

Missouri Surveyor

A Quarterly Publication of the
Missouri Society of Professional Surveyors

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December 2026

What's in this issue...

Colonel Stephen Long: Engineer, Inventor, Surveyor, Explorer 5
The New ALTA Standards – 7.B. 8
Scott Faenger Retirement 12
69th Annual Meeting Stump The Chump Results 16
Highlights from the MSPS 69th Annual Meeting and Convention 21
The Genesis of Missouri from Wilderness Outpost to Statehood 26
APEPLSPLA Board Open House in Kansas City 31
Not Your Usual Protraction Problem 33
Zion USGS Disc 34
Cadillac Mountain Acadia National Park 35
2026 Lost Monuments Remembered 37

CALENDAR OF EVENTS

2026 & 2027

December 11, 2026
Zoom Call, Board Meeting
MSPS Office, Jefferson City, MO

April 28-30, 2027
49th Annual Spring Workshop
Lodge of the Four Seasons, Lake Ozark

September 9-11, 2027
70th Annual Meeting and Convention
St. Charles Convention Center and Embassy Suites

Front Cover: A look at the open vault box exposing the datum point for NGS Benchmark X 328 (PID KE1119) in the right-of-way of US 24 in north Independence, Missouri. The adjusted NAVD 88 Ortho height is 938.92 feet and was used in this survey to tie in vertical control over a GPS network. This First Order Class II monument was established by precise leveling in 1986. Much of the original station description surroundings have changed, but the mark was found in good condition.
Photo by Chris Ferguson

Back Cover: National Forest Boundary post and sign found grown into mature tree in Sec. 21, Township 33 North, Range 11 West, Texas County. Field theory is the post may have been leaned against a double Post Oak which eventually grew around the post.
Photo by Katie Jones

Chris Ferguson, Editor
Austin DeSain, Editor



Notes from Editor DeSain's Desk

B. Austin DeSain, P.L.S., Director, Editor

Congratulations to my Co-Editor Chris Ferguson on his new role as MSPS President, and a congratulations to Mark Wiley for a great year served. Also congrats to Phil Grout as VP, and new Board Members Francis Duncan and Jason Beasley. Trust me when I say that this is a working organization with the issues affecting Missouri Surveyors in the forefront of all considerations. With the hard work of the officers, Board Members and committee-members, this organization moves into it's 70th. Thanks to all of the members for article and photo submissions to the newsletter, donations for scholarships, participation as exam proctors, educators, and legislators. The group in attendance at the October Business Meeting had a lengthy discussion in support of continuing the printed newsletter, to which I'm thankful, because I enjoy taking time out of each quarter to help bring you this tangible, printed newsletter, at about $8 an edition.

Sometimes in our profession we run into situations that knock us down flat, whether a problem with a client, a job, the survey conditions or outside of our work, we have to find a way to regroup and keep moving. Time is linear and projects are not always. Surveying isn't slowing down and I've heard more often recently that surveyors will be needed more than ever as we move into the next years. The thing about an opinion-based profession, based on mathematical calculations, legal understanding, and professional judgement, is that the common sense we've worked so hard to develop, sometimes seems like a scarce commodity in various surroundings. Be proud you're a surveyor, and be proud of your work.

This quarter, we bring the second half of Jeff Pauk's Col. Stephen Long article, the surveyor explorer who mapped the Missouri River years prior to Lewis and Clark. I've put together a short piece about the 2026 ALTA Standards, Item 7B. We've compiled the highlights from this past annual meeting highlights with the Stump the Chump results. The Genesis of MO nears the end with the 7th run. A GLO lotting problem, comics, and found monuments from the West and the East. While reflecting on this year's Lost Monuments Remembered section, I wonder about surveyors working 10 and 20 years past retirement. With 49 new Professional Land Surveyors in 2026, the future may be so bright you'll have to wear your sunglasses at night.

(continued on page 4)

THE MISSOURI SURVEYOR

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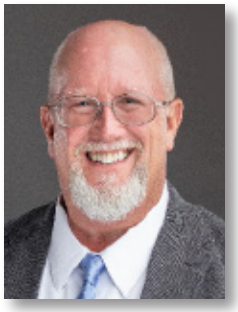
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President's Message

Chris Ferguson, PLS



"A Tale of Two Cities"

I shamelessly pirated the title of Charles Dickens' famous book to apply to my journey across the state beginning as a junior crewman in the late 1980's outside St. Louis to today near Kansas City. In many ways this surveying tale of mine sometimes read like a Dickens novel, but I'd rather focus on the positive and leave "the bad old days" in the past where they belong.





Most of all, I'm pleased and proud to serve as your President this year - it's truly one of the biggest highlights of what has proven to be a long and fairly rewarding career. As a young crewman, little did I ever think that I might even become a "Registered Land Surveyor" (which we were titled at the time) but someday become the "MARLS" (see note above) President.
But this isn't just about me. If I can aspire to this office, so could each of you if you chose to. I cannot encourage you enough to get involved in ***your*** (*emphasis added*) Society! There are numerous committees which long for energetic surveyors with new experiences and perspectives along with almost as many openings for nominations to the Board of Directors. Not everyone gets elected the first time to the Board (I didn't because I missed the voting), but after about 15 years I went on the ballot again to eventually arrive here. My alibi the first time was I didn't know "you had to be present to win" and worked out in the field the morning of the election. You live and learn…!

This is not merely about a plaque on the office wall and the "red ribbon" on a convention name badge, however. I'm here to represent you and voice your concerns to people who are often otherwise closed off to regular contact with us PLS's. I'm also here to try to leave MSPS maybe a little better off than I found it, if at all possible. So hopefully our organization remains active and thriving in good times like these and awful times such as "the Great Recession" that many of us practicing back then still harbor bad dreams about. It's an exciting time as we embark on the Society's 70th year in a few weeks and I look forward to making the "Platinum Anniversary" one to remember.

(continued on page 4)

Notes from Editor DeSain's Desk *(continued)*

Often after total station and GNSS are used by non-surveyors, the profession is requested to intervene to fix issues. Remind clients of the statutes, and the problems that may be faced if surveying without a license. Stand up for your profession, educate the public. Your clients may thank you, and you may head off the problems before they happen next time.

Austin

President's Message *(continued)*

We had a great Annual Meeting several weeks ago, and it's always a pleasure to go to Springfield every so often. The Oasis was a good venue as always, and the only thing that might affect my Yelp review would have been Thursday's breakfast and lunch, but the Hotel recovered nicely after that. I'm looking forward to the one next fall in St. Charles being even better.

Congratulations to all our new PLS's and LSI's who passed their exams this year! It was encouraging to see so many new faces eager to join our ranks, and I look forward to meeting you all soon. And remember, stay involved in MSPS as an active member. It's your Society to carry forward into what looks to be a promising future!

Perhaps as a relief to the reader, I won't submit Editor's Notes while in this term as I'm sure Co-Editor Austin DeSain can cover that topic well without me for a few issues. I will still be working as an editor and contributor, and with that I won't miss this chance to encourage you to send highlights from your daily work to share. Sometimes what we find routine is quite new for our peers; so, please don't hesitate to send something of interest to us whenever. Format is on the back page, and about the only thing we might exclude is an abundance of profanity or anything derogatory to other Members.

Before I close, I'd like to thank all those who have helped to make my path forward easier yet set the bar high, from Executive Director Sandy Boeckman and Past President Mark Wiley to my fellow Officers, Board of Directors and Committee Chairs. And special thanks most certainly to my wife Beth and other supportive family members who have abided this rather lengthy period of service. Last but not least is a *Thank You* to all of you who gave me your vote of confidence to take on this new role. I'll do my best to fulfill those expectations.

Here's to a safe and prosperous 2027!

Chris

Colonel Stephen Long: Engineer, Inventor, Surveyor, Explorer

(Continued from September 2026 Missouri Surveyor)

Originally published in the Madison County Historical Society, MCHS News, Vol. 14 No. 2, March 2026

by Jeffrey Pauk

On Long's suggestion, the 1820 goals for the expedition were revised and funding was approved. The revised mission made speed and distance the primary objective and thorough-ness secondary. Unfortunately, when Long reached St. Louis, funding had not yet arrived and he was forced to leave without it. By the time the funds did arrive, the party was hundreds of miles to the west.

The *Western Explorer,* loaded with specimens, journals, drawings, and paintings from the prior year, headed back to St. Louis. The remaining party headed out on June 5 to reach the Platte River. They had been warned by local natives and trap-pers that the proposed route they were following was fraught with peril. Little rain, no grazing suitable for horses, and likely hostile interaction with Western tribes were likely experiences.

They usually traveled be-tween twenty and thirty miles per day. Despite the pace, the scientists found times to do their work. While at the Pawnee villages, they interact-ed with the natives and were taught how to dry meat, use buffalo chips for heat and cooking, and spent time trading and learning about the Pawnee culture. Language guides were developed for future communication.

Throughout the trip, Long took astronomical observations to determine latitude and longitude and wrote mapping notes of the travels. They traveled along the South Platte and by June 30, the explorers caught their first glimpse of the Rocky Mountains. It took them six days to reach the mountains. They found a gorge through the mountains from which the South Platte flowed and decided that it was more important that they move south rather than risk time and safety in attempting to find the source.

On July 12, a party of four men set out to climb Pikes Peak, reaching the summit in two days. They were the first recorded white men to climb the mountain. While at the top, they were able to sketch what they saw and were better able to provide insight as to the topography in all directions. They also noted plants and observed animals. After their descent, a group of the party led by Captain Bell followed the Arkansas River westwardly for two days into the mountains before turning back to the base of the mountain range. The explorers then followed the Arkansas across what they considered largely inhospitable lands.

At one point, Long decided to split the group and supplies and send one group with Bell along the Arkansas River to Fort Smith while he took the other group south in search of the Red River.

Long's group trudged southward until they found what they thought was the Red River (it was not) and followed it east-ward. They experienced temperatures reaching 100 degrees during the day and their mules and horses were sick and weak from lack of food. Lack of information and accurate maps pre-vented them from determining their location, but after several days of little food and water, and numerous dangerous encounters, Long was able to take an astronomical observation and confirmed they were further north than they should be. At this point, they had no choice but to continue on the waterway to the Arkansas River.

(continued on next page)



These examples of the work done to document the West on Long's expeditions. Above is a painting by Samuel Seymour of an 1819 Indian Council near Council Bluffs. (Beinecke Rare Book and Manuscript Library, Yale University)

Colonel Stephen Long *(continued)*

A few days later they met some men on the river who told them that Captain Bell's group had arrived at Fort Smith a few days earlier. Three of the soldiers in Bell's detachment deserted, taking the three best horses and most of the scientific and narrative journals.

Once at Fort Smith, the re-united group wrote summary reports of their adventures before traveling on to Cape Girardeau where they dispersed to make their own ways home. Long and Bell traveled to Washington, arriving in November 1820, to report to superiors who instructed them to make maps from the expedition. A two-volume book of the expedition was compiled by Edwin James (the expedition's botanist, geologist, linguist, and physician) and presented to the government as well as to the American Philosophical Society.



Below is a nature painting of a muskrat by Titian Ramsay Peale, circa 1819-1820 (American Philosophical Society)

Much has been made of the relative successes and failures of the expedition. *(Before making your decision on this, I suggest reading "Stephen Long and American Frontier Exploration" by Roger L. Nichols and Patrick L. Halley.)* Regardless, Long's map of the West provided much new information for those who followed in the succeeding decades. Long was given the task of producing a map of the United States for the office of Topographical Engineers at a scale of 36 miles to the inch incorporating the compiled information from all explorations to that point. The final result was 55 inches by 49 inches and for several decades was considered the most accurate map of the country.

In early 1823, Colonel Alexander Macomb, the chief of engineers, requested Long to lead another expedition of the Mississippi, Minnesota, and Red Rivers (in Minnesota) to the 49th Parallel and eastwardly along the Northern boundary of the US to the Northern bank of Lake Superior. Many of the scientists on the trip West eagerly joined Long on this trip North. Once again the party assembled scientific instruments, journals, and needed supplies and met at Fort Crawford at Prairie du Chien.

Leaving on June 24, they traveled in two groups. One on the river and another overland. By August 5, they had arrived at Pembia near the Canadian border. On August 8, Long had completed his astronomical observations and had determined the location of the 49th Parallel: the Northern boundary of the United States. A post was set in the ground with U.S. engraved on the south side and G.B. (Great Britain) engraved on the north.

The astounding part of this story is that Long's post was only about 250 yards south of the true location, which is remarkable given the instrumentation available during his time. The party explored north to Lake Winnipeg, then followed rivers back south to the border before heading east to Lake Superior, Sault St. Marie and Mackinac where they disbanded. Long and the scientific party continued through the Great Lakes to Rochester, New York, and Philadelphia, arriving on October 27 after travelling 4,500 miles in six months.

In the eight years encompassing 1816 to 1823, Long's six expeditions not only covered over 26,000 miles, but had been completed without the death of a single member, although the fates of the three deserters are unknown. The reports of those expeditions were completed within one or two years of the conclusion of each one respectively. In comparison, Lewis and Clark's report wasn't completed until eight years later and the full report of their journals didn't come out until 1905. Some of the discoveries from Long's

Western expedition discovered the same species as Lewis and Clark, but this wasn't realized until years after the completion of Long's report.

The biggest criticism of Long is the fact that he described the area west of Missouri and Iowa as the "Great American Desert." Critics claim that settlement of this area was delayed because of this label, and it was the primary reason that the wagon trains passed over this area on the way to California and the Northwest.

This is an unfair characterization of Long's judgement. In 1837, John Deere invented a plow that could cut through the tough prairie sod. It revolutionized farming. In the early years of Long's life, the best ground for farming was generally considered areas which were wooded or in floodplains. Land without trees was considered barren and in many locations prairie grasses were difficult for cattle and horses to digest. The trials and tribulations of the western expedition were proof of this. Long's horses and mules were constantly sickened by the plants and sources of water were sparse. Long wasn't alone in this description. In 1806, Zebulon Pike described the western plains in a similar manner. Another consideration is that several historical weather researchers believe that the central plains were in the midst of a drought when Long was exploring.

Long's explorations were significant enough to place him in the annals of history, but he was just getting started in his contributions to science and engineering.

Already a member of the American Philosophical Society for his expeditions, he became a consulting engineer in the construction of the B&O Railroad between Baltimore and Ellicott City, Maryland. He received several patents for his designs for locomotives and their improvements. In 1829, he published a book, "The Rail Road Manual," based on his work of surveying, designing, and building the B&O. It became the official guide for early railroad construction. The railroad work also thrust him into the work of building bridges, and he patented several bridge truss designs which were used for both rail and roads. Another innovation was his use of wood blocks to pre-stress the bridge trusses to distribute weight more efficiently. It is a standard engineering practice today.

Long remained with the B&O until 1830. From 1834 to 1837, he surveyed railroads through Georgia and Tennessee and followed as chief engineer of the Western 7 Atlantic Railroad. Through this work, he created the location for the center of the City of Atlanta at the Southern terminus. The location was marked with a stone marker and designated as Mile Post 0.

Multiple National Roads were created from his later reconnaissance surveys. His brother, Dr. Moses Long, became the agent for the sale of Long bridges, which were constructed across the country. He was promoted to Major in 1838 when the Topographical Engineers became a separate company. In 1843, he was assigned the duties of Supervisor of the Improvements of the western rivers, which tasked him with projects on the Arkansas, Mississippi, Missouri, Ohio, Red, and Rock Rivers.

Aside dredging and clearing debris from rivers, he also supervised the building of a canal to circumvent the Falls of the Ohio at Louisville, and the building of a riverboat harbor in Dubuque. He was one of the officers assembled for the court martial of explorer John C. Fremont. In 1847, during the second war with Mexico, he supervised the building of several steamboats.

Having spent much of his later career in Cincinnati, Louisville, and St. Louis, in 1856, he moved to Alton where four of his siblings resided. In 1861, he was promoted to Colonel and was assigned the position of Chief of Topographical Engineers. During the Civil War, he primarily worked on improvements to navigation on Lake Ontario. He retired from the Army in 1863 at the age of 79 after 45 years of service. He passed away at home in Alton on Sep. 4, 1864.

When one considers Long's accomplishments as an explorer, military engineer, civil engineer, inventor, and early railroad construction engineer, it becomes apparent how much of the development of the country he influenced. In 1890, one of the mountains he and his party observed was named by the U.S. Government in his honor. Long's Peak is the highest mountain in Rocky Mountain National Park.

Author's Note: When Stephen Long conducted his first and second expeditions, the Illinois Territory extended north to the Canadian border and Madison County included all of the territory north of its current southern boundary. Although much of the area he explored is not within current Madison County borders, it was at that time, and thus should be considered a part of our history.

The New ALTA Standards – 7.B.

by Austin DeSain

Earlier this year, the ALTA/NSPS Standards took effect on February 23, 2026. By now, you've likely certified to the latest and greatest if you deliver those types of surveys. The prior versions from 2016 and 2021 each had their particular overhauled sections. With each change to the Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, we have had to adjust and adapt our practice and verbiage to point the liability in the appropriate direction, while supporting lenders, clients and title companies in transactions. Out of the gate, we learn as much as we can and discuss amongst other surveyors and peers for each applicable situation on the surveys we have in front of us at the time, while remembering particularly painful situations from past work, to figure out the new path forward. As surveyors, we learn, adapt, and continue with the latest regulations often.

There are always several levels of acceptance of the standards that we relate to our own comfort and liability with each survey. We're told with each new release that this is the standard, meet it. It can feel like a line in the sand that we step over each release. We're generally up to speed and as studied as we can be regarding the updates by the time we're certifying them. The reality is that the full level of learning and adapting does take a little bit. At the bare minimum, we've thought through a work-around or two that will allow us to proceed with our survey and still certify to the optional Table A items that we're not totally agreeable to. As time goes on, we become more amenable to the latest version, mostly through an understanding of the changes and why they're important for modern times. The simple facts though, are that they were prepared by a joint committee made up of members from both the American Land Title Association (ALTA) and the National Society of Professional Surveyors (NSPS), and they are the mandated as a condition of loan underwriting and collateral risk assessment by commercial lenders. The Office of the Comptroller of the Currency (OCC), Federal Deposit Insurance Corporation (FDIC), with other federal entities involved in funding, along with the title industry have assembled with surveyors to prepare the ALTA/NSPS requirements to provide consistency across agencies for lending. Without certifying to the latest required standards, you are raising all kinds of red flags among lenders, title companies and other agencies. Those work-around situations may become less, or may become more set in stone as we become knowledgeable of the reasons behind the change to the standards, or find out that the title companies or lenders are actually responding in an unexpected way.

In the months after the release of the 2026 Minimum Standard Detail Requirements, many of the liabilities attached or detached from the verbiage changes in the standards become evident. The same goes for the Optional Survey Responsibilities and Specifications, but likely we've found a way to sharpen our machetes to blaze the path forward. Except of course, if your work is a longer timeframe survey that began under the prior standards.

From 2016 to 2021, and prior, the "Surveying Standards and Standards of Care" section saw an overhaul, primarily in section 3.E.i Measurement Standards, "Relative Positional Precision". The 95 percent confidence level has remained and is critical to meet the standards when determining the position of the surveyed property in relation to measuring the property corners for adjacent properties. The measured corners used to calculate the boundaries of the subject survey no longer have to be the immediately adjacent corners, however, I think you should look there first. A handful of other clarity corrections in this section have helped the surveyor establish the property boundaries in a more calculatable way, while allowing for the surveyor to make the decisions during performance of the survey that "maybe the neighbor's survey is actually the one we should not be using as the reference." A show of hands for all the surveyors who ended up surveying the whole street to establish a lot, or the whole block, or the whole subdivision, or the whole section, or several sections.

Other changes that came along with the latest version had to do with sections 4. Records Research, that now allow the surveyor to complete the survey with other title evidence satisfactory to the insurer, if a title commitment is not available. In section 5. Fieldwork, we usually see updates relate to the practice in the field that are reflective of the technologies and modern times. This section is typically reflective of the state standards for land surveying, as they (should) evolve more often to reflect that state's requirements. Section 5 has been updated to state "using practices generally recognized as acceptable by the surveying profession for purposes of an ALTA/NSPS Land Title Survey." Then going on to add details in each subsection that should be considered by the surveyor doing the survey.

(continued on page 10)



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The New ALTA Standards – 7.B. *(continued)*

Bringing us to Item 7, one of the most popular to inspect for changes before reading all of the other updates. Almost like when you used to get a Mad magazine and flip through to see if a new installment of Spy vs Spy was included. When the latest ALTA Standards are released, all the surveyors I've known flip right to item 7, certification – because this is the language that you will use on your survey to certify that it meets the current ALTA standards. The certification itself (item 7.A) has not changed itself with this release, other than the year being made current. However, a part B item has been added where there was not one prior. Item 7.B. "Certification may be extended to successors and assigns of the lender if requested.".

The PDF "Frequently Asked Questions And other guidance on ALTA/NSPS Land Title Surveys including the 2026 Standards" (google it, it's a long link to a PDF), provided by the American Land Title Association (ALTA), addresses this update as:

Often a request is made, or specific instructions given, for the surveyor to certify to "ATIMA" and/or "ISAOA." These are acronyms that mean "as their interests may appear" and "its successors and/or assigns." The loan policy defines "insured" in a way that should remove the need for such wording, but if the lender demands that the title company put those in the policy, the title company will likely want to surveyor to certify to the same.

Surveyors should seek guidance from their attorneys on the desirability of certifying in this matter; however, in any event, they may want to avoid certifying to successors and assigns of the client/buyer.

In the past, we have been asked to include this language on certifications, sometimes we have and sometimes we have not. The important piece is to remember that the language in Item 7.B. includes "of the lender". This allows the lender to use the survey for buying or selling the loan. It does not transfer to any other parties except those that the lender deems. Make sure that your survey includes a lender, often there are financial entities like investment groups or private parties and they carry liabilities, as they are not financial institutions and if you certify to an investor rather than a lender, you are creating a situation of "indefinite liability". Make sure that you are working with a lender, reach out to them directly if possible to inquire about the Optional Table A items from the beginning, so that you know your client's lender. Occasionally, there are multiple parties other than the lender, and I would encourage you to discourage your client from allowing multiple entities to be certified to, other than the main three – the lender, the client and the title company. If additional parties want to be included in your certification, you can provide them with a third-party release of liability agreement and even charge for each additional third-party. Remember that, with each name added to your certification, you are providing your survey and creating a liability situation for other people and groups who may not necessarily be in the best interest of your survey or the transaction. Along those lines, be sure that your contract for the work is directly with the client, lender or title company. You should certify to your client, who is in the transaction.

I wanted to pass this along because it is often an item of contention and confusion for surveyors. Often we are pressured from some client's attorney or other party working for the client to add names to the certification, add language in the notes, address items particular ways, and even change the survey. Remember that you are the surveyor, and your decisions are based on your professional judgement, experience, education, and many other factors. The certification will bear your name and professional seal, and the liability that goes with it. Do your best to navigate this process in a professional and efficient manner, and with your client's best interest in mind. The points of this article are based on my opinion in working through these situations, and I hope that the readers can learn from this article to form their own opinions and practices.

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Scott Faenger Retirement

Scott Faenger, PLS, retired as Missouri State Surveyor in Oct., following 23 years of dedicated service to the Missouri Land Survey Program. Scott began his career in 2003 with the Missouri State Parks survey crew and transferred to the Land Survey Program's Cadastral Section in 2005. He became the Cadastral Section Chief and then the state's fifth State Land Surveyor, leading the program for nearly five years.

During his tenure as State Land Surveyor, Scott was instrumental in numerous projects that significantly benefitted the program. A few highlights and accolades from his time include:

- Missouri Surveyor of the Year, 2024
- Robert E. Myers Service Award, 2025
- Dedication of the Robert E. Myers Land Survey Building, 2025
- SB 938 fee increase for the Land Survey Program, 2026

Scott was truly dedicated to the success and promotion of the importance of the program. His leadership and commitment will be missed by his team, and we are very thankful for all that he accomplished during his time with the program.

Scott plans to continue his surveying career in northwest Arkansas, near his family and grandchildren, allowing him to enjoy more time with loved ones. A small retirement party was held on Oct. 15, celebrating his many accomplishments and memories with the Land Survey Program.

Written by: Amy Forsythe, Administrative Support Professional, MDA
Jason Beasley, Project Surveyor, MDA
Jacque Walters, Repository Section Chief, MDA









Update: New Missouri State Plane Coordinate System and NGS Beta Products

As most of you in the land survey industry already know, the existing North American Datum of 1983 (NAD 83) is non-geocentric by about 2.2 meters-three dimensionally. To solve the problem, NAD 83 is being replaced by the North American Terrestrial Reference Frame of 2022 (NATRF2022), a plate-fixed frame that is tied to ITRF2020 at epoch 2020. The new frame uses the same ellipsoid model GRS80, but it is shifted to be more geocentric.

In addition to the new system, Missouri will receive a new State Plane Coordinate System, consisting of two layers. The first layer contains one statewide zone. The second layer consists of what the National Geodetic Survey (NGS) terms a partial coverage layer and a special purpose zone which extends over the state line into Kansas. The combination of these 31 zones will serve as Missouri's multiple zone layer.

NGS has expressed disapproval with-the use of the US Survey foot for the new system. Note that it will be permissible to use the international foot or the meter.

Missouri's Standards and Revised Statutes have been revised to accommodate the new system. Moving forward, Missouri Statute allows for work in other appropriate geodetic datums such as NAD 83 (2011).

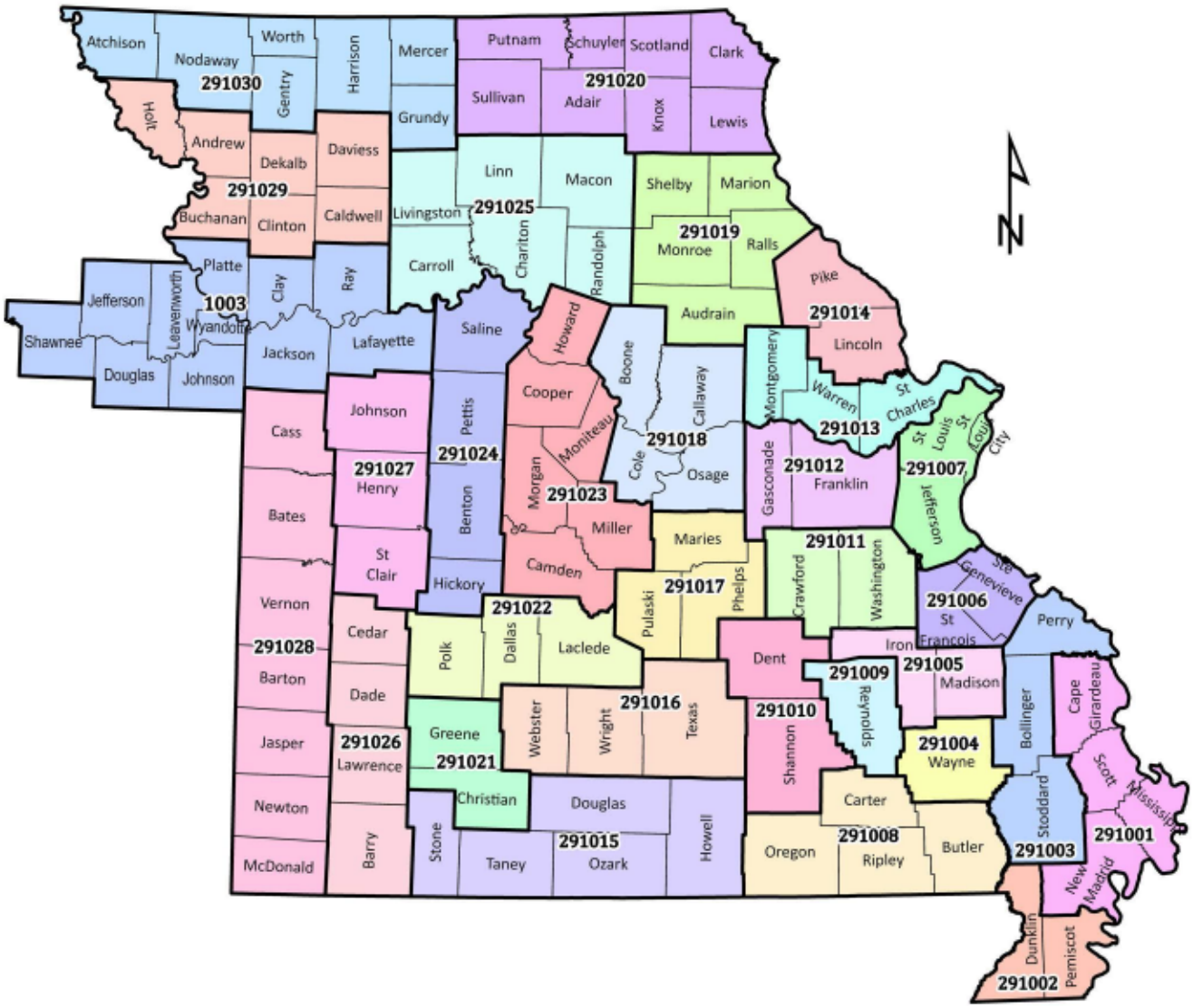
On Sept. 15, 2026, NGS released the Modernized National Spatial Reference System (NSRS) Beta Tools. NGS welcomes testing and feedback from surveyors, such as our membership, to help improve these tools. Please look over the NGS beta website, found through the main website at https://www.ngs.noaa.gov/. The release of the beta testing will continue for six months to allow for feedback. After the feedback period, NGS will implement changes and approve the modernized NSRS, which has no exact release date at the time of this writing.

Written by: Jess Moss, Geodetic Section Chief, Land Survey Program-MDA





Missouri State Plane Coordinate System



Zone Code	Zone Name	Zone Abbr.
* 290001	Missouri	MO
** 1003	Kansas City	KANC
291001	Missouri Cape Girardeau	MO_CAPG
291002	Missouri Kennet	MO_KNET
291003	Misouri Perryville	MO_PRVL
291004	Misouri Piedmont	MO_PIED
291005	Missouri Fredericktown	MO_FRED
291006	Missouri Farmington	MO_FARM
291007	Missouri St. Louis	MO_STL
291008	Missouri Poplar Bluff	MO_PLRB
291009	Missouri Ellington	MO_ELTN

Zone Code	Zone Name	Zone Abbr.
291010	Missouri Salem	MO_SAL
291011	Missouri Cuba	MO_CUBA
291012	Missouri Washington	MO_WASH
291013	Missouri St. Charles	MO_STCH
291014	Missouri Troy	MO_TROY
291015	Missouri Branson	MO_BRAN
291016	Missouri Marshfield	MO_MRFD
291017	Missouri Rolla	MO_ROL
291018	Missouri Columbia	MO_COL
291019	Missouri Hannibal	MO_HAN
291020	Missouri Kirksville	MO_KIRK

Zone Code	Zone Name	Zone Abbr.
291021	Missouri Springfield	MO_SPFD
291022	Missouri Lebanon	MO_LEBN
291023	Missouri Boonville	MO_BNVL
291024	Missouri Sedalia	MO_SED
291025	Missouri Moberly	MO_MOBY
291026	Missouri Monet	MO_MONT
291027	Missouri Warrensburg	MO_WARB
291028	Missouri Joplin	MO_JOPN
291029	Missouri St. Joseph	MO_SJOS
291030	Missouri Maryville	MO_MARY

*Note: 290001 is the statewide zone for Missouri
**Note: 1003 is a special use zone that crosses state lines

Borders

Counties

Zones

Prepared by the Missouri Land Survey Program

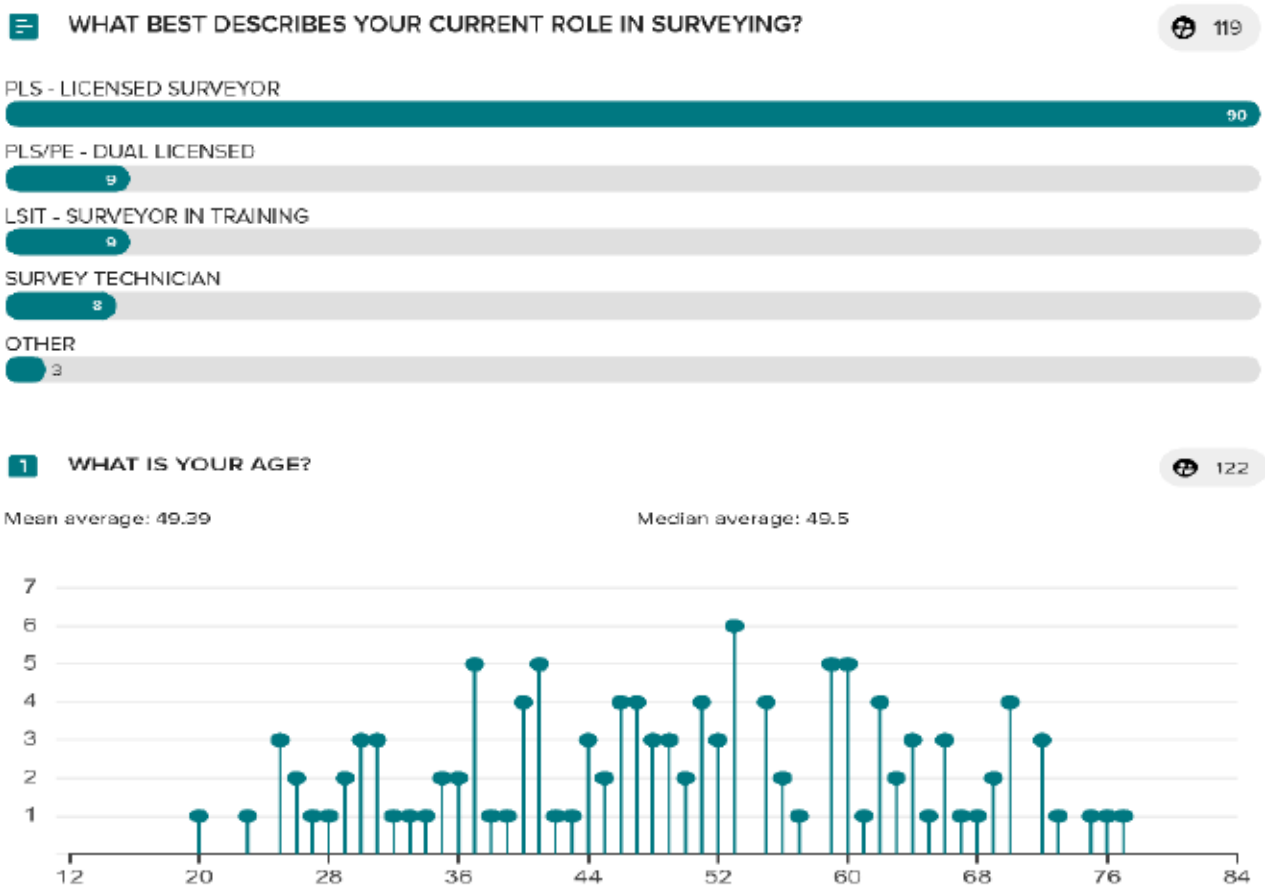
69th Annual Meeting Stump The Chump Results

This past 69th Annual Meeting and Conference featured a Stump The Chump session on Friday, October 2nd, 2026 where panelists sat on stage and the moderator asked questions to them for their opinion on each topic or issue. Following the panelists responses, the audience was asked to submit poll results through a QR code using their phones. Additionally, there was a live question option for audience members to enter survey related questions to be addressed by the panelists, or just for consideration of important issues that all could see. The questions weren't answered live during the session, but many conversations afterwards resulted.

Although the poll results are a little skewed because there was not total 100% participation, there was a lot. Generally, the consensus of the room was reflected on the poll results. Also, the moderator handed the microphone to the audience members to take questions and comments. The audience participation was great!

The panelists:
Shane Terhune, PLS, Missouri Licensing Board
Darrell D. Pratte, PLS, Retired, Missouri State Surveyor
Joe Paiva, PhD, PLS, Midwest Geospatial Academy
Jim Peterson, PE, PLS, PhD, Leica Geosystems
Bob Shotts, PLS, Archer Elgin Shotts
Ray Riggs, PLS, Riggs Brothers Surveyors, LLC

Moderator:
Tim Devaney, PLS, McClure Engineering

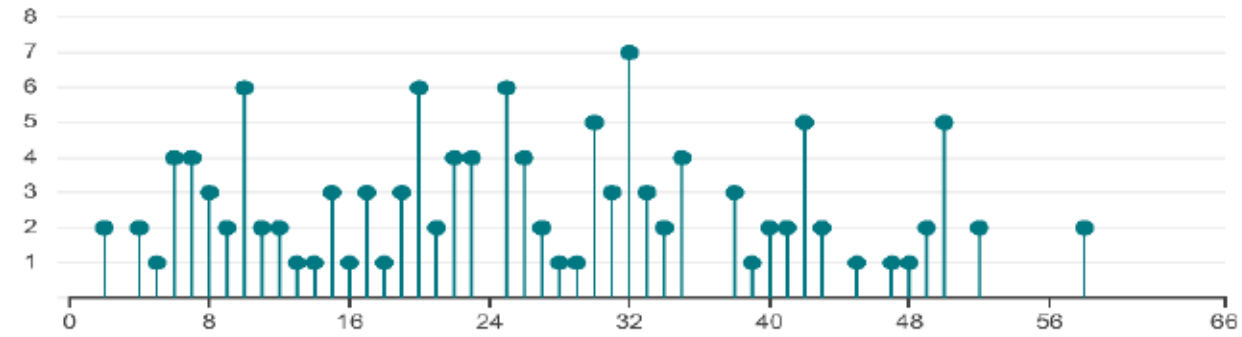


1 HOW MANY YEARS HAVE YOU WORKED IN THE SURVEYING PROFESSION?

124

Mean average: 26.06

Median average: 25



HOW MANY PEOPLE WORK AT YOUR FIRM?

126



DO YOU MOSTLY SURVEY IN URBAN OR RURAL AREAS?

129



(continued on page 19)

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69th Annual Meeting Stump The Chump Results *(continued)*



FIVE YEARS FROM NOW, WILL MISSOURI HAVE ENOUGH LICENSED SURVEYORS TO MEET DEMAND? 123

YES - WE'LL BE FINE! 24

IT WILL BE TIGHT! 64

NO, THERE WILL BE A SERIOUS SHORTAGE! 25

NOT SURE! 10

SHOULD MISSOURI REQUIRE SOME KIND OF COLLEGE DEGREE FOR LICENSURE? 121

YES - BACHELOR'S DEGREE 13

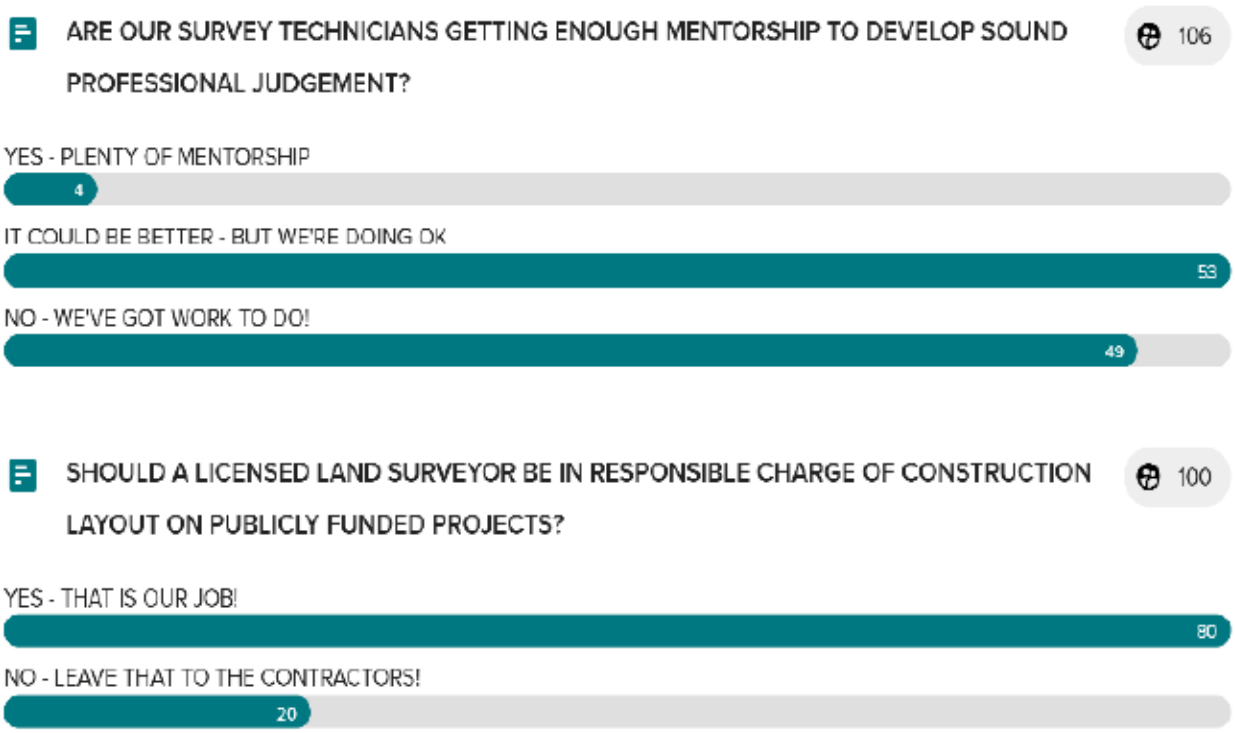
YES - ASSOCIATE'S DEGREE 70

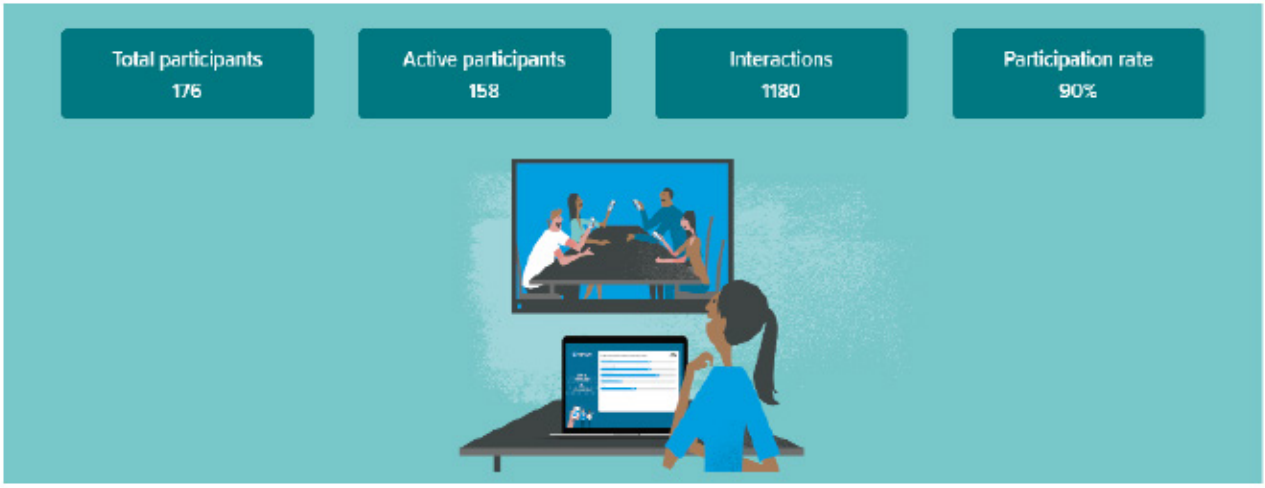
NO - THINGS ARE FINE THE WAY THEY ARE! 36

NO - THERE ARE ALREADY TOO MANY CLASSES! 2

(continued on next page)

69th Annual Meeting Stump The Chump Results *(continued)*





Thanks to all attendees, the panelists and moderator for a fun and informative session.

Highlights from the Missouri Society of Professional Surveyors 69th Annual Meeting and Convention, October 1-3, 2026, at the Oasis Hotel & Convention Center, Springfield, MO.



Darrell Pratte, PLS, covered Missouri Standards and emphasized how when AI is used to ask about the standards, it's hit or miss.



Jim Peterson, PE, PLS, PhD, Leica Geosystems, covered a comparative analysis of data from Leica tilt compensator GNSS units vs. multiple observations, times, dates, and meeting the requirements.



Pat Stack and Sean Cleveland, Seiler Instruments, covered field to office workflows, GNSS data refinement and advanced filtering for point cloud data using Trimble Business Center.



Darrell Pratte and Kevin DeSain represented the Surveyors Historical Society. MSPS and SHS will host a Joint conference together in September, 2027!

(continued on next page)

Highlights from the Missouri Society of Professional Surveyors 69th Annual Meeting and Convention *(continued)*



LSI Katelyn Jones with Mike Zahner, past Missouri Director of NSPS wearing his MARLS polo.



Francis Duncan, PLS, MODOT and Joe Paiva, PhD, PLS, represented Midwest Geospatial Academy.



The Construction Forum with Cardinal Surveying and MSPS Vice President Phil Grout



Surveyor of the Year – Chuck Quinby

(continued on page 24)

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Highlights from the Missouri Society of Professional Surveyors 69th Annual Meeting and Convention *(continued)*



Surveyors Materials & Transit & Level



Cherokee Imaging



Ralph Riggs presents Ray Riggs the Robert E. Myers Service Award



Lifetime Achievement Award – David Krehbiel









Congratulations to all the new licensees!



Incoming MSPS President Ferguson congratulates past president Wiley with a plaque.

The Genesis of Missouri from Wilderness Outpost to Statehood, by William E. Foley

Introduction and Selection for *Missouri Surveyor*

by B. Austin DeSain, PLS

In the years after the turn of the century, the tensions grew between natives and the new settlers. The number of Native-American camps grew and scattered in the countryside between Fort Osage and the Boonslick settlements along the Missouri River. The western edges of St. Charles were exposed and the settlers were uneasy as fear blazed the trail of their decision-making. They rejected William Clark's suggestions to relocate to more secure areas and defiantly chose to stand their ground as reports of pending Indian attacks, even potential British-Indian alliances, spread throughout the settlements from Chicago to New Madrid. During the war of 1812, the territory governors Lewis and Howard spent long times away from the region, which did not help with uneasiness. As the Missourians uneasiness increased, they became defensive against the Indian camps who they'd found friendships in years past.

Once the Governor returned, many committees and boards had organized to plead for increased security and raise the concerns about their native neighbors. The governor evacuated Fort Osage in the spring of 1813. Sibley returned to St. Louis with his belongings. A block house and camp were constructed at Portage Des Sioux, where officials invited the Sacs and Foxes to take up residences and flee their villages along the Illinois side of the Mississippi river as the U.S. campaigns pushed to relocate the natives. 155 canoes arrived at Portage Des Sioux in September of that year, and the U.S. established a trading factory with the resettlement of the Sacs and Foxes in Missouri. Missouri's territorial delegate warned the War Department of the "savage Osages", a major hit to the relationship that Choteau had spent years cultivating. The Osage however, remained loyal to the United States.

In 1813, Moses Austin noted economic hard times and even asked that new supplies not be sent to the region. He noted that locals were covering themselves with Indian garments, unable to find their own new materials and fabrics. Despite an increase in demand for lead with the war in 1812, labor shortages and unusual severe weather conditions caused the region to go through hard times. After the hard years though, the population surged. New settlers from south of the Mason-Dixon line made their way to Missouri, Jackson had more than 300 people by 1818. The population increased rapidly after the war, and the U.S. took direction to relocate more tribes further west. The first U.S. Public Lands became for sale as the region was settled further to the west and south of the Missouri River.

Chapter 14. A Land of Promise

Confronted with these persistent outpourings of discontent, Congress labored to reach a satisfactory solution to the problem. In January 1812, the Board of Land Commissioners had issued its final report containing a resumé of its actions, including a list of every claim that had been filed with the recorder and a summary of the verdict on each claim. The board had examined over 3,000 private claims, and it had confirmed 1,342 of them. Most of the claims approved by the board were small, with only five containing more than 500 acres. In submitting the report to the secretary of the treasury, board member Clement Penrose explained that the board's task had been greatly complicated by the failure of Spanish officials to adhere to any systematic procedures in making land grants. He outlined various types of claims which the board had not been authorized to confirm, but which he believed should be granted. 43

Congress acted speedily on the recommendations. Less than a month after the board officially communicated its decisions to the House of Representatives, the president approved a bill for the further settlement of land claims in the Missouri Territory. The act confirmed most of the classes of claims that Penrose had recommended for approval. It also empowered the recorder of land titles to review once again all private claims still not confirmed and to issue a final opinion on those. In its eagerness to settle the land-claims question fairly, Congress adopted a liberal policy of confirmation. An additional law approved by the president on 12 April 1814 confirmed most French and Spanish concessions made prior to 10 March 1804, except those judged antedated or fraudulent,

but even this did not satisfy completely the Missouri claimants. 44
As a consequence of the growing congressional liberality, many claimants greatly expanded their confirmed holdings. Auguste Chouteau's real estate increased from 9,000 acres and 7 town lots in St. Charles and St. Louis to 23,500 acres and 12 town lots as a result of the 1814 revisions. His brother Pierre's confirmed possessions went from a total of 500 acres to more than 22,700 acres. Philip Marie Leduc expanded his confirmed holdings from a single town lot in New Madrid to nearly 13,000 acres. Similar increases were experienced by other large claimants. 45

Frederick Bates, the recorder of land titles, spent nearly four years reexamining the unsettled private claims before presenting Josiah Meigs, the commissioner of the General Land Office, with a final report on 2 February 1816. Although the recorder had approved for confirmation a great many additional Spanish titles, he had rejected a large number of others. Therefore, following the conclusion of Bates's lengthy investigation, the clamor from the remaining claimants continued largely unabated. 46

Still confronted with a barrage of petitions and memorials demanding further action on the subject, the U.S. House of Representatives requested the secretary of the treasury to submit copies of all reports compiled by the various commissioners appointed to settle and adjust land claims in the Missouri Territory. Secretary William H. Crawford forwarded copies of all such communications to the House on 5 February 1816, but, after only briefly considering the problem, the House referred the entire matter back to Crawford with instructions for him to review all pertinent memorials and petitions and then to prepare yet another plan for the final adjustment of the Spanish claims. 47



The *Zebulon Pike* became in 1817 the first steamboat to travel up the Mississippi to St. Louis. This modern rendering of the event by Norbury Wayman.

At the next session of Congress, the secretary reported to the House, "It is extremely improbable that injustice has been done by the rejection of claims which ought to have been confirmed."48. Crawford noted that Congress had consistently relaxed the requirements for confirmation in the past, and therefore he believed that no further concessions were necessary. However, the secretary did suggest that one final opportunity be given claimants to file previously unrecorded claims for consideration. 49. After receiving Crawford's recommendations, the House decided against further action.
There were few truly disinterested parties when it came to land claims in the Missouri Territory. Speculation in Spanish titles was a big business that affected the vast majority of early territorial residents in one way or another. Even officials designated to adjudicate the disputed titles-John B. C. Lucas and Frederick Bates, for example—dabbled in land speculation. Beyond that, the absence of authoritative records made it virtually impossible to determine the number of bona fide claims that remained unconfirmed. Some legitimate claims may not have been approved, but even if Congress had approved every known title, many of which were clearly fraudulent, it is unlikely that the problem would have been resolved. Such an action would only have encouraged the filing of a large number of additional claims and would have brought further demands for greater leniency from Congress. Thus, when Missouri's territorial period came to a close in 1820, the Spanish land-claims controversy remained a hotly contested issue, and it would continue to stir up dissension for years. All frontier territories encountered serious problems arising from foreign land titles, but the contest in Missouri had been particularly intense. 50

(continued on next page)

The Genesis of Missouri from Wilderness Outpost to Statehood *(continued)*

The attempt to gauge the legitimacy of the Spanish grants was only one aspect of the land-titles question in the Missouri Territory. An 1815 congressional measure further complicated matters for officials charged with disposing of the federal lands by authorizing persons owning lands that had been damaged by the New Madrid earthquakes to relocate at no charge on the same quantity of land on any of the U.S. public lands approved for sale. The law did limit New Madrid claimants to 640 acres of new land, and it also prohibited relocation on mineral lands. 51

Upon receiving word that this measure had been approved, speculators poured into the New Madrid area in the spring of 1815 seeking to purchase titles to damaged lands from unsuspecting residents before they learned about the new law. Even Governor Clark was tempted to take advantage of the situation; he authorized Theodore Hunt and Charles Lucas to purchase titles to damaged lands for him shortly after the new act had been adopted. Speculation in New Madrid claims became so widespread that U.S. Attorney General William Wirt finally ruled in 1820 that New Madrid claims could not be transferred from the original owner except by death, and then only to one's heirs. 52

Although the New Madrid relief measure had been designed to alleviate suffering in the devastated area, most Missourians believed that its principal beneficiaries had been the speculators. Their attempts to claim the choicest lands in central Missouri with New Madrid certificates aroused the wrath of persons already residing in the region. The situation became especially serious when Secretary Crawford determined that the right of preemption, extended to the Missouri Territory by Congress in 1814, did not apply to Howard County because at the time it was still a part of the Indian country. Congress had attempted to deal with the rapidly escalating number of unauthorized entries on the public domains by enacting the nebulous statute extending the right of preemption to all persons residing in the Missouri Territory on 12 April 1814. 53

With thousands of squatters, including virtually all of the settlers in the Boonslick country, waiting to claim the lands they had occupied and improved as soon as the U.S. government offered them for sale, Crawford's ruling excluding Howard County came as a serious blow. By denying residents already established in that region any priority in the purchase of land, the decision in effect opened all lands in central Missouri to claims by the holders of the New Madrid certificates. Samuel Hammond, the U.S. receiver of public monies in St. Louis, reported that as a result of the secretary's action, claims had been filed to cover the best improved farms in Howard County and the already-flourishing villages of Franklin and Boonville. 54

Squatting on the public lands until they were opened to sale was a way of life on the American frontier, and opposition to Crawford's interpretation was immediate and intense. The territorial assembly's memorial to Congress declared that Crawford's instructions were "not only arbitrary and unauthorized by law, but most unjust, cruel and oppressive, towards a people who have fought and bled for the Soil they cultivate." The hostility became so strong in Howard County that John Mason Peck, who was preaching in the area during the height of the crisis, reported that he "could not call at a cabin without being accosted: 'Got a New Madrid claim?' 'Are you one of these land speculators stranger?" 55

In the face of such opposition, Secretary Crawford quickly retreated from his original ruling. He informed the commissioner of the land office on 14 December 1818 that since Congress was considering the possibility of extending the right of preemption to Howard County, all lands so claimed should not be offered for sale, thereby removing them from the potential grasp of the New Madrid claimants. On 21 January 1819, the secretary capitulated and agreed to apply the provisions of the 1814 law to Howard County. Taking no chances, Missouri's territorial delegate to Congress, John Scott, had secured the passage of a law, finally approved on 3 March 1819, which formally extended the preemption provisions of the earlier act to include Howard County specifically. 56

As competition for available lands in the territory grew, pressure increased rapidly on the federal government to open Missouri's public lands for sale. Although in 1811 Congress had authorized the president to take such a step whenever he thought it

necessary, not a single acre of Missouri's public lands had been offered for sale by 1816. 57. Several factors accounted for the administration's tardiness in approving the sale of lands in Missouri, including the intervention of the War of 1812, the unresolved Spanish land-claims issues, the difficulties in extinguishing Indian titles, the failure to complete land surveys, and the lingering reluctance by some members of the administration to encourage settlement west of the Mississippi.

Governor Clark's efforts to remove all intruders from Indian lands and President Madison's directive evicting the illegal settlers from the unsold public lands unleashed another barrage of angry protests from territorial residents. In fact, the removal edicts were unenforceable. Col. Alexander McNair flatly stated that the territorial militia would refuse to march against the intruders. The president quickly retreated from his initial order and approved a law on 25 March 1816 permitting settlers to remain on the public lands until they were offered for sale. 58

As the land hunger pushed speculation in private holdings to new heights, the campaign to bring Missouri's public lands into the market gained momentum. Proponents of the sale of the public lands in Missouri predicted that their proposal would enrich the national treasury, end unlawful intrusions on the public domain, and increase the population to the point that the region could defend itself against any enemy. 59. The long-awaited announcement of the opening of public land sales in Missouri appeared in the Missouri Gazette on 5 June 1818. President James Monroe ordered the sales to begin in St. Louis on the first Monday in August 1818 and in Howard County on the first Monday in September. In accordance with the provisions of federal land statutes, Missouri's public lands were offered for sale at public auction to the highest bidder. Federal law fixed the minimum price at two dollars per acre, and although the smallest quantity that could be purchased was 160 acres, the government granted prospective buyers liberal terms of credit.

The first sales opened on schedule in St. Louis, but they had to be postponed in Howard County because of the tardy arrival of that region's land-office officials. As soon as the sales got underway, local newspapers reported feverish bidding and high prices. In 1819, improved lands in the vicinity of St. Louis averaged between four and twelve dollars an acre. One particularly good section of land near Franklin brought over twenty-six dollars an acre. In response to prodding from Missouri's territorial delegate, John Scott, the U.S. Land Office in Jackson finally offered lands for sale in 1821. The easy credit system that permitted purchasers to obtain sizable tracts of public lands with only minimal down payments added to the speculative mania. President Monroe proposed curbing land speculation by raising the minimum price, but local residents strongly objected to any such move. 60

While the lure of cheap lands attracted growing numbers of settlers to the territory, the scarcity of labor remained a serious local problem. During the war years the shortage had been especially acute, but even after the conflict had ended, competition for the limited labor supply remained keen. "Smart young men are the scarcest articles to be found in this place," Christian Wilt had informed his uncle in 1814. Employers complained about having to tolerate incompetent and unreliable hired hands; skilled workers were particularly difficult to find. By 1817, bricklayers, masons, and carpenters received three dollars per day for their services, while unskilled workers generally were paid at least half that amount. 61

One important segment of the territorial population did not benefit from the high prevailing wage levels. Missouri slaves remained unpaid for their labors. Black slave emigrants accompanying their migrating southern owners added their numbers to the territory's long-established slave population. Blacks consistently made up roughly 15 percent of territorial Missouri's total population, but in some counties the proportion of blacks was considerably higher. At the time of statehood, for example, one-fourth or more of the people in Ste. Genevieve and Howard counties were of African ancestry. Missouri's slave population increased from 3,000 in 1810 to nearly 10,000 in 1820. During that same period, however, the territory's free black population declined dramatically. In 1810 there were approximately 600 free blacks among the territory's more than 20,000 inhabitants, but by 1820, even though the territorial population had jumped to 66,000, the number of free blacks had dropped to about 375. The decrease was temporary, however, and following statehood, the free black population in Missouri started to grow, as it did in most other border states. 62

(continued on next page)

The Genesis of Missouri from Wilderness Outpost to Statehood (continued)

Credit for this selection of pages from *The Genesis of Missouri From Wilderness Outpost to Statehood* is thanks to The University of Missouri Press, Columbia, Missouri

Author's Notes Cited from this selection:

Chapter 14. A Land of Promise

43. Lemont K. Richardson, "Private Land Claims in Missouri," part 2, 285-86; American State Papers, Public Lands, 2:388-603; and Clement Penrose to Albert Gallatin, 24 March 1812, in American State Papers, Public Lands, 378.
44. 2 U.S. Statutes at Large (1850), 748-52, and 3 U.S. Statutes at Large (1850), 121-23.
45. Richardson, "Private Land Claims in Missouri," part 3, 393-94.
46. American State Papers, Public Lands, 3:274-330.
47. William H. Crawford to Speaker of the House Henry Clay, 5 February 1818, in ibid., 274, and Annals of Congress, 15 Cong., 1 sess., 1744 (16 April 1818).
48. William H. Crawford to Speaker of the House Henry Clay, 7 December 1818, in American State Papers, Public Lands, 3:348.
49. Ibid.
50. On the persistence of land-claims problems, see Nancy Jo Tice, "The Territorial Delegate, 1784-1820" (Ph.D. diss., University of Wisconsin, 1967), 259. A discussion of the land-claims problem in the Territory of Orleans, which was quite similar to that in the Missouri Territory, can be found in Harry L. Coles, Jr., "Applicability of the Public Land System in Louisiana."
51.3 U.S. Statutes at Large (1850), 211–12.
52. Agreement between William Clark, Theodore Hunt, and Charles Lucas, 18 June 1815, and William Clark to Charles Lucas, 10 October 1815, Lucas Collection, Missouri Historical Society; William Wirt to William H. Crawford, 11 May 1820, in American State Papers, Public Lands, 3:437.
53. William H. Crawford to Josiah Meigs, 27 November 1818, in Territorial Papers, 15:433–64; Franklin Missouri Intelligencer, 30 April 1819.
54. Samuel Hammond to Josiah Meigs, 27 December 1818, in Territorial Papers, 15:486-87; Schroeder, "Spread of Settlement in Howard County, Missouri," 10-15.
55. Missouri Gazette, 1 January 1819; St. Louis Enquirer, 6 January 1819; William Clark to Thomas A. Smith, 20 January 1819, Thomas A. Smith Collection, State Historical Society of Missouri; Memorial to Congress by the Territorial Assembly, referred 22 January 1819, in Territorial Papers, 15:503; and Peck, Forty Years of Pioneer Life, 147.
56. William H. Crawford to Josiah Meigs, 14 December 1818 and 21 January 1819, in Territorial Papers, 15:473, 499-500; 3 U.S. Statutes at Large (1850), 517.
57.2 U.S. Statutes at Large (1850), 665.
58. Proclamation of Governor William Clark, 4 December 1815, in Territorial Papers, 15:191–92; Proclamation of President James Madison, 12 December 1815, in Missouri Gazette, 27 January 1816; Moses Austin to James Bryan, 22 January 1816, in Eugene C. Barker, ed., The Austin Papers, 2:254; Resolutions of the Territorial Assembly, 22 January 1816, and Alexander McNair to Josiah Meigs, 27 January 1816, in Territorial Papers, 15:105-9, 112; and 3 U.S. Statutes at Large (1850), 260-61.
59. Alexander McNair to Josiah Meigs, 16 June 1817, in Territorial Papers, 15:283.
60. Thomas A. Smith to Josiah Meigs, 30 July 1818; Letterbook No. 7, Thomas A. Smith Collection; Missouri Gazette, 28 August and 6 November 1818, 9 June 1819; St. Louis Enquirer, 31 March 1819; Flint, Recollections, 198; and Memorial from Citizens of Howard County in Missouri Gazette, 20 February 1820.
61. Christian Wilt to Joseph Hertzog, Christian Wilt Letterbook, 19 March 1814; Halvor Gordon Melom, "The Economic Development of St. Louis, 1803–1846" (Ph.D. diss., University of Missouri, 1947), 294.
62. Harrison A. Trexler, Slavery in Missouri: 1804-1865, 9-10; Arvarh E. Strickland, "Aspects of Slavery in Missouri, 1821," 509-11. Lawrence O. Christensen points out that even though Missouri had outlawed free blacks from entering the state as early as 1821, many of them continued to come to St. Louis from outside the state. See his "Cyprion Clamorgan, The Colored Aristocracy of St. Louis," 4.

APEPLSPLA Board Open House in Kansas City

by Chris Ferguson

At 8:00 AM sharp on July 28, 2026, a quarterly "Open House" of the Missouri Board of Architects, Professional Engineers, Professional Land Surveyors, and Professional Landscape Architects began as scheduled at the Convention Center of the Courtyard by Mariott - Blue Springs. These "traveling shows" - if you will - allow professionals from far-flung parts of the state to view activities of the Board that normally occur only in Jefferson City.

Following opening remarks by Interim Board Chairman Bob Shotts, PLS, PLA, some introductions were made announcing present and future members of the Board. Executive Director Rhonda Bullock followed giving an update on the Governor's approval of Board Members and the appointment of Architect Robert "Chad" Greer as the incoming Board Chair going forward.



Opening remarks by Bob Shotts, PLS, PLA, Division Chair

Although the Professional Land Surveyor Division of the Board is currently suffering from attrition, there were nonetheless three PLS members present, including Bob Shotts (past Landscape Architect Chair), Shane Terhune (PLS Division Chair), and Kevin Skibiski (PE Division Chair); so, the Board remains in capable hands until the PLS Division vacancies are filled.

Part of the concept of the Open House is that the Board members will address questions posed in advance by the audience. Among answers given were the Board's opinion on Artificial Intelligence (AI). Kevin Skibiski remarked that the new technology is "just a tool" suggesting the registered professional remains responsible for any results AI may render. That was the consensus of the other members.

Other questions covered were whether the Board has intentions to outreach for STEM candidates (they don't – that will pass to professional associations such as MSPE and MSPS). Several more were rather engineering and landscape architect specific and not reprinted here.

Another issue brought up was individual complaints about certain professions represented by the Board. They strongly reiterated that they treat everyone the same regardless of status and investigate all complaints objectively and as completely as possible. In attendance were two lawyers from the State Attorney General's Office which are assigned to Board investigations who concurred with that remark.

Two items of interest to us Land Surveyors were the subject of audits and "in-person" Professional Development Units (PDU's). We were assured that audits are totally random with no bias toward any individual licensee. Regarding PDU's it was noted that the live attendance requirements (especially for Missouri Standards of Practice) were suspended during COVID and will most likely resume soon with some guideline regarding how many credits are to be received in person versus online/ webinar/correspondence course, etc. forthcoming.

With the pending addition of Interior Designers to the Board, a name change is imminent. That version has yet to be decided, but most present wanted a shorter name rather than adding more initials to the already rather clunky "Apple slaw" acronym with oddly interspersed "P's" throughout.

(continued on next page)

APEPLSPLA Board Open House in Kansas City *(continued)*

The author has attended one of these meetings before, around 20 years ago in St. Louis. Both times, there were few surveyors in attendance with this one only hosting two or three PLS's not on the Board. Understandably, it's a fairly long trip to the larger cities hosting this event (STL, KC, Springfield), but in my opinion it's worthwhile whenever you can make it. As a bonus, a PDH certificate is given to attendees at the end of the Open House portion, making a visit to the city and along with answering questions in the quarterly issues of "Dimensions" worth 3 or more PDH's per year – not so bad considering the normal cost per hour of continuing education.

With special thanks to the Board's Lead Administrative Support Assistant Alexia Prieur, the history of our Board along with the Year-End Report follow this article.



Executive Director Rhonda Bullock, Chad Greer, AIA, and Kevin Skibiski, PE, PLS await their turn to speak



Kevin Skibiski, Shane Terhune, PLS and Jane Earnhart PLA look on

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Not Your Usual Protraction Problem

Dr. Richard Elgin, PS, PE and Sylvester Furse, PS
Archer-Elgin Engineering & Surveying
Rolla, MO

UNUSUAL PROTRACTION

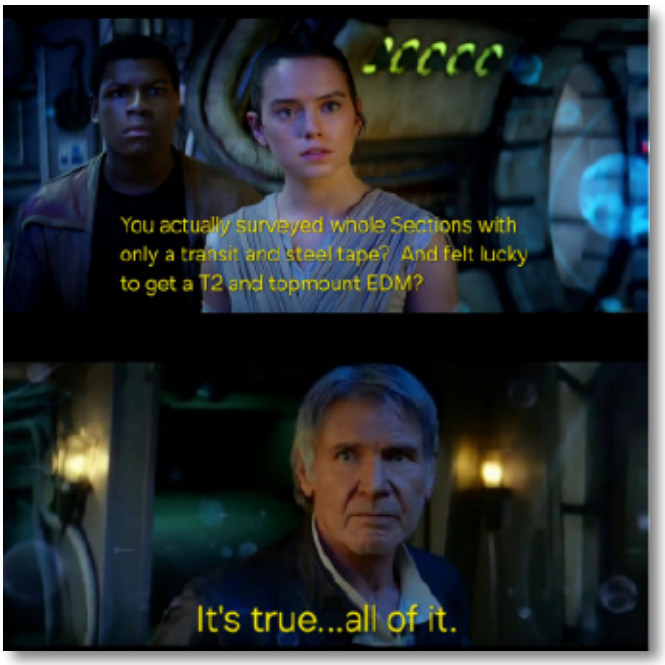
The protraction scheme used by the GLO for Missouri (and Arkansas) plats is very regular. Even for the fractional sections, it is generally consistent. Occasionally there is an unusual township, made so by rivers, grant boundaries or Standard Lines. Missouri has several rows of townships that stretch across the state that lie south of these Standard Lines; the closing row of fractional sections (1 through 6) for these townships can have sections that are up to about 2.5 miles long (north-south). This condition is caused by measurement errors in the 5th Principal Meridian south of the Missouri River. These extra-long sections require a different protraction scheme. Unfortunately for them, there is no standard method that was universally used for these special-case sections. This article and accompanying problem illustrate the application of one such unusual protraction method. (That likely will likely create some wonderment in those who work out the problem.)

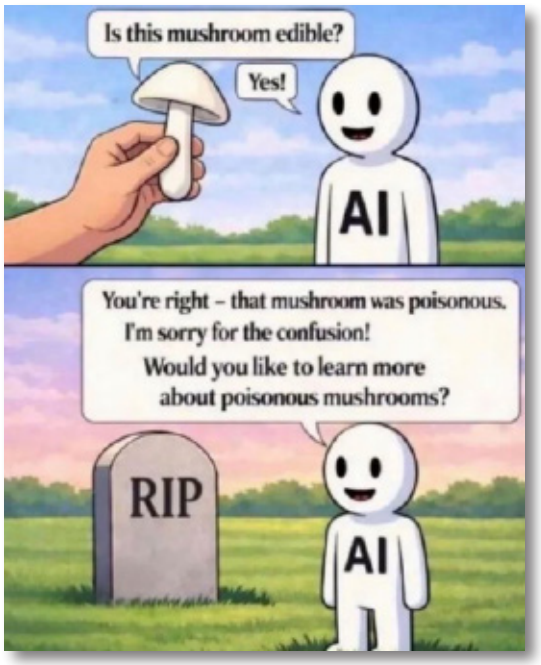
THE PROBLEM STATEMENT

Figure 1 is a copy of the GLO plat for Section 6 (T24N, R5W, Oregon County.) It shows the GLO's protraction of the section with some of the protracted dimensions reproduced in red (for clarity). On Figure 2, the darkened symbols represent found, accepted, existent corners. Also shown are the measured coordinate value for these corners, north over east in feet. No other survey evidence was found in the Northwest Quarter of Section 6. Based on this information, compute the coordinates to set the Northwest and Northeast corners of Lot 2, Northwest Quarter and then compute the bearing and distance between these corners.

YOUR SOLUTION

If you wish, email your answer/comments/solution to "*Missouri Surveyor*" Editor, Chris Ferguson, PLS at: surveyor1322@hotmail.com. An examination of how to approach this protraction problem will be published in a future edition, along with comments.





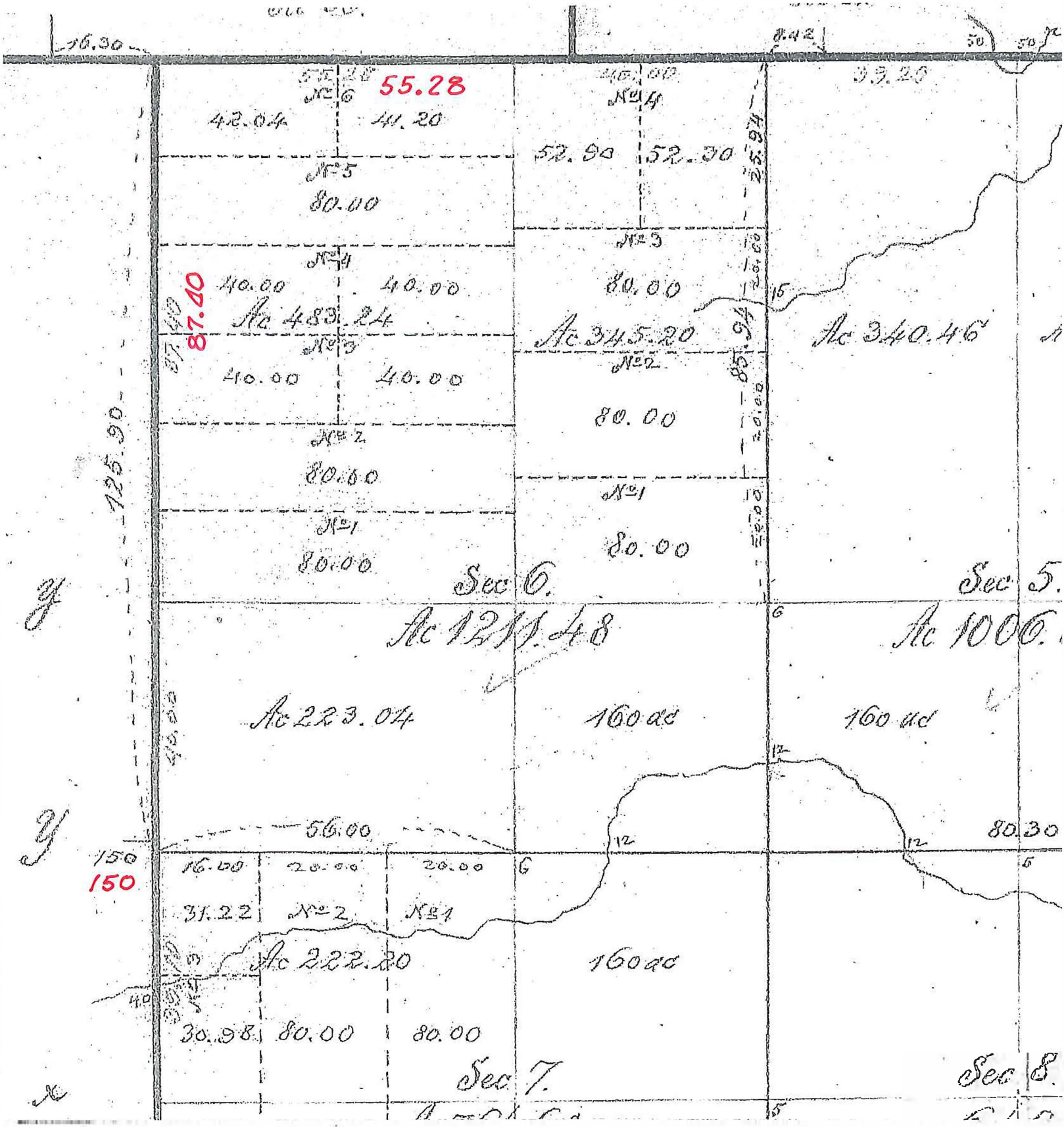

55.28
87.40
Sec 6.
Sec 5.
Sec 7.
Sec 8.
160 ac
160 ac
160 ac
Ac 483.24
Ac 345.20
Ac 340.46
Ac 223.04
Ac 222.20
42.04
41.20
52.90
52.30
80.00
40.00
80.00
80.00
80.00
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80.30
125.90
150
150

Figure 1

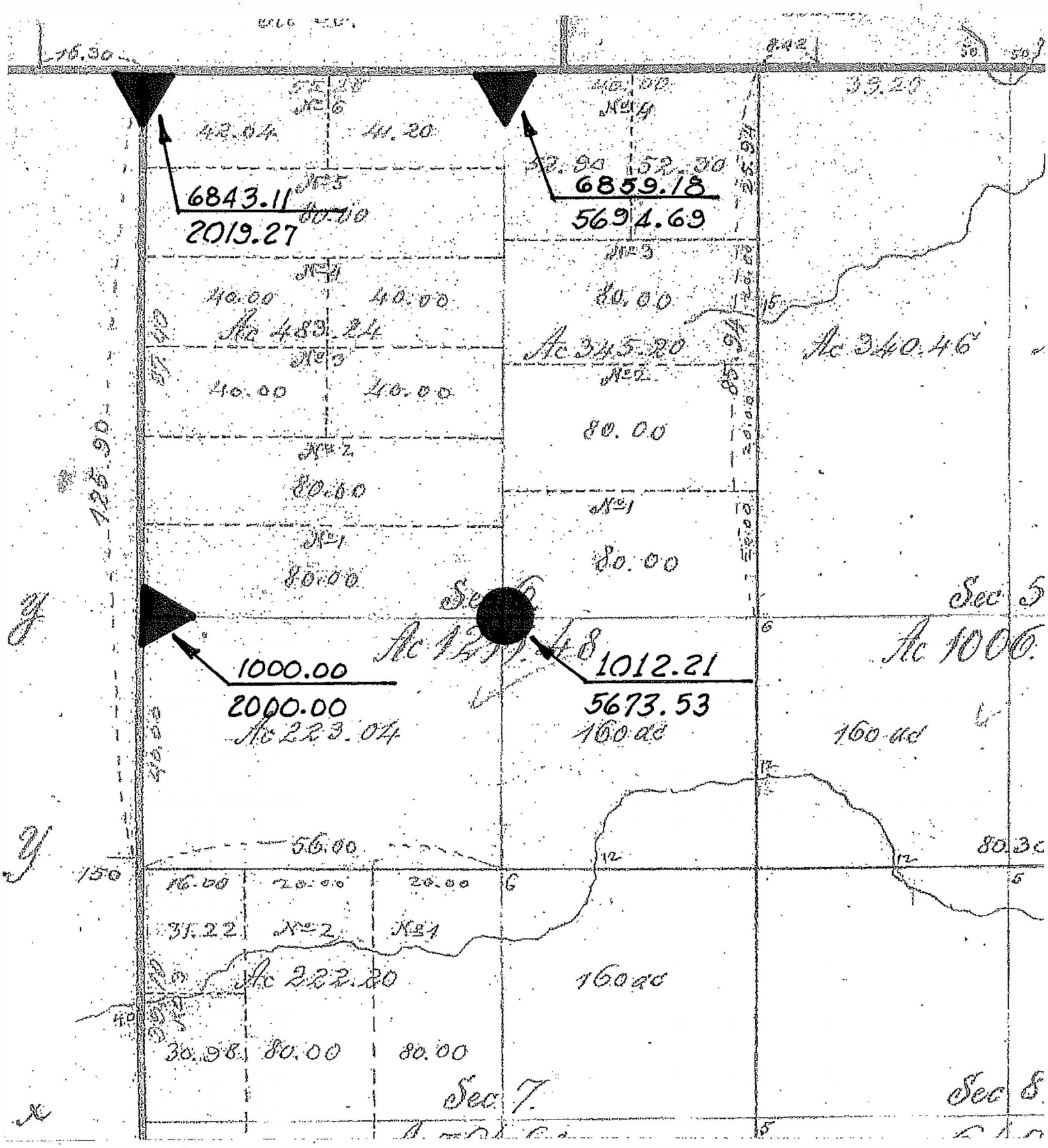

6843.11
2019.27
6859.18
5694.69
1000.00
2000.00
1012.21
5673.53
Sec 6
Sec 5
Sec 7
Sec 8
Ac 483.24
Ac 345.20
Ac 340.46
Ac 223.04
Ac 222.80
Ac 1000
160 ac
160 ac
160 ac

Figure 2

Zion USGS Disc





U.S.G.S. Disc located at Observation Point in Zion National Park, Utah. The site the disc was set overlooks the canyon in the park where the Lodge and Visitor Center are located. The overlook is 2100 feet +/- above the canyon floor and 700'+/- above one of Zion's most popular hikes "Angels Landing Trail" this is considered one of the most "dangerous hikes" in the National Park system. It was a 4 mile hike to reach Observation point (8 mile round trip), taking 3-4 hours to complete, so be prepared if you plan on making the hike.

Images taken and provided by Stephen Jantosik, PLS, Metropolitan St. Louis Sewer District

Cadillac Mountain Acadia National Park – A Bolt, A Summit Marker and A Triangulation Station

by Austin DeSain, PLS

Back in September, we took a trip to Cadillac Mountain in Acadia National Park, Maine. Like most vacations, I wandered off looking for survey markers, unsure what I'd really find. Cadillac Mountain is the highest point on the Eastern Seabord, and the first place to see the sunrise in the United States. It takes an additional pass and reservation, on top of the National Park entrance fee. We didn't see the sunrise, but made it to the summit on our own time after a long day of trekking around Acadia. The mountain is made of old granite, and near an open scenic view area, I found a large 1-inch diameter iron ringbolt driven into the rock and looked up the NGS Datasheet. The bolt is PID PE1787, originally set in 1968 and described as part of the U.S. Coast and Geodetic Survey. This is a scenic open area, and you can see the islands in Frenchman Bay and coastline of Mount Desert Island all around as you look north and east towards the Gulf of Maine and the North Atlantic.







(continued on next page)

Cadillac Mountain Acadia National Park – A Bolt, A Summit Marker and A Triangulation Statio *(continued)*

About 900 feet south of the bolt is a trail up to the summit marker, surrounded by trees in a less scenic spot. I found the marker with my daughter, a few feet away was a U.S.C.G.S. Triangulation Disc. The data sheet has interesting descriptions from visits by surveyors through the ages, like in 1902 "It is a very commanding position and the view is unobstructed in all directions." The U.S. Coast & Geodetic Survey set this marker as a drill hole in 1856, and a rock cairn by it with a series of reference holes tied to it on sketches. In 1931, from the datasheet: "A fine automobile road on the mountain was opened in 1931, and this road passes some 500 feet to the N of the station, making it easy of access." In 1934, the U.S.C.G.S. set a standard bronze tablet, with PID PE1778. The official Summit Marker stamped K24 1934 is 13 feet away, Elevation 1,529.96 feet. After we returned to the parking area, we saw the sign.

I hope you all enjoy tracking down survey markers wherever you go! Send images and descriptions of your findings to editor@missourisurveyor.org.

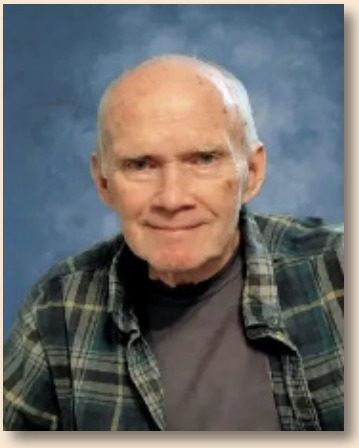




2026 Lost Monuments Remembered



R. Tim Daugherty
1957 to 2026
PLS 2096. Rest in Peace



Bruce E. Thomas
1948 to 2026
PLS 2220. Rest in Peace



Steven R. Proctor
1961 to 2026
PLS 20000148666. Rest in Peace



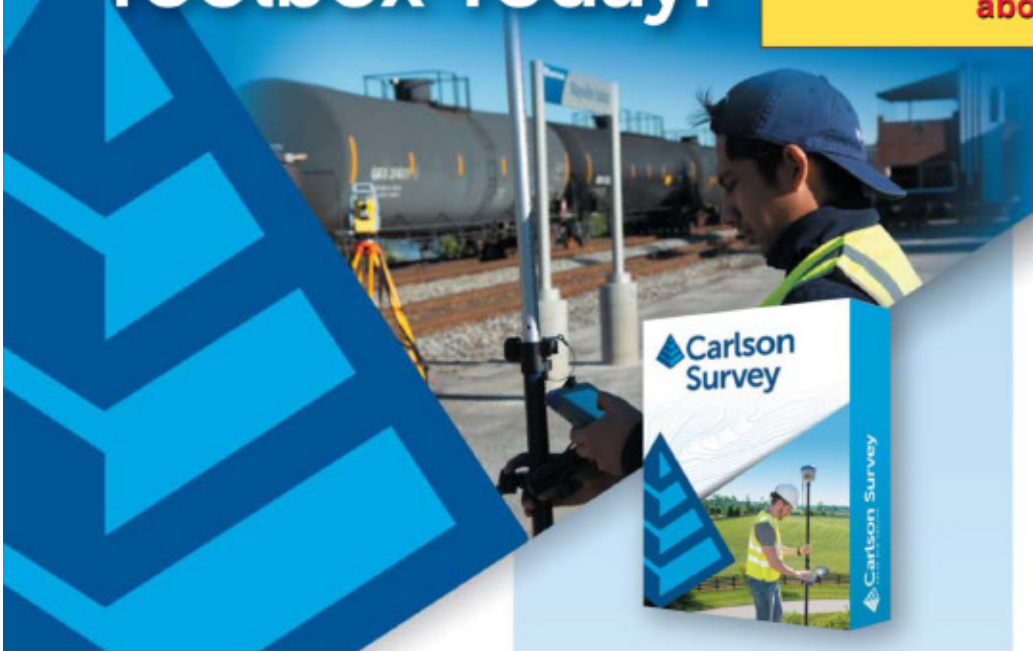
Morris "Dane" Colbert
1964 to 2026
PLS 2457. Rest in Peace

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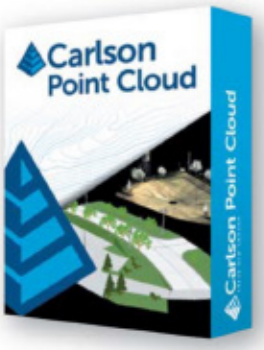
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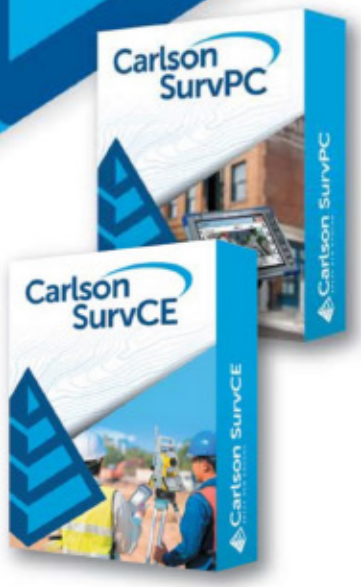
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Katie Jones, LSI stops briefly near a recovered GLO Bearing Tree taken in 1821 as an accessory to the common corner to Sections 3, 4, 9 & 10 in Township 33 North, Range 4 West, Dent County, Missouri within the Mark Twain National Forest (Salem District). This 30" diameter White Oak was originally measured in 1821 and last documented by County Surveyor W. Davis in 1963 after being identified as original by USFS Yellow Sheets in the early 1930's.

(Katie Jones photo)

Articles and Photos Welcome

MSPS offers you an opportunity to showcase your and/or your company's work in the Missouri Surveyor reaching nearly 1000 readers!

You are invited to share photos and/or stories much like what is in this issue with the rest of our professional community. All that's asked is to take high-quality pictures (thumbnail photos do not scale up very well) and submit the articles in Microsoft Word. Send those with a brief description to either of the magazine's editors listed on the front page and look for your chance to be in the next edition!



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