



MISSOURI SURVEYOR



A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri

June 2017



CALENDAR OF EVENTS

2017

July 15, 2017

Board Meeting
Jefferson City, MO

August 23-25, 2017

Review Course
Jefferson City, MO

October 19-21, 2017

60th Annual Meeting and Convention
Ramada Plaza Hotel & Oasis
Convention Center,
Springfield, MO

December 2, 2017

Board Meeting
Jefferson City, MO

2018

May 3-5, 2018

Board Meeting, Golf Tournament and
40th Annual Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

October 3-6, 2018

61st Annual Meeting and Convention
Tan-Tar-A Resort
Osage Beach, MO

Donald R. Martin, Editor



Notes from the Editor's Desk

Donald R. Martin



Greetings all and welcome to the June 2017 *Missouri Surveyor*. In this edition we bring readers stories from beyond the near horizon of surveying media with surveying and surveyor related tales from the broader vistas of general press and literature. It has Ol' pard Tripod, the three legged ground hog lifting up his instrument man's backwards ball cap and scratching his head wondering where the articles come from. Though a bit bewildered, he shares my appreciation and gratitude to the authors and editors generously sharing their work in our *Newsletter*. Now, onto the pages, press clips, pictures, pamphlets, pronouncements, President's message, proprietors' ads, poking of fun, picking of scholarships... please, persuade me to put a plug in this, pronto!

Our first feature is a three part collection of stories out of Texas regarding the Feds' attempt to ignore customary surveying practices and threaten private land tenure in *BLM Admits 'Incorrect Methodology' Used in Surveys* by John Ingle, *Texans Applaud Suspension of US Land Surveys* by David Lee and another by Mr. Ingle, *Texas Surveying Board Expresses Concerns Over BLM Case*. These tales highlight our required vigilance in practicing and protecting the methods we know better than any other profession or executive government action! Next, a book review which includes interesting details of the work of one of 19th century New England's finest surveyors, Henry David Thoreau. Enjoy *The Slide Rule and the Crowbar: Henry David Thoreau in the Anthropocene* by Daegan Miller. Do not ignore our next offering, a celebration of accomplishment by some of our own members as we recognize the 2017 *NSPS Public Relations Award* recipient....us! *MSPS* and our Osage Treaty Line events from 2016 are recognized and honored. Next up is the important news detailed in *Surveyors' Coordinate Systems for 2022 and Beyond* by Tim Burch...and don't miss the associated flyer on page 21 inviting surveyor feedback to the *NSPS/AAGS/NGS Advisory Committee on National Spatial Reference System Legislation*. Nested between Tim Burch's article and the flyer is a proud announcement – the *MSPS Non-Traditional Scholarship* recipient **Casey Janelle Young** is introduced!

A regional interest story is next in *One Sloppy Land Surveyor Almost Caused a War Between Missouri and Iowa* by Sarah Laskow writing her take on the Honey War. Then, Norwich University (Vermont) student Thomas Izzarelli tells of a television featured character's connection to real life 1800's railroad icon and surveyor, Greenville Mellen Dodge in *'Hell on Wheels'*. The story of surveyor Dodge is followed by another proud announcement, this one from the State Land Survey Program. Their 2017 recipient of the *Lashley Scholarship* is **Kelly Weigle**. Durango's Mike Smedley is next with his lighthearted *Colorado's Survey Errors are Borderline Crazy*. Our closing feature is *Three Life Changing Questions: One Foundational Leadership Principle* by LtCol. Danny White, USMC (retired). This *lieuTENant* (colonel) **Dan** will be joining us at our 2017 Annual Meeting! Amidst the mentioned features, don't miss our photo tribute and thank you to our *vendors and sponsors of the Spring Workshop*, an invitation for *Games, Golf, Guns & Giveaways at the MSPS 60th Annual Meeting* in October at Springfield and our *NSPS Governor Troy Hayes* meeting with Senator Blunt in Washington.

I hope you enjoy this edition and remember *Missouri Surveyor* is your voice; I welcome that which you may have to say, write and show. 🇲🇴

Donald

THE MISSOURI SURVEYOR

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President's Message

Joe Clayton, PLS



Hello to all of my survey friends here in Missouri. Last newsletter I told you we had submitted an entry to the *NSPS Public Relations Award for 2017*, citing our Osage Treaty Line efforts from last year. **We WON!!!** Announced March 17 at the National Surveying & Geospatial Conference in Silver Springs, Maryland, ours was selected from multiple entries - it's not like we won a one horse race! In the December newsletter I thanked the many folks who gave of themselves both in time and funds to see our events through to success, this award affirms our accomplishments! Remember our Board is receptive to ideas for events and activities for MSPS. Maybe in 2021 when we celebrate the Bicentennial of Missouri Statehood or in 2023 the 200th anniversary of our western state boundary!

If you missed this year's Spring Workshop you missed a good one. We had 200 attendees and 17 vendors. The Lodge provided us with great food and a good dry place to be during a 100 year flood. Scheduling a workshop when it's raining too hard to work, but still have a nice sunny afternoon to play golf the day before has to be a rarity!

Our website now has the 2017 Membership Directory located under the *Resources* tab. It's a great addition. Now if you find a capped pin with a LS number you can look up the number online in real time while still standing in the field!

Steve Schmidt with the *Santa Fe Trail Association* recently reached out with questions about our Osage Treaty line information. It was easy to guide him to our website! Steve was one of our speakers at our annual meeting in 2015 and came to the Fort Osage event last August. Their group has been supportive in our efforts involving Joseph C. Brown, their surveyor of record. Their bi-annual symposium is going to be held in Olathe, Kansas September 27-30 with actives throughout the greater Kansas City area; for more information go to <http://www.santafetrail.org/>.

The 1st Regular Session of the 99th General Assembly is behind us. Representatives and Senators have returned home and the bureaucrats go about the business of operating the state agencies. I always worry at this time of year for our state employee members. "Do more with less" should be our state motto rather than "Show me" for I've heard that every year since I started with the state of Missouri back in the 80s. Even now that I'm retired from government service I still hear "do more with less" on the nightly news. Now our state employees have the lowest average salaries of any state in the union. All 3 of the state agencies engaged in surveying have seen their staffs drastically reduced, making it harder to grow staff internally or maintain organizational memory. MoDOT has steadily declined their number of surveyors from just over 125 in the early 90s down to around 40 today. Conservation went from 13 employees in 2006 to a staff of 4. And we all know the State Land Survey Program story having dropped from around 28 folks in the year 2000 to 13 currently. Yes new technology has played the same downsizing role in government as it has in private practice. But our government friends have additional burdens of responsibility being accountable to us, bureaucrats, auditors and sunshine requests while trying to maintain oversight on projects contracted with us in private practice. So even when funded, without the personnel to execute the administrative tasks needed to meet bureaucratic requirements projects will not be started. So remember, we are not in this all together alone! If you are speaking with your Representatives maybe \$6 more dollars per hundred gallons of gas isn't a bad idea; or 25 more cents a month on a cell phone bill to fund staffing and contracting needs at Rolla isn't a bad idea. Let's do something before "doing more with less" leaves us having *having less with less*. Stay positive state employees...you are appreciated for your service and I thank you! 🇺🇸

Joe!

BLM Admits ‘Incorrect Methodology’ Used in Surveys

by John Ingle, Times Record News, April 5, 2017 – Reprinted with permission from Wichita Falls Times Record News.

The acting chief cadastral surveyor from the Bureau of Land Management’s New Mexico, Texas and Oklahoma region, in a letter filed in a federal district court in Wichita Falls, admitted the agency used “incorrect methodology” while determining the gradient boundary on Texas properties along the Red River.

Steve Beyerlein wrote in the March 29 letter to the state director in New Mexico that information obtained during a deposition on March 2 revealed that BLM surveyors might not have used the doctrines of erosion, accretion and avulsion appropriately while surveying properties in a 116-mile stretch from Doan’s Crossing in Wilbarger County to the community of Stanfield in Clay County. The BLM will suspend surveys of three properties.

“Having reviewed this deposition testimony and other new information, the BLM believes the survey methodology used was in error, and may have caused errors in identifying the location of the Gradient Boundary,” Beyerlein wrote.

The gradient boundary, as defined by the U.S. Supreme Court in Oklahoma v. Texas in the 1920s, is the midpoint between the edge of the normal flow of water in the Red River and the south cut bank. A BLM survey in the late 2000s on some properties in question resulted in the federal agency placing monuments, or boundary markers, more than a mile from the river in some instances.

The BLM began a scoping process in 2013 as part of the process to update their Resource Management Plan, which was last updated in the mid-1990s. That was the first time landowners were told that what they thought was their property, according to the federal government, was actually public lands.

“Due to this use of incorrect methodology,” Beyerlein wrote, “the BLM is suspending these three surveys, effective on this date, in order to allow for further investigation.”

The surveyor further explained that when the agency suspends a survey, all administrative matters, too, are put on hold until there is a resolution.

“Following investigation, the survey may be cancelled, corrected, or reinstated, either in whole or in part, but no administrative action based on the plats filed for these three surveys may be initiated or completed by BLM while these surveys are suspended,” he said.

Landowners and others filed or joined in a lawsuit against the BLM in November 2015 in fight for what they believe has long been their property, and on which they’ve paid taxes.

Plaintiffs’ attorney Rob Henneke, general counsel and director of the Center for the American Future at the Texas Public Policy Foundation, said the letter is a concession by the federal government that they were wrong regarding the surveys that they had filed and the methodology they used. He said it also shows that the plaintiffs’ position that the the BLM was not in conformance with the Supreme Court ruling had merit.



A survey crew from the Bureau of Land Management begins their work in November 2016 on Kevin Hunter’s land in far northeastern Wichita County at the Red River.

(Photo: Torin Halsey/Times Record News)

“That’s been a position that, up until now, the government has never agreed with and had never taken,” he said. “So, it’s significant that it’s a change in the way they see the case.”

Henneke said while it is a judicial admission of using incorrect methodology, the BLM doesn’t say in the letter that the plaintiffs’ position is correct.

U.S. Rep. Mac Thornberry (R-Clarendon), who has filed legislation that would force a complete survey of the 116-miles in question, called the announcement by the BLM “welcome news.”

“The portions of the river that the agency has surveyed strayed widely from the accepted gradient

boundary survey method established by the Supreme Court in *Oklahoma v. Texas*, he said in a statement. “It is encouraging that the BLM has admitted their error and that all administrative action will be suspended until the matter is resolved. I will continue working with the landowners, local and state officials, and Senator (John) Cornyn (R-Texas) until this issue is resolved once and for all.”

The plaintiffs last week filed a motion for summary judgment by U.S. District Court for the Northern District of Texas Judge Reed O’Connor asking him to make a ruling before the case’s July trial date. Henneke said the notice filed by the BLM doesn’t do anything the change the timeline or end the case. 🇺🇸



On the Cover:

MSPS members from Cardinal Surveying & Mapping in St. Charles are busy *on the air* and *in the field*! PLS Shelly Clark (front cover) joins a local REALTOR on his radio show and shares real life “Survey Nightmares” to help consumers recognize the importance of *Boundary Surveys* and PLS Will Clark (back cover) marks the corners of clients’ “Dream Homes” on their ever important *Property Boundaries*.

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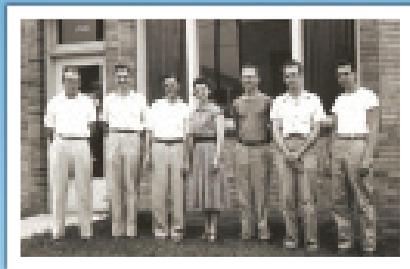
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Texans Applaud Suspension of US Land Surveys

by David Lee, Courthouse News Service, April 7, 2017 – www.courthousenews.com

TWICHITA FALLS, Texas (CN) – Texas landowners cheered Friday for the U.S. Bureau of Land Management’s halting of controversial Obama-era land surveys along the Red River boundary with Oklahoma that they deemed a 90,000-acre land grab.

Several landowners, three counties and one sheriff sued the BLM in 2015 in federal court, claiming it is “well-established” that Texas begins at the southern bank of the Red River and federal ownership is limited to the bottom half of the sandy riverbed outside of the state. The lawsuit says the BLM claims the boundary extends past that, sometimes by over a mile.

BLM spokesperson Paul McGuire told Media Matters in 2014 that the agency’s land surveys are part of a “broad-based planning effort” for Kansas, Oklahoma and Texas, saying periodic surveys are needed in response to technological and landscape changes.

As an example, McGuire said “the consequences of hydraulic fracking” are “precisely the type of thing we’d be looking at in more detail.”

“It is a routine thing that BLM does. The plans that we rely on generally have to be updated every 15 to 20 years. So the ones that we currently have on the books for this year date back to the 1990s. It’s much broader than the Red River but we have a strip of land in the region,” McGuire told the publication.

BLM has denied that it plans to engage in a future “land grab” around the Red River, but landowners still alleged that the surveys meant the federal government claimed it owns up to 90,000 acres of Texas land along 117 miles of the river.

On Tuesday, the BLM filed a notice with the court to suspend three of the land surveys. The filing cites a March 29 letter that Steve Beyerlein, acting BLM chief cadastral surveyor, wrote to New Mexico authorities that admits to “incorrect methodology” being used in the surveys.

“BLM has recently obtained new information (including in a deposition on March 2, 2017 taken in that lawsuit) that brings into question whether the doctrines of erosion, accretion and avulsion were appropriately

considered,” Beyerlein’s letter states. “Having reviewed this deposition testimony and other new information, the BLM believes the survey methodology used was in error, and may have caused errors in identifying the location of the gradient boundary.” (Parentheses in original.)

Beyerlein said the land surveys may be cancelled, corrected or reinstated after an investigation is conducted.

Texas Attorney General Ken Paxton applauded the Trump administration Friday for protecting Texans’ property rights and preventing the federal government from infringing on the state’s sovereign borders. Paxton intervened on the landowners’ behalf days after their lawsuit was filed, calling the action an illegal “land grab” by federal officials.

“It was our contention all along that the BLM’s surveys were conducted improperly and unlawfully,” Paxton said in a statement. “We will vigilantly defend Texas’ border from federal overreach.”

The landowners’ attorney, Rob Henneke with the Texas Public Policy Foundation, said the letter shows his clients’ argument that the BLM was not in compliance with a U.S. Supreme Court ruling has merit.

“That’s been a position that, up until now, the government has never agreed with and has never taken,” he told the Wichita Falls Times Record News on Wednesday. “So, it’s significant that it’s a change in the way they see the case.”

U.S. District Judge Reed O’Connor dismissed the landowners’ Fifth Amendment claims against the BLM last June, but allowed their request for declaratory judgment, mandamus and an injunction “regarding the method for locating the boundary between their property and federal territory” to move forward, finding they have constitutional standing. 🇺🇸

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Texas Surveying Board Expresses Concerns over BLM Case

by John Ingle, Times Record News, April 11, 2017 – Reprinted with permission from Wichita Falls Times Record News.

A Texas agency charged with overseeing land surveyors and the use of surveying techniques to determine gradient boundaries told a federal district court that should it choose to side with the federal government in a land dispute, it could potentially “disrupt precedent” of the near-century old method used in the state.

The Texas Board of Professional Land Surveying, in an *amicus* brief filed Monday in the U.S. District Court of the Northern District of Texas, said Texas surveyors have used the method approved by the U.S. Supreme Court in the 1920s to determine gradient boundaries along the state’s navigable waterways since the technique was developed by Cols. Arthur Stiles and Arthur Kidder. The agency said further court cases have upheld the procedure, which was not properly administered by the Bureau of Land Management, the federal agency laying claim to private lands along the Red River in Wilbarger, Wichita and Clay counties.

The BLM admitted recently that it was incorrect in its implementation of the method.



Surveyors from the Bureau of Land Management came onto Kevin Hunter’s property along the Red River Monday morning to begin the determination of where his land ends and where government-owned land begins.

(Photo: Torin Halsey/Times Record News)

“A ruling in this case that upholds the accuracy of the BLM markers would have the potential to disrupt precedent that has informed the practice of land surveying in Texas for nearly a century,” the filing said. “This case involves boundary determination along a segment of the Red River, but it also implicates the remaining 423-mile stretch of the river. Moreover, because Texas has extended the gradient boundary rule to apply to all navigable rivers within the state ... recognition of the BLM markers could imperil boundaries between private and public ownership along other waterways.”

The TBPLS presents three arguments in the brief: The BLM survey doesn’t adhere to the proper application of the method to determine the gradient boundary; accepting the location of the BLM markers would disrupt gradient boundary surveying precedent in Texas; and recognition of the BLM markers would frustrate the TBPLS because no Texas-licensed surveyor performed the survey for the BLM.

The agency argues that proper application of the methodology does not support where the BLM markers are located, sometimes more than a mile away from the river and located in vegetated areas. The Red River Compact of 2000, which was ratified by Congress, set the boundary between Texas and Oklahoma as the vegetation line along the south cut bank of the river.

“The proper application of the gradient boundary method would designate the southern boundary of the Red River to be much closer to the water flow of the river than the BLM markers indicated,” the agency argued. “This is because the method prescribes a boundary that, by definition, is the midway point between the bottom of the river bank and the top of the lowest qualified bank on the Red River’s accretion bank, the bank where natural materials are deposited by water in the stream.”

The TBPLS argues the federal agency was attempting to set the boundary based on what was discovered in the 1920s without taking into consideration the effects of avulsion, erosion and accretion. The BLM admitted so in a March 29 letter from acting BLM chief surveyor for the New Mexico, Texas and Oklahoma region Steve Beyerlein to the New Mexico state director.

(continued on next page)

Texas Surveying Board (continued)

“This means that the non-avulsive changes in the river’s course since the 1920s have resulted in corresponding changes in the location of the gradient boundary,” the TBPLS argued. “However, the BLM surveys do not account for this change because they do not locate the gradient boundary by applying the rules and techniques established in “Oklahoma v. Texas” by performing a boundary analysis near the flow of the river.”

The Texas agency also cited notes from a Texas and Oklahoma Red River Boundary Commission meeting in 1996. In that case, the top surveyor for the state, Ben Thomson, said the gradient boundary was the point between the water line and the vegetation line. BLM surveyor John Bennet, according to the filing, agreed with Thomson’s statement as to where the gradient boundary would be.

The TBPLS also argued the BLM surveyors were not licensed by the state of Texas to, in this case, conduct gradient boundary surveys.

“... the BLM surveyors who set the contested markers are not on the active roster of licensed surveyors in Texas. Accordingly, their survey efforts should not be recognized insofar as they apply to the determination of private-property boundaries,” the state agency argued. “Recognition of the BLM markers as the northern boundary of private owners would be inconsistent with the (Texas Professional Land Surveying Practices) Act and could inhibit TBPLS’s interest in protecting the public by requiring that real property boundaries in Texas are determined by surveyors licensed to practice in Texas.

“Moreover, a survey performed by Texas-certified surveyors would have produced different results in this case because those surveyors would be bound to apply Texas law setting the southern limit of the Red River at its southern gradient boundary.”

The case is schedule for trial in July, However, the plaintiffs have asked Judge Reed O’Connor of the U.S. District Court of the Northern District of Texas to make a partial summary judgment before the trial date. ■

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The Slide Rule and the Crowbar: Henry David Thoreau in the Anthropocene

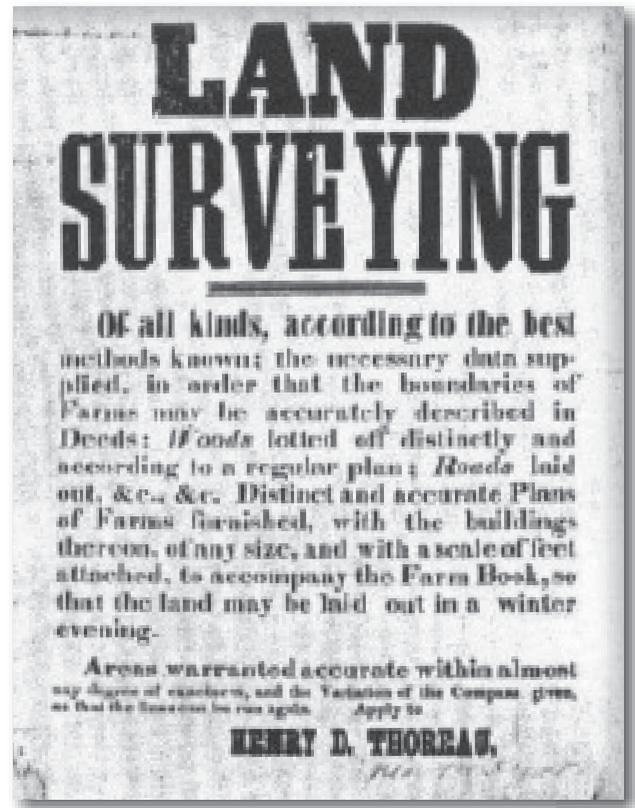
by Daegan Miller, April 23, 2017, *Los Angeles Review of Books*

IN 1704, a mill dam was built in Billerica, Massachusetts, on the banks of the Concord River. It was a small dam, but the social ripples it sent intensified over the course of 150 years, especially after 1798, when the mill and its dam were sold to a group of early capitalists, who raised the dam's height because a higher fall meant more power and thus better financial returns. This was the dawn of the Industrial Revolution in the United States, and the Concord was at its epicenter; indeed, just a few miles downstream, near the confluence of the Concord and Merrimack Rivers, stood the famous Lowell Mill complex, the United States's first factory system.

But there was a problem. The town of Concord, upstream from the dam, like many of its neighboring villages, was a farming town whose pastoral economy also revolved around water power. The Concord River is nearly flat, and when spring came it inevitably flooded, which was good for the farmers because when those yearly floods receded they left behind a nutrient-rich layer of silt. From this silt grew rich meadow hay, which fattened cows and livestock, which were sold to nearby towns, all of which left Concord's farmers well off. But after the Billerica dam's height was increased in 1798, farmers in Concord noticed that the floodwaters were slow to drain, and so spoiled their meadows' hay. Thus began six decades of legal wrangling to determine whether the Concord River's flow was best used to power a machine or to grow a blade of grass.

In 1859, an association of Concord's farmers hired Henry David Thoreau to measure the abutments of all the bridges that crossed the river upstream from Billerica. (Bridge abutments act as mini-dams, impeding a river's flow.) The association's plan was to have Thoreau figure out just how much the bridges contributed to the flooding, with the hope that the answer would be not very much. This evidence could then be taken to the State of Massachusetts, which was in the midst of conducting an investigation into the source of Concord's flooding, and ultimately used to justify tearing the Billerica dam down.

Though it has been generally forgotten, Thoreau was regarded in his own day as Concord's preeminent land surveyor. He drew up scores of maps between 1849 and his death in 1862. (They've been scattered to archives throughout the Northeast, but the vast majority of them are held by the public library in his hometown, which has made them available, free to all, online.) As the literary critic Patrick Chura showed in his 2010 book *Thoreau the Land*



Surveyor, surveying "was an essential [...] component of the author's life and character" that left its indelible mark on nearly everything Thoreau wrote, from his first book, *A Week on the Concord and Merrimack Rivers* — a literary map of the river running through his hometown — to the posthumous essays published in *The Maine Woods*. One of the last projects that Thoreau ever worked on — he fell ill with the tuberculosis that would kill him just a few months later — was an enormously detailed seven-and-a-half-foot map of the Concord River. This map has always been a mystery to Thoreauvians. It's not clear why he made it, since Thoreau's employers had no use for a map: they were after statistics, not cartography. Nor does it appear to be connected to any literary project.

This mysterious map is at the center of Robert M. Thorson's newest book, *The Boatman: Henry David Thoreau's River Years*. Thorson made his first Thoreauvian splash in 2014 with *Walden's Shore: Henry David Thoreau and Nineteenth-Century Science*, an insightful book that

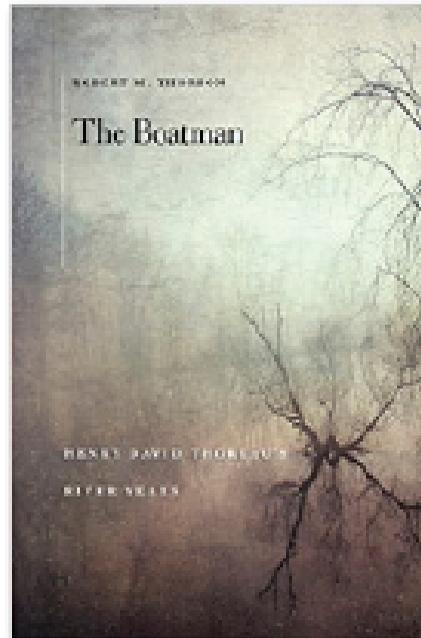
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The Slide Rule and the Crowbar: Henry David Thoreau in the Anthropocene (continued)

reads *Walden; Or, Life in the Woods* not as a literary or philosophical text but as a series of geological experiments. For Thorson, himself a professor of geology, the most impressive thing about Thoreau is what a gifted scientist he was, and it was to “counterbalance [...] a recent trend in ecocriticism that refracts science through literature without being scientific” that Thorson wrote *Walden’s Shore*. *The Boatman* is, in essence, a 200-page coda to Thorson’s earlier book, but rather than geology, Thorson turns his attention to potamology, the study of rivers. In it, Thorson argues that Thoreau “properly interpreted most of the key ideas of fluvial geomorphology a half century before the subject was invented.” He was, in Thorson’s words, “a lone genius” whose contributions to science we’ve too long ignored.

Thorson anchors that claim with an astonishing reading of Thoreau’s river map, supplemented by dozens of relevant entries from the author’s 47-volume journal as well as his handwritten notes preserved in the Concord Free Public Library. These are rich troves for the potamologically literate: the map itself is covered in a riot of detailed jottings on river depth, width, and the composition of the bottom, and one can find among Thoreau’s ephemera dozens of pages of minute figures and calculations. Part of what makes Thorson’s work on Thoreau so unusual is that he hardly bothers with literary, political, or intellectual approaches to his subject at all — he’s after data, and when he finds it, he checks it, weighing it against today’s best practices. (Thorson has generously posted all of this research online.) He comes away from his historical data-crunching deeply impressed with Thoreau’s skill: “[W]orking on his own, Thoreau inaugurated a truly scientific investigation of the largest, most powerful and wildest thing in his life, the Concord River.”

But it’s what Thoreau did next that confirms the extraordinary character of his scientific achievement, according to Thorson. Once Thoreau had his measurements in hand, he “generated a half dozen thought experiments that he tested” against his findings. He then combined these with his understanding of the deep geological history of Concord, supplemented by hours of painstaking research in Harvard’s library into cutting-edge French hydraulics, to come up with a general theory of river dynamics. Thoreau had figured out exactly how his river worked, from its subsurface currents to its eddies to the way it carves the bed in which it lies. As Thorson puts it, he “may have known more about rivers [...] than anyone else in America.”



The Boatman is an impressive feat of empirical research, and Thorson’s conclusions are an important contribution to the scholarship on Thoreau as natural scientist. Had he stopped here, it would be one of those books frequently and admirably cited by a small circle of academic specialists. *The Boatman*, however, has grander ambitions: Thorson hopes that his Thoreau can lead us, slide rule in hand,

through the hot times of the Anthropocene. Yet this is where he starts to run into trouble.

There are any number of definitions of “the Anthropocene,” a term popularized in 2000 by the ecologist Eugene Stoermer and the atmospheric chemist Paul Crutzen, but most revolve around the notion that human-generated global climate change is a calamitous break in world history. That’s not quite Thorson’s take. Instead, he’s curiously, cautiously celebratory: for him, the Anthropocene is an age in which humans have at last become aware that our agency “is completely interwoven with nature.” Though global climate change, ocean acidification, rampant pollution, and deforestation may all have their negative consequences, Thorson wants us to keep in mind that Thoreau found “beauty in even the most devastated corners of nature,” and that his “positive attitude can help us brace for the global changes heading our way.” The Thoreauvian lesson of the Anthropocene, Thorson warns in his gently technocratic conclusion, is that we must learn to let “science lead the law when it comes to environmental management,” for only science can guide us safely through whatever lies ahead. (Though he doesn’t mention them, Thorson’s position is close to the Ecomodernists a group of technologists and social scientists who are quite sure that they can engineer a “good, or even a great, Anthropocene” for us, if only we let them.)

(continued on page 14)



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The Slide Rule and the Crowbar: Henry David Thoreau in the Anthropocene (continued)

The irony is that though Thoreau's work may very well tell us a great deal about the Anthropocene, Thorson's Thoreau — a Thoreau stripped of his literary, ethical, political, and philosophical complexity — doesn't, and the problem lies with Thorson's disinterest in all of Thoreau's nonscientific work. In *Walden's Shore*, Thorson described a Thoreau — "my Thoreau" — who was in need of "resuscitation": a hardheaded scientist unconcerned with society, economics, politics, literature, economics, or psychology, who lived for objective data alone. It is true that one benefit of such ruthless simplification is clarity, and Thorson's relentless pruning allows him dozens of glittering observations into Thoreau's own world that have previously been missed. For instance, there is a passage in the essay "Walking" that has long puzzled scholars in its uncharacteristic (for Thoreau) celebration of Manifest Destiny, in which Thoreau tells us that every time he went for a walk, he inevitably headed southwest, because "the future lies that way." To many scholars, this has seemed to be a veiled embrace of the American sea-to-shining-sea project. But Thorson points out that one of Thoreau's favorite walking routes was along the Concord River, which, due to the underlying geology, runs to the southwest. Such simple material facts of Thoreau's daily life, Thorson shows, often get lost in the thicket of humanistic criticism.

But in jettisoning everything except for his scientific practice, Thorson leaves us with an impoverished Thoreau, one stripped of both connections to his time and relevance to ours. Thorson is clearly uncomfortable, for instance, with Thoreau's more radical, socially engaged side: there's almost no mention of "Civil Disobedience," one of the founding texts of an American anarchist tradition, with its declaration that government "can have no pure right over my person and property," nor of the politically scorching "Slavery in Massachusetts," which concludes: "[M]y thoughts are murder to the State." Nor is there much about Thoreau's ringing embrace of John Brown after Brown's Harpers Ferry raid in 1859. Indeed, the only mention of Thoreau's politics comes in a brief dismissal of Thoreau's antislavery writing as "abolitionist rant."

One of the currents just below The Boatman's surface is a narrative of a politically enraged young man who dreamed, in 1849, of direct action, of taking a crowbar to the dam that was at the center of the flowage controversy and liberating the river, but who eventually mellowed, exchanging the crowbar for the slide rule, revolutionary notions for dispassionate, scientific facts. It's as if an Earth First! twentysomething of today grew up, went to grad

school, and became an EPA field scientist dutifully taking water samples. "The younger Thoreau was a boatman with wild, agitated, idealistic ideas," Thorson writes. "The older Thoreau was a boatman whose mature flow of thoughts was slower."

But when the rest of Thoreau's work is brought back into focus, we find a strident critic as well as an accomplished scientist, a master of the slide rule and the crowbar, one of the earliest Americans to realize that our landscapes, our economy, and our politics are all indivisibly bound together. Far from mellowing as he aged, Thoreau remained scathingly acerbic in his criticism of American market-oriented society. A few months after he finished his river survey, he wrote a blistering critique of capitalism thinly veiled as a pleasant bit of nature writing called "Huckleberries." "What sort of a country is that where the huckleberry fields are private property?" Thoreau asked, then elaborated:

When I pass such fields on the highway, my heart sinks within me. I see a blight on the land. Nature is under a veil there. I make haste away from the accursed spot. Nothing could deform her fair face more. I cannot think of it ever after but as the place where fair and palatable berries, are [sic] converted into money, where the huckleberry is desecrated.

All environmental crises, Thoreau well knew, are also social crises, and a devastated corner of nature could only have as its complement a devastated corner of humanity. It is hard to see how this Thoreau can be reconciled with the ecomodern optimist who would embrace the Anthropocene as an age of scientific beauty, or science as the savior of our warming world. If Thoreau is to be our guide to the Anthropocene, then we must also be ready to accept his radicalism, his skepticism of "man's improvements," and his call for, as he puts it in "Walking," "[a] people who would begin by burning the fences and let the forests stand!" 🇺🇸

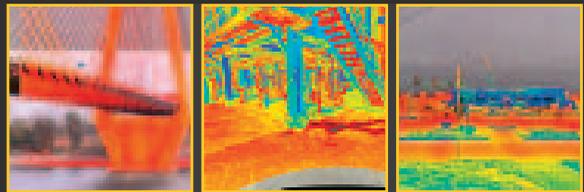
Daegan Miller is a writer and landscape historian. His first book, This Radical Land: A Natural History of American Dissent, is due out from the University of Chicago Press in February 2018.

Article reprinted with permission of Los Angeles Review of Books Executive Editor Boris Dralyuk. The original story is available as initially published at <https://lareviewofbooks.org/article/the-slide-rule-and-the-crowbar-henry-david-thoreau-in-the-anthropocene/>.

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Surveyors' Coordinate Systems for 2022 and Beyond

by Tim Bunch, May 3, 2017 – From GPS World (gpsworld.com)

Ask anyone what time means to them, and they will give you a different answer. Benjamin Franklin famously stated that “time is money.” Time for the surveyor can mean being out in the field retracing a boundary, drafting a plat or working with a client to help them see their goals achieved. Just like any other profession, time can be a friend or foe for the surveyor. We seem to run out of it more than we have an excess of it. Either way, time marches on as we go about our business.

Time, however, is changing the surveyor’s world and how we go about our methods of measurement. While it seems like a crazy concept, time is the major component requiring changes to geodetic procedural processes and how we will determine our locations in the future.

We will continue to see advances in hardware and software along with new interfaces and ways to collect and display survey data almost daily, and we will continue to deal with adaptation. However, surveyors must be ready for the next big challenge: a national horizontal and vertical adjustment of the National Spatial Reference System (NSRS) into a new standard. The North American Terrestrial Reference Frame of 2022 (NATRF2022.) is currently being developed by NGS and will replace NAD83 and NAVD88. Most surveyors will ask why we are getting ready for a historic change in datums. Easy — it’s all about time.

Expanded Variables

Just as early travelers thought the Earth was flat and learned it wasn’t through exploration and science, we are learning more everyday regarding how our world is changing. To get a better understanding of how our world is changing, NGS and the geodesy community have expanded the environmental variables of geographic location to areas including gravity, geoid undulations and geopotential data, plate tectonics and crustal evolution, and additional GNSS data analysis through satellites and continuously operating reference station (CORS) installations.

By introducing new attributes affecting coordinate data, including horizontal motions induced directly or indirectly by adjoining tectonic plates, horizontal motions induced by Global Isostatic Adjustment, other horizontal motions and all vertical motions in their entirety (per NGS NOAA Technical Report NOS NGS 62), data captured will be used to create an Intra-Frame Velocity Model (IFVM). Data following this format will be now be used to monitor the movement of survey positions from implementation forward. The key factor in which all the data is centralized is time.

My GPS World colleague David Zilkoski presented a thorough explanation (“NGS to Replace NAVD88 in 2022: What GNSS Users Need To Know) of the nuts and bolts behind the changes. Here are the basic reasons behind the new adjustment as provided by NGS:

NAD 83 and NAVD 88, although still the official horizontal and vertical datums of the National Spatial Reference System (NSRS), have been identified as having shortcomings that are best addressed through defining new horizontal and vertical datums.

Specifically, NAD 83 is non-geocentric by about 2.2 meters. Secondly, NAVD 88 is both biased (by about one-half meter) and tilted (about 1 meter coast to coast) relative to the best global geoid models available today. Both of these issues derive from the fact that both datums were defined primarily using terrestrial surveying techniques at passive geodetic survey marks. This network of survey marks deteriorate over time (both through unchecked physical movement and simple removal), and resources are not available to maintain them.

The new reference frames (geometric and geopotential) will rely primarily Global Navigation Satellite Systems (GNSS) such as the Global Positioning System (GPS) as well as an updated and time-tracked geoid model. This paradigm will be easier and more cost-effective to maintain.

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Surveyors' Coordinate Systems for 2022 and Beyond (continued)

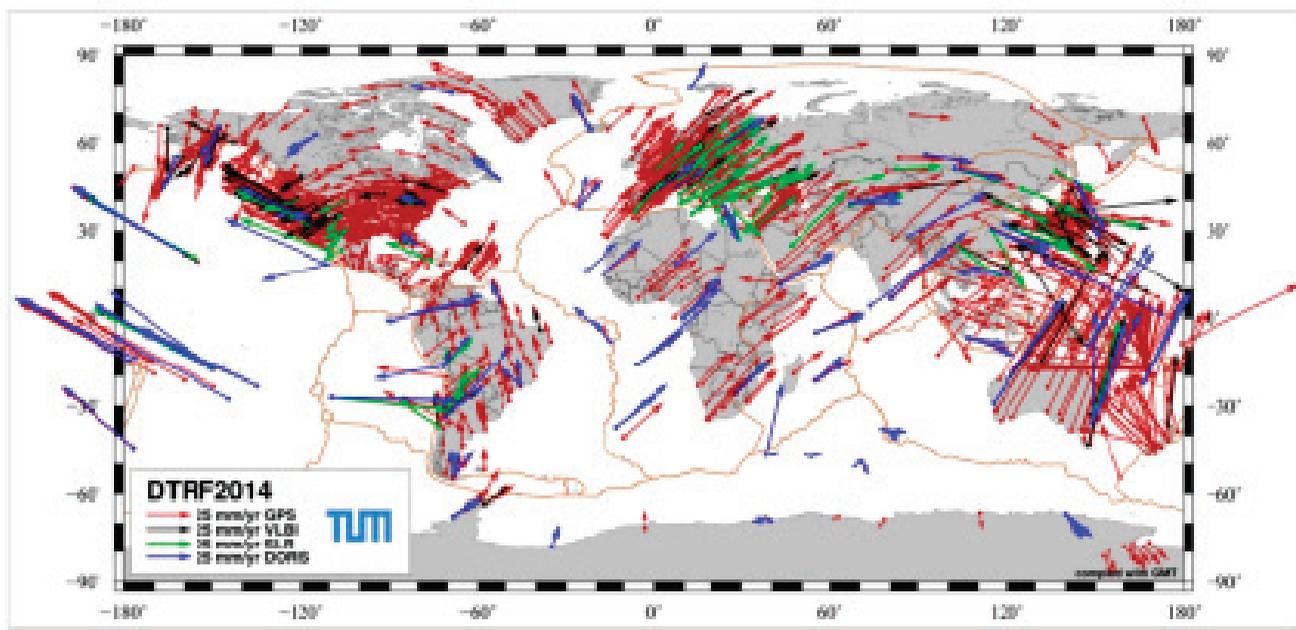


Plate tectonics

These proposed changes to the NSRS, however, are based upon how much we have learned about our changing Earth using GNSS equipment and data collection. Time, as it turns out, is a big factor in how we measure and document locations. A point that is determined exactly here on this day at a specific moment will have moved due to plate tectonics and other variables to there over a period of time.

New Vertical Component

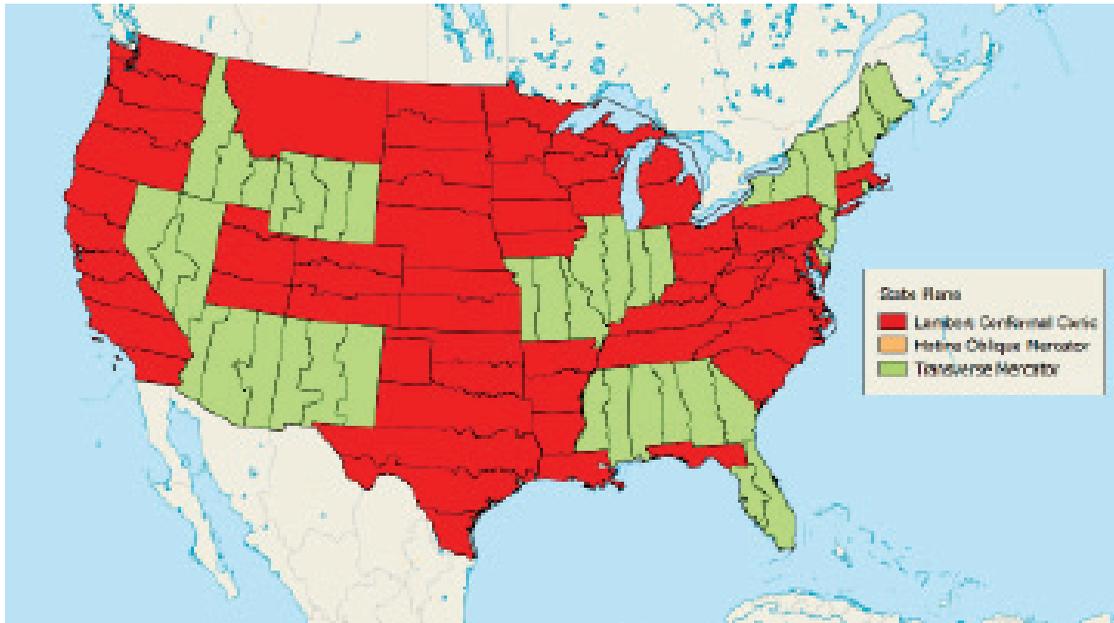
Another aspect of the datum change will be the definition of a new vertical component. Surveyors are familiar with the establishment of NGVD29 based upon mean sea level, and also NAVD88 being based upon the benchmark at Father Point/Rimouski, Quebec, Canada with reference to the International Great Lakes Datum of 1985. What science has taught us in the years beyond NAVD88 is that there is a greater force at play when it comes to the vertical piece of geolocation: gravity.

Yes, gravity keeps us on the ground and causes water to flow downhill, but the development of gravitational studies has led to incredible discoveries of how gravity affects elevation. It was always assumed that the gravitational pull on the earth was uniform worldwide, but with the development of instruments that can measure and map the variations in gravity, NGS will be redefining the vertical datum through a program called GRAV-D. NGS is currently flying in various portions of the U.S. and is scheduled to be completed by 2021 in order to roll out with the new horizontal program in 2022.

So, it turns out that time has been affecting not just our productivity but also our positions on the earth. Another famous quote by Paulo Coelho does hold true: "Time neither moves nor is stationary. Time changes." Time has passed since this article began; did you feel the earth move?

What about our survey monuments and state plane coordinates?

For many surveyors, the main question is simple: why now? What is so bad with our existing NAD83 and NAVD88 datums?



Map courtesy of GISGeography, at <http://gisgeography.com/state-plane-coordinate-system-spcs/>

The reason is very simple; staying current with our favorite tool in the toolbox: GNSS. Surveyors have always been about “monuments” and perpetuation of data from established points located on the face of the Earth with published and/or known values. This concept has become even more important to the surveying community once the proliferation of geographic-based and state plane coordinate data was published for all to utilize. I touched on the surveyor’s use and data collection/perpetuation of location values in a past column (GPS World November 2016). As long as NGS updated the national database with more information and a simple adjustment every so often, life was good and simple.

But now we have worlds colliding; static monuments with published horizontal and vertical values in one corner, while in the other corner is the new paradigm of ever shifting crustal plates and changing positional values monitored by GNSS data through satellites and a network of CORS located worldwide.

This situation makes me harken back to one of my favorite “Ghostbusters” lines from Bill Murray’s character, Dr. Peter Venkman: “Human sacrifice, dogs and cats living together – mass hysteria...”

Okay, maybe it won’t be quite that bad but there will be many surveyors that will have trouble wrapping their minds around the new concept of “moving monuments.” Our reliance on state plane coordinate systems (SPCS) is at an all-time high with the sharing of data by various parties being more seamless than ever. The notion that a permanent monument’s positional values will be constantly changing is a head-spinner to most.

NGS has also stated that their new system and procedures will not maintain data values for SPCS (see NSPS State Plane Flyer, Page 22). There are currently 125 SPCS zones and 3235 county systems throughout the US and territories in place that rely on NGS data as the main framework, so having tools for reference and conversion in place will be crucial. Thus, it will be a herculean task to create a procedure/process to easily pass coordinate values between our many static systems worldwide and the new dynamic but very robust system underway from NGS.

Based upon information currently available about the NAD2022 system, it would be more efficient for all those who use geolocation data to modify their thinking to adapt to a dynamic coordinate system. However, this is a similar situation to early scientists and geographers throwing out all references to flat-earth maps and atlases. For surveyors in the twilight of their careers, these are radical items to consider and a far cry from the standardized chain and theodolite. (Maybe there will be mass hysteria...)

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Surveyors' Coordinate Systems for 2022 and Beyond (continued)

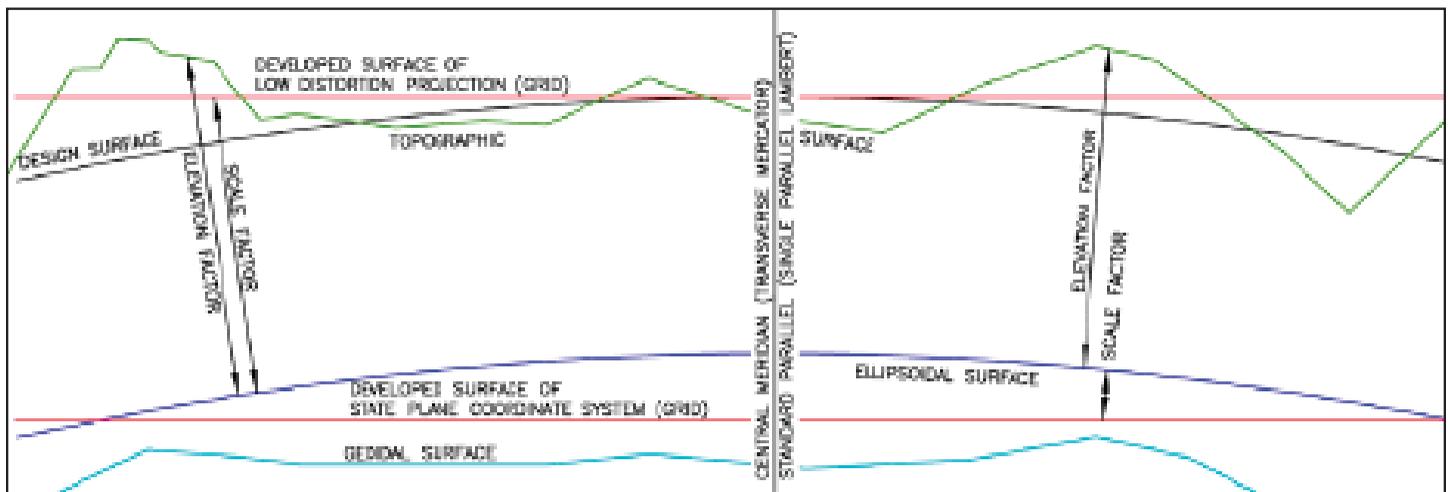
The good news is that we have very intelligent people in the surveying and geodetic community who are working on solutions for the masses. The beauty of newer technology is how quickly hardware and software can be adapted to fit these new data conditions. Getting the word out on these changes and educating our profession will be a key factor to its success.

Further Refinement of Coordinate Systems

While the use of GNSS has enabled the discovery of time as a significant variable in geolocation, it has also expanded out coverage area of coordinate systems to much larger areas. Distances that could not be computed prior to GNSS are now easily attained and large projects can be managed within a common coordinate system. County, regional and state agencies can now create large-scale GIS databases that utilize a single coordinate system as well.

However, there are two differing tracks being formed with the continued development of the new datum by NGS. While the new datum will become more precise and predictable, there are movements in opposing camps to make changes in user coordinate in the furthest possible ways: statewide single zone system versus county/regional low distortion projection (LDP) systems. They both have their strengths and weaknesses, and will depend on the application of the user to choose the appropriate system.

- Most states currently have two or more zones so there potential to combine all zones into one, but a major drawback will be the loss of accuracy away from the defining points. For GIS users, this accuracy will more than adequate and will allow the merging of data from across the state into one unified system.
- Surveyors, however, are an interesting bunch in that they accept only the most accurate AND precise measurements. The growing use of LDP is rapidly changing the implementation and management of coordinate system in smaller areas such as counties and regional DOT districts.



However, both systems have a place in our surveying and mapping world. NGS has stated that while they will help with transformation software and apps, it will leave the decision of legislative standards to each state. It will be paramount that each state study what makes the most sense for its users and pass the appropriate legislation.



“The days are long but the years are short”

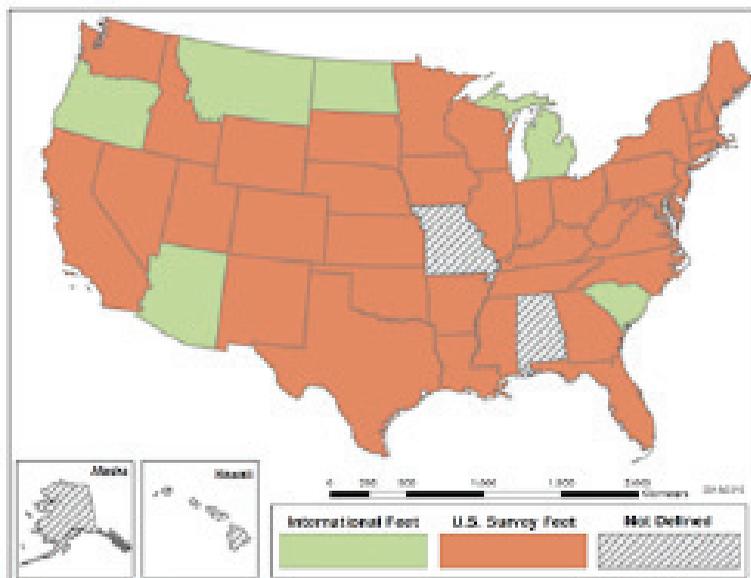
As I look back and realize how much has changed with modern technology and overall knowledge of our profession, it is with much anticipation how much more will change with advancements we don't even know about yet. The electronic distance meter (EDM) was revolutionary for many surveyors and I've waxed poetic about my feelings regarding RTK GNSS in past columns (GPS World May 2016). Once again, however, technology and information based upon its use has revolutionized our data system.

As a profession, surveyors have embraced GNSS use and data collection from the early implementation of the system. And while the advances of UAV use, laser scanners and LiDAR along with software improvements have revolutionized data collection, these proposed coordinate improvements by NGS will bring more potential quality information into the surveyor's hands.

And while time is money as Mr. Franklin famously stated, 2022 is just around the corner. A good friend of mine is famous for saying: “Good coordination begins with good coordinates.” The work performed by NGS is helping us do just that. The entire surveying, mapping and geodetic community has lots to accomplish to be ready for the changes from NGS. Let's get to work. 🇺🇸

Tim Burch, GPS World's co-contributing editor for survey, is director of Surveying at SPACECO Inc. in Rosemont, Illinois. He has been working as a professional land surveyor since 1985, and is the secretary, Board of Directors, National Society of Professional Surveyors.

Reprinted with permission from Survey Scene, a monthly newsletter from GPS World magazine. Available online at <http://gpsworld.com/surveyors-coordinate-systems-for-2022-and-beyond/>.



Young Awarded Non Traditional Student Scholarship

Casey Janelle Young, Springfield, was recently awarded the “Non Traditional Student” Scholarship from the MSPS Scholarship Foundation. Casey is currently attending Linn Technical College where she is finishing up courses required for licensure including CVT 241 - Surveying II. She is also taking courses remotely from the University of Wyoming. Casey attended the Missouri University of Science and Technology and received a BS in Business from Columbia College. She is currently employed by Wilson Surveying Company in Springfield. Good luck in your career Casey!



Your NAD 83-Based State Plane-Legislated Coordinates **Will Not** Be Maintained after 2022!



What will you and your fellow professionals do? Panic? Ignore the Issue? **or Act? Please let us know!**

What is changing?

The North American Datum of 1983 (NAD 83) will be replaced in 2022. The new datum will have a different name.

The North American Vertical Datum of 1988 (NAVD 88) will also be replaced in 2022. Its replacement will also have a new name.

Expected horizontal shifts from NAD 83 to the new datum are in the 1-2 meter range. The National Geodetic Survey will provide a coarse, map-grade transformation tool (such as NADCON and GEOCON) to connect NAD 83 with the new datum.

Who will be affected?

All states and territories will be transitioned to the new datums. Forty-eight states have a state-specific coordinate system law tied to NAD 83. **Your state law will not reflect the National Spatial Reference System after 2022.**

Who can help?

The National Geodetic Survey (NGS), the National Society of Professional Surveyors (NSPS) and the American Association for Geodetic Surveying (AAGS) are here to help your state make these changes in legislation!

You can help by understanding your own state's laws and how these changes will impact you.

Should you change or modify your state law?

NGS, NSPS and AAGS believe it would benefit state surveyors and mapping professionals for laws or regulations to reflect the latest federal geodetic infrastructure, namely **the National Spatial Reference System**.

Why should you change or modify your state law?

1. Federal agencies will adopt the new datum, so national products like **Federal Emergency Management Agency (FEMA) flood insurance rate maps** will no longer reference NAD 83, nor NAVD 88. Using the current (most updated) datum will avoid confusion and increase consistency with federal engineering or constructions projects.

2. Federal resources will no longer be used to maintain or correct issues with data on superseded datums. **Instead, NGS will focus on supporting users of the updated National Spatial Reference System (NSRS).**

3. More geospatial data is being collected and shared every day. A consistent and regularly updated NSRS will provide greater efficiency across surveying and mapping sectors.

What do you think?

We welcome your feedback! Please provide any feedback you like to one of our committee members, below.

NSPS/AAGS/NGS Advisory Committee on National Spatial Reference System Legislation

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One Sloppy Land Surveyor Almost Caused a War Between Missouri and Iowa

by Sarah Laskow, March 24, 2017, This article first appeared at Atlas Obscura. Reprinted with permission, © Atlas Obscura Inc. <http://www.atlasobscura.com/articles/honey-war-missouri-iowa-border>

In 1839, the outcome of the “Honey War” hinged on the exact location of the Missouri-Iowa border.



The beginning of the Sullivan line.

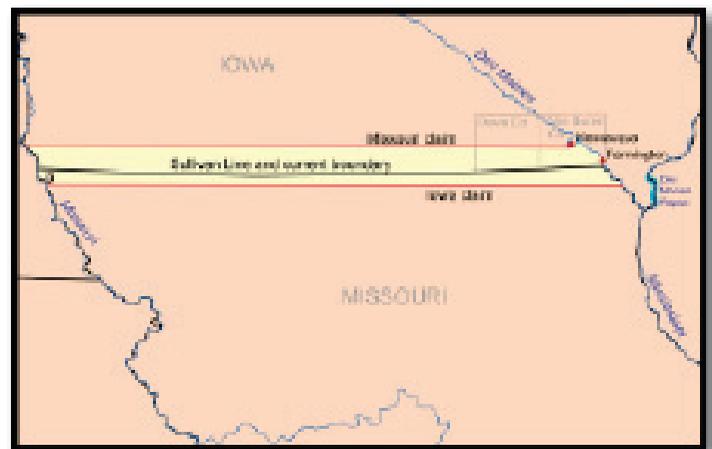
When Sheriff Uriah S. Gregory—those who knew him called him Sandy—made his way into disputed territory for the second time, he must have known it would not go well for him.

When he crossed from land that surely belonged to the state of Missouri onto land that might have belonged to the territory of Iowa, there wouldn't have been much of anything to designate the difference, in the flat expanse of grass and trees. Whatever markers John C. Sullivan had left when he surveyed the line in 1816—scratches on trees, small mounds of sod, the occasional wooden post—would have faded into the landscape in the 23 years since.

But Gregory knew he was heading into an area where he was not welcome. Missouri claimed this land all the way to the Booth line, another survey line drawn in 1836 about nine miles north, but the people who lived here considered themselves part of Iowa. The last time Gregory had crossed the Sullivan line, back in October, he had met a group of locals at a house raising, and when he had explained, carefully, that he had come to collect their taxes on behalf of the state of Missouri, they told him

that it would be in his best interest—best for his personal safety—if he went back over the border.

Since then, the border conflict between Missouri and Iowa had tensed into what historians would call “the Honey War,” after some unknown Missourian went over the border and cut down three bee trees filled with honey. It was about to escalate even further.



The disputed land of the Honey War.

The trouble that would cause the Honey War began in 1816, with some less-than-perfect surveying work. John C. Sullivan had been tasked with drawing a border described in a treaty with the Osage. He started at the confluence of the Missouri and Kansas rivers and marked a line due north, for one hundred miles. That part went well.

When he started working his way east, though, Sullivan's calculations went wrong. He forgot to account for the difference between magnetic north and polar north, and so as his line went east, it strayed gradually northwards, at a tilt. The errant line ended at the Des Moines river, which would become a point of contention later on. In 1821, when Missouri became a state, the official description used “the rapids of the river Des Moines” as a reference point for the eastern end of Sullivan's line. The Des Moines river didn't have any rapids of note; however, if Sullivan's original line had kept going east, it would have intersected a set of significant rapids in the Mississippi River, which were named, confusingly enough, the “Des Moines rapids.”

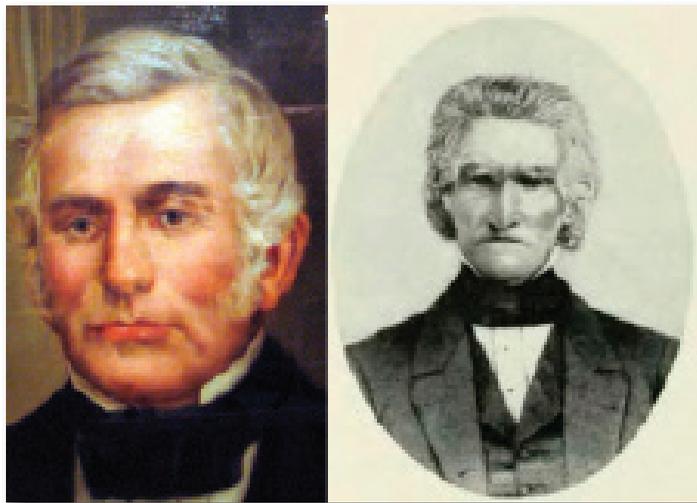
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One Sloppy Land Surveyor (continued)

At the time, these confusions were of little interest to white people: few settlers were interested in that land. About two decades later, though, Missourians and Iowa settlers both were very interested in this stretch of fertile land. In 1837, the governor of Missouri had the border re-surveyed, by John C. Brown. Brown planned to start from the opposite end of the border, the eastern-most point, located—he thought—at rapids in the Des Moines river.

Since that river didn't really have rapids, Brown kept traveling north along the river until he found a rippling spot of river he liked the look of. "The decision to choose those particular 'rapids' was evidently based on nothing substantial," writes David D. March in *The History of Missouri*. "They were not the first 'rapids' encountered as the men moved up the river...they were no more important than any of the other eleven along the river's course." Starting at the this spot, though, moved Missouri's border about nine miles north of the Sullivan line on its eastern end and about 13 miles north on the western end. (Brown, unlike Sullivan, managed to mark out a straight border line.)

Not long after this second line was drawn, Iowa and the federal government organized a third survey of the same border. At the end of that work, the federal representative, Albert Miller Lea, unhelpfully reported that there were four lines that could legitimately be considered Missouri's border—the Sullivan line, the straight line Sullivan was supposed to have drawn, the Brown line (the farthest north), or a line south of the Sullivan line that intersected the rapids on the Mississippi river.

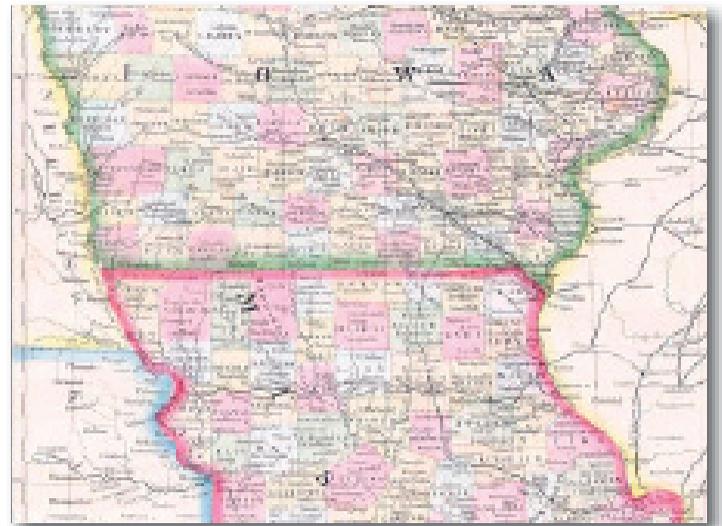


Governor Boggs (left) and Governor Lucas (right)

That territory, then, was up for grabs. Missouri Governor Lilburn Boggs claimed that his state had jurisdiction over the land up to the Brown line—the border most advantageous to Missouri. Iowa Territorial Governor Robert Lucas issued a counter-proclamation that claimed jurisdiction down the Sullivan line and called on local law enforcement to protect Iowa's land.

This was what Sheriff Gregory was walking into. After his first, failed foray, he had written to Governor Boggs, who issued yet another proclamation urging Missouri law enforcement officials to do their duty and collect taxes up to the Brown line. In 1839, for the second time, Gregory went back into the disputed territory, but this time the Iowa settlers were waiting for him. He was quickly jailed by Sheriff Henry Heffleman and charged with "usurpation of authority."

The governor of Missouri took this an excuse to rally the militia.



The resolved border, in a 1864 map.

Neither the Missouri militia nor the Iowa militia was very impressive, although all accounts agree that the Missouri militia was larger. They also agree that some of the Iowa recruits showed up with some very creative weaponry, including but not limited to pitchforks, swords left over from the War of 1812, flintlock rifles, a plow blade strung on a chain, a butter churn dasher, a sausage stuffer, and a six-foot sword, of sorts, cut from sheet iron. In the cold of winter, neither side was well-supplied, though, with food or shelter; the Missouri militia raided a store in LaGrange for food. (The state government later reimbursed the store owner.)

Even before the troops had massed along the border, though, more level-headed men were trying to calm tensions rather than, like their governors, inflame them. Various delegations were traveling back and forth across the border, and soon both sides agreed that they probably shouldn't start an actual war over these lines. The Missouri militia was sent home; the Iowa militia discovered the armed conflict had been called off when they went to look for the Missouri militia and found their enemies gone.

The militia men themselves didn't actually care that much about the issue at hand. They were just hoping to be paid for their services. But the Missouri militia men, at least, were annoyed enough by the whole ordeal that they acted out a strange pageant to express their disgruntlement. They took a quarter of venison they had shot earlier, divided it into two pieces, and hung both up from a tree. One half was supposed to represent Governor Boggs, the other Governor Lucas. The men "fired a few rounds at them, until we considered them dead! dead!!" reported one participant. The militia then gave the two pieces of venison a mock military burial. "They were interred by the honor of war," the militiaman wrote. "We fired over their graves, and then returned the encampment."



Marker showing the start of the Sullivan Line.



Although the most tense part of the war had ended, it would take years for the disagreement over the actual border between the two states to be resolved. Eventually, the U.S. Supreme Court would decide that the original, crooked Sullivan line was the true border. The line was resurveyed one more time, and this time, the surveyors marked the border with more lasting stone monuments.

Sheriff Sandy Gregory had been moved farther away from the border when the militias started gathering. But after the militia disbanded, he was set free. For another few years, the legal issues from the incident continued to follow him, but the charges against him were eventually dropped. The state of Missouri paid him a handsome \$250.75 for his troubles—enough, one hopes, to make up for the trouble his small but key role in this drama caused him. 🇺🇸

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In Memory of David Clark

David Clark, 69, of Troy, Kansas passed away Wednesday, April 12, 2017 at the Highland Healthcare.

David was born on August 18, 1947 in Troy, Kansas to Robert L. & Mary A. (Sell) Clark.

He was a member of the U.S. Army, serving in Vietnam as a medic. David owned & operated his own business as a land surveyor in Troy, Kansas. He was also a member of the American Legion Post #55, Troy, Kansas, VFW Post #5531, Wathena, Kansas, society of Land Surveyors of Kansas & Missouri.

David married Kay Cornett on January 11, 1971 in Miami, Oklahoma. She survives of the home.

He was preceded in death by his parents.

Additional survivors: Son, Rick Clark (Amanda), Highland, Kansas Daughter, Wendy Rahe (Bob), Hiawatha, Kansas Grandchildren, Justin, Ellie, Cooper, Lilly & Zayla Clark His dog, Lady Brother, Bill Clark, St. Louis, Missouri Sister, Mary Rose Sargent, St. Joseph, Missouri Nieces & nephews

Funeral Service was held April 18, 2017 At the Community of Christ Church in Fanning, Kansas. Burial: Mount Olive Cemetery, Troy, Kansas. Memorials: Troy Class of 1965 Scholarship Fund. www.harmanrohde.com



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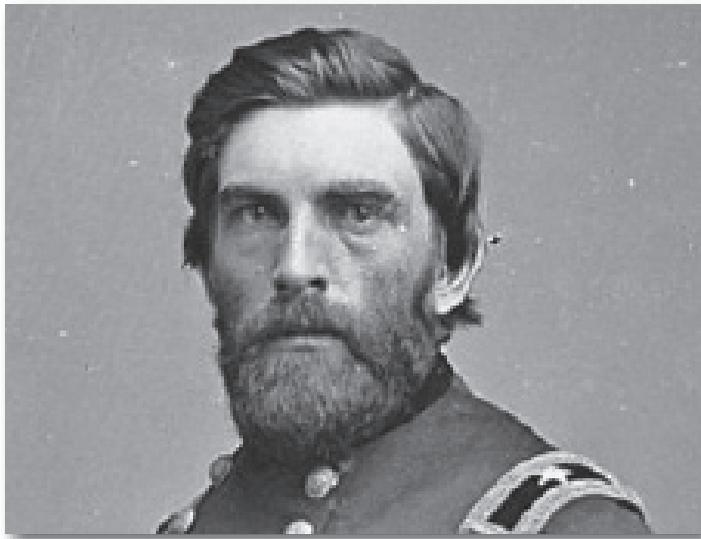
'Hell on Wheels'

by Thomas Izzarelli, Norwich Guidon Staff Writer, April 24, 2017, Norwich University

If the story of a man conquering the wild and unpredictable west in 1869 while building the Transcontinental Railroad sounds like the plot of the AMC television series "Hell on Wheels," there's a reason why.

The main character in the AMC series, Cullen Bohannon, served as the Chief Engineer for the Union Pacific Railroad, discovered a pass through the Black Hills of Wyoming, and was present for the driving of the golden spike at Promontory Summit, Utah, that joined the Union Pacific and Central Pacific Railroads.

While Cullen Bohannon is the fictionalized creation of AMC, these were the real-life adventures of Norwich University alumnus Grenville Mellen Dodge. The 57 episodes of "Hell on Wheels," which originally aired from 2011 to 2016, provided a down and dirty glimpse of the rugged, dangerous, and often deadly conditions faced by the men that worked the 1,912 mile Transcontinental Railroad.



Dodge's incredible life, which brought him from his birthplace in Danvers, Mass., in 1831 and later to the halls of Norwich in 1848, also feature heroic achievements during America's Civil War.

The creators of "Hell on Wheels," Joe and Tony Gayton, chose not to make a docu-drama about the building of the railroad but were inspired while developing their fictionalized story by the 2006 documentary entitled American Experience. (www.collider.com).

In an interview published by the Hollywood Reporter, the Gayton brothers felt that Dodge was a great character and had given consideration to include him as a character in the series along with a number of other historical characters. However, by the end of the planning, Dodge was not included as it would have been difficult to do so as many of his real-life contributions had already been attributed to the main character, Bohannon.

Names of historical figures that were introduced into the fictionalized "Hell on Wheels" story included: Union General Ulysses S. Grant, railroad businessman Thomas "Doc" Durant, and head of the Central Pacific Railroad Collis P. Huntington. The true story of the building of the Transcontinental Railroad could not be told without the mention of these men along with President Abraham Lincoln. But it is Dodge's amazing true story that animates the show and reveals one of Norwich's more colorful and adventurous alumni.

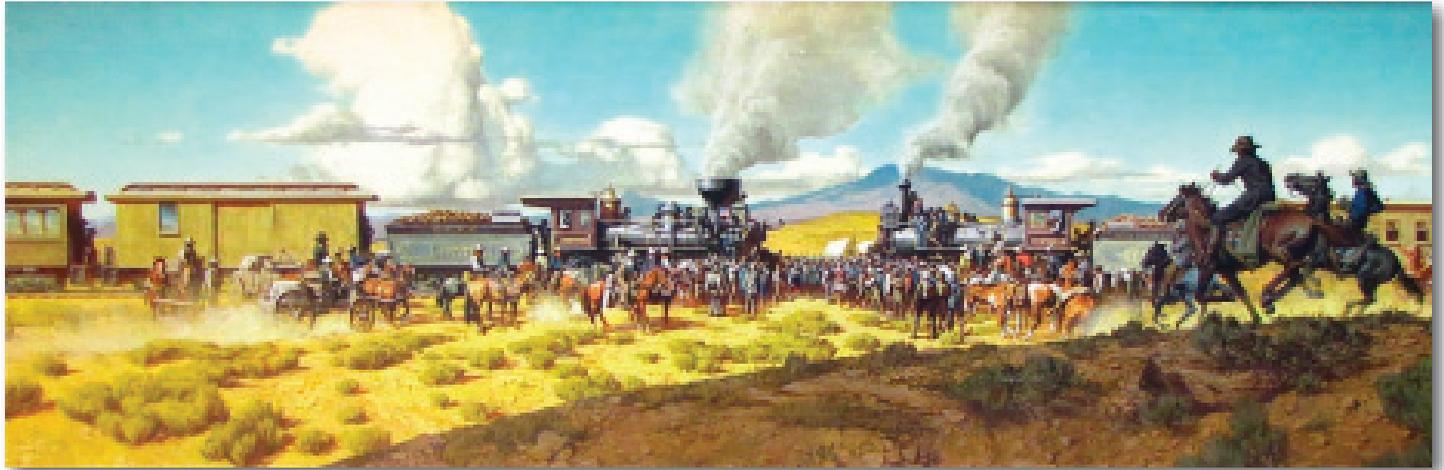
The show looked at many of the significant issues that Dodge was faced within his effort to see the railroad completed, including post-war hostilities between former Confederate and Union soldiers, as well as relations with newly freed slaves, immigrant workers and Native American Indians.

The series derived its name from the phrase coined by the writer Samuel Bowles, who described the upstart towns with wide opened gatherings of saloons, whorehouses and casinos that followed and served the railroad workers as they progressed across the country. The towns were often temporary and the large tents and competing businesses folded and moved along with the construction of the railway.

The building of the Transcontinental Railroad was contracted to two companies: The Central Pacific Railroad (C.P.) building from Sacramento, Calif., in the west and the Union Pacific Railroad (U.P.), building from Council Bluffs, Iowa, in the east. As the chief engineer for the Union Pacific, Dodge had the immense responsibility of determining the best route for the railroad, how the lines would navigate over mountains and through valleys and where towns would be developed along the route. For this task, he would rely at least in part on his Norwich education as an engineer.

(continued on next page)

'Hell on Wheels' (continued)



Dodge's significant contributions to building the Transcontinental Railroad and his engineering, railroad and political experience did not come without challenges. For the man who would be called America's greatest railroad builder by author and historian Stephen E. Ambrose ("Nothing Like It In the World: The Men Who Built the Transcontinental Railroad 1863-1869") the path was not an easy one and almost did not happen.

It was a family connection that landed Dodge at Norwich University. At the age of 14, Dodge was working on the farm of Mrs. Edward Lander in Salem, Mass. Mrs. Lander's son, Frederick, was a cadet at Norwich. Dodge assisted with surveying a small railroad for the family and Frederick Lander encouraged Dodge to become a civil engineer and to obtain a military education.

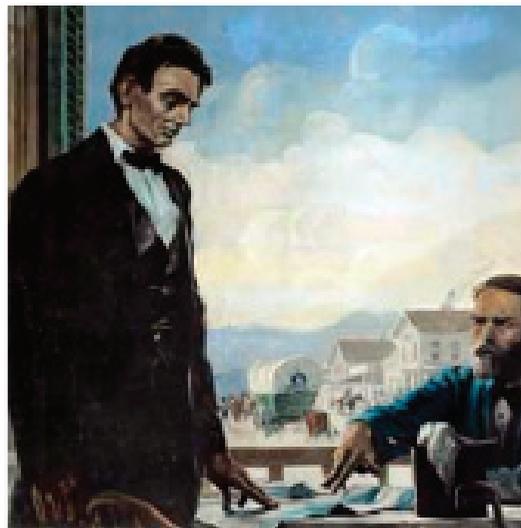
In September of 1848, Dodge entered Norwich and it was here that he would first become interested in the concept of a transcontinental railroad. Dodge would earn a Bachelor of Arts and civil engineering degree and in July of 1851, he graduated as a civil and military engineer from Capt. Alden Partridge's military school taking one season's practical course in the field.

At Norwich, Dodge boarded with the widow of Col. Truman B. Ransom, a former president of Norwich, who was killed in 1847 leading a

regiment in the Mexican War. Dodge would follow two of the Ransoms' sons and fellow classmates, Thomas and Dunbar, to Illinois where he began working as a land surveyor, according to the Norwich archives (archives.norwich.edu).

Dodge developed a reputation as an extremely skillful surveyor and was well-respected for his abilities to envision the best routes for railroad lines as well as assess lands for valuable minerals and resources.

On Aug. 14, 1859, Abraham Lincoln, then the candidate for the Republican nomination for president, had been campaigning in Council Bluffs, Iowa, when Dodge was pointed out and Lincoln was told that Dodge knew more about railroads than just about anyone. After being introduced, Lincoln immediately sought Dodge's advice on the best route for a Pacific railroad to the West.



Railroad attorney Lincoln met with railroad surveyor Dodge, 1859 in Iowa.

Lincoln was very interested in this railway crossing the country and he recognized the value it would have to the country. The two would talk for the next two hours after which Dodge would say of Lincoln's inquiry "He shelled my woods completely and got all the information I'd collected" as related in Ambrose's book .

The O. Dan Lashley Memorial Scholarship

by Thomas Izzarelli, Guidon Staff Writer, April 24, 2017

RTI Drafting & Design Student Kelly Weigle awarded the O. Dan Lashley Memorial Scholarship.

For the Fall 2016 semester, Kelly Weigle was awarded the O. Dan Lashley Memorial Scholarship at Rolla Technical Institute (RTI) in Rolla. Presenting the scholarship to Kelly is selection committee member and Missouri State Land Surveyor Darrell Pratte, PLS. Kelly will graduate from the Rolla Technical Institute Drafting & Design Program in May 2017.

The annual \$500 scholarship was commissioned by O. Dan Lashley, a long-time Department of Natural Resources surveyor and Rolla resident, specifically for an RTI Drafting & Design second year student interested in land surveying. Mr. Lashley had a love of surveying, educating young people about the profession, and encouraging them to consider a career as a Professional Land Surveyor. 🟩



Pictured from left: Kelly Weigle, Darrell Pratte, PLS

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Colorado's Survey Errors are Borderline Crazy

by Mike Smedley, Contributing Columnist, *The Durango Herald*, May 1, 2017, <https://durangoherald.com/>

As a Colorado native, Denver-born in the 1950s and now living in Durango heaven, I have only recently become aware of the imperfect nature of our rectangular state. While I understand the longitudinally challenged Utah border near Paradox, I have not been able to find a story behind the notch in our southern border southwest of Chromo in Archuleta County. Can you help? Sign me, Wrecked Angle

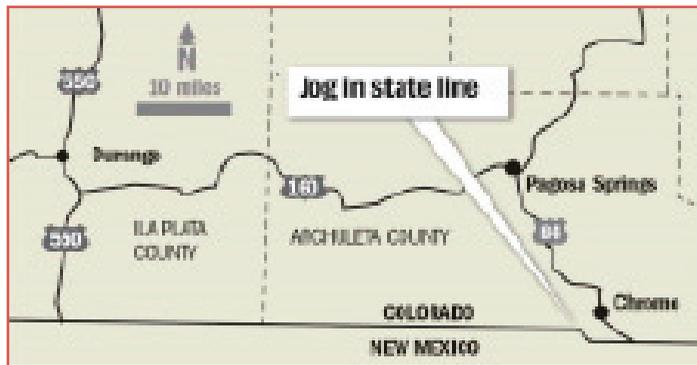
First, let's establish that Colorado is neither perfect nor rectangular.

The first part is painfully obvious. But Action Line won't get into Colorado's faults, foibles, fatuousness, flimflammy, flaws, flubs and foolishness.

And those are but some of the F-words. There are others. We'll move on.

Regarding the rectangle, Colorado appears to be a symmetrical box.

But zoom in on Google maps and you'll see the border jogs – not only at Paradox, but most notably along the New Mexico border, including the weird Chromo kink.



This might be the first and only time Chromo has been called kinky. Again, we'll move on.

In the mid-1800s, Congress designated the border between the Colorado and New Mexico territories as "the 37th parallel, between the 103rd and 109th meridians."

So the federal government hired two surveying parties, one in 1868 and the other in 1874.

The limitations of 19th century surveying are staggering. Consider that state-of-the-art technology consists of a transit and compass, chronometer and astronomical readings.

And pack animals, bedrolls and a chuckwagon. You had to really enjoy camping to be a surveyor in those days.

Everything was swell with the border until the turn of the

century. Then the states and Congress began bickering about the state line.

A federal survey was redone and the original demarcations were found to be way off. As a result, a large strip of the Centennial State would need to be transferred to the Land of Enchantment.

That strip included most of a town, two villages and five post offices.

Colorado was rightly miffed, New Mexico was thrilled and Congress in 1908 voted to adopt the new line, which President William Howard Taft promptly vetoed.

The issue hit the Supreme Court. In a 1925 ruling (read it at <http://tinyurl.com/border-jog>) the Supremes said "chill out and get over it."

Not really, but words to that effect.

Noting that states were created based on the original border and the fact that it had been in effect for a half century, the court said "governments are bound by the practical line that has been established as their boundary, although not precisely a true one."

The situation at Paradox was also a mapping error.

In 1879, a survey was ordered to draw a straight line from the Four Corners north to Wyoming.

When crews got to Wyoming, surveyors realized they were off, and a westward jog had to exist somewhere.

They discovered a 1-mile deviation over an 8-mile stretch near Paradox. Isn't it ironic that Paradox would be the site of an official surveying anomaly?

But the story doesn't end there.

The Four Corners monument is in the wrong spot by 1,807.14 feet to the east, according to the National Geodetic Survey.

Talk about monumental errors!

But moving the Four Corners to the "correct" place would be way over the line.

Thanks to that Supreme Court ruling, the established marker is the correct one despite being incorrect.

So don't fret about that photo of you on hands and knees at the Four Corners.

You were legally in Colorado, Utah, Arizona and New Mexico at the same time, even though you weren't. 🇺🇸

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MSPS's representative to the National Society of Professional Surveyors, Troy Hayes, attended the annual Lobby Day where he met with several of the Missouri Delegation to discuss advances in surveying. From left to right in this photo is Tim Bohn and Ryan Burley of Surdex, Senator Roy Blunt and Troy Hayes, PLS.

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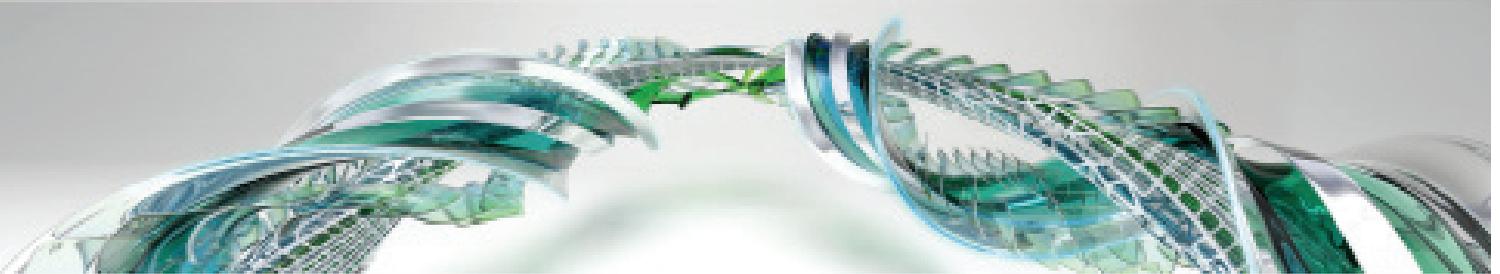
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- Calculator Use & Basic algebra
- Trigonometry and Geometry
- Traverse Calculations and Coordinate Geometry
- Surveying Math Applications

Thursday, August 24 ~ 8:00 am - 5:00 pm & Evening Session

Surveying Fundamentals

- Errors Analysis & State Plane Coordinates
- Route Surveys, GPS & GIS
- Exam Preparation, Legal Principles & Definitions

Friday, August 25 ~ 8:00 am - 3:30 pm

Missouri Practice

- Missouri Minimum Standards & Board Rules
- Missouri GLO System, Resurveys on Missouri's GLO system (RSMO Chapter 60)
- Other Missouri Statutes, Riparian Boundaries

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INSTRUCTORS

Dr. Joseph Paiva, PLS, is a geomatics and business development expert and a former university educator, who is now CEO and Principal of GeoLearn (www.geo-learn.com), an online education company specializing in courses for professionals and technicians in the geospatial industry.

Dr. Dick Elgin, PLS, PE, works for Archer-Elgin Surveying and Engineering, LLC (Rolla). He authored "The U.S. Public Land Survey System for Missouri."

Mike Flowers, PLS, is the former Missouri State Land Surveyor. He is a member of the Missouri Board of Architects, Professional Engineers, Professional Surveyors and Landscape Architects.

All are well known surveying professionals. Joe Paiva helped found the Review Course and for years all three have previously taught parts of it.



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Three Life Changing Questions: One Foundational Leadership Principle

by LtCol Danny White, USMC (Retired)



Many leadership talks I heard while serving as a U.S. Marine Corps officer focused on how to lead a military unit, lead organizations, or develop your Marines to be better leaders. I don't recall ever hearing a military speaker share about how do you lead yourself.

As a student of leadership, I find this surprising. One of the first principles the instructors taught us, during officer candidates school (i.e., officer boot camp), then again during

our initial training as brand new Second Lieutenants, was "Know yourself and seek improvement." In fact, this principle was always first in the list of 11 Marine Corps leadership principles.

As a brand new Marine, I naively thought, "Hey, that's easy. Put a check in that box and move on to the next principle." As a Lieutenant Colonel, I realized, "That principle is a very profound one. I'm just now gaining a basic understanding of it."

So what changed for me as a leader during the 21-½ years between those two internal dialogs? Through a series of events, I was challenged with three life-changing questions:

- 1) Who are you?
- 2) What are you doing here?
- 3) Why do you act and react the way you do?

While wrestling with answering those three questions honestly, the proverbial light bulb went on—in answering those questions honestly, I now had a rudimentary grasp of "Know yourself and seek improvement."

Other experts have discussed this leadership principle when looking at other organizations. In *Heroic Leadership: Best Practices from a 450-Year-Old Company That Changed the World*, Chris Lowney writes that "All leadership begins with self-leadership.... We're all leaders, and we're leading all the time, well or poorly."

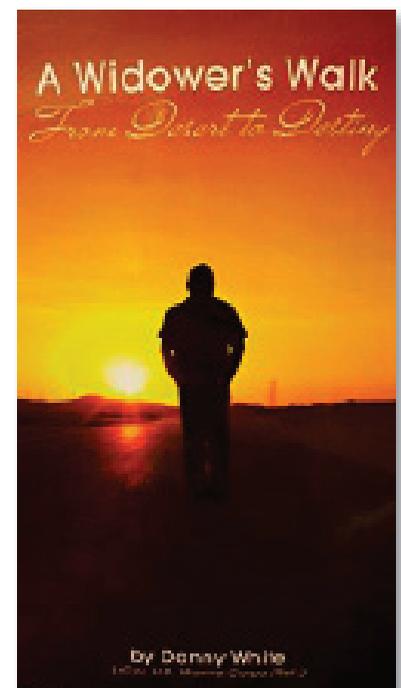
Then in *The Power of Four: Leadership Lessons of Crazy Horse*, Joseph Marshall discusses the Lakota Indian chief Crazy Horse and how he developed as a leader within his tribe. Perhaps not surprisingly, Crazy Horse's first leadership principle was "Know yourself."

Thus, I believe that by answering these three life-changing questions honestly, we will then know how to lead ourselves—and do so well, not poorly. Then we'll be in a position to better lead others and organizations. Otherwise, a leader will plateau as he or she attempts to lead others and organizations while not understanding how to lead himself or herself.

As a bit of a warning, it was not an easy process for me to work through, and at times wrestle with, those three questions. There was a great deal of soul searching and brutal honesty—discovering insecurity, being a workaholic, and defining myself by rows of military medals. Yet the result was more than worth it, as I gained a quiet confidence as a wiser leader and better equipped to serve my work place, family and community.

Will you accept this challenge—to answer these three questions? 🇺🇸

Endnote: Danny White is a proud associate member of Missouri Society of Association Executives. After transitioning from the Marine Corps, he founded Lead with Liberty (www.leadwithliberty.com) a leadership speaking/consulting/coaching business—to share leadership lessons learned as a Marine, husband, and father. In 2014, he published *A Widower's Walk: From Desert to Destiny*.



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