standing and doing remarkably well considering our limited resources.

There are two things that stand out to me as major milestones. The first is that this program was created at the request of the professionals in the state. My role and others at NC A&T were only to facilitate the development of the program. Some of you will remember that to create the curriculum we adjourned over twenty (20) professionals with expertise across the spectrum. We had put together representative curriculums from four other respected institutions, collected textbooks, and asked you to arrive at what you felt was the best fit for NC A&T, the students we would be marketing to, and the profession. You took that task seriously and we came away with a curriculum that was presented to the faculty at NC A&T and then the UNC System for approval. Meanwhile, the Society was diligently working to add the four-year degree requirement to 89-C. Both were approved within a month of each other and the Geomatics program at NC A&T became a reality in the fall of 2006.

Jerry Nave came on board in January of 2007, and together we have taught all the surveying classes in the program until we brought Leila Hashem Beni into the fold in January of 2017. She is responsible for the two photogrammetry classes as well as the GIS class. She is also our research arm of the program.

My personal milestone for the program was the achievement of ABET accreditation in August of 2017. This was the height of my career, and I felt it was time to paddle my way into the sunset in my kayak. Jerry made me promise to work a little longer. Finally, I agreed that I would work until I turned 70. That birthday has arrived and in May when classes are complete, I will be stepping down as coordinator of the program. At the University level, the program has been approved for two new positions to replace me. I guess I should feel honored that it's taking two! If needed, I will be returning on an as needed basis to fill in for one or two online classes per semester. The program will be in excellent hands and our wonderful Advisory Committee is always there to keep us pointed in the right direction.

My final note is a hardy thank you to the chapters that supported our students and the Sandhills students' lunches on Thursday and Friday at the NCSS conference. Since most of our students are online, it was wonderful to see them face-to-face and get to know them personally. Our graduates were also in attendance, and it is great to know that they are contributing to the profession. I must say that I got goosebumps when they stood up to be recognized on Friday knowing that I had a "smidgin" of something to do with their success. I am one proud mama bear in that respect. It was heart-warming to see our graduates mingling with our undergraduates and then talking to the Sandhills students as well. This is what marketing and inspiration should look like. Please, let's continue this in the years to come.

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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NSPS North Carolina Report

by Jim Craddock, PLS

I am humbled and honored to be selected by our Society to serve as your NSPS Delegate. I thank our past Director, Randy Rambeau for his guidance and support in this transition. Join me in recognizing the years of service and representation that Randy has given to the North Carolina Society of Surveyors at the state and national levels. North Carolina has a long tradition of excellence and leadership within the survey profession. I plan to continue that tradition as your representative to the National Society of Professional Surveyors.

My first meeting as your delegate will be the Spring 2022 NSPS Business Meeting and Day on the Hill March 29 – April 2, 2022. I have made my reservations and registered for the Day on the Hill meetings with Members of the U. S. Congress and U. S. Senate. These meetings are important to our society increasing our ability to provide the public with the best data to make informed decisions concerning infrastructure and the environment. The three issues that NSPS will be focusing on include: (1) design Professional Licensing; (2) corps of Engineers surveying, mapping, and geospatial engineering in the 2022 Water Resources Development Act (WRDA); and (3) reform of surveying and mapping in FEMA's National Flood Insurance Program (NFIP) reauthorization.

I will attend meetings of the Certified Survey Technician Question and Answer Session, Certified Floodplain Surveyor Committee among others to see where I can be most effective. The Southern Coalition Directors meeting will be beneficial to provide liaisons with our surrounding state societies.

The Workforce Development Committee is especially important to me, and I believe to our society. I plan to actively seek information on how our fellow professionals are working through this issue.

Lastly, I will stay to attend Curt Sumner's retirement dinner Saturday evening. I have known Curt for over 20 years and wish to celebrate his commitment to the profession of surveying on behalf of North Carolina.

I look forward to serving you well. Thank you for your trust in me.

Jim Craddock began his surveying career in 1974. He became President of Concord Engineering and Surveying in 2018. He was elected to serve as the NSPS NC Director in 2021. As a member of NSPS he serves as a member of the Unmanned Aerial Systems Committee and the Certified Floodplain Surveyor Committee.

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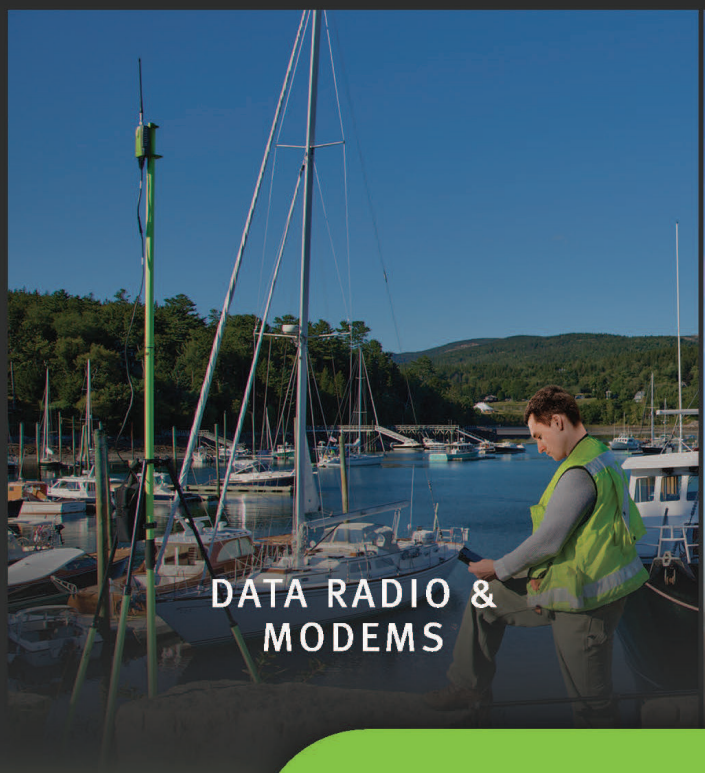
NSPS Memorandum of Understanding

In 2012, NCSS agreed to partner with the National Society of Professional Surveyors (NSPS) to foster membership on both the state and national levels. As a result, your membership with NCSS now includes dual membership with NSPS. Read the MOU on our website at: www.ncsurveyors.com/about_ncss/governing_documents/nsps

GNSS AND RADIO/MODEM SOLUTIONS



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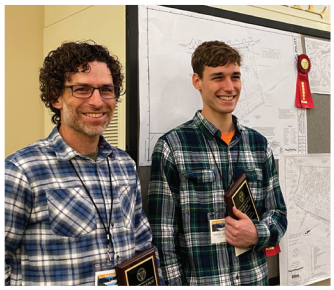
Although our original keynote speaker Tim Burch was not able to join us, individuals stepped in to educate surveyors on technical subject matters as well as a presentation on Electronic Recording and the history of the Bodie Island Baseline.

Forty students attended as our guests from Sandhills Community College and North Carolina A&T University either Thursday or Friday. They were able to hear from the Licensing Board (NCBELS) and the National Council of Engineers and Surveyors. They brought great energy to the day!

Sam King won our Grand Prize John Deere Gator! Overall, networking, new friendships, students, solid education and great food made it an exciting weekend as we Focus on Success.



Educating & Training Survey Technicians

by Bill Beardslee, PLS, PE, PP

For the past two years, academic requirements for land surveyors have been a vivid topic of discussion. This resulted in the passing of Senate Bill 219, restructuring North Carolina's requirements to qualify for licensure. While that legislation sets the basic ground rules, educating and training survey technicians on the road to licensure is incumbent on the licensed professionals who employ them.

I will not bore you with paragraphs on how it was when I started in the field – four-man crews. The crew member was mentored and taught by the instrument person and the party chief. It was in the very true sense an internship. From comments I have heard around the country, that process doesn't exist anymore. Not only that, but in-house training programs of any kind rarely exist, particularly in small firms. Today, the only requirement for an instrument operator appears to be knowledge of how to use the data collectors. The field crew members push buttons, gather data, but have a limited understanding what the data means, if it is right or wrong, or how it is developed.

We licensees, as a whole, are not the teachers or mentors that our predecessors were. Do you have a training or mentoring program in your company?

Well, folks, guess what – SHAME ON US!

The problem is not just field issues, but at the professional level also. I overheard an interesting conversation between an educator from a well-respected surveying program and a company owner. The owner was complaining that the students who came through the college program were not having success passing the professional part of the licensing exam. The educator said, "Hey, wait a minute! One hundred percent of our students pass the fundamentals part of the test after our program. Why aren't you mentoring them to help them develop the knowledge and skills necessary to pass the professional part?" Interesting point.

In the current environment, new personnel are difficult to find. Maintaining staff has become crucial to the productivity of each firm. This can be costly, as training time is not production time. For a new employee, there will be a break-in time. That length of time is called the "learning curve" and is not the same for every employee.

The new employee must be mentored by someone with complete knowledge of the topics and the ability to answer questions accurately and clearly. Internal communication is critical. A project vision is given by the client to the project manager, who in turn needs to translate that in a clear and concise format to the party chief and ultimately the person who will prepare the finished drawing. The party chief must then provide direction to the crew members in a thorough and timely manner in order to complete the tasks required. This concept should be communicated to the employee throughout the training process

Completing the project requires a reversal of this communication chain from the crew, to the chief, to the project manager, and ultimately the finished product to the client. The common break in this linkage appears to be the one between the project manager and the party chief, where words are few and directives assumed.

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This concept should be communicated to the employee throughout the training process.

To create a positive education and training program within a firm, these steps are important:

- Set a regular time and place for your program.
- Do not allow emergencies to curtail the schedule.
- Create one track for new hires.
- Create a separate track for continuing education of current staff, such as updating technology and topics such as research, evaluation, analysis and a broad scope of surveying and communication activities to offer the employee a greater understanding of the surveying world and its interrelation with the public.
- Ask all the stakeholders what they feel should be in the program. They have some idea of what they need or want to learn.
- Educating and training should be a program, not an event.

Do not allow the failure of any staff to be caused by the lack of effort of senior staff. Noted author and trainer, Richard Branson, opines: "Train people well enough so they can leave, treat them well enough so they don't want to."

Each firm has an opportunity to use the NSPS Certified Survey Technician Program (CST) which establishes a road map for the advancement of both field and office personnel. Information about that program's requirements, tests, and costs is available on the NSPS website.

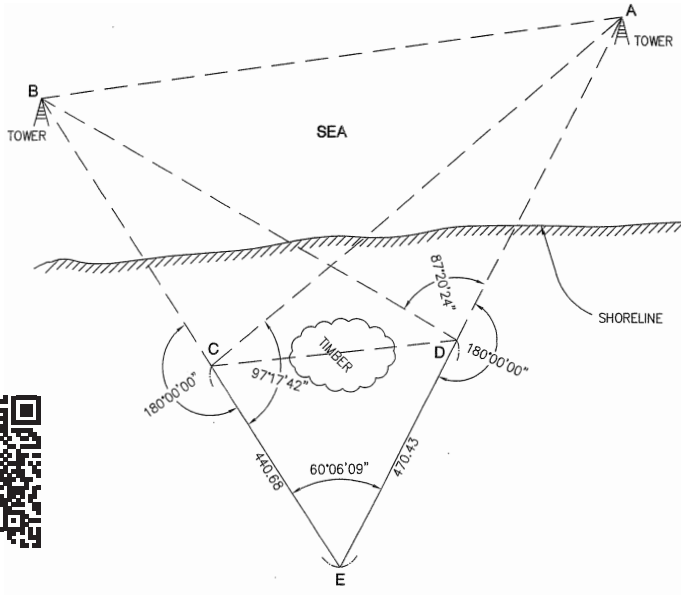
We, as licensed surveyors, have an obligation to mentor and guide our staff for personal improvement - not to mention the improvement of production and profit for the company. Over the last few decades, we have dropped that ball. Let's pick it up again!

William E. Beardslee, PLS, PE, PP, is a licensed Professional Land Surveyor, Engineer and Planner with over 45 years of experience in the field of land development. He is known for his excellent presentation and writing capabilities, along with being one of the leading technical experts on land development in the engineering and surveying arena.

PROBLEM CORNER

PROBLEM:

The government has constructed offshore communication towers to help monitor the coastal waters. A fiber optic cable needs to be connected from the points on land to the towers for increased security. This cable will enable the towers to transmit more information quicker, for surveillance and environmental purposes.



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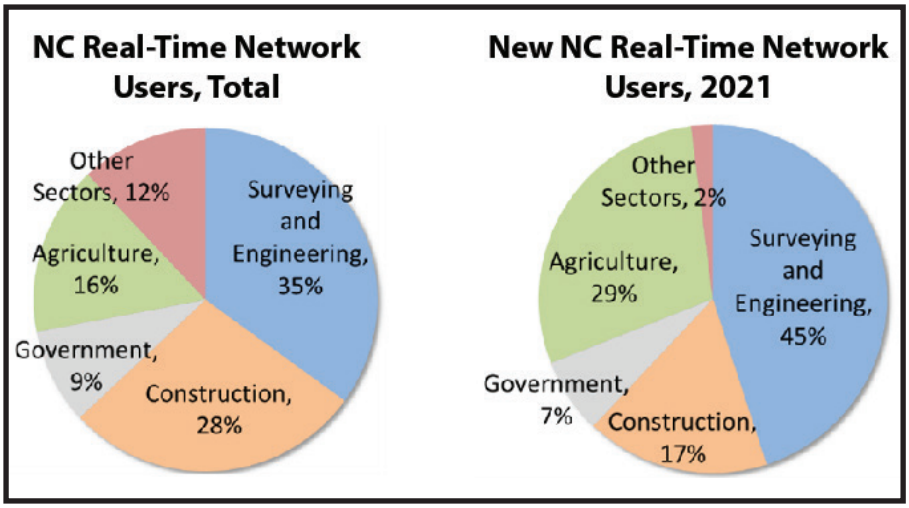
Real-Time Network Value

by Frank Mundy, PLS

For a moment, please take a ride in a time capsule with me back to September 2006. Some of you were practicing land surveyors back then just as I was. Some of you may not have joined the profession yet, and if you are 35 or younger, you were probably still in high school. STEWART hired me in 2006 to help begin the introduction of land surveying into the firm's breadth of services. Obviously, before we could begin, we needed equipment, and we needed it fast to support our already growing backlog of projects. I reached out to all local vendors for quotes, and each proposal included GPS equipment that could access the newly up and running North Carolina Real-Time Network (RTN).



While the network at that time didn't reach every corner of the state as it does today, it covered a wide expanse around the larger metropolitan areas. Each vendors' quote outlined the ability for their unit to access the state's new RTN. Furthermore, each outlined that all my days of running long traverses and level loops, collecting and post-processing GPS data, as well as sitting up my own real-time kinematic networks were gone. All this for a one-time $500 fee to the state-supplied system. Like every one of you, I jumped at the chance to work with this methodology to make our new operation as efficient and competitive as possible. There was no way that we could do things "the old way" if our competitors were completing projects faster and more economically for our clients.

Fast forward to 2022. The GPS equipment initially bought way back when is long gone. If I'm not mistaken, we're at least on our third, if not fourth generation of replacement units since that day. Yet, I'm still using the same access to the RTN that I bought in 2006. I, along with every other RTN user, have never paid another penny for access other than the $500 spent on that first day of subscription. With that said, we all are entirely dependent on the system staying online, up to date, maintained, and fully functional twenty-four hours a day, seven days a week.

Conversely, if memory serves, the vendor that sold that first batch of equipment to us for nearly $40,000, didn't offer a similar value proposition. There was never a discussion that this equipment would be maintained for free, calibrated for free, and replaced for free for perpetuity. We would all agree that while we would appreciate our valued vendors offering this type of package, it is without doubt nonsensical. So why do we expect this of the RTN which is such a valuable component in the success of our own and the state's economies?

When the RTN was created, the legislature in Raleigh was very concerned about more "taxes" or "additional fees" being levied on North Carolina businesses. This concern was especially true for a "new technology" that quite frankly had not been completely proven or had widespread use. In fact, the system was initially used internally by the North Carolina Geodetic Survey (NGS) and the North Carolina Department of Transportation (NCDOT), along with other state agencies. Use by private entities was initially an additional piece to the incomplete puzzle.

Over time the use of this system has exploded throughout all facets of the state's economy. Not only does every

survey and engineering firm in the state and beyond have a subscription, but other industries now have a substantial stake in the RTN. For instance, in a recently published report by the NCGS, Surveying and Engineering firms made up only 35% of the users of the RTN in 2021. Government use made up only 9%. Construction and agricultural subscribers make up nearly 44% of the total use of the RTN in 2021.

New users of the system in 2021 totaled 346. Using quick math at $500 per login, these new subscribers brought approximately $173,000 in revenue. Unfortunately, last year, just like every year since its inception, the RTN's required annual operating costs grossly exceeded the amount of subscription revenue that can be generated using the one-time $500 fee model. For example, in 2021 the network's annual operating cost was approximately $645,000.

It would be a substantial understatement to say that Gary Thompson, NCGS Chief, and his staff have done an amazing job keeping the system online while also expanding it. Gary and his team, along with the support of the North Carolina Department of Public Safety, have been very strategic in acquiring funds to backfill this annual deficit including working closely with NCDOT and others within the state government. The support of NCDOT cannot be understated and has been critical in the development and operation of the CORS/RTN. In addition to financial support, NCDOT facilities also host many CORS stations throughout the state. Over the years, additional partnerships have included the Tobacco Trust Fund and Wireless 911 Board. The future operation and financial viability of the RTN should not be solely dependent upon these types of annual deals between organizations. Think of how much your organization depends on the RTN each day based on that $500 initial investment.

In April 2021 with the support of the NC Department of Public Safety and the North Carolina Society of Surveyors, NC House Representative Randolph Moore (R-District 78), sponsored House Bill 560 (HB560). This bill is also known as the "Public Safety Reform" bill for the 2021-2022 session of the General Assembly. If passed as currently written, the bill would give the NCGS the ability to create a Continuously Operating Reference Station (CORS) Fund. With CORS being the basis for the RTN, the bill states that the CORS fund can accept "general fund appropriations, gifts, donations, grants, devises, fees, and monies contributed by State and non-State entities for the operation, maintenance, and expansion of the North Carolina CORS/Real Time Network (RTN)."

What does this mean in layman's terms, you ask? If passed by the legislature and signed into law by the governor, this item would give the NCGS the ability to accept all the funding mechanisms mentioned including setting up an annual users' fee for the RTN. As many of you know, South Carolina, for example, has a similar RTN system to that of North Carolina. South Carolina charges a $500 per year fee for access to the RTN. An annual fee in North Carolina, like South Carolina, would potentially cover all costs associated with the existing CORS/RTN, as well as prepare the system for expansion. In contrast, in states where government-operated systems do not exist, privatized networks have been installed for use, subscription, and membership.

As you can see above, we all have a stake in the success of the NCGS and the CORS/RTN. Not only as surveyors and engineers but as professionals, business leaders, and quite frankly, citizens of the State of North Carolina. From a professional standpoint, during 2021, the NC CORS data was used over 1.7 million times and generated efficiency gains worth over $120 million. From a business perspective, the NC CORS network generated more than $2.3 million in annual state sales and income tax revenue, and $590 thousand in local sales tax revenue. Finally, the NC CORS network generated over an estimated $230 million in total benefits to North Carolina's economy.

We see each day the benefits of the NC RTN. It needs our support both financially and otherwise to continue in the way that we all have grown accustomed. Please join me in support of HB 560 thereby advocating for all that NCGS and the CORS/RTN have done and will continue to do for the growth of the State of North Carolina.

All data from the article above taken from "2021 Economic Benefits of the NC CORS Network" Report published by the North Carolina Geodetic Survey.

Frank Mundy is a past president of the NCSS, a current member of the NCGS Advisory Board and is the Executive Vice President, Operations at STEWART.

Envision

This article is the first of a series of white pages highlighting the technology and services of NCSS sustaining members. If you would like more information about AirWorks please visit their website at https://airworks.io.

The Future of Land Surveying is Here - What's Holding You Back From Scaling Up with AI?

by Krista Looney

Imagine where your business would be if you could find a way to do more work while working less.

As in, tackling more projects and hitting deadlines with ease while cutting back on overtime.
Bringing on more clients and boosting revenue without all the late nights and weekends.

Probably sounds too good to be true, right?

What if it's not?

AI is already drastically altering the efficiency of the construction industry everywhere you look. Project teams are analyzing real-time project data with AI to nail down schedules and budgets. Field crews are fighting labor shortages and maximizing productivity and safety with autonomous equipment for everything from excavation to demolition to bricklaying.

AI especially has the potential to revolutionize the land surveying sector of construction. A report by RICS identifies 88% of surveying tasks as candidates for automation. Autonomous operations could soon cover everything from contract development to UAV data collection to drafting of civil design plans. When the industry is looking at such a widespread potential for AI implementation, what's holding firms back?

To some, AI might be perceived as intimidating, superfluous, or detrimental to jobs. But what are its true risks vs. rewards? Let's take a look at four common mindsets that might be preventing your land surveying firm or department from seeking out AI solutions:

1. AI will ruin the surveying job market.
AI may not be the job-eating entity you think it is – it just might be the tool that allows continued growth in spite of a tight labor market.

It's no secret that land surveying and drafting positions are becoming increasingly difficult to fill. Additionally, a surge of impending retirements in the surveying industry is only going to make the labor shortage more pronounced.

AI is primed to take care of select repetitive tasks, like tediously copying lines in CAD, creating archive records, or formulating standard reports from templates, thereby alleviating some of the pains of the current labor shortage. However, AI will never truly replace creative thinking, personal connections, or other human intangibles that affect decision-making. Surveyors are here to stay, and you'll always have job openings you're looking to fill.

Yet, AI could still be a major draw for potential employees. When you consider that 71% of millennials take into account how a company embraces technology when choosing where to work, being on the cutting edge could be crucial for attracting qualified candidates in today's workforce.

When it comes down to it, AI is not only poised to help land surveying firms handle workloads during the labor shortage, it could also be the digital incentive that helps attract and retain top talent.

2. AI will replace jobs - I'll have to let my current employees go.
While it's true that AI can automate certain manual jobs, AI specializes in replicating repetitive, tedious tasks. Is it really any surveyor's dream job to sit and draw parking lot lines and topography grades all day? Wouldn't it be more beneficial to let geospatial AI wade through all the tedious data, freeing up your employees for more creative or engaging undertakings?

AI is on track to be the obvious, efficient choice for simple tasks moving forward. By integrating AI into your workflow, you can actually help employees expand their career horizons by liberating them from menial work and training them with skills that address the new challenges presented by AI. This could be anything from programming to data management to new client relations.

AI shouldn't be viewed as an entity that will replace employees, but as a tool that complements them. In an increasingly digital world, implementing AI actually creates opportunities for career development with modern skill sets that will increase your employees' value. In the end, this not only benefits individuals but also your company and the industry as a whole.

3. Things are fine the way they are. AI tools are unnecessary and expensive.
Land surveying is actually a profession that's always been on the cutting edge. When you consider that the profession dates back to the Bronze Age, it's amazing to think of how far surveying technology has come. Understanding the history and theory behind your practice is crucial, and manual methods certainly have their place. However, can you imagine if you were routinely using only plumb bobs, compasses, chains, and theodolites to collect data and then drafting all your deliverables by hand, while other firms were using modern-day GIS and CAD?

You couldn't compete.

For land surveyors, the status quo has never been an option. Even though keeping up with technological advances will always come with some upfront costs, staying efficient and competitive is a necessary part of the job and well worth the investment.

Consider geomatics and UAV data collection. At this point, you've probably devoted some of your budget to these processes, but have also experienced the time and cost-saving benefits of these hot industry trends compared to manual methods. However, technology isn't stopping there. The impending next level is to use geospatial AI and autonomous drafting to process the data, opening up the potential for up to 70% reduction in drafting time and 80% savings in drafting costs.

Eye-popping efficiency like that is hard to ignore, and word of geomatics and other innovative construction technology is spreading beyond the immediate industry. These methods are starting to be more widely accepted and even highly sought after in project proposals - just take a look at the language in the infrastructure bill.

In a profession that's always evolving, the competitive advantages of in-demand tech will likely quickly outrun implementation costs. You can't afford NOT to invest.

4. We're interested in implementing AI, but we just don't know where to start.
We get it. The thought of trying to tackle AI in-house can be pretty daunting. Implementing your own AI tools and programs is not a casual project for the average firm.

The thing about AI is, not only do you need the technical know-how to develop machine learning algorithms, you then need massive amounts of data to fine-tune them. So, even if you could create your own AI tools, they would only be based on limited data from your own projects.

Conversely, if you partner with a firm that specializes in AI, their highly-trained algorithms are constantly analyzing data from hundreds or thousands of projects from a wide range of clients. More input means increasingly efficient and effective output. In other words, it might be in your best interest to outsource.

Outsourcing gives you the technical expertise without having to start from scratch in-house. It also provides access to AI products and services that are built on a comprehensive set of data. When it comes to AI, bringing in outside experts is an effective way to get you up and running.

Time-Dependent Coordinates in the New Modernized NSRS

by David B. Zilkoski

The National Geodetic Survey (NGS)'s new, modernized NSRS is only about three years away. My previous Tarheel Surveyor articles have highlighted many aspects of the new geometric reference frame and geopotential datum. This article will highlight the time-dependent aspect of the modernized NSRS and why it is necessary for the new system. As stated in previous articles, NGS is developing models and tools for users to be able to transform coordinates between the four national terrestrial reference frames and the International Terrestrial Reference Frame, as well as estimate coordinates at epochs different from the survey observation epoch by accounting for movement. Hopefully, everyone has been reading NGS's blueprint documents (https://geodesy.noaa.gov/datums/newdatums/policy.shtml) that were updated during 2021, and participating in NGS's webinar series that provide the latest information about the changes from the existing NSRS to the new NSRS (https://geodesy.noaa.gov/web/science_edu/webinar_series/2021-webinars.shtml).

So, the question is what does NGS mean by estimate coordinates at epochs different from the survey epoch, and why is it necessary to account for movement in the new, modernized NSRS? In October 2021, NGS published a new paper about the modernized NSRS that describes the mathematical **relationship between the Intra-Frame Deformation Model (IFDM2022) and the Euler Pole Parameters (EPP2022)**. *[Note: NGS's January 2022 Modernization News announcement stated that the Intra-Frame Velocity Model (IFVM2022) name has been changed to the Intra-Frame Deformation Model (IFDM2022).]* Users can sign up for the Modernization newsletters at the following website: https://geodesy.noaa.gov/INFO/subscribe.shtml, and can obtain access to previous newsletters at the following website: https://geodesy.noaa.gov/datums/newdatums/TrackOurProgress.shtml).

Coordinates basically change because the Earth's surface is moving due to the movement of major tectonic plates (see the box titled "What is Tectonic Shift"). NGS understands this and is attempting to manage the changing coordinates by providing a time-dependent component. EPP stands for "Euler Pole Parameters" (a way of describing a plate's rotation) and IFDM2022 stands for "Intra-Frame Deformation Model" (a way of computing the drift in coordinates). The EPP2022 and IFDM2022 are models that NGS will use to transform coordinates between the four national terrestrial reference frames and the International Terrestrial Reference Frame. So, why is it necessary to account for movement?

NGS's 2021 revised Blueprint 1, NOAA Technical Report NOS NGS 62, Blueprint for the Modernized NSRS, Part 1: Geometric Coordinates and Terrestrial Reference Frames (https://geodesy.noaa.gov/library/pdfs/NOAA_TR_NOS_NGS_0062.pdf) provides an explanation of Euler Poles and "Plate-Fixed" frames. The following is stated in NGS's NOS NGS 62 report under the section titled "Plate-Fixed" Frames and Euler Poles (section 4):

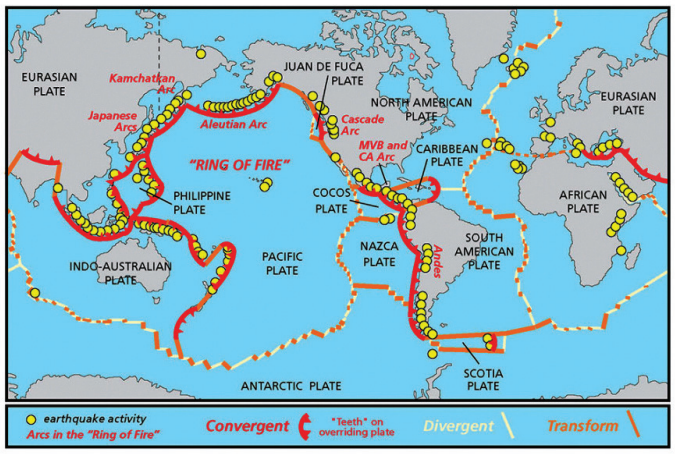
> "When considering only the rigid (not deforming) part of a tectonic plate, the horizontal motion of the plate (relative to a global plate-independent reference frame, like the ITRF) can be modeled as a rotation about a geocentric axis passing through a fixed point on Earth's surface. Although such models must make certain assumptions (such as the rigidity of the plate), the dominant motion of the majority of points on most tectonic plates is the rotation about a fixed point. That point is known as an "Euler pole."

What is important to know is an estimation of a plate's Euler Pole location and the angular velocity with which the plate rotates can be empirically determined using

GNSS observations from a CORS network distributed throughout the plate.

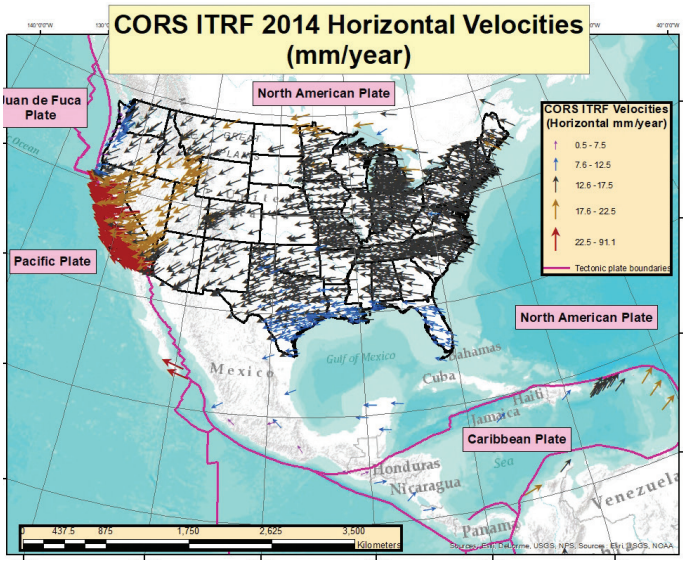
What is Tectonic Shift?

Tectonic shift is the **movement of the plates** that make up Earth's crust.

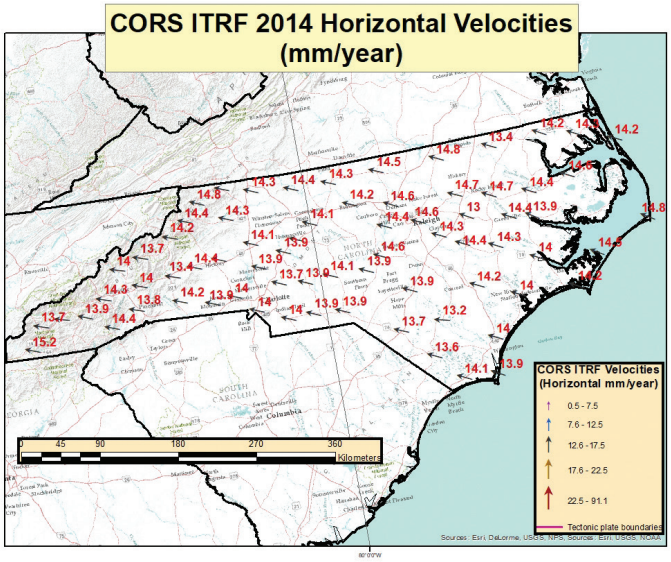


The Earth is made up of roughly a dozen major plates and several minor plates.

To better visualize the potential size of the movement I downloaded the CORS ITRF2014 coordinates and velocities from NGS's website (https://geodesy.noaa.gov/CORS/news/mycs2/mycs2.shtml#arp_coords_vels_list) and compiled the results. The box titled "CORS ITRF 2014 Horizontal Velocities" provides the horizontal vectors based on NGS's file that I downloaded on January 13, 2022. Only CORSs designated as operational and computed velocities were included in the plot.



So, what does this look like in North Carolina? To visualize the relative differences in horizontal velocities between neighboring CORSs, I plotted the ITRF 2014 Horizontal Velocities for CORSs located in North Carolina (see the box titled "CORS ITRF 2014 Horizontal Velocities in North Carolina"). Looking at the figure it's obvious that all of the velocities are around 14 mm/year and moving in the same direction.



Every place on Earth is moving and that includes neighboring marks on the same tectonic plate. What this means is that after the motions due to the movement of the North American Plate are removed, there are remaining motions left that change the relative differences in coordinates of neighboring marks located on the same tectonic plate. Figure 2 from the NOS NGS 62 report provides a plot of estimates of these remaining velocities (see the box titled "Figure 2 from NOS NGS 62").

Figure 2 from NOS NGS 62 report is a plot of the non-Eulerian motions east of 110o west longitudes. Non-Eulerian motions basically refers to the remaining movement after the movement for the North American plate has been removed. As depicted in figure 2 in the report, most of the remaining velocities in North Carolina are less than 3 mm/year. The concept is that the EPP2022 and IFDM2022 models will remove the Eulerian and non-Eulerian movement of the marks. As indicated in NGS's NOS NGS 62 report, these

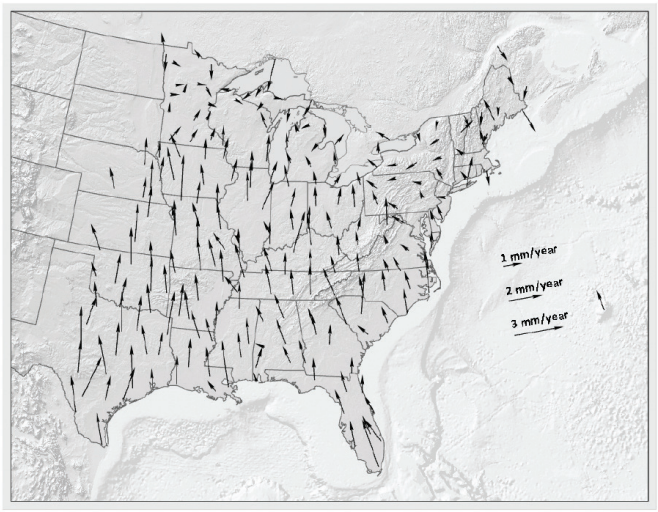
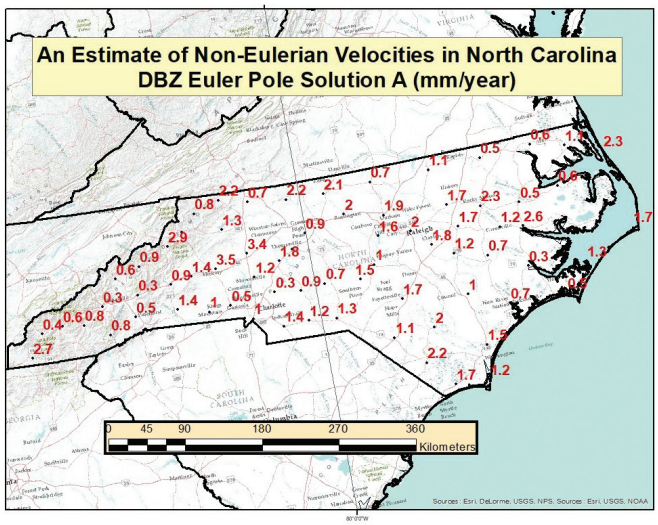


Figure 2: Horizontal non-Eulerian velocities (observed minus Euler-derived) to the east of longitude 250°. Their magnitude is smaller than 2 mm/year. It is expected that those stations which were used to derive the Euler pole will behave well (have small non-Eulerian velocities) while other stations may have larger non-Eulerian velocities.

remaining horizontal velocities will be small but they will not be zero. I estimated my own Euler Pole Parameters using NOAA CORSs located in conterminous United States east of 113° west longitude. The box titled "An Estimate of Non-Eulerian Horizontal Velocities in NC" provides my estimates of the remaining non-Eulerian movement values in North Carolina. The estimation of Euler Pole Parameters depends on which CORSs are included in the solution. My estimates are very crude and the final values estimated by NGS will be different. My intent is to only show an estimate of the size and variation of the remaining movement, and the reason why NGS needs to provide models and tools to estimate coordinates at epochs different from the survey observation epoch by accounting for movement within the reference frame. As previously stated, the EPP model removes the dominant motion of the majority of points on the tectonic plate. The model depends on what data are included in the model. This is where the experts at NGS will study the best method and set of data to be included in the EPP2022 and IFDM2022 models. NGS's models and tools will work behind the scenes so most of these movements will be transparent to users. Surveyors in California have been dealing with these types of movements for many years now. It is important for users to understand the concepts so they use the appropriate coordinates as described in my Fall 2021 Tarheel Surveyor article.



David B. Zilkoski served as Director, National Geodetic Survey, from 2005 - 2009 and was the Project Manager of the New Adjustment of the North American Vertical Datum of 1988. He currently works as a geodetic consultant on NGS' modernization of the National Spatial Reference System. He is Chair of North Carolina Geodetic Survey Advisory Committee and a member of the North Carolina 2022 Reference Frame Working Group.

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Timothy S. Guisewhite

Home Town
Charleston, SC

Wife's Name
Toni Guisewhite

Children
Hali (20), Keller (19), Eden (16), Evie (15), Elliot (10) & Oakley (6)

Favorite Food
Coffee…I think it's actually a food group.

Most Recent Purchase
2019 Toyota Tacoma, a workable compliment to my '92 flatbed project. And…uh…all kinds of backpacking gear. (I'll admit it's my midlife obsession.)

First Job
Busboy at a Shoney's restaurant.

Tim Guisewhite is the newest member of the North Carolina Society of Surveyors' Executive Committee. He was sworn in as the new Vice President on February 25th in Pinehurst at the annual Presidential Banquet. Tim is married to Toni, and together they have six children ranging from ages six to twenty. He is the owner of Guisewhite Professional Land Surveying, PC in Lincoln County. If that doesn't sound like enough on his plate, Tim is also the lead pastor of Calvary Chapel Riverbend.

Like many surveyors, he took a circuitous route as a licensee. High school counselors didn't direct his career path; instead, he was encouraged by another surveyor who lived down the street. Tim spent his childhood wanting to be a professional surfer, but after those plans "were dashed due to lack of ability," he pursued becoming a forest ranger.

While attending college at Liberty University to pursue forestry, he met a forest ranger who shared some realities about the career path. He told Tim, "You have to volunteer until someone dies, and whoever has been volunteering the longest is next in line." Tim thought that his college debt was too pressing to pursue this career, so he reconsidered his professional pathway. Thanks to neighbor David Creswell, Tim learned about the survey profession, and Mr. Creswell

encouraged him to give it a try based on his interests. Like so many PLSs, he had never considered surveying as a career. In 1998 he embarked on a new pursuit, and Tim says he has never looked back. "Surveying has taken me from the beach to the mountains, from Georgia to New Hampshire, to every beautiful and awful place in between."

Tim started his career at Trico Engineering in Charleston, SC. After his and Toni's first child was born, they relocated to Tuckerton, New Jersey

"Surveying has taken me from the beach to the mountains, from Georgia to New Hampshire, to every beautiful and awful place in between."

(NJ), where he worked for a small local firm Nelke, Constantine & Associates. In 2002, wooed by technology, he joined Taylor Wiseman & Taylor in Mt. Laurel, NJ. In 2006, Tim felt called to ministry, so he began remote Bible classes with Calvary Chapel. In 2007, he said goodbye to the surveying profession to attend a Bible College in Hungary. "I'll never forget the conversation with my boss the day I gave my notice. He sat me down and said, 'let me tell you God's will for your life," then proceeded to outline how I was third in line for his job. Tim replied, "Everything of this world tells me I need to stay, but everything of the next tells me I need to go." He and Toni sold their possessions and moved to Eastern Europe. While there, they were mission-oriented, but the Lord seemed to say, "Your mission field is to go back home to the US." In 2008, Tim moved his family to Greenville, SC, where we helped plant a church eventually being re-hired by Taylor Wiseman, who in 2011, relocated Tim to their Charlotte office.

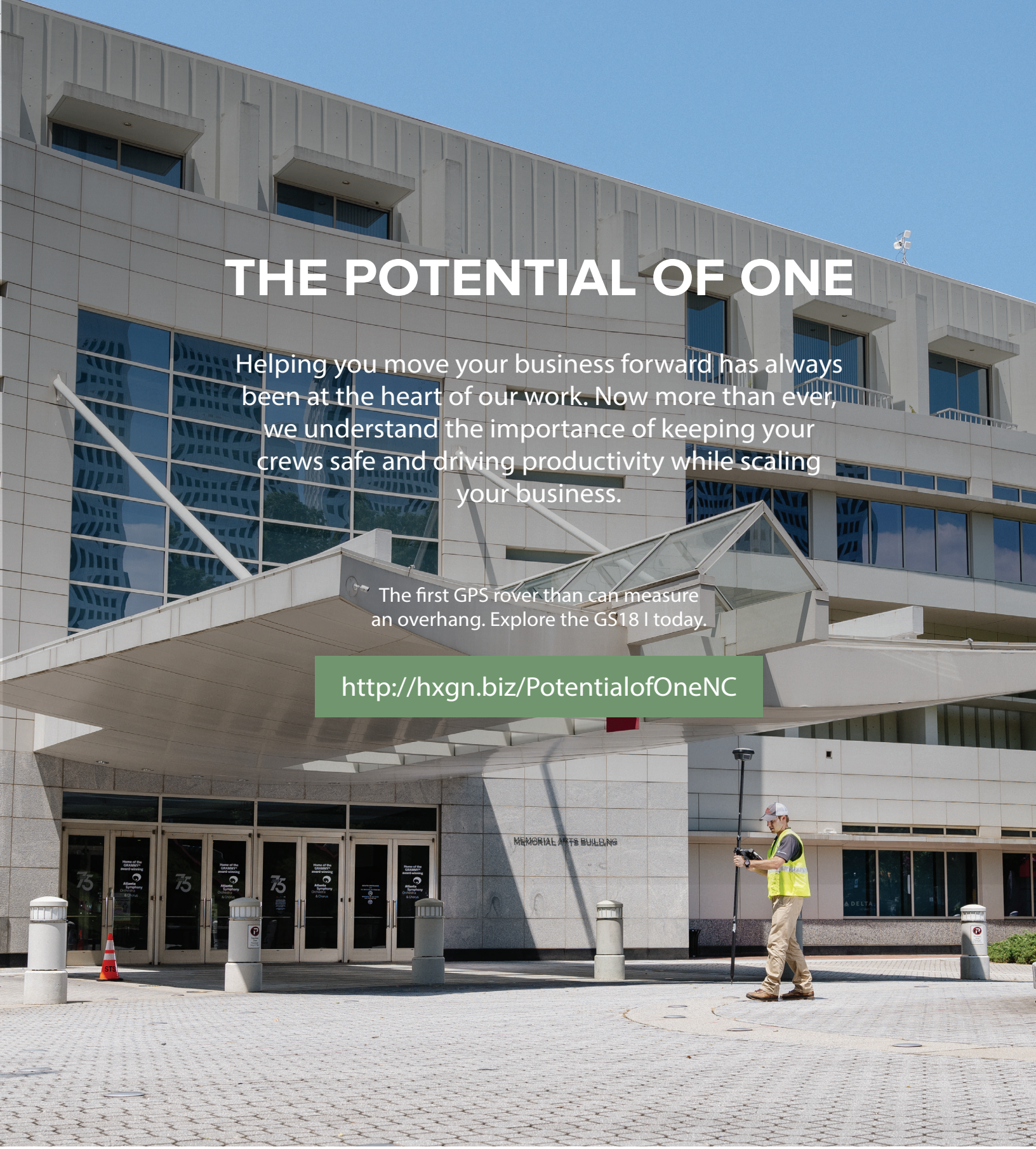
In 2016, he and Toni planted Calvary Chapel Riverbend Church, and in 2017, Tim established his family company Guisewhite Professional Land Surveying. Tim reflects, "It's been a wild ride, but it's incredible to see the Lord give back everything we have given over to Him. We have a thriving church fellowship, beautiful family, and more work than I can shake a stick at. It's been quite a journey to this point, and I'm more than grateful for the home we've made in North Carolina, our friends, family, church, and community!"

Other than church, Tim has never been a member of another organization until he joined NCSS. He credits an older surveyor who worked for Taylor Wiseman and Taylor in New Jersey for inspiring him to join. Don McKay told Tim before moving to North Carolina, "When you get there, make sure you join the local society. It's good for you to know other surveyors in your area." Because Tim respected Don, he joined the Mecklenburg Chapter soon after moving to Charlotte. He sees the wisdom in Don's advice. Belonging to a chapter builds relationships offering friendship, advice, and resources. Tim said he was impressed with the respectability of everyone he met. He also noted that the longer he has been involved in the leadership of NCSS, the more value he sees in being part of an organization that has his professional interests in focus.

When asked about his favorite piece of equipment, the reader may relate to Tim's humorous response.

"Oooo…that's a tough one…depends on the day. We seem to have a love/hate relationship with these things. I use a Javad Triumph LS+ GNSS receiver. It's phenomenal, then some days you just want to make it go "bloop" in the pond. I have Trimble & Leica Robots that are both amazing total stations, until those days you just want to push them into oncoming traffic. I have a 1955 Wild Heerbrugg NA2 level, the one with the compensator push-button…old faithful there (no thoughts of destruction). A few years back, I got to messing with a Warren-Knight Sipe-Sumner Surveyor's Compass. I've run some rural property line flagging with it. I was amazed to take the grid bearing, convergence and declination, run a few thousand feet over any terrain and pop right out at the corners. Compass surveying is truly a lost, art and I'm a little old school, so my Sipe-Sumner is my favorite. It is definitely a surveyor's toy."

The project that means the most to Tim is a 2017 survey of 1,468 acres in Lancaster County, South Carolina. It was memorable because he completed it with his son, Keller, who was 14 years old at the time. It was Keller's first BIG tract survey, and Tim's client allowed them to do it every other Friday over a six-month period. They cut approximately 42,000 linear feet of boundaries and blazed/flagged the trees along the way. Calculating that angle and turning it and following the old lines is what got Tim hooked on surveying. He showed his son all the old blazes along the way. Now Keller is headed along the same career path attending NC A&T. As a bonus, they tied the survey to the stone pillar at the "Old North Corner" the 1818 NC/SC Boundary Marker. Tim hopes it was this survey that gave Keller inspiration to follow in his father's footsteps.



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