

November 2020

# SIDE SHOTS

Professional Land Surveyors of Colorado

Volume 51, Issue 4

## NATIONAL GEODETIC SURVEY PERFORMING GPS ON BENCH MARK

— PAGE 10

Prst std  
U.S. Postage  
PAID  
Denver, CO  
Permit No. 1222

Becky Roland  
Executive Director  
PLSC, Inc  
PO Box 441069  
Aurora, CO 80044



Frontier Precision is committed to ensuring your business has what it needs, whenever and wherever you need it. We keep you working with vital equipment, repairs, rentals, and supplies. We have one of the nation's largest rental fleets of surveying, construction, and mapping products. If you need equipment to keep your crews working, but aren't ready to purchase, contact one of our rental specialists for a competitive quote on long and short term rentals. Frontier Precision - always in your corner.

The elements are not in your corner.  
The deadline is not in your corner.  
The access to the job site is not in your corner.  
We are.

Want more information? Contact:

Jason Dysthe, Geospatial Sales Representative  
[jasond@frontierprecision.com](mailto:jasond@frontierprecision.com)  
720.214.3500 or 800.652.1522 [Toll Free]



Frontier Precision | 5480 West 60th Avenue, Unit A | Arvada, CO 80003



**PROFESSIONAL LAND SURVEYORS  
OF COLORADO, INC.**

AFFILIATE—NATIONAL SOCIETY OF  
PROFESSIONAL SURVEYORS  
MEMBER—COLORADO ENGINEERING COUNCIL  
MEMBER—WESTERN FEDERATION OF  
PROFESSIONAL SURVEYORS

**OFFICERS (2020)**

**STEVE PARKER**  
*President*  
land\_surveyist@hotmail.com  
O: 719-590-9194

**DON HULSEY**  
*Vice President*  
don@csamlc.com  
M: 719-209-2029

**SHAUN LEE**  
*Secretary/Treasurer*  
sdl051@yahoo.com  
O: 570-499-8073

**BECKY ROLAND**  
*Executive Director*  
PO Box 441069, Aurora, CO 80044 • broland@plsc.net  
Phoenix AMC O: (303) 551-3266 F: (720) 230-4846

**2020 PLSC CHAPTER  
ORGANIZATION**

**CENTRAL COLORADO PROFESSIONAL SURVEYORS**

**President, Robert Boehm**  
Vice President, Derek Brown; Secretary, Cole Conger  
Treasurer, Daniel Davis  
Directors: Devon Arnold, Dane Courville, Jeff MacKenna,  
Laura Minch, Tony Peall, Brian Socia

**NORTHERN CHAPTER - PLSC, INC.**

**President: Tony Fendick**  
President-elect: Laine Landau; Secretary/Treasurer, Heather Lassner  
Directors: Steve Parks, Michael DeDecker, James Snow, Pete Paulus  
President Emeritus: Steve Parks

**NORTHWEST 1/4 COLORADO  
LAND SURVEYORS**

**President: Brian T. Kelly**  
Vice President, William Whelan; Secretary/Treasurer, Jeff Gustafson  
Directors: Thomas H. Effinger, Skidge Moon, Walter Magill,  
Lloyd Powers, Peter Epp  
President Emeritus: Gordon Dowling

**SOUTHERN COLORADO PROFESSIONAL  
LAND SURVEYORS**

**President: Don R. Hulsey**  
Vice President: Mark Johannes; Secretary: Steve Parker  
Treasurer: Dan Hanten  
Directors: Jon Tessin, Steve Rutzen, Eric White,  
Joseph Alessi, III, Kenneth Gould, Jr., Dennis Craig, Spencer Barron  
President Emeritus: Steve Parker  
Honorable Lifetime: Nathan Lira, PLS

**SOUTHWESTERN CHAPTER - PLSC, INC.**

**President: Todd Johnson**  
Vice President: Josh Casselberry  
Secretary /Treasurer: Dave Seiler

**WESTERN COLORADO LAND SURVEYORS**

**President: Brian Bowker**  
Vice President: Chris Ransier; Secretary-Treasurer: Alex Lheritier  
Directors: Scott Thompson, Peter Krick, Tom Sylvester  
Sean Mullen, Kurt Shepherd, Alec Thomas, Ted Juntilla

# SIDE SHOTS

**NOVEMBER JOURNAL 2020**

**VOLUME 51**

**NUMBER 4**

■ President's Letter .....	4
■ From the Editor .....	5
■ Save the Date! Rocky Mountain Surveyors Summit.....	7
■ Bureau of Land Management Letter .....	8
■ New National Geodetic Survey Rocky Mountain Regional Advisor .....	10
■ In Memoriam – Dexter Brinker, PE-PLS .....	14
■ PLSC Refresher Course .....	16
■ Elevations, Now Called Heights.....	18
■ Rule of the Month – You Make the Call .....	21
■ WCC Surveying Program Update.....	23
■ WFPS – State Matrix .....	26
■ NSPS Government Affairs Update.....	27
■ PLSC Board of Directors Meeting Minutes .....	37
■ Chapter News .....	39
■ Sustaining Members .....	42

**ON THE COVER:** Photo of the 2017 Geoid Slope Validation  
Survey over Wolf Creek Pass along Hwy 160. Photographer,  
Brian Shaw

*Side Shots is the official publication of the Professional Land Surveyors of Colorado, Inc.  
and is published quarterly for the betterment of the surveying profession.*

**Steve Parker**  
*President*

**Don Hulsey**  
*Vice President*

*For Editorial Correspondence, contact:*

**Chris Power**

*Editor: Side Shots*

3825 Iris Ave., Suite 395, Boulder, CO 80303  
303-443-7001 • cpower@flatironsinc.com

*This publication is not copyrighted and articles may be reprinted with due credit.  
Statements made and opinions expressed are from the contributors and do not necessarily  
express the official views of the Professional Land Surveyors of Colorado, Inc.*

**Deadlines for editorials, articles, pictures and advertising are January 1, April 1,  
July 1 and October 1. All material received after the current deadline will appear  
in the next issue of Side Shots.**

*We would like to invite anyone who is interested to advertise in Side Shots.*

*Do you have something you want to sell, trade or buy? Why not use Side Shots for your  
next ad? We can also reproduce business cards for advertising. Ad space reservation must be arranged  
with Becky Roland, PO Box 441069, Aurora, CO 80044; 303-551-3266.  
(Deadlines: January 1, April 1, July 1 and October 1).*

**Current Advertising Rates:**

*Business card size or less - Member \$25.00; Non-member \$30.00*

*One-Half Page - Member \$115.00; Non-member \$150.00*

*Full Page - Member \$225.00; Non-member \$300.00*

*Color advertisements — add 33 percent*





## PROFESSIONAL LAND SURVEYORS OF COLORADO, INC.

PO Box 441069, Aurora, CO 80044

AFFILIATE – NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS  
MEMBER- WESTERN FEDERATION OF PROFESSIONAL SURVEYORS

### OFFICERS (2019-2020)

DON HULSEY  
VICE PRESIDENT  
M: (720) 209-2029  
don@csamllc.com

TODD BEERS  
PAST PRESIDENT  
O: (303) 353-3528  
todd.beers@merrick.com

STEVE PARKER  
PRESIDENT  
O: (719-641-3355)  
president@plsc.net

BECKY ROLAND  
EXECUTIVE DIRECTOR  
O: (303) 551-3266  
broland@plsc.net

SHAUN LEE  
SECRETARY-  
TREASURER  
O: (570) 499-8073  
sdl051@yahoo.com

### DIRECTORS (2017-2020)

BRIAN DENNIS  
O: (719) 337-1262

LEIF JOY  
O: (970) 878-5292

TOM SYLVESTER  
O: (970) 255-7386

MIKE GREER  
O: (303) 271-8787

### DIRECTORS (2019-2022)

ERIC CARSON  
O: (303) 980-9104

SCOTT THOMPSON  
O: (970) 244-1821

ERIC WHITE  
O: (719) 268-8500

HEATHER LASSNER  
O: (970) 310-4089

### WFPS DELEGATES (2019-2020)

ROGER NELSON  
O: (720) 587-2657

TODD BEERS  
(O): 303-353-3528

### NSPS DIRECTOR (2019-2020)

TODD BEERS  
(O): 303-353-3528

Our surveying profession has a challenge that we grapple with every year, but we need not look far for answers. Here are the three challenges: The Department of Labor statistics show a relatively low interest in becoming a surveyor, we have an aging demographic of professionals, and there is economic uncertainty due to a global pandemic. As we adapt to the “new normal,” and our young people try to make heads-or-tails of what the future holds, I believe now is the best time for us, as a body of professionals who love their work, to reach out to this up-and-coming generation. Surveying professionals in Colorado, together with the PLSC, are proactively facing these hurdles head-on as we enter 2021. I highly encourage you to get involved.



The future of surveying remains a priority for the PLSC. The surveying profession, much like other occupations, recognizes that our future depends on our entry-level technical staff and young professional surveyors. Working together with existing educational programs and helping to establish new programs like the one at Western Colorado Community College (WCCC), we can network with would-be surveyors and surveying/engineering employers to create apprenticeship and hiring programs that join formal education with job opportunities.

PLSC has been participating with the Colorado School Counselor Association (CSCA) annual conferences to promote the profession to high school counselors. We use this conference to promote vocational surveying programs at the high school level. Also, the NSPS Trig-Star program and competition is used to expose high school math students to surveying.

The NSPS Certified Survey Technician (CST) is not only a tool for providing certification for survey technicians, but it is also used to promote the surveying profession to college students and career oriented entry-level staff. By utilizing the materials and testing, a technician can earn U.S. Department of Labor-recognized certification of their profession to help maximize their employment.

In addition to these more formal avenues, young surveyors have an opportunity to network with their counterparts across the state. After attending a couple of NSPS Young Surveyors Network (YSN) gatherings, I am amazed with this group as they continue to grow as professionals. As their membership grows, the PLSC is incorporating ways to blend the next generation's skillsets and ideas into our strategic plans and leadership. If you are a surveyor under the age of 35, join today and become part of the future of our profession. If you are surveyor over 35, pass this information to a young surveyor.

The PLSC recognizes that, to reach our younger generations, we must adapt our communications approach. We transitioned most of our communications to web-based meetings, email newsletters, social media, and the PLSC website (plsc.net). We are constantly on the lookout for surveying-related topics, original surveying content and would welcome any ideas and feedback.

Sincerely,  
Steven Parker, PLS CFM CFedS  
PLSC President [president@plsc.net](mailto:president@plsc.net)



In the August issue, news of Covid-19 cases seeming to level off was our main concern. That seems like a year ago. Now cases are increasing again, most everyone is in a mask, winter is coming, and no one knows what is going to happen in the next several months. Perhaps even more notable for Colorado

residents, 2020 may be remembered most as the year of the wildfires. There are so many near the Front Range at the time of this writing, it's easy to mix up the names; Cameron Peak, Mullen, Cal-Wood, Williams Fork, and a monster with a name not lacking in understatement, the East Troublesome Fire. We wear masks as much for the smoke particles as the virus. And yet, surveying activity around the state seems to be keeping everyone very busy. It's a year to remember. And forget.

Maybe this issue of Side Shots will take your mind off of your worries. We have a lot to offer this time.

Our cover story is an article by Brian Shaw, the new National Geodetic Survey Rocky Mountain Regional Advisor, who has taken on the previous roles of Pam Fromhertz, has written an introduction himself, plus items about the NSRS Modernization Release delay, the NGS Webinar Series, an online lesson, and the GPS on Benchmarks Campaign that is still ongoing. I welcome Brian to Side Shots and hope that he becomes a regular contributor.

On a sad note, one of the founders of the PLSC has died, Dexter Brinker. He was the first PLSC President, in 1966, and was well known for founding the Brinker School of Surveying and Mapping in Denver, with over

200 alumni. Our thanks to Mickey Shackelford and the Brinker family for contributing his story and photos.

There is an announcement of next year's PLSC Land Surveying Refresher Courses, which will run from January 6<sup>th</sup> to March 17<sup>th</sup>, 2021. Please spread the word to anyone you know who is preparing to sit for the exam next year. Next is another fine article from Gaby Neunzert, "Elevations – Now Called Heights" and a Rule of the Month column from Earl Henderson, "You Make the Call." Tom Sylvester has an update on his surveying program at Western Colorado Community College along with an article on how "We Need to Talk to Each Other More."

Todd Beers sent a spreadsheet with data from the Western Federation of Professional Surveyors (WFPS) that shows some interesting information on memberships, licensing details, education, publications and laws, for 7 of the 13 participating states. And he also contributed an NSPS Government Affairs Update with much national news of interest.

Dean Glorso sent us a poem called "Oscar Bart," along with a photo of him surveying the planned site of the US Marine Corps Memorial Expansion, at 6<sup>th</sup> and Colfax.

And we conclude with Board of Directors minutes from the September 8<sup>th</sup>, 2020 meeting, and the always interesting Chapter News.

Thanks to everyone who took the time and made the effort to send these things, and for everyone's continued support of Side Shots. Let's all hope for a much better 2021.

Chris J. Power, Editor

## **An unusual 'level' without a level vial.**

Submitted by Gaby Neunzert, PLS

A non-surveying physicist friend of an archeology author had an unusual idea for a 'leveling stick', which could have been made before a level vial was invented. His suggestion was to start with an 8 to 10 ft bamboo stick and initially just tie a string in the middle. By trial and error, the tie point would then have to be moved to find a rough horizontal balance location. For actual leveling, an assistant on each end would mark the initial alignment. Like with an optical level, it would then be necessary to reverse ends. The difference between the two foresights would be the horizontal, thus eliminating the need for finding the exact balance point. This method obviously needs a 3-person crew, no wind and a large amount of patience.

# Aibot X6

## Flexible surveying & geo-mapping

- Safely go where conventional equipment can't reach
- Point cloud generation, volumetrics, GM creation
- Creation of location & inventory plans, topographic images, planning fundamentals, and aerial photos



Call 1-800-545-0932  
for your demo

**HOLMANS | USA**  
PRECISION PERFORMANCE SINCE 1955  
6201 Jefferson St. NE, Albuquerque, NM 87109 | [www.HOLMANS.com](http://www.HOLMANS.com)

## Complete Photogrammetric Services

# MAP WORKS

**Contact: Ralph Vomaske, Certified Photogrammetist, ASPRS**

**7625 W. 5th Ave. #110D • Lakewood, CO 80226**

**Phone: 303-667-3540**

**E-mail: [gmapworks@gmail.com](mailto:gmapworks@gmail.com)**

# SAVE THE DATE

## PROFESSIONAL LAND SURVEYORS OF COLORADO

### 2021 Rocky Mountain Surveyors Summit



**When: February 24– 26**

**Where: Denver Marriott West**

The Rocky Mountain Surveyors Summit is currently being planned as an in-person conference with our Featured Speaker and CFedS.

Additional education is planned to be available via online webinar.

Look for a full schedule of speakers and topics this Fall through *Side Shots* and the PLSC website.



**PLSC**

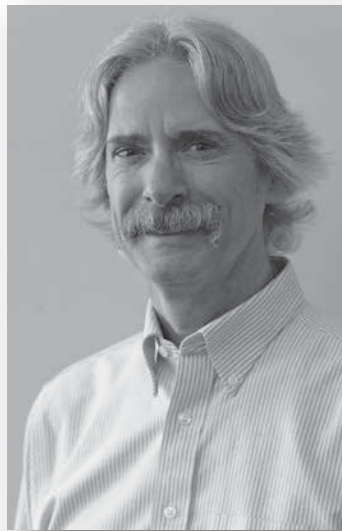
**PROFESSIONAL LAND  
SURVEYORS OF  
COLORADO**

PO Box 441069  
Aurora, CO 80044

Phone: 303-551-3266  
Direct questions to:

Becky Roland, PLSC Exec. Director - [broland@plsc.net](mailto:broland@plsc.net)  
Kayce Keane, RMSS Chairman - [kayce@blcsurveyors.com](mailto:kayce@blcsurveyors.com)

### OUR FEATURED SPEAKER:



Gary Kent is in his 38<sup>th</sup> year with Schneider Geomatics in Indianapolis - having transitioned to part-time status this year - and, also provides training, consulting and expert witness services as manager of Meridian Land Consulting, LLC. He has served on the Indiana State Board of Registration for Professional Surveyors since 2004 and is a past-president of both the American Congress on Surveying and Mapping and the Indiana Society of Professional Land Surveyors. Gary has presented programs on boundary law, easements and rights of way, surveying standards and practice, and leadership in all 50 states and is frequently sought as an expert witness in cases related to boundaries, easements and survey standards.

### FEATURED PRESENTATIONS:

*The Art of Retracement*

*Surveyors Judicial Role*





United States Department of the Interior  
BUREAU OF LAND MANAGEMENT  
Colorado State Office  
2850 Youngfield Street  
Lakewood, Colorado 80215-7210  
[www.co.blm.gov](http://www.co.blm.gov)



CO-956  
9650

September 25, 2020

Mr. Chris Power, Editor  
Side Shots  
3825 Iris Ave.  
Boulder, Colorado 80301

Dear Mr. Power:

This letter informs you of official BLM cadastral surveys in Colorado that have been accepted from May 29, 2020, through August 10, 2020, officially filed, and are now available in the Public Room, Bureau of Land Management, Colorado State Office, 2850 Youngfield Street, Lakewood, Colorado 80215. The surveys will also be available at <https://glorerecords.blm.gov>.

The accepted surveys are listed below by township, range, meridian, group number, type, approval date and number of plats.

<u>Township</u>	<u>Range</u>	<u>Meridian</u>	<u>Group No.</u>	<u>Type</u>	<u>Approved</u>	<u>Plats</u>
T. 14 S.	R. 100 W.	Sixth	1700	Plat & Notes	05/29/20	2
T. 6 S.	R. 90 W.	Sixth	1717	Plat Only	06/25/20	2
T. 1 N.	R. 102 W.	Sixth	1725	Plat Only	07/21/20	2
T. 36 N.	R. 1 W.	NMPM	1669	Plat & Notes	08/10/20	1

As other surveys are completed, I will advise you of their acceptance. You may circulate this letter among the membership of the Professional Land Surveyors of Colorado.

Sincerely yours,

Randy Bloom  
Chief Cadastral Surveyor for Colorado



# Need to get Utilities located?



Don't let these guys scare you..

## **Call UCS for Utility Locating**

**We will tell you what they are hiding under those boxes...**



**Underground  
Consulting Solutions**

**- QUALITY -  
- DEPENDABLE -  
- EXPERIENCED -**

*We'll get the job done right -  
the first time*



**Underground  
Consulting Solutions**



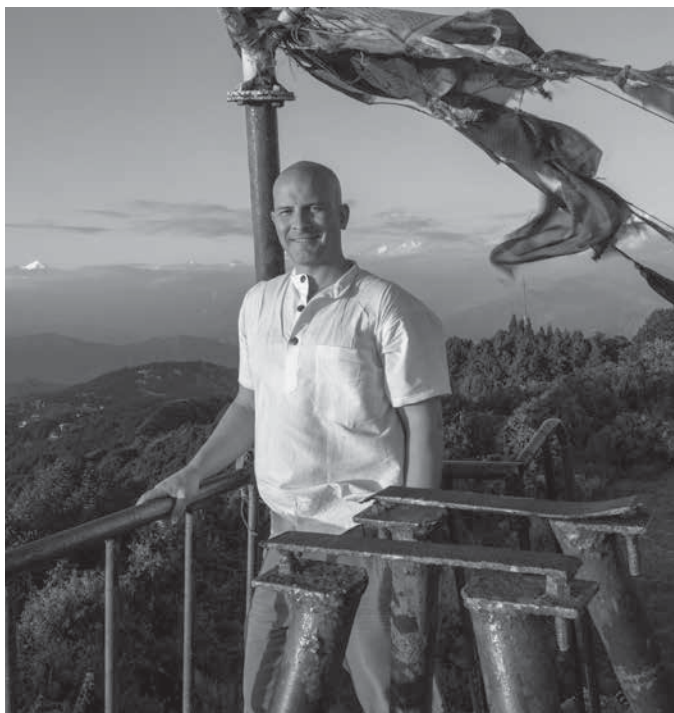
**Private and Engineering Utility Locates**

# New National Geodetic Survey Rocky Mountain Regional Advisor

By Brian Shaw

Rocky Mountain Regional Advisor (CO, MT, WY)

NOAA's National Geodetic Survey (NGS)



It is with great pleasure that I was selected to become the new NGS Rocky Mountain Regional Advisor working out of the NOAA office in Boulder, Colorado. I have the honor to follow in the footsteps of Pam Fromhertz, who was the previous Regional Advisor as well as the Colorado State Advisor for many years prior to the regional transition. I have worked for NGS since 2002 and in 2013 I began working as a geodesist very closely with the advisor branch chief and the geodetic advisors. Working so closely with the advisors has helped me to appreciate how this job is a very important connection between NGS and our regional constituents. This job is essential in helping to inform our customers about the many things that NGS organizes, develops, and maintains for the National Spatial Reference System (NSRS) and other critical geodetic infrastructures. As a federal civil servant I am honored to have my primary duty be to inform and prepare the Rocky Mountain regional constituents. I look forward to working with all of you to prepare Colorado for the modernization of the NSRS. I am a Rocky Mountain man at heart, having grown up in Colorado Springs and both of my parents were born in this beautiful region. As I adapt to my new role attending meetings, conferences, and webinars in Colorado, I look forward to meeting all of you at these

events virtually in the near term and in person in the future.

The best way to reach me is via email at [brian.shaw@noaa.gov](mailto:brian.shaw@noaa.gov) and you can find other contact information on the advisor website. <https://geodesy.noaa.gov/ADVISORS/>

## National Geodetic Survey Update

### NSRS Modernization Release Delayed

NGS has been working on developing and rolling out the modernized NSRS to replace the North American Datum of 1983 (NAD 83), the North American Vertical Datum of 1988 (NAVD 88) and the State Plane Coordinate System of 1983 (SPCS 83) originally planned for 2022. Due to various issues, NGS recently determined we were not going to be able to complete all of the things needed to release the new Reference Frames, Geopotential Datum, SPCS2022 and all of the tools and transformations needed for the modernized NSRS by 2022. Even though some components can be completed earlier, it was decided that it would be best to roll out all of the parts of the modernized NSRS together. Currently we are estimating this will occur in the 2024–2025 timeframe.

Read the Official Delayed Release Message here:

<https://geodesy.noaa.gov/datums/newdatums/delayed-release.shtml>

FAQs for this delay here:

<https://geodesy.noaa.gov/datums/newdatums/FAQNewDatums.shtml>

## Notable Dates and Deadlines

### March 31, 2021 — SPCS2022 Deadline for Submitting Completed Designs

The SPCS2022 deadline for submitting requests and proposals has passed and was in March of this year. The next deadline for submitting completed designs for the constituent defined zones will be March of 2021. John Hunter, the NGS state geodetic coordinator is leading this effort developing Low Distortion Projection (LDP) zones for Colorado. While the NGS deadline is next year the state geodetic coordinator has set an internal deadline for December 1, 2020, to allow time to get everything together and ready to submit for the NGS deadline.



For more information please visit:

<https://geodesy.noaa.gov/SPCS/policy.shtml>

## **December 31, 2021 — Submitting GPS on Benchmarks for the Transformation Tool.**

In 2019 NGS started the GPS on Benchmarks Campaign for the 2022 Transformation Tool by releasing a list of approximately 90,000 benchmarks across the United States and Territories to help define transformations between the current vertical datums (NAVD 88 for Colorado) and the future North America-Pacific Geopotential Datum of 2022 (NAPGD2022). To provide NGS with enough time to build the best transformation tool, December 31, 2021 was established as a cutoff date for data to be included. More information about the GPS on Benchmarks campaign is provided below or you can visit:

<https://geodesy.noaa.gov/GPSonBM/>

## **December 31, 2022 - Deprecation of the U.S. Survey Foot.**

Over the last year NGS has been working with the National Institute of Standards and Technology (NIST) to deprecate the U.S. survey foot. There have been many webinars on this topic that can be found on the NGS website that go into the history of why this is happening. When the modernized NSRS is released it will only use the international foot but NGS will still support the U.S. survey foot for uses with the SPCS of 1983 and 1927. You can read or respond to the Federal Register Notice about the deprecation of the U.S. survey foot here:

<https://www.federalregister.gov/d/2020-21902>

## **Notable Information**

### **NGS Webinar Series**

Every month NGS hosts webinars where speakers present information related to NGS programs, projects, products and services. These webinars help to educate and engage our constituents and help us to gather feedback from our customers. Registration is free for all of these webinars and they are recorded and made available for people to view at a later date.

[https://geodesy.noaa.gov/web/science\\_edu/webinar\\_series/](https://geodesy.noaa.gov/web/science_edu/webinar_series/)

### **New Online Lesson**

NGS has developed Online Lessons in partnership with The COMET Program providing self-paced lessons on geodetic topics. The newest lesson “GNSS Positioning: Survey Planning and Data Acquisition” is the fifth lesson developed by NGS. This lesson joins Foundations

of GNSS, two lessons on Gravity for Geodesy, and a lesson about Understanding Heights and Vertical Datums. These lessons are great opportunities to learn more about geodesy. Registration is required to take the training, but the lessons are free to any registered user.

[https://geodesy.noaa.gov/web/science\\_edu/online\\_lessons/index.shtml](https://geodesy.noaa.gov/web/science_edu/online_lessons/index.shtml)

There are also several educational videos developed in coordination with COMET on datums, surveying, and other topics that can be viewed here:

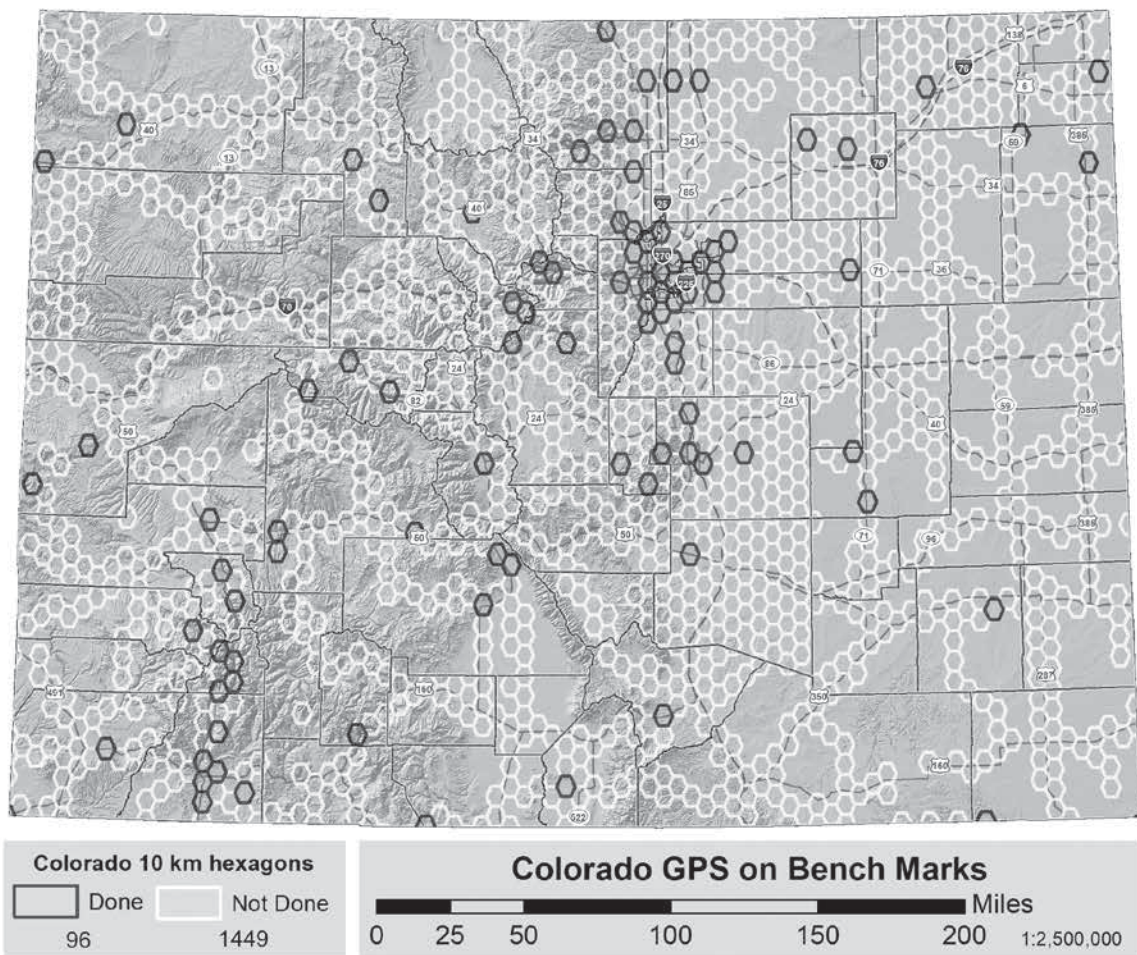
[https://geodesy.noaa.gov/corbin/class\\_description/NGS\\_Video\\_Library.shtml](https://geodesy.noaa.gov/corbin/class_description/NGS_Video_Library.shtml)

### **GPS on Benchmarks**

As mentioned above, NGS currently has an active GPS on Benchmarks Campaign for the 2022 Transformation Tool, running through December 31, 2021. This campaign’s primary goal is to acquire as much data as possible to make the best transformation from the current vertical datums to NAPGD2022. To do this NGS has done a significant amount of analysis to identify and prioritize the benchmarks that would contribute the most to making the best transformation. The benchmarks selected for the priority list have two primary classifications that will impact the scale and the quality of the transformation. NGS is requesting two independent occupations on each mark to have confidence in the ellipsoid heights observed that will be used.

For scale, NGS decided to have two scales of marks to help our constituents evaluate their local needs. The first scale created hexagons at a spatial resolution of 10 kilometers which is NGS’ primary goal for nation coverage and is a resolution we believed will be challenging but possible. Since some states and localities might want to collect data at a larger scale and the resolution of the transformation grid, we have provided a second resolution at the 2 kilometer scale. This will enable cities and highly populated areas to collect occupations at a finer resolution to improve the transformation tool. A note for those that might notice that these hexagons are not truly 10km and 2km wide, you are correct! They are 2 arcminute (2 km) and 6 arcminute (10 km) hexagons which means they vary in size depending on the latitude. So if you look at hexagons in Puerto Rico they are smaller and wider than hexagons you will see in Alaska. We chose to classify them as an average distance in kilometers since we figured that would be easier for users to understand than saying 2 and 6 arcminute-wide hexagons.

For quality, NGS split the benchmarks into two priorities (A and B) based on the quality of the benchmark. Priority A benchmarks are all First and Second order benchmarks with an A, B, or C Stability. Priority B benchmarks are lower quality but were selected to help fill spatial gaps to assist the transformation spatial resolution. These



priorities also have a number tied to the benchmark that identifies if it requires 1 or 2 occupations to be completed. So a benchmark with an A-1 priority needs one more occupation while a benchmark with a B-2 priority needs 2 occupations to be completed.

Many of the benchmarks with published datasheets have not been recovered since they were monumented—often in the 1930s and 40s—so we have provided a secondary list of Permanent Identifiers (PIDs) for each hexagon allowing users to have additional benchmarks that meet the criteria in case the primary benchmark selected for a hexagon is no longer there, or is not GPSable due to various reasons. We are requesting that users submit mark recoveries for any benchmarks that are not found or are not suitable for GPS observations. NGS has recently updated our Mark Recovery Form at:

([https://geodesy.noaa.gov/cgi-bin/mark\\_recovery\\_form.prl](https://geodesy.noaa.gov/cgi-bin/mark_recovery_form.prl)) making it much more user friendly and mobile device friendly.

This form also allows you to take photos and even locate marks in your local area when using your mobile device. NGS also created a comprehensive Web Map Application at:

(<https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=6093dd81e9e947a9062e2fe5fb2f7f5>)

that allows users to explore the priority list and hexagons in their area, providing a great tool for performing

desktop recon before hitting the road to go hunt for benchmarks. The data that feeds this web map is being updated regularly, generally on a weekly basis.

So far in Colorado, 96 of the 1449 10 km hexagons have been completed so we have a long way to go to try and get as many occupied before the deadline. I have provided a map of the completed and needed hexagons for you to see your local area. I hope this inspires you to get out in the field and help this campaign either by performing GPS occupations in your local area, or going out and doing mark recoveries on the benchmarks in the priority list. These mark recoveries will greatly help NGS and other surveyors to know that a benchmark is still there or that it is not suitable for GPS. If you are interested in more technical details you can visit the Technical Details web page at:

<https://geodesy.noaa.gov/GPSonBM/technical-details.shtml>



COMM.TECH

# Increasing your bottom line

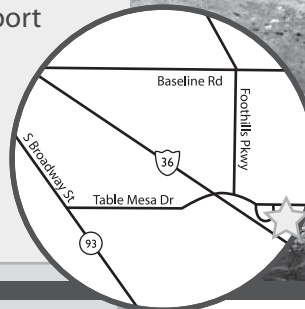
with customized drafting and design software solutions since 1994

## products

- AutoCAD LT
- AutoCAD
- Map 3D
- Civil 3D
- Infrastructure Design Suites
- Infrastructure Map Server
- Raster Design
- Design Review
- Subscription

## services

- State of the art training facility
- Implementation & customization
- Workflow analysis consulting
- Styles & standards set-up
- License activation support
- License compliance
- Technical support
- Pilot projects
- Transition assistance
- On-site consulting
- Government Specialist



303.530.4976 | [www.ctcivil.com](http://www.ctcivil.com)

5398 Manhattan Circle  
Boulder, CO 80303

**Autodesk®**

Silver Partner  
Architecture, Engineering & Construction  
Authorized Government Partner

Digital Terrain Models  
Digital Elevation Models  
Orthometric Photos

*Western*  
Research & Development, Ltd.

Topographic Mapping  
3-D As-Builts  
Contour Maps

## State-of-the-art LiDAR & Digital Imaging

### ● High Accuracy LiDAR

Maximum rate of 200,000 KHz which translates to a point cloud as high as 150 points/m<sup>2</sup>.

### ● High Definition Digital Images

Our Leica 39 megapixel RCD 105 Digital Camera produces images at two inches per pixel or higher.

### ● Real-time Decision-making

Our field & flight crews are staffed with Professional Engineers & Land Surveyors who truly understand data collection in real-time.

### ● Reliable Topographic Mapping

The helicopter flies at low altitudes and is capable of providing elevations at two-tenths of a foot or less.



Tel (307) 632-5656

5908 Yellowstone Rd, Cheyenne, WY

[www.wrd-ltd.com](http://www.wrd-ltd.com)

# In Memoriam

## Dexter Merriam Brinker, PE-PLS

### 1925-2020

#### Introduction:

The following memorial and obituary was written from a compilation of information provided by the family of Dexter Brinker after his passing earlier this year along with the official obituary published in the Durango Herald on August 10, 2020, and some information taken from back issues of Side Shots, newspapers and other publications. I have known Dexter and Mary for over 30 years through our relationship as members of the National Society of Professional Surveyors and the American Congress on Surveying and Mapping, as well as through our common friend and colleague, Mr. Art Hipp. The pictures of Dex and Mary as well as the picture of Dexter in his military uniform were provided by an anonymous family member. The group picture is from the Rocky Mountain Rescue Group (Volume 1, Issue 7, Winter 2007) at their 60th Anniversary Meeting. Dex was a founding member and one of the first Presidents and stayed active in the RMRG until his death. I am very pleased that the PLSC is memorializing Dex in this issue.

— Mickey Shackelford, PLS

By: An Anonymous Family Member and Mickey Shackelford, PLS

**Dexter Merriam Brinker, PE, PLS** was born to Waller Chenault Brinker and Madelyn Moore Keezer in Denver, Colorado on May 15, 1925, and passed away peacefully in Durango on July 19, 2020. Dexter was a descendant of Gov. William Bradford of Plymouth, MA, a passenger on the Mayflower's trans-Atlantic journey of 1620, who was a founder and longtime Governor of the Plymouth Colony settlement. Dexter's ancestors, including several historical family names were present at The American Revolution, the Civil War, and many other important events that shaped our young country. Others played essential roles in the founding and building of our country, the State of Colorado, and the City of Denver. In 1880 his great-grandparents, Joseph and Elizabeth Brinker began The Brinker Collegiate Institute in Denver, which was the first college-level school in America located west of the Mississippi River. His family played a big part in early Denver, and that spark was passed on to Dexter, who always had a passion for hard work, discovery, and service.

As a young man, Dexter's chores included caring for the chickens and shoveling snow on the whole city block. His education was guided by his teacher/mother and his attorney/banker father. He was a boy scout and played the bugle, and graduated to playing the trumpet which he played while accompanying his father who was a gifted pianist. He worked summers helping carpenters build his father's houses, and he bought a Model A Ford and took it completely apart and put it back together by himself.

Dexter attended the Colorado School of Mines on a scholarship until he was drafted into the Army in 1943 at the tender age of only 19 years old. Dexter served with the 36th Infantry Division, while attached to Headquarters as a scout and forward observer, where he received several commendations, including the Combat Infantry Badge and the Bronze Star for actions in France, and finished his Army service occupying Germany, until 1946.

On returning to the U.S., Dexter fulfilled a lifelong interest in trains and rode the D&RGW narrow gauge train throughout the entire line, including freight trains with sheep and the galloping geese. Continuing his desire to serve, Dexter helped initiate and start The Rocky Mountain Rescue Group as a founding member and remained active in the organization as a Past President. RMRG is the first organized rescue organization in Colorado that still provides leading volunteer services out





of Boulder, Colorado, and is one of the oldest and most experienced mountain rescue teams in the country.

He earned an AB degree in physics, 1949, and a BS degree in civil engineering, 1952, both from the University of Colorado. After finishing school Dexter went on to provide Civil Engineering and Land Surveying expertise throughout Colorado. He was a survey party chief on the Gross Reservoir and Dam, Dillon Reservoir Dam, Rio Grande Railroad extension at Hayden, and played various roles on many other additional major construction projects including the Moffat Tunnel and the Eisenhower Tunnel, and several other major construction projects in and around Denver.

Dexter worked for several years prior to the founding of the Professional Land Surveyors of Colorado to work with the Colorado Society of Engineers or the American Congress on Surveying and Mapping to improve the status of the land surveying profession in Colorado. He was a major founding member and the driving force in organizing the PLSC and in 1966 became the first President. Then in 1971, following his family's educational interests, he began the Brinker School of Surveying and Mapping in Denver that offered classroom teaching as well as correspondence courses, where he graduated over 200 well-trained Surveyors.

Dexter drafted several surveying bills that lead to state licensing requirements for land surveyors in Colorado. Additionally, Dexter presented many surveying papers and seminars for the PLSC, NSPS and ACSM. His work and efforts have left a major mark on Colorado's surveying profession and legislation. In 1964 Dexter even sought the Republican nod for the Office of State Senator from the Southern Senatorial District of Boulder County. Working as a lobbyist during the 43rd and 44th General Assemblies Brinker got experience directly related to the office he sought. Dexter was unsuccessful in his lone bid for State Senator.

In 1962 Dex married the love of his life, Mary Mae Massack, a teacher, and they remained together until her passing in 2016. The young couple traveled to France and Germany and Dexter remarked about how much nicer the Germans were now, compared to 1945. The Brinkers moved to Durango in 1984 and Dexter built a home close to Ignacio. Dexter and Mary never had children of their own, but Mary had all of her students who loved them both, and they are survived by several nieces, and many loving friends.

Mr. Brinker was a licensed Professional Civil Engineer and Professional Land Surveyor for most of his life, predeceased in 2016 by his wife of 52 years, Mary M. Brinker. Dexter did not wish to have services, although he and Mary were kind and good Christian people. Instead Dexter would ask those good people to get out the vote to preserve our Country and remember the sacrifice of all who worked to build it. As Sergeant

#### SOME OF RMRG'S PAST PRESIDENTS REUNITE



LEFT TO RIGHT: Dave Lewis, Dexter Brinker, Kelly Lucy, Joe Stepanek, and Bill May.

*Photo courtesy of Rocky Mountain Rescue Group*

Brinker would say "Remain vigilant and keep your powder dry!"

A loving husband and beloved family member, a good friend and great mentor, he will be dearly missed by all who knew him.

#### Another notable quote from Dex Brinker:

Regarding PLSC Legislative Committee Activities completed in 2005: To quote Dexter Brinker (one of the founding members of the PLSC, and a major contributor to most of Colorado's laws regarding surveying): "No law is drafted perfectly the first time. You do the best you can with the available input at the time, then change it as more experience is gained."

SIDE SHOTS – Vol. 37, No. 1 – Feb 2006

#### Dexter M. Brinker, PE-PLS

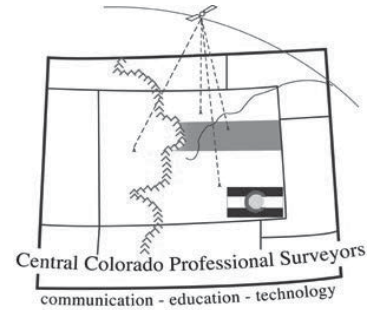
- Graduated from North Denver High School in 1943.
- Served in the U.S. Army, 1943 - 1946, Combat Infantry service with the 36th Infantry Division in France, Germany and Austria.
- A.B. (Physics) 1949 and B.S. (Civil Engineering) 1952, University of Colorado.
- Worked for several engineering and surveying firms in Denver area before starting own business in land surveying, mapping and civil engineering.
- Operated the Brinker School of Surveying and Mapping, 1971 – 1980.
- Charter Member and first President of P.L.S.C. 1966.
- Drafted many of Colorado's land survey laws from 1963 to 2004.
- Founding member and a Past President of the Rocky Mountain Rescue Group.



# Land Surveying Refresher Course

## January 6 to March 17, 2021

Offered by the Professional Lands Surveyors of Colorado, Inc., and the Central Colorado Professional Surveyors



This course offers a review and self-study plan for those taking the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Surveying (FS) and Principles and Practice of Surveying (PS) examinations. The course is designed to aid candidates in developing and expanding exam-taking proficiencies. The **Wednesday** evening classes will be 3 hours in length, starting promptly at 6:00 PM. Look for information about the online class at <http://www.plsc.net/>

### Fundamentals

- 1 Jan. 6 Overview of NCEES FS and PS Exams
- 2 Jan. 13 Survey Computations I
- 3 Jan. 20 Survey Computations II
- 4 Jan. 27 GIS, State Plane, Geodesy
- 5 Feb. 3 Boundary Law and Legal Terms

### Principles and Practice

- 6 Feb. 10 Public Land Survey System
- 7 Feb. 17 Colorado Survey Law I
- Feb. 24-26 Rocky Mountain Survey Summit**
- 8 Mar. 3 Colorado Survey Law II
- 9 Mar. 10 Professional Ethics

10 March 17 Mock PS and FS Examination

Featured Speakers: Alan Blair, Scott Thompson-Buchanan, JB Guyton, Sean Mullen, Roger Nelson, Lynn Patten, Dr. Jan Van Sickle and Tom Sylvester

The fee for the entire course is \$450 or \$75 per individual class. Registration is open beginning November 1, 2020. See <http://www.plsc.net/> for registration and online information. Classes will be held in one of the conference rooms at the Jefferson County Courts and Administration Building (Taj Mahal), 100 Jefferson County Parkway, Golden, CO. Online classes will be broadcast each night, and recordings will be available 1-2 weeks after each class. If attending in person, use the parking lot and main door on the east side of the building. Signage will lead you to the classroom. For questions, contact Becky Roland, Executive Director, PLSC, 303-551-3266, [broland@plsc.net](mailto:broland@plsc.net). Visit the NCEES site at <http://ncees.org/exams/> to learn more about the FS and PS examinations.



Phoenix 2



Inspire 1 & 2



Omni



Phantom 4 Pro



Indago Mapper



RL-H4C



ES Total Station



FC-5000



HiPer HR



GT Robot



RL-SV2S



## ***We Have Everything You Need!***

If you're looking for great deals on equipment then call our experts or stop by one of our many locations and see for yourself what products and services GeoShack has to offer. We have everything you need to get the job done accurately and right the first time.

Don't forget to ask us about our **GeoShack Advantage** programs – where you can get support, training, and other services along with your equipment purchase.

**GeoShack Denver**  
5385 Quebec Street  
Commerce City CO 80022

**For more info call**  
**(303) 853-0311**



# ELEVATIONS – now called HEIGHTS

By Gaby Neunzert, PLS

This presentation is divided, with the first half describing some traditional elevations and the second half outlining the electronic changes to come.

Within the near future, the surveying profession will experience a new concept in vertical measuring. Conceptually, the two systems to reckon elevation are completely different. With the “old” system, every absolute elevation had to be tied to the national network of physical benchmarks; the “new” system relies entirely on electronic data from a GPS observation. The old extended “sea level” across the continents and the new heights are tied to a virtual geoid. Even though the same order of magnitude, there will be some measurable non-uniform differences between the 2 data systems.

Historically, elevations, now called orthometric heights, were established by direct or indirect leveling methods and monumented with brass benchmarks. Now, electronics are making it possible to modernize our about 200 year old vertical system. Further, most users probably never have given it any thought that the concept of “sea level” is artificial and it has to be implemented by the Federal Government (NGS) on a national basis. In addition, the physical system is in dire need of an expensive resurvey for maintenance and even repair. In the future, NGS will no longer physically monument benchmarks in the field and private surveyors will have to establish their own vertical monumentation.

Regional “sea level” elevations were probably first run for the construction of shipping canals along the east coast of the US, beginning about 1820. Later, elevations on a national basis became a necessity with the construction of railroads and highways. Transcontinental elevations were run on the rail by regular differential leveling, concurrently with the construction of the transcontinental RR’s, about 1870±. This connected the east with the west coast. Using Wye levels, an untold number of leveling miles were run, with a maximum backsight of 50 ft, balanced by an equal length foresight. Unlike with other countries, there seems to have been no unique “mean sea level datum station” for the entire nation. After establishing some tidal

benchmarks along the west coast, it was found that “sea level” was not uniform across the entire continent. Usually it takes 19± years (Metonic cycle) to fully calibrate a tidal benchmark.

Possibly frustrating for a recreational user is the apparent change in elevation of landmarks due to a change in methodology. Initially, the elevations of many mountaintops and prominent land features were determined trigonometrically from the valley below. With the original survey having had possibly sights of many miles and unable to see the top properly, a resurvey by an alternate method can produce different results by many feet. It undoubtedly will be argued that an exact elevation of a mountaintop is of academic value.

Next in time, from about 1850 and well into the 1950’s, came the use of the stadia method, with the plane table and alidade as the mapping tool. From the very beginning, until well into the 1950’s, all topographic maps were made on the ground with a plane table and for some applications it still may be the preferred method. For this presentation, only a very small part of the procedure for contouring will be presented. It is assumed that the plane table is operational in the mapping area and that an elevation is on the table. Then, with only the operator’s experience for guidance, 20 – 30 salient points are selected and plotted together with elevations to the nearest foot. The selection could be topographic features, a break in contours or other items considered important. With any pair of adjacent elevation points, it is now possible to have a straight line between them representing the difference in elevation. By inspection (or by computer), this line can be prorated into integer elevation values. Now, by definition, a contour is a “line of equal elevation”. Once started, the contours are extended by “feel” into the blank areas, by relying on the imagination of the instrument person and the visual “lay of the land”, but no more data is gathered. Editing may take place as the work progresses or adjacent sheets are added. In the office, other than making the contours look “even” and “smooth”, there is no further control until the ultimate printing of the map. Whether the prorating and even-spacing of contours are



made in the field or by modern computers, it can leave the wrong impression that the elevations of the ground are known better than a fraction of the contour interval. In modern terminology: Contours visually represent the best average, but not the true elevation of the ground. No matter how they were generated, the preceding is true, from the plane table in the past to electronic drones at the present, and contours still to this day represent an indispensable component of our modern world.

After the mid 1950's, contours and spot elevations of mountaintops, etc. on maps, usually were determined photogrammetrically. In general, these elevations often printed to the nearest foot, are more likely to the nearest  $\frac{1}{4}$  of the contour interval of the map. Google maps probably use ellipsoid elevations, or values copied from paper maps. Scanning with a mouse produces elevations which most likely are within many feet of the posted values. In the future, physically occupying every topographic feature with a professional GPS receiver to obtain a "new" elevation may not be realistic.

The fathom, equal to 6 ft, is a historical measure of water depth in the ocean and it is slowly being replaced by the metre. There are about 200 tidal stations along the coast of the US. For each, the average of the high and low tide data is used to define mean sea level and the average of the low tides defines the water level used for water depth. On nautical charts the water depths, as shown either by contours or spot reference, are referenced to low tides. Many navigation charts and maps of shorelines show elevation in feet on land and water depth in fathoms, feet or metres.

Vertical Datums of the US, maintained by the US National Geodetic Service (NGS):

NGVD 1929 = National Geodetic Vertical Datum 1929; elevations determined by differential leveling.

NAVD 1988 = North American Vertical Datum 1988; elevations determined by differential leveling.

GRAV-D Project = Projected for 2022 (name and implementation tentative); heights determined by satellite and geoid. Results published in metres.

Following below, is an overview of the proposed GRAV-D Project for heights.

The future GRAV-D project as envisioned by NGS, sees both horizontal coordinates and heights obtained by one GPS field observation. At the

moment, this raw data has to be processed by NGS for the final answer. Following below, in abstract format, are the logic steps for determining "height" by satellites:

1—Each GPS satellite broadcasts the orbit data for every member of the constellation. Together with the time of observation, this "fixes" the position of the satellite in its astronomical elliptical orbit and ties to a reference system of the earth.

2.—By iteration, with the apparent intersection of the "pseudo ranges" from 3 satellites, the position of the receiver, in Latitude/Longitude, as well as its ellipsoid dependent height (elevation), can be calculated. In turn, this allows for the calculation of the position and ties to the Earth Centered Earth Fixed (ECEF) system, using the GRS'80 reference ellipsoid.

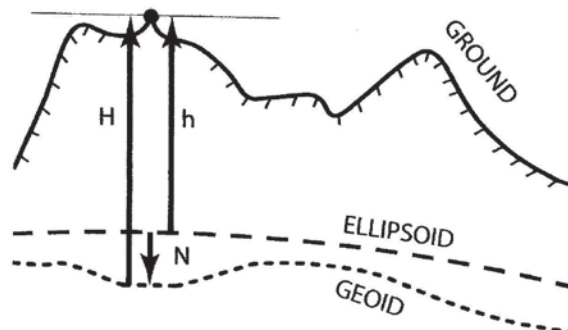


Fig. 1  
GEOMETRY for MOST of CONTINENTAL US  
(geoid below ellipsoid)

3—At this point, the logic between the "horizontal coordinates" and "vertical height" separates:

Horizontal calculations:

Considering that a mathematical ellipsoid is the model of the earth and surveyors need plane coordinates, it is necessary to mathematically "flatten" the earth. The user must select the ellipsoid (Clarke 1866, GRS80, etc.) and the projection (Mercator or Lambert). A change in any parameter will produce different coordinates for the same station.

Vertical calculations:

The same ellipsoid used for the horizontal position is used for the vertical height and answers will vary depending on the ellipsoid used. Note: the ellipsoid values are not tied to anything physical and therefore must be tied to the ground by calculations. The calculations involve 3 datums (surface of the earth, ellipsoid

and geoid) and their distances between them (orthometric height and geoid height).

#### Definitions:

Orthometric Height (H) = the “vertical” distance from the ground and perpendicular to the geoid. Data equivalent to historical differential leveling. Depending on the location on the geoid, the orthometric height becomes the sum or the difference between the ellipsoid and the geoid heights.

Ellipsoid Height (h) = the physical, vertical measurement from the station to the ellipsoid.

Geoid Height (N) = the physical vertical distance either above (positive value) or below the (negative value) ellipsoid. The global range is between +85 m (Iceland) to -106 m (southern India). The values are produced based on the Earth Gravitational Model 2020 (EGM 2020).

For most of the US, the geoid is below the ellipsoid (Fig.1) and hence the values are negative, resulting in the equation is  $H = h - (-N)$ . By difference, for most of Alaska, the geoid is above the ellipsoid (Fig.2) and the values are positive, thus giving the equation  $H = h + N$

Geoid: an imaginary, equipotential, undulating gravity surface, containing the surface of the oceans and extending under the continents. Shape not mathematically defined. Latest version: GEOID 18

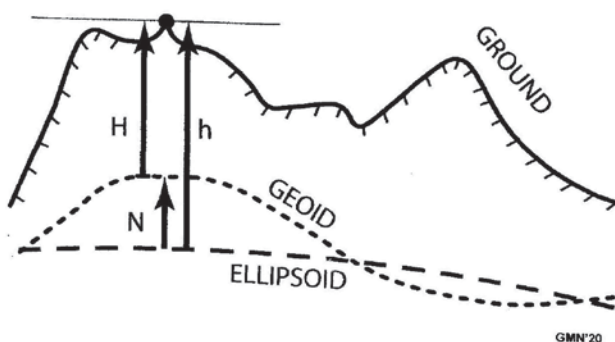


Fig. 2  
GEOMETRY of MOST of ALASKA  
(geoid above ellipsoid)

#### Final word:

The National Geodetic Survey (NGS) website should be consulted frequently for a more comprehensive coverage and timeline.

Even more than in the past, it is absolutely IMPERATIVE that on EACH surveying document, the data base for each horizontal and vertical measurement is stated.

Starting in the near future, based on a calculated Lat/Long from a field GPS observation, NGS will calculate the geoid height and then the orthometric GRAV-D height.

There is also the possibility that this “new” technology can provide some measurements to determine the amount of vertical displacement of earth tides and earthquakes.

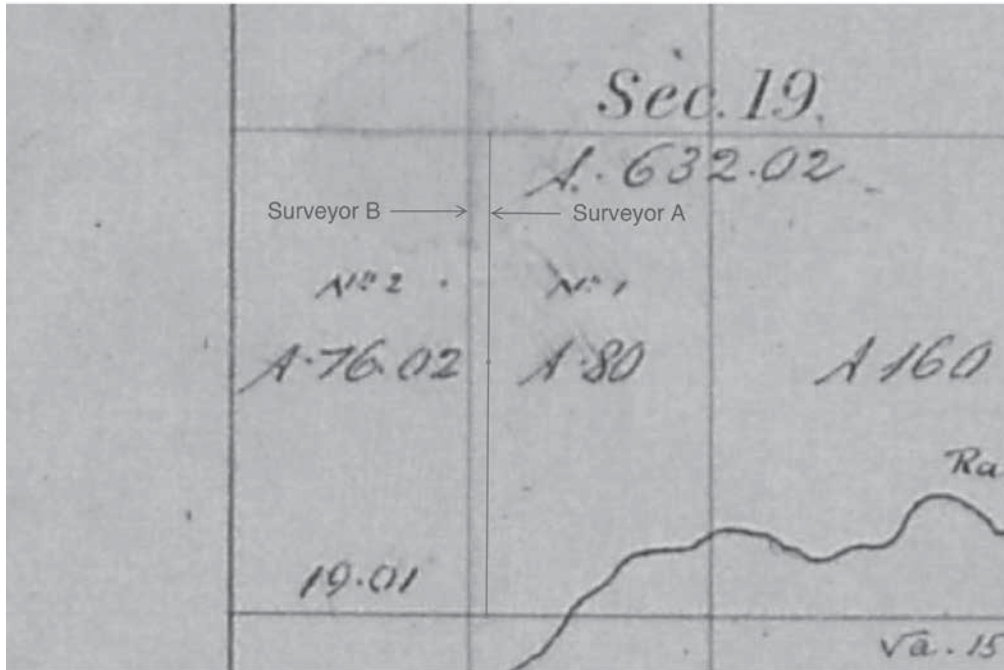
Intuitively, it is not the time to retire the old spirit level since there could be a combination of the new and the old. With the new, an absolute height for the start of a line of levels or absolute heights into a project site can be obtained, without ever looking for a brass NGS benchmark. After that, differential leveling could then still be used to survey-in nearby spot elevations as needed.

Drawings by: Martin R. Neunzert



# You Make the Call

By Earl Henderson, PLS



## *You Make the Call-Episode 1*

### Episode 1

This is a synopsis of a recent situation I was involved in. And of course, the names have been changed to protect the innocent...and the guilty. I'll let you decide which is which. I recommend keeping a running sketch as you read through this.

Here's the setup. This took place in the Southwest quarter of Section 19, so remember, the west line of the section is the west line of the township. The BLM survey from 1863 shows the SW1/4 divided by a North-South dividing line such that the east portion of the SW1/4 is 80 acres and the west portion is 76.02 acres. The north line of the west portion of the NW1/4 is shown as 19.00 chains and the south line of the west portion of the SW1/4 of Section 19 is 19.01 chains. Makes sense, right? We all know that the error in the township is placed in the west lots of the section after 80 standard acres was allotted to the lots/parts to their east. I don't know why this particular quarter was divided in halves and not quarters/lots, but the entire township is shown that way, even along the north line of the township. But that is irrelevant. So far we have no problem. But remember, it's only 1863. And also remember that even though the BLM platted these dimensions, they didn't survey the lines in question.

In 1885 the "east half of the southwest quarter of Section 19..." was patented "containing 80 acres".

In 1890 the "west half of the southwest quarter of Section 19..." was patented "containing 76.02 acres."

It would appear as though these patents establish by precedent the aliquot descriptions of these parcels even though they are unequal in size and the W1/2 is not described as a "Lot" as we might expect. But still, I see no problems...yet.

From 1890 to the 1970's various portions of the SW1/4 of Section 19 were conveyed and subdivided by description but always by means of aliquot parts. Even those parcels in the W1/2 of the SW1/4 of Section 19 were described by aliquot part. Then in 1972, Surveyor A conducted the first surveys of the SW1/4 of Section 19. He completed at least two surveys on two subject properties, one in the NW1/4 of the SW1/4 of Section 19 and another in the SE1/4 of the SW1/4 of Section 19. There's documentation, in the form of a recorded plat, of his survey in the NW1/4 of the SW1/4, but the other is known only by reference on a more modern survey. Attempts to obtain a copy of that survey were unsuccessful as the company that had a copy had purged their records. But from these it's clear that

Surveyor A completed a breakdown of the SW1/4 of Section 19, possibly even going further afield to determine the center of the section. (No documentation of that was found, but the center of section is not in dispute in this situation. That's another article altogether. You can look forward to Episode 2.) At that point, and likely based on the aliquot descriptions of "the east half of the SW1/4" and "the west half of the SW 1/4" found in the various deeds, Surveyor A proceeded to monument and plat the North-South dividing line of the SW1/4 by splitting the East-West dimensions precisely in half, creating equally sized halves, rather than an unequal division as shown on the 1863 BLM survey, a difference of about 30'. He set monuments at the north and south endpoints of this line and the midpoint. Following these surveys, of course, the property owners proceeded to build and maintain fences along these lines, because, after all, they were established by a Professional Land Surveyor.

One interesting point to ponder and to debate with your fellow PLS's is, are the three monuments he set at the 1/16<sup>th</sup> corners?

Next on the scene, in 1995, Surveyor B completed a survey in the NW1/4 of the SW1/4 of Section 19. In doing so he completed, and even showed on his plat, a nearly complete breakdown of the entirety of Section 19. He discovered the mistake made by Surveyor A along with his monuments and the fences. He decided to ignore the found monuments of Surveyor A and the fences established therefrom. He documented the locations of those monuments and fences, but established a new east line of his subject property approximately 30' west of the line of Surveyor A in a proper PLSS subdivision location based on unequal "halves" of the SW1/4 of Section 19 as platted and patented by the BLM. But after doing all this, and showing it all on the plat, he put no explanation on his plat that may have helped future surveyors or even the property owners in 1995. He merely monumented a different line. I have to wonder if he walked the line with his client and/or gave his client any additional explanation verbally. Also consider that Surveyor A's client is west of the lines in question and has no motivation to move his 23 year old fence to the west, taking 30' "away from himself", nor any motivation to inform his neighbor to his east, who at this point had not had a survey completed.

Surveyor B monumented the north end of the line he established 30' west of the line of Surveyor A and the midpoint. So ponder again, are these monuments at the 1/16<sup>th</sup> corners?

I suggest you stop right here for a moment and consider this situation before proceeding. Suppose it's 1996 and you are the next following PLS, what would your decision be of the location of the North-South centerline of the SW1/4 of Section 19? Do you follow in the footsteps

of the original surveyor who we know subdivided the quarter section incorrectly? Or do you perpetuate the intended PLSS division established by Surveyor B? Why? Imagine you're on the witness stand testifying as an expert. What precedent, research, etc. do you use to back up your decision? And would your decision be different if the property owners had moved their fences to the line established by Surveyor B before you got there? IMHO, at this point in time, the decision should be an easy one. But of course, this is not the end of the narrative.

Following Surveyor B, 5 subsequent surveyors, from 1999-2019, completed 13 various surveys and subdivisions in the SW1/4 of Section 19, and each and every one of them followed the North-South centerline established by Surveyor B. But in almost every case, they also documented the locations of the monuments set by Surveyor A and the locations of the fences established by the property owners based on the surveys by Surveyor A. In some cases, the subsequent property owners had used these more modern surveys to move their fences 30' to the west from where they were originally built.

Now stop and consider your position again. It's now 2020 and you are facing the combined consensus of 6 PLS's, 14 survey plats and a number of property owners vs. 1 PLS with 2 surveys, one of which you can't document. What decision do you make now? Would you stick to the guns you established earlier or change your call? In either case, why? Remember, you're on the stand. You don't get to just pick one and walk away. You have to back it up.

I'm going to make it just a little bit easier. Because you're not facing all those property owners, just a couple. Your job is to survey the S1/2 of the NW1/4 of the SW1/4 of Section 19. You find two sets of monuments set along the east lines of the said part that are 30' apart. But the North-South fence from the North monument to the midpoint monument set by Surveyor A still follows that line and has never been moved 30' to the west even though several of the 6 subsequent PLS's have monumented the line 30' to the west. South of the midpoint, the fence has been moved to the west, but there are records that show the original fence along the line established by Surveyor A.

The judge is looking you in the eyes. You make the call.

I'll quote a friend I highly respect, a former SWAT commander, who told me, "Courage is not the absence of fear, but the management of fear." Do you have the courage of your convictions? One day, if you find yourself on that stand having to defend your decision, you may find out.

Be safe out there.



Land Surveying and Geomatics Degree Program at Western Colorado Community College,  
a subdivision of Colorado Mesa University Grand Junction, Colorado

## AES Board Re-confirms Acceptance of our Land Surveying and Geomatics Programs and We Need to Talk To Each Other More

By Thomas W. Sylvester, P. E. and P. L. S.

This article is primarily on the second subject line of “We Need to Talk To Each Other More”, but I also wanted to give you a quick update on some AES Board action at their meeting of October 9, 2020.

The AES Board formally met on October 9, 2020 with one of its agenda items being a bi-annual review of our Land Surveying and Geomatics programs at WCCC, a division of CMU. They had asked for copies of all of our syllabi for the surveying (SURV) courses mid-summer. I sent them copies of our latest syllabi and some summary documentation of our programs as a whole and our sequencing of classes. I was able to virtually attend the meeting on October 9 and was able to answer a handful of questions some members of the Board asked. They then

moved and passed a motion recognizing our program as being acceptable per the CRS and Board Rules. I’ll continue to do my best to coordinate with them, the PLSC, my advisory council, and other professionals to ensure we continue to meet our AES Board’s expectations.

Now, on to “We Need to Talk To Each Other More”.

During our boundary law course work, we talk a lot about looking for and gathering evidence. The books we use make reference to “called for original monuments”. These are the gold standard. Once you find an original called for monument in its undisturbed original position, you have found “The Corner”. But what about all of those uncalled-for monuments that you find? These can be rebar with caps containing a PLS’s number, to bare rebar, to old



**WESTERN COLORADO**  
**COMMUNITY COLLEGE**  
*A Division of Colorado Mesa University*

### CHANGE YOUR LIFE WITH COLORADO’S ONLY LAND SURVEYING DEGREE PROGRAM

Sponsored by the PLSC, the Land Surveying and Geomatics programs at Western Colorado Community College are designed for students on a career pathway toward becoming a licensed Professional Land Surveyor.

#### WCCC OFFERS TWO PROGRAMS:

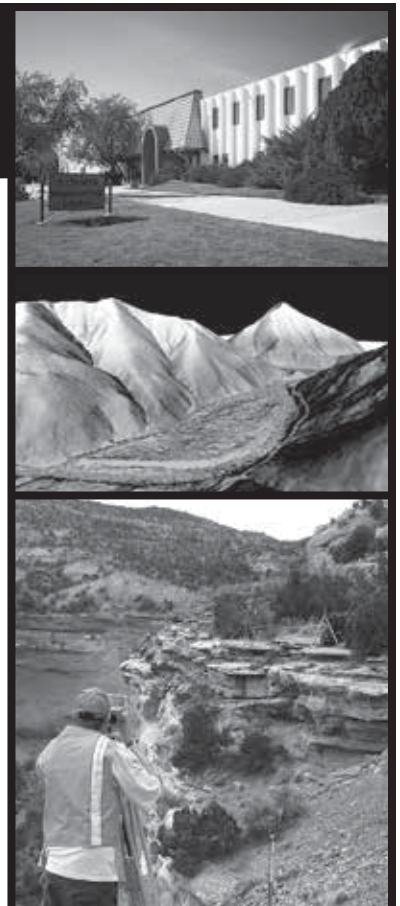
- **Associates in Applied Science Degree in Land Surveying and Geomatics** for those without prior college coursework. This program is designed to be completed within two years.
- **Post-baccalaureate Technical Certificate** for those with a minimum of a Bachelor of Science or Bachelor of Arts degree who need the required surveying curriculum to meet the education requirements to sit for the PLS exams. The Technical Certificate program is designed to be completed in one year.



Learn more at [coloradomesa.edu/wccc/programs/land-surveying-geomatics](https://coloradomesa.edu/wccc/programs/land-surveying-geomatics)



Contact WCCC Students Services at 970.255.2600 for admissions, registration and financial aid information.



axels, to pipes with insulators on them, to wheel hubs, etc.? Some of these may show up on a Deposited Survey in your county or perhaps on a survey plat provided by your client. Many are just found somewhere in the vicinity of the end of a bearing and distance call in the deed you are researching.

I emphasize to my students the need to gather as much evidence as you can find. I like to say All of the evidence, but you can never be sure you have found it ALL. This includes deeds of your subject property, adjoiner deeds, surveys of or in the vicinity of your survey, GLO plats and field notes if appropriate, tied lines of occupation, fences, house corners, cultivated field or garden boundaries, and even those numerous uncalled-for monuments. As the authors of the books say, "If the monument is not called for, it is not controlling". I agree. But just because an uncalled-for monument (and other evidence of boundary lines) may not be controlling, it does NOT mean it is to be disregarded. IT IS EVIDENCE! And we need to weigh All of the evidence we find in making our decision in offering our professional opinion on where the boundary lines and boundary corners are in our survey.

Our AES Board Rules also discuss that if we find another monument that purports to represent the corner of the property we are surveying and we decide not to accept that monument and set our own, we must put a note on the plat of why we are not accepting the other monument.

This is where the subject of talking to our professional colleagues comes in. You may have found a monument with a cap and PLS number, but you may have other evidence that may lead you to disagree that it represents the property corner. Or you find an unmarked monument (bare rebar) or some other monument that appears to be the same one or in the same position that shows up on a copy of a survey that you were able to obtain, for which you can identify the professional who prepared that survey plat, and again you have additional evidence to lead you to believe this is NOT the proper property corner location. What do we do? If we truly believe it does not represent the proper location of the property corner, we, too often, set our own monument, and put a note on the plat of why we rejected the other monument and why.

I think we may be acting too hastily when doing this. Surveyors are often laconic and taciturn, preferring the lone hunt in the field for the evidence to the bubbly conversation of the masses.

I contend that we have not gathered all the evidence available to us. If we can identify the person who set or even found and accepted that monument, WE NEED TO TALK TO HIM/HER FIRST before we reject the monument outright. What did they find? Where did we find it? What evidence was available to them? What evidence was available to us?

These conversations don't have to be confrontational or contentious. I've had occasion where we found an aliquot monument 20 feet out of position. When talking to the

surveyor involved, he recalled having some equipment problems on that survey. After hearing our evidence, he asked that we pull his monument and return it to him. On another occasion, we found a property corner and a C 1/4 corner approximately 50 feet apart. The other professional's survey showed one as an aliquot corner and the other as a property corner. However, the field evidence indicated that the caps had been reversed. He, too, was thankful for our notification and promptly remedied the situation. However, on the other hand, we had an occasion to place a 1/64 corner by the proper intersection of two lines, to find out that sometime later, another surveyor set another 1/64 corner about 10 feet from ours. When I called that surveyor, he mentioned that they had an old plat showing a carriage bolt buried in the ground at their newly set position. They had also tied that carriage bolt many years earlier. Of course, the road had been paved many years ago, too. With further review, we found that fence lines in the vicinity more closely matched their position rather than the position we had established. The end result was that I felt they had better evidence than I did of the position of the original corner and hence changed my survey to accept their corner position.

However, I will admit that in over 22 years of experience in the Grand Valley, these conversations are all to infrequent. I have called others maybe a total of 5 times over the years and received only about 2 to 3 calls from others during that same time frame. I often see notes on plats that show a rejected corner, or if the plat was prior to the requisite note, a bearing and distance to the other corner not accepted. I suspect many of these decisions are made without consulting the other surveyor.

None of us like confrontation. How do we encourage this type of conversation without the fear of a contentious dialogue? My suggestion is to get to know your colleagues in your area. One way to do this is to be an active member of your local PLSC chapter. As you get to know your colleagues in a social setting and learn to respect them, it is much easier to call them when you run into one of these questionable situations. When we do make that call, we should not be too quick to say they are wrong, but that we have a different outcome and perhaps they have some additional information we didn't have. When we get that call, we again, should put our ego and pride aside and not be too quick to become defensive, but should listen to their questions and evidence. We may learn something that would lead us to make a different decision or we may be able to offer them some new information so that they had more evidence to make a decision similar to ours. We need to put our egos away and discuss the situation professionally.

All in all, I just think **We Need to Talk To Each Other More!**





**303-679-8122**

Info@SurveySystems.net  
www.SurveySystemsInc.com

Survey Systems has the capabilities to team with your Survey Firm to provide a hydrographic/bathymetric survey.

Survey Systems (SSI) has assembled a versatile hydrographic platform that is customizable to your clients' needs. SSIs' hydrographic surveying capabilities include multi & single beam sonar, stage capacity table, dredge pay quantity, hill shade model or underwater object detection and recovery.

**SURVEY SYSTEMS**

A Professional Land Surveying Company SDVOSB | SBE

## UNDERGROUND UTILITY LOCATING



**Diversified Underground** is a Denver Based DBE-certified Company providing Subsurface Utility Engineering (SUE), Utility Locating, Hydro Vacuum Excavation throughout Colorado and the surrounding states.



### SUBSURFACE UTILITY ENGINEERING (SUE)

Diversified Underground combines utility locating, hydro vacuum excavating and data research / management to produce an accurate map depiction of existing underground utilities.

### UTILITY LOCATING

Diversified Underground offers complete utility locating services for the identification and marking of privately and publicly owned underground utilities.



**Phone: (303) 636-9999 • Fax: (303) 671-8728 • [www.diversifiedunderground.com](http://www.diversifiedunderground.com)**

# WFPS STATE ASSOCIATION MATRIX

	ARIZONA	CALIFORNIA	COLORADO	HAWAII	NEVADA	UTAH	WASHINGTON
<b>MEMBERSHIP &amp; DUES</b>							
Total Number of Members	370	1600	338	81	277	405	994
Number of Licensed Surveyors Residing in the State	800	2800	1125	172	288		
Number of Licensed Members	248	1200	195	32	192	298	642
Regular Member Dues	\$ 230.00	\$240	\$ 150.00	\$ 110.00	\$ 175.00	\$ 150.00	\$ 230.00
NSPS 100% Member?	YES	NO	YES	YES	YES	YES	YES
NSPS Dues Included in Regular Member Dues Fees?	YES	NO	\$40 YES	YES	YES	YES	YES
<b>CHAPTERS</b>							
Number of Chapters	6	21	6	0	3	5	12
Chapter Dues Included in Member Dues Fees	YES	NO	YES	N/A	NO	YES	YES
Does the State Collect Dues for Chapter	YES	NO	YES	N/A	YES	YES	YES
Chapter Dues Amount	\$ 25.00	\$ 25.00	\$20.00	N/A	\$ 35.00	\$ -	\$ 15.00
Does State Share Proceeds of Events	No	No	YES	N/A	No	No	Yes
<b>LICENSING &amp; RENEWALS</b>							
Cost of License Renewal	\$ 225.00	\$115	\$90	\$ 204.00	\$ 100.00	\$ 74.00	\$ 116.00
Renewal Period	3 Years	2 Years	2 Years	2 Years	2 Years	2 Years	2 Years
Mandatory Continuing Education	NO	NO	NO	NO	YES	YES	YES
Degree Requirement	NO	NO	Associate	NO	YES	YES	NO
<b>ADVANCED EDUCATION</b>							
Four Year Degree Program in State	NO	YES	YES	NO	YES	YES	NO
Two Year Degree Program in State	NO	YES	YES	YES	NO	YES	YES
<b>GOVERNANCE &amp; STRUCTURE</b>							
WFPS Director Elected or Appointed	Appointed	Appointed	Appointed	Appointed	Appointed	Elected	Appointed
WFPS Director Voting Member of the Board	NO	NO	YES	YES	NO	YES	YES
NSPS & WFPS Required to be Same Person	NO	NO	NO	NO	NO	NO	NO
Does State Have Separate Foundation	YES	YES	NO	NO	YES	YES	YES
Executive Director/Secretary	YES	YES	YES	YES	YES	YES	YES
Lobbyist	NO	YES	YES	Coalition	NO	YES	Coalition
<b>COMMUNICATION</b>							
Printed Magazine? If yes, how often	NO	2 Times a Yr.	4 Times a Yr.	NO	4 Times a Yr.	2 Times a Yr.	2 Times a Yr.
E-News? If yes, how often	Monthly	Monthly	Monthly	Bi-Monthly	Monthly	Quarterly	Monthly
<b>LAWS &amp; REGULATIONS</b>							
Definition of Land Surveying		B&P 8726	CRS 38-51-102(11) CRS 38-53-103(11)	HRS §464-1	<u>NRS 625.040</u>	<u>UC 58-22-102(11)</u>	<u>RCW 18.43.020</u>
Dig Laws/Utility Notification		Govt 4216	CRS 9-1.5	YES	<u>YES</u>	<u>YES</u>	<u>YES</u>
Monument Preservation	<u>ARS 33-103</u>	B&P 8771	CRS 18-4-508	HRS §172-13	<u>NRS 329</u>	<u>YES</u>	Pending Leg.
2022 Datum		Draft Leg.	NO	NO	Draft Leg.	On Hold	<u>RCW 58.20</u>
Right of Entry	<u>ARS 33-104</u>	Govt 8774 Civil 846.5 Penal 602.8	CRS 18-4-515	NO	NO	NO	NO
[Note: No data for AK, ID, MT, NM, OR or WY]							

**NSPS Government Affairs Update Prepared by  
John M. Palatiello & Associates, Inc.  
A Miller/Wenhold Capitol Strategies Company**

## **NSPS Government Affairs Consultants & Advisors March 2020**

### **NSPS Day on the Hill Issues Postponed**

In January, NSPS Executive Director Curtis Sumner, Government Affairs Committee Chairman Pat Smith, Government Affairs Consultant John Palatiello, and Federal Lobbyist John "JB" Byrd met for a day-long planning session for a review and update of Federal legislative and policy issues, including a progress report on the items NSPS took to Capitol Hill in 2019 focusing on the USGS 3D Elevation Program (3DEP), NOAA's Digital Coast Act, the Federal Land Asset Inventory Reform (FLAIR) Act, and FEMA's National Flood Insurance Program (NFIP). The group also set the agenda for the 2020 NSPS Day on the Hill scheduled for April 1, 2020. They were: (1) surveying in the infrastructure/highway bill; (2) the impact on surveyors of limits on "geolocation data" in privacy legislation; and (3) separating surveying and other design professions that impact public health, safety, and welfare from other occupational licenses that have been the subject of de-licensing efforts. Given the logistical challenges concerning the Coronavirus pandemic, NSPS postponed the Day on the Hill. Due to the Pandemic throughout our country at this time, during a conference-call meeting of the NSPS Executive Committee this month a motion was approved to cancel all events related to the 2020 NSPS Spring business meetings and "Day on the Hill" activities scheduled for March 30-April 4 in Arlington, VA and Washington DC area. An alternative plan is being developed for "Day on the Hill" activities and will be sent out when finalized.

### **Coronavirus and State Outreach**

A template letter, drafted by NSPS Government Affairs Consultants, John M. Palatiello & Associates, Inc., was circulated by NSPS to all state societies in an effort to keep surveying operations open, and exempt from any Governor's orders related to the Coronavirus. Several state societies have sent a letter to their Governor to request the exemption. Surveying is limited or shut down in some states, while operations can continue in others. The Maryland Society of Surveyors (MSS) was pleased to announce that it was the first state to specifically achieve such a gubernatorial designation when its letter resulted in guidance released by its Governor, Lawrence Hogan, Jr. specifically clarifying that firms in surveying, engineering, architecture, and interior design may

remain open, as they are deemed essential businesses related to federal critical infrastructure sectors. Some other states have since followed. Statements issued by NSPS in response to questions on this issue can be found on the NSPS website at [www.nsps.us.com/page/COVID-19](http://www.nsps.us.com/page/COVID-19).

### **NSPS Government Affairs Issues**

As a reminder, the NSPS Board previously approved Government Affairs Committee recommendations on the following issues.

- **Subsidence** - Create a task force to study and develop a legislative proposal on subsidence. There is already some legislation in Congress that begins to address subsidence (Sec. 4 of H.R.1261, the National Landslide Preparedness Act, provides, "As the Secretary determines to be appropriate and subject to appropriations, the Secretary, through existing programs, shall advance the identification, mapping, research, monitoring, restoration, and mitigation of subsidence and groundwater resource accounting, losses from subsidence, including saltwater intrusion, particularly in areas affected by drought and sea level rise.") In December 2019, a delegation from NSPS visited USGS and NOAA personnel in Reston, Virginia, and several NSPS members also attended via conference call for a discussion on how the surveying profession could compliment satellite imagery in tracking uplift and subsidence in a new program USGS is calling the National Land-Level Change (NLLC) map. A follow-up meeting was held in January between NSPS Executive Director Curt Sumner and Federal Lobbyist John "JB" Byrd and USGS personnel in Washington, DC.
- **Occupational Licensing** – Create a task force to review and enhance on the draft white paper JMP&A produced. COFPAES drafted a "sense of the Congress" resolution on the importance of design professional licensing to protecting public health, welfare, and safety. Beginning in January, JMP&A visited several Congressional staff to pursue lead sponsors for such a resolution, and hosted one conference call utilizing key NSPS members in Nevada. COFPAES member organizations are also supporting and participating in efforts to promote the resolution in Congress.



- URISA White Paper - Create a task force to review and draft a NSPS response to the URISA White Paper "Defining the Boundaries of Practice Between Surveyors and GIS Professionals".
- NSRS 2022 - Form a working group of representatives of each state affiliate to share knowledge, information, and lobbying activities on state legislation to implement NSRS 2022.

## Appropriations/CR/Shutdown

In December, 2019, President Trump signed two Omnibus Appropriations bills (H.R. 1865 & H.R. 1158) to keep Federal agencies and programs functioning through September 30, the end of FY 2020.

## Department of Commerce

### Coastal Communities Adaptation Act

In February 2019, Rep. Harley Rouda (D-CA) introduced H.R. 1317, the Coastal Communities Adaptation Act. The bill seeks to improve the resilience of the built and natural environment to natural disasters and climate change using, among other measures, natural and nature-based features. It provides a competitive grant program in NOAA to advance coastal risk reduction and resilience measures. Included in the bill is a provision to require qualifications based selection (QBS) for grant recipients' contracting for program management, construction management, feasibility studies, preliminary engineering, design, engineering, surveying, mapping, or architectural related services. This is a provision COFPAES, of which NSPS is a member, has successfully added to other federal grant program legislation.

### Digital Coast

In April 2019, bipartisan legislation, the "Digital Coast Act", was introduced authorizing the Secretary of Commerce, through NOAA, to establish a program that collects priority coastal geospatial data and supports an information platform capable of efficiently integrating coastal data with decision support tools, training, and best practices to inform and improve local, State, regional, and Federal capacities to manage coastal regions. The Senate bill, S. 1069, was introduced by Sens. Tammy Baldwin (D-WI), Lisa Murkowski (R-AK), Dan Sullivan (R-AK) and Maria Cantwell (D-WA) while the House bill, H.R. 2189, was introduced by Reps. Dutch Ruppersberger (D-MD) and Don Young (R-AK). NSPS was quoted in the news release on the bill's introduction published by Sen. Baldwin. In September 18, H.R. 2189 was favorably reported by the House Committee on Natural Resources. In November, NSPS cosigned a coalition letter to the Senate Commerce

Committee requesting a markup be scheduled for S. 1069. S. 1069 was approved by the Senate Commerce Committee on November 13. In December, H.R. 2189 was added to H.R. 729 which was then passed by the House by a recorded vote of 262-151. Senate action on either the House or Senate bill may occur in the 2nd quarter of 2020.

### IOCM

In March, S. 914, the "Coordinated Ocean Observations and Research Act of 2019," was introduced by Sen. Roger Wicker (R-MS). The bill reauthorizes the Integrated Coastal and Ocean Observation System Act of 2009 and was reported favorably by the Senate Commerce Committee in April 2019. In February, H.R. 1314, the "Integrated Coastal and Ocean Observation System Act Amendments of 2019" was introduced by Rep. Don Young (R-AK). In September, H.R. 1314 was reported favorably by the House Committee on Natural Resources.

## Department of Education

### GeoEducation Bill

NSPS has been asked by Rep. Nydia Velazquez (D-NY) to assist with development of a bill focused on "GeoEducation." NSPS met her former staff in January 2019 and then her current staff in August 2019. NSPS and the Velazquez staff worked on a series of questions for the Congressional Research Service (CRS) to provide some background on and we hope to have a bill introduced in the near future. NSPS is still in the process of corraling examples of state legislation that may be used as template language for a Federal version of the bill.

## Department of Homeland Security/FEMA

### FEMA/NFIP Reform/IMAGES Act

The recent FY2020 Appropriations action extended the NFIP until September 30, 2020. In December 2019, NSPS joined 14 other organizations in cosigning a letter authored by the Flood Map Coalition which was sent to key contacts in Congressional Appropriators. The letter urged the Senate Appropriations Committee to fund FEMA's flood map program at the FY 2019 level (\$263 million) for FY 2020. The letter stated, "Investment in accurate flood maps is foundational to our nation's efforts to reduce loss of life and property." The letter continued, "the flood mapping coalition urges support for the House bill's figure of \$263 million rather than the Senate bill's figure of \$148 million."

On February 27, Ryan R. Branfort, PLS, GISP, Senior Vice President with Wilson & Company, Inc., Engineers & Architects of Salina, KS, a member of NSPS, the Kansas Society of Land Surveyors (KSLS), and a former

NSPS Governor representing KSLs, testified before a joint hearing of the Subcommittee on Environment and Subcommittee on Investigations and Oversight of the Committee on Science, Space, and Technology of the U.S. House of Representatives. The hearing covered the science and technology behind Federal flood maps in a changing climate. Ryan presented geospatial technologies, data, services, and applications to improve flood mapping.

In March 2019, the House Committee on Financial Services held a hearing on FEMA's National Flood Insurance Program (NFIP). Virtually every witness highlighted the importance of elevation data, collected through LiDAR to support accurate topography collected for FEMA. After the hearing, Rep. Vicente Gonzalez (D-TX) posted a news release touting his leadership in introducing the NSPS-supported IMAGES Act, H.R. 4905 in the 115th Congress, with a link to his questioning of the witnesses on how to improve the FEMA mapping, including an emphasis on the USGS 3D Elevation Program (3DEP). In June 2019, Reps. Gonzalez and Rep. Alex Mooney (R-WV) were successful in adding much of the IMAGES Act to H.R. 3167, the House NFIP Reauthorization bill. NSPS was quoted in the news release by Rep. Gonzalez's office. The Senate Banking Committee plans for a long-term authorization are muddled. The current major Senate bill, S. 2187, the National Flood Insurance Program Reauthorization and Reform Act of 2019, was introduced by Senator Robert Menendez (D-NJ). Section 208 of that bill authorizes funding for Light Detection and Ranging (LiDAR) technology for more accurate mapping of flood risk across the country, reducing confusion and generating better data.

In April of 2019, S. 1144, the Flood Insurance Rate Map Interagency Technology (FIRM IT) Act of 2019, was introduced in the U.S. Senate by Senator Marco Rubio (R-FL). A companion bill, H.R. 2318, was reintroduced in the U.S. House of Representatives by Representative Bill Posey (R-FL). This legislation would direct FEMA to consult with the Department of Defense, the U.S. Geological Survey, and the National Oceanic and Atmospheric Administration in order to obtain the most up-to-date information relevant to National Flood Insurance Program (NFIP) rate maps. This will allow policy holders who utilize NFIP to have the most accurate data for flood hazard identification. NSPS was quoted in the news release by Senator Rubio's office.

In 2019, NSPS member Jim Nadeau was appointed to the FEMA Technical Mapping Advisory Council (TMAC) for a three-year term. In July and in December, FEMA's TMAC met in Arlington, VA. During the July meeting, TMAC members conducted a final review and discussion of the TMAC 2018 Annual Report and voted to submit it to FEMA.

The next TMAC meeting will be virtual on Tuesday, April 14, 2020, and Wednesday, April 15, 2020. The meeting will be open to the public via an Adobe Connect link and conference line.

#### Crawford Bill

In February 2019, Rep. Rick Crawford (R-AR) re-introduced the "Scientific Flood Mapping Act," H.R. 1402. It would expand the US Geological Survey's (USGS) mapping mission by transferring the Federal Emergency Management Agency (FEMA) flood risk mapping program in support of the National Flood Insurance Program (NFIP) to USGS. FEMA would still run the NFIP, but all flood mapping activities will be performed by the USGS, with its leadership, technical expertise, and contractors. In a victory for NSPS, the bill would not only keep the composition of the Technical Mapping Advisory Council (TMAC) intact, but would expand its membership. NSPS is currently represented on the TMAC by Jim Nadeau. NSPS members Jim Nadeau and Wendy Lathrop were joined by NSPS Executive Director Cutis Sumner, government affairs consultant John Palatiello and lobbyist John "JB" Byrd for a meeting in 2018 with staff of Rep. Rick Crawford (R-AR) to seek ways to improve the TMAC and NFIP, without eliminating the valuable input FEMA gets from professionals in the private sector from surveying, mapping, engineering and other technical and professional disciplines.

## **Department of the Interior**

#### 3DEP

NSPS has endorsed the USGS 3DEP program to provide consistent elevation data, primarily through LiDAR collection, for the United States, and has been a leader in efforts to assure the program is fully funded at \$146 million per year. Efforts are underway to also include provisions as part of both the FEMA/NFIP Flood Map Reform bill and Infrastructure Bill. NSPS has also organized and mobilized other organizations that support 3DEP, such as the National Association of Realtors, who made a similar request of Congress. This 3DEP Coalition has seen the data acquisition for elevation increase from \$20 million in 2013 to \$120 million in 2018.

In February, NSPS Government Affairs Consultant John Palatiello presented testimony before a subcommittee of the House Appropriations Committee. The hearing focused on the USGS 3DEP program and the funding request for FY 2021. In his prepared remarks, Palatiello stated "Our request and recommendation to the Subcommittee is to appropriate funds for the 3DEP program at its optimal annual level of \$146 million among all participating agencies." Speaking on behalf of the 3DEP Coalition, comprised of representatives of over 45 organizations, including NSPS, from

surveying, mapping and geospatial; real estate; home building; flood management; emergency response; environmental; science; mining; insurance; telecom; agriculture; and infrastructure, Palatiello urged full funding of the national LiDAR and IFSAR program that would enable the entire United States to be mapped with consistent elevation data with a 8-year repeat cycle. This coalition, managed by John M. Palatiello & Associates, Inc., met in May 2019 at the Capitol Hill offices of the National Association of Realtors to plot strategy for securing funding for the USGS LiDAR data elevation initiative for FY2020. 3DEP will satisfy the growing demand for consistent, high-quality topographic data and a wide range of other three dimensional representations of the Nation's natural and constructed features. The USGS has identified more than 600 applications that would benefit from enhanced elevation data. Data procured from 3DEP can be applied to flood risk management; infrastructure; landslides and other hazards; water resources; aviation safety; telecommunications; homeland security; emergency response; precision agriculture; energy; pipeline safety; and other areas. 3DEP will promote economic growth, facilitate responsible environmental protection and resource development and management, assist with infrastructure improvement, and generally enhance the quality of life of all Americans. Earlier this month, a House letter was delivered to the House Appropriations Committee requesting \$146 Million for USGS 3DEP, cosigned by 36 Members of Congress. A Senate letter with the same request, cosigned by 13 Senators, was delivered to the Senate Appropriators. NSPS was one of 40 organizations making the same request of Congressional Appropriators for FY 2020. As a consequence of this unprecedented outreach, report language was included in 4 separate Appropriation Subcommittees in the House: Interior; Homeland Security; Agriculture; and Transportation.

Also, on February 20, 2020, 3DEP was featured during a Congressional briefing co-hosted by the House Manufacturing Caucus and sponsored by NSPS. This panel addressed how domestic manufacturing jobs can be supported by mapping efforts used by Federal agencies to locate critical minerals and materials. Critical minerals and materials are used for cell phones, computers, automobiles, airplanes, ships, and many other products that are critical to our economy and security. Unfortunately, the United States relies on other countries entirely for more than a dozen minerals that are vital to the national economy and security. Experts in manufacturing, geology, and mapping covered the manufacturing connection between the U.S. Geological Survey's Earth Mapping Resources Initiative (MRI), 3D Elevation Program (3DEP), and the Department of Energy's Critical Materials Institute (CMI). Curt Sumner attended, John Byrd was moderator and John Palatiello was a presenter.

In August 2019, an NSPS-led delegation of organizations supportive of 3DEP met with the new Office of Management and Budget (OMB) analyst responsible for preparing the annual USGS budget. NSPS Executive Director Curtis Sumner, NSPS Government Affairs Consultant John Palatiello, as well as NSPS Federal Lobbyist John "JB" Byrd joined their respective colleagues from the geospatial, real estate, energy, geology, and infrastructure advocacy organizations requesting that USGS be fully funded at \$146 million in the President's FY2021 budget request to Congress.

With the two FY2020 "Minibuses" (H.R. 1158 & H.R. 1865) signed into law for FY 2020 appropriations, we are pleased to communicate that the U.S. Geological Survey's 3D Elevation Program (3DEP) was the recipient of the following report language (H.R. 1865 Report Section D):

*Core Science Systems.-The agreement provides \$137,902,000, which includes \$24,051,000 for science, synthesis, and analysis. National Cooperative Geologic Mapping is funded at \$34,397,000 which provides funding for Phase Three of the National Geologic Database as outlined in House Report 116-100. The National Geospatial program is funded at \$79,454,000 which includes **\$7,722,000 for the Alaska mapping initiative and the following increases: \$5,000,000 for the 3D Elevation program (3DEP) to accelerate achievement of 100 percent coverage of the Great Lakes region; \$2,000,000 for the US Topo program to procure product-on-demand updates; and \$3,000,000 to produce digital surface models using unclassified satellite optical data for the U.S. and territories not mapped with LiDAR in 2021.** It is expected that any funding awarded outside the Federal sector will undergo a competitive review process.*

*Energy, Minerals, and Environmental Health.-The agreement provides \$113,536,000 for Energy, Minerals, and Environmental Health. Mineral Resources is funded at \$59,869,000 which includes **\$10,598,000, the budget request, for the critical minerals Earth Mapping Resources Initiative, (Earth MRI).** Energy Resources is funded at \$30,172,000 and provides \$4,000,000 for the implementation of Secretarial Order 3352.*

In June 2019, the House of Representatives passed H.R. 1261, the National Landslide Preparedness Act, thanks to the leadership of the bill's sponsor, Rep. Suzan DelBene (D-WA). The bill passed by voice vote and now goes to the Senate. It includes a NSPS-supported provision to authorize the USGS to implement a 3D Elevation Program (3DEP), authorized at \$40 million annually, to update and coordinate the collection of elevation data across the country. The Senate bill, S. 529, was adopted by the Senate Commerce Committee,



but only has a \$20 Million authorization. S. 529 has been placed on the Senate Calendar and could be passed by the Senate.

In May 2019, Senator Lisa Murkowski (R-AK) introduced S.1317, the "American Mineral Security Act". In October 2019, the bill was reported favorably out of the Senate Committee on Energy and Mineral Resources. Section 104 authorizes the Secretary of the Interior to carry out surveys and field work (including drilling, remote sensing, geophysical surveys, topographical and geological mapping, and geochemical sampling and analysis) to supplement existing information and datasets available for determining the existence of critical minerals in the United States.

#### FLAIR

GAO reports highlight the lack of a current, accurate inventory of Federal Real Property. On the other hand, the Federal government funds a variety of single-purpose databases. Since 1980, the National Academy of Sciences (NAS) has been calling for the development of a multipurpose cadastre, or land registry. The FLAIR Act authorizes the Department of the Interior to develop and manage a single multipurpose, uniform Federal GIS database to track and account for all Federal Real Property, as called for by GAO and recommended by the National Academy. In May 2019, Reps. Ron Kind (D-WI) and Bruce Westerman (R-AR) introduced the House bill (H.R. 2485) and Sens. Kevin Cramer (R-ND) and Martin Heinrich (D-NM) introduced the Senate companion (S. 1295). NSPS was quoted in the news release by Senator Cramer's office. In September 2019, NSPS Government Affairs Consultant John Palatiello testified on H.R. 2485 before a legislative hearing held by the House Natural Resources Subcommittee on Energy and Mineral Resources.

#### Geospatial Governance -- COGO/FGDC/NGAC/GDA

In September 2019, NSPS Federal Lobbyist John "JB" Byrd attended the National Geospatial Advisory Committee (NGAC) meeting in Shepherdstown, West Virginia. During the discussion of the Geospatial Data Act (GDA), OMB has determined that the GDA guidance will be provided through a revision of Circular A-16. The FGDC needed to meet the targeted deadline of October 2019 (1 year or since 2018 GDA was enacted) on a report on how to implement GDA. The proposed revisions to A-16 are currently under review at OMB, and there is an expectation now that there will be no public comment period. This was raised in a recent conference call of the Coalition of Geospatial Organizations (COGO) which this year is chaired by NSPS member Jon Warren. It was noted that the GDA also amends the membership of the NGAC by adding a requirement that "licensed geospatial data acquisition professionals" be part of the membership. NSPS led the effort to add this NGAC criteria to the bill, citing the lack

of adequate membership among geospatial data service and acquisition providers in recent years. On March 10, John Palatiello represented NSPS on "Leaders Forum" - a web session, hosted by the Federal Geographic Data Committee (FGDC) that was rescheduled from an in-person meeting - to provide input on the next National Spatial Data Infrastructure (NSDI) strategic plan. Among other issues, he articulated the need for public input to the A-16 revision and GDA implementation, an emphasis on data acquisition for the NSDI. NSPS member Gary Thompson of North Carolina is the current NSPS representative on the NGAC. This year's appointments were expected to be made by the end of March, but is likely delayed due to the Coronavirus. The next NGAC meeting is scheduled for April 14-15, 2020.

#### MAPLand Act

Earlier this month, Representatives Russ Fulcher (R-ID) and Derek Kilmer (D-WA) introduced H.R. 6169, the Modernizing Access to our Public Land (MAPLand) Act of 2020. Senators Martha McSally (R-AZ) and Angus King (I-ME) introduced the Senate version, S. 3427. The bill will standardize the digitization and dissemination of information regarding recreational access and allowable activities on millions of acres of federal public lands throughout Idaho and the United States. Doing so will make millions of Americans, including hunters, anglers, and outdoor recreationists, increasingly aware of opportunities to access and use their public lands in a manner beneficial to innumerable local and regional economies.

#### Sinkhole Mapping

In January 2019, Rep. Darren Soto (D-FL) introduced H.R. 496, the Sinkhole Mapping Act of 2019. In September, NSPS Government Affairs Consultant John Palatiello testified on H.R. 496 before a legislative hearing held by the House Natural Resources Subcommittee on Energy and Mineral Resources. Last week, the bill was reported favorably out of the House Committee on Natural Resources.

#### UAS

News about the Department of the Interior (DOI) grounding its fleet of drones made headlines late last year, but the language used by the DOI positioned it as more of a review than a suspension. That leeway has been removed now that Secretary of the Interior David Bernhardt has signed Secretary's Order 3379. The directive orders the cessation of non-emergency unmanned aircraft systems fleet operations. The statement confirms that drones will be able to be used in emergency situations, although that will require the department to go through its own waiver process. Those situations are defined as fighting wildfires, search and rescue, and dealing with natural disasters that may threaten life or property. How long this review will take and what exactly it will look like has not been defined,

but it is clear that getting the DOI's drone fleet back into the air for routine operations is going to take some time.

## Department of Labor

### Davis-Bacon Act

In August 2019, NSPS Government Affairs Consultant John Palatiello appeared before a Regulatory Enforcement Fairness hearing conducted by the National Ombudsman of the Small Business Administration (SBA), continuing the effort to repeal All Agency Memorandum 212, applying the Davis-Bacon Act to members of survey crews. Palatiello told ombudsman Stefanie Baker Wehagen and a panel Federal officials the Labor Department's 2013 regulation was based on a bad process and bad policy. He noted that it has been six years since the Obama Administration defined survey crew members as "laborers and mechanics" under the controversial federal prevailing wage law, "yet the Wage and Hour Division still not issued wage determinations for survey crew occupations", but has made 200 "conformances". He asked the ombudsman to join the SBA Office of Chief Counsel for Advocacy in urging the Labor Department to repeal AAM 212. NSPS has also learned that the Wage and Hour Division of the Department of Labor has issued a conformance that includes a prevailing wage rate for a Party Chief, which is inconsistent with AAM 212. JMP&A, on behalf of NSPS, has brought these irregularities to the attention of the Acting Secretary of Labor and has asked for a meeting with the Wage and Hour Division staff. In November 2019, Pat Smith, John Byrd and John Palatiello participated in a meeting with the former Acting Secretary of Labor and Deputy Secretary, where the Davis-Bacon issue was raised. The Secretary confirmed the issue is still on the Department's radar screen, but did not provide any update on a rescission or resolution.

## Department of Transportation

### Infrastructure

Infrastructure is critical to our nation's prosperity. In February 2018, President Trump introduced a major infrastructure program of an estimated \$1.5 trillion for roads, bridges, airports, and other types of infrastructure. All of these projects require quality and accurate surveying and mapping data, products and services. In recognizing the importance of accurate geospatial data, Congress should include legislative language calling for surveying, mapping and geospatial data for the planning, design, construction, operation, and maintenance for all related infrastructure projects. Data needs include: Elevation; Boundary; Topo; Planimetrics; As-Builts; Asset Management; and others. NSPS is urging sponsorship of provisions enabling the utilization of surveying and

mapping technologies and applications in infrastructure legislation in the 116th Congress.

In March 2019, a delegation from among the NSPS Executive Committee members were invited to a meeting at the White House. The delegation met in April with Francis Brooke, the White House specialist handling infrastructure as part of the National Economic Council (NEC) which is tasked to lend expertise to the President. For the better part of an hour, the NSPS delegation discussed the surveying profession's vantage point on Infrastructure priorities with special emphasis on State and Local coordination with USDOT. Leading up to the meeting at the White House, the Chairman of the Senate Committee on Environment and Public Works, Senator John Barrasso (R-WY), which is drafting the Infrastructure Bill, briefed NSPS members. The White House recognizes NSPS' voice on Infrastructure and wants to continue to engage the surveying profession with infrastructure efforts on the Hill.

### Highway Bill

The highway bill will need to be reauthorized in 2020. Should the infrastructure bill not move, which seems to be the case, it is likely there will be a separate Highway bill. In July, the Senate Committee on Environment and Public Works introduced and reported the 2020 Highway Bill to the Senate floor on a bipartisan 21-0 vote. The "America's Transportation Infrastructure Act of 2019" includes Section 1304 for Intelligent Transportation Systems, Section 1308 for Geomatic Data, Section 1522 for a Permeable Pavements Study, and Section 3005 for research and technology development and deployment. NSPS wrote Senator John Barrasso (R-WY), a speaker at the NSPS Day on the Hill breakfast last April, commending him and the committee for the bipartisan effort that will require the collection of surveying data and utilize the expertise of the surveying profession. The NSPS letter was entered in to the committee's record with other organizations in support of the panel's progress before the September 2020 deadline for the existing highway bill. The House Committee on Transportation and Infrastructure has not yet introduced their version of a Highway bill or a comprehensive Infrastructure bill. There is discussion of infrastructure being part of the 4th Coronavirus relief/stimulus bill that Congress may take up in April.

Committee report language for S. 2302 includes:

*Section 1125 also requires the Secretary to update and expand on a 2008 report entitled "Wildlife Vehicle Collision Reduction Study: 2008 Report to Congress" within 18 months of enactment of the surface transportation reauthorization legislation. This section requires the Secretary, not later than 3 years after enactment, to develop a series of in-person and online workforce development and technical training courses*

to reduce wildlife-vehicle collisions and improve habitat connectivity. In addition, this section requires the Federal Highway Administration to develop a standardized methodology for collecting and reporting **spatially** precise wildlife collision and carcass data for the National Highway System, create guidelines for States to voluntarily utilize such methodology if they choose to do so, and provide a report to Congress regarding the methodology and guidelines within 18 months of enactment. Further, this section requires the Secretary to establish guidance, to be carried out by States on a voluntary basis, which contains a threshold for determining whether a highway shall be evaluated for potential mitigation measures to reduce wildlife-vehicle collisions and to increase habitat connectivity.

Section 1308 requires the Secretary to develop and issue for public comment guidance for the acceptance and use of information obtained from a non-Federal interest through **geomatic techniques**, including **remote sensing and land surveying, cartography, geographic information systems, global navigation satellite systems, photogrammetry, or other remote means**. The Committee recognizes the need to modernize the use of new and existing geospatial information sources and the collection of that information through a variety of means, including remotely operated and stationary technologies like sensor-equipped vehicles, buildings, and unmanned drones.

Permeable pavements study Section 1522 requires the Secretary to conduct a study on the effects of permeable pavements on **flood control** and to develop related models and best practices. This section requires the Secretary to make a report on the results of the study available to State and local governments.

#### CHAPTER 1—FEDERAL-AID HIGHWAYS

§101. Definitions and declaration of policy (a)

DEFINITIONS. — In this title, the following definitions apply: (1) APPORTIONMENT. — \* \* \* \* \*

(4) CONSTRUCTION. — \* \* \* \* \* (A) preliminary engineering, engineering, and design-related services directly relating to the construction of a highway project, including engineering, design, project development and management, construction project management and inspection, **surveying, assessing resilience, mapping (including the establishment of temporary and permanent geodetic control in accordance with specifications of the National Oceanic and Atmospheric Administration), and architectural-related services**;

## Federal Communications Commission (FCC)

### Broadband Mapping

Earlier this month, the President signed into law, S. 1822 (P.L. 116-130), a broadband bill that merged multiple bills into one package to allow for improved mapping for the availability of broadband internet service is essential to promoting the deployment of high-speed service to all Americans, especially those in unserved and underserved areas.

Also this month, NSPS member Brent Birth, PLS, of Pennsylvania was appointed by Federal Communications Commission (FCC) Chairman Ajit Pai to the FCC Task Force Working Group for "Mapping and Analyzing Connectivity on Agricultural Lands". This working group will report to the Task Force for Reviewing the Connectivity and Technology Needs of Precision Agriculture in the United States (Precision Ag Connectivity Task Force) authorized in the 2018 Farm Bill which included a provision NSPS sought for a professional with geospatial expertise be added to the Task Force. Brent's appointment to the working group came as a direct result from an NSPS campaign, including a letter to the FCC, as well as from a Congressional multi-member letter led by Rep. Dan Meuser (R-PA) to the FCC. Brent's first meeting with the Task Force occurred March 25 by electronic format.

### Ligado/LightSquared

In 2016, LightSquared has rebranded with a new name, Ligado Networks LLC. Ligado has petitioned the FCC to repurpose satellite frequencies near GPS to also support terrestrial telecom services, effectively transferring its license for space-based broadcasting to powerful terrestrially-based broadcast towers. Ligado's custom networks would provide services for industrial operations such as power grids and connectivity for drones and driverless cars, in addition to consumer broadband services. The nation's leading GPS experts voted unanimously in August 2018 to oppose allowing Ligado Networks to use spectrum neighboring the GPS band for terrestrial communications. The NationalSpace-Based Positioning, Navigation, and Timing Advisory Board urged opposition to the proposal saying that even if the transmissions' power was lowered to just under 10 watts it "will create totally unacceptable interference for a great number of GPS users in the United States."

NSPS was able to convince COGO to author a December 2018 letter to oppose the Ligado application pending before the FCC. NSPS has been asked to submit a separate letter to the FCC requesting the rejection of the Ligado application. In March, NSPS Executive Director Curt Sumner urged the Federal Communications Commission (FCC) Chairman Ajit Pai to reject a spectrum application by Ligado



Networks (formerly LightSquared). In the letter, Sumner explained, *"surveying and mapping is essential to a variety of communications systems and networks, with utilization of the Global Positioning System (GPS) being an important tool in the performance of such professional services. I am writing to you to express our concern about the Ligado Networks proposals and the interference they would cause to GPS and GNSS data acquisition, processing, and use. Unbiased testing has repeatedly confirmed that such implementation would surely undermine many of the uses of that data which have come to be anticipated, even essential, among the public and within the geospatial profession that provides services to it. We take very seriously the role of our respective members in protecting the public's interests from harm, and strongly urge the rejection of the Ligado Networks proposals which will undoubtedly cause such harm."* NSPS has also re-engaged with the GPS Innovation Alliance, as a member. This coalition is an outgrowth of the coalition that was formed to defeat the original LightSquared proposal early in this decade.

#### PNT

In January, President Trump signed an Executive Order on Strengthening National Resilience through Responsible Use of Positioning, Navigation, and Timing (PNT) Services, which directs the Federal government to develop guidance that mitigates the risks of disruption to critical infrastructure that rely on PNT services. As the first nation to take this action, the Administration is advancing America's leadership in emerging technologies and securing infrastructure vital to national security, commercial industry, and our everyday lives. PNT service, such as the Global Positioning System (GPS), is among the most used utilities in the world. Americans rely on it every day for a variety of purposes ranging from electricity to smartphone applications. This action by the President will help to ensure that the United States maintains uninterrupted access to essential services that rely on PNT. In February, NSPS government affairs consultant John Palatiello and lobbyist John "JB" Byrd participated in a White House conference call and meeting with discussions from the National Security Council, Department of Transportation, and Department of Homeland Security.

### **Federal Trade Commission (FTC)**

#### Privacy

Major privacy legislation, S. 3456, was introduced earlier this month by Senator Jerry Moran (R-KS). The bill pre-empts state laws to establish a single, national standard on data and individual citizen privacy. Prior to the bill's introduction, NSPS expressed concern to the Senator on the use of the term "precise geolocation data" in legislation and the potential impact of such language on surveyors and other geospatial professionals. As

introduced, the bill language would NOT affect ordinary surveying and geospatial data collection, storage, dissemination, and application activities involving data such as a person's name, address or parcel identification. In a victory for NSPS, Senator Moran's staff provided assurances the Consumer Data Privacy and Security Act, will NOT apply to any conceivable activity of a surveyor.

Also this month, NSPS Federal Lobbyist John "JB" Byrd participated on a conference call with key professional staff of the House Committee on Energy and Commerce to communicate concerns language found in the discussion draft circulated by the Committee staff. JB was assured by the bipartisan staff members that the surveying profession was not included in the bill. NSPS is still seeking exemption language to help clarify and communicate to the broader community.

### **Office of Management and Budget (OMB)/ General Services Administration (GSA)/ Small Business Administration (SBA)**

#### Brooks Act/COFPAES/CIPC

Through the Construction Industry Procurement Coalition (CIPC), NSPS is working on introduction of a comprehensive construction procurement reform bill that will call for the prohibition of reverse auctions for A/E services, including for surveying and mapping. In March, NSPS Executive Director Curtis Sumner and NSPS Federal Lobbyist John "JB" Byrd participated in a coalition briefing co-hosted by the House Committee on Small Business. Sumner and JB discussed the importance of QBS contracting and the impact on small businesses.

In January, Representatives Ro Khanna (D-CA) and Mark Meadows (R-NC) introduced the "Construction Consensus Procurement Improvement Act" (H.R. 5644). As introduced, the NSPS-supported bipartisan legislation would improve the procurement process for federally funded construction-related projects. If passed, it would ban federal agencies from using reverse auctions to award design and construction contracts. The Senate passed its version of the bill (S. 1434), in late December 2019. Through the Construction Industry Procurement Coalition (CIPC) and COFPAES, NSPS has been working on this legislation to prohibit reverse auctions for A/E services, including for surveying and mapping. In March 2019, NSPS Executive Director Curtis Sumner and NSPS Federal Lobbyist John "JB" Byrd participated in a coalition briefing co-hosted by the House Committee on Small Business. In that session, Sumner and Byrd discussed the importance of QBS contracting. Rep. Meadows has since been named Chief of Staff to President Trump at the White House and will resign from Congress.

The Council on Federal Procurement of Architectural and Engineering Services (COFPAES), a coalition of design societies is being strengthened with NSPS and ASCE as the longstanding members. AIA has agreed to rejoin, and IIBEC has joined for the first time. The short-term goal is to have NSPE, ASLA, ACEC, and perhaps one or two other organizations also join a strengthened COFPAES. COFPAES is also working with the Office of Federal Procurement Policy, having met in November 2017 with Acting OFPP Administrator Leslie Field, in May 2018, and in December 2018 with OFPP and FGSA officials, on reforms to address the fact that it now takes federal agencies as long as 2 years to complete a QBS award on a multiple award, ID/IQ contract. John Palatiello has been invited to participate in a distance learning forum hosted by GSA that will include more than 100 Federal acquisition officials to discuss the length of time it is taking to award QBS contracts, including causes and potential reforms and remedies.

In June, the U.S. House of Representatives passed H.R.3351, the Financial Services and General Government Appropriations Act, 2020 by a vote of 224 - 196. Included in the House Appropriations Committee report accompanying the bill is a requirement that the General Services Administration study and report to Congress on its compliance with the Brooks Act and part 36 of the Federal Acquisition Regulation (FAR), providing for qualifications based selection (QBS). The Council on Federal Procurement of Architectural & Engineering Services (COFPAES), of which NSPS is a member, has long advocated for better compliance and enforcement of QBS by GSA, citing a strong legal case against use of GSA Schedule contracts for A&E (including surveying and mapping) services. The report language includes:

*Design Services.--The Committee recognizes the need for transparency and oversight of Federally funded design services and construction projects to ensure responsible, cost effective, and fair procurement practices. The Committee supports efforts to ensure*

*proper transparency and oversight of such design services and construction projects, which are often complex and site specific. Within six months of the enactment of this Act, GSA is directed to submit a report to the Committee addressing the enforcement of any existing regulations requiring that independent design professionals be consulted on Federally funded design services and construction projects, as prescribed by the Brooks Act and Federal Acquisition Regulation Part 36. The report should include how many violations have been identified over the last five years and any steps GSA has taken to mitigate any future violations.*

#### National Surveying Week

John M. Palatiello & Associates, Inc., was successful in obtaining a letter from President Trump in observance of National Surveyors Week in which the President included the following quote:

*"Today, we depend on surveying to develop economic plans that effectively use resources and land throughout the United States. This week, I extend appreciation to those who are currently in this field. Through your dedicated work, you are helping to make our country stronger and more prosperous. I send my best wishes for a memorable celebration and continued success."*

#### OMB Circular A-76

In December 2019, Rep. Greg Steube (R-FL) and Sen. John Thune (R-SD) introduced the "Freedom From Government Competition Act" (H.R. 5329/ S. 2990), a bill long supported by NSPS. The bills establish a process by which Federal agencies analyze their commercial activities (those for which private sector providers can be found in the Yellow Pages of the phone book) to determine whether government employees or private companies are the most efficient and economical provider of such services, thereby lifting the moratorium on OMB Circular A-76.

# OSCAR BART

By Dean Glorso, PLS, Apr 25, 2019

Oscar Bart was a lath and plaster man  
In the nineteen thirties he honed his skills  
A building tradesman when craft meant pride  
When we knew him, he was mired by age

Plaster of Paris put mud in his veins  
One leg shorter put a weave in his step  
The sideways motion made him  
A charismatic old hipster

The thin paper of a *Chesterfield King*  
Permanently stuck to his lip  
Bellowed smoke across his cheeks  
His eyes squinting from irritation

His face never clean shaven  
But his thick purple lips smiled largely  
As he walked into the old store  
We would rise to the occasion

And listen closely as to what he had to say  
As his wisdom and humor  
Gave us a charge  
Smart-aleck kids we liked the old fool

We're now past Old Oscar's age  
And stuck in ways of habit & routine

But will a poet someday inscribe  
A line or two in honor of us

*A Greatest Generation* released the helm  
It's now our time to impress the young  
With craft and savvy for them to believe  
Swagger on, swagger on....



Dean Glorso, PLS and Debra Zerr, Girl Scout, who assembled volunteers to construct the first gravel walkway planned for the site of the USMC Memorial expansion, at 6th and Colfax. For details visit <https://usmcmemorialfoundation.org/>



**Dreaming of incorporating UAS into your business?**

**Wanting to get FAA Remote Pilot Certified?**

**Let the FAAS team help you build YOUR professional UAS team.**

This UAS Certification Training course gives you the tools you need to pass your FAA Remote Pilot written exam. This one-day course will cover the key main elements of the 107 exam and provides you with additional at home study materials, including Air Craft's proprietary study guide, FAA manuals, practice exams, log book, and even flight exercises.

#### **What you get:**

- Eight hours ground school
- Proprietary study guide saves study time.
- Practice Exams
- All FAA Exam Study Materials
- Flight Exercises
- Bonus flying techniques

#### **Our Instructors:**

FAA Certified (Commercial & UAS)  
FAA Safety Team Representatives  
Hundreds of hours of real – world  
UAS flight operation experience.

**Join us for our next UAS  
Certification Class in Denver  
Saturday, May 19<sup>th</sup>  
Email [bryan@air-craft.us](mailto:bryan@air-craft.us) for  
more info or to register.**



# Board of Directors Meeting Minutes

September 8, 2020 • 4:30PM

## 1. Call to Order – Parker

Name	Position	Chapter	Attending?
Steve Parker	President	Southern	x
Don Hulsey	Vice President	Southern	
Shaun Lee	Secretary/Treasurer	Central	x
Becky Roland	Executive Director	n/a	x
Heather Lassner	Director	Northern/TrigStar	
Eric Carson	Director	Central	
Brian Dennis	Director	Southern	x
Mike Greer	Director	Central	x
Leif Joy	Director	NW ¼	
Eric White	Director	Southern	
Tom Sylvester	Director	Western	x
Scott Thompson	Director	Western	x
Todd Beers	Ex-Officio	Central, NSPS Rep.	x
Parker Newby	Non-Voting	Southwest	
Roger Nelson	Non-Voting	WFPS Delegate	
Guests:			
John Hunter		Geo-Coordinator	x
Peggy Streicher	GIS in the Rockies		
Ralph Pettit		Legislative Co-Chair	x
Todd Johnston	Southwestern		
Chapter			
Robert Boehm	Central Chapter		
Tony Fendick	Northern Chapter		
Willie Whelen	NW ¼ Chapter		
Brian Bowker		Western Slope	
Chapter	X		
Brian Shaw		NGS	x

## 2. Determination of Quorum (6 voting) – Lee

## 3. Any changes to the Agenda? – Parker

- Added NGS Update

## 4. Approve August Minutes – Parker

- MOTION:** To approve the August 2020 Minutes as amended. (Dennis/Lee) – Approved (1 abstention-Greer)

## 5. Financial Items - Parker/Lee/Roland

- Investment Update from Key Bank (Savings, Earnings, Performance)
  - Checking \$122,792
  - Savings \$62,840
  - Still need investment access – Shaun will contact Key Investments
- Paid CMU Foundation and Scholarships – need to transfer from investments to checking

## 6. GIS in the Rockies Parker

- GISCO dropped out of the group

- John Hunter, Brian Shaw presenting; additional panel with Steve Parker
- Conference is all virtual

## 7. Colorado Coordinator Activities Hunter

- Reviewed website and form for feedback
- Goal is to have everything finalized by the end of year

## 8. Summit Update Roland

- Gary Kent and CFedS presentations will be live (if possible) and broadcast
- Additional presentations will be available as virtual only and will include DORA, vendors

## 9. NSPS Update Beers

- Cancelled in person meetings
- All Committee meetings/BOD Meeting will be virtual this month

## 10. NGS Update Shaw

- NGS sent delay message – 2024/25
- Have started to collect gravity data
- NGS has posted some recorded webinars
  - [https://geodesy.noaa.gov/web/science\\_edu/online\\_lessons/index.shtml](https://geodesy.noaa.gov/web/science_edu/online_lessons/index.shtml)
  - [https://geodesy.noaa.gov/web/science\\_edu/webinar\\_series/delayed-release-nrsr.shtml](https://geodesy.noaa.gov/web/science_edu/webinar_series/delayed-release-nrsr.shtml)

## 11. WCCC Update/Scholarship Committee Sylvester

## 12. NSPS YSN Combs

- Will schedule a 2nd Happy Hour
- NCEES has a new employee who is reaching out to PLSC and other states to promote surveying

## 13. QBS Update White

- Meeting next month

## 14. Project Updates

- Colorado Railroad Museum Project Hulsey/Boehm
  - No report
- Adams County Fendick/Lassner
  - No report
- Sawyer Garston Collection Hulsey
  - Still moving forward

## 15. Reports

- Executive Director Roland
  - Working Group met last week on Elections/Volunteer Recruitment
  - Need assistance with material/volunteers for

- upcoming Virtual Career Fairs/Counselors' Conference
    - 1. Todd Beers volunteered to help with presentations
  - b. Lobbyist/Legislative Committee Thompson/Pettit
    - i. Need to provide input to lobbyists on what our goals are for upcoming session
      - 1. Recording Law changes to deposits
      - 2. Meeting with Clerk and Recorders after elections
      - 3. Meeting with lobbyists on Tuesday
      - 4. Recording monument records digitally – MOU with CDOT
      - 5. Could State purchase Don Lambert's database? Updates are needed and data is missing – need to contact Don
        - a. Establish a subcommittee for this
      - 6. Survey membership for input on what issues PLSC should address
  - c. Membership Committee – Carson
    - i. No report
  - d. Outreach Committee – Dennis
    - i. August 29 Steve Parker and Brian Dennis met with Girl Scouts for Geocaching Badge (PLSC is listed as a resource on the Girl Scout Leaders' Facebook)
  - e. Education Committee – Roland
    - i. Refresher Course will likely be online only
  - f. Trig Star Committee – Lassner
    - i. No report
  - g. CST Committee – Parker
    - i. Two confirmed to take CST Level 3
  - h. *Side Shots* Report – Roland
    - i. Brian Dennis will send the NCEES questions for possible article in *Side Shots*
    - ii. Becky Roland will reach out to Chris Power regarding an article interviewing PLSC members
  - i. WSPS Delegates' Report – Beers
    - i. Virtual Meeting in June – WSPS wants to develop a training/refresher course for PLS/LSIT (competes with PLSC)
  - j. Colorado County Surveyors – Joy
    - i. No report
16. Chapter Reports
- a. Southern Parker
    - i. Had a meeting in August (in-person)
    - ii. Next meeting in October and then Holiday Party
  - b. Central Lee
    - i. Planning golf tournament October 3
  - c. Northern
    - i. Meeting last week to plan upcoming meetings
    - ii. Election is underway
  - d. NW ¼ Whelen
    - i. No report
  - e. Western Bowker
    - i. Met September 9 from State Patrol on safety
    - ii. Membership Committee review of documents
    - iii. Next meeting November 18
  - f. Southwestern Johnston
    - i. Meeting next Tuesday (in-person and virtual)
17. Next Meeting Date and Location
- a. Next BOD Meeting - October 13 at 4:30PM
  - b. BOD business work group (Elevator Speeches) – TBD Becky will send out a poll for best date
18. Adjourn (Sylvester/Dennis)

# CHAPTER NEWS

## CCPS

The CCPS Board held a meeting last Thursday so I'll provide the highlights of the discussion. Financials are looking good. We still need to transfer funds from our old account to the new account and we'll be working with PLSC on transferring funds from the Golf Tournament registration. Since we're entering election season the election committee proposed language to amend our bylaws to allow voting online rather than by mail-in ballot. To keep it anonymous and avoid conflicts of interest we'll look to the PLSC to manage the online voting and provide the results. We also discussed amending the election dates back a month from October to November. Assuming that gets approved, be looking for a ballot in your inbox around the middle of November. On that note please make sure that PLSC has your current email address so that you'll receive the link to the voting site. If anyone is interested in running for a position on the board, you can reach out to express your interest by sending an email to [colocentralsurveyors@gmail.com](mailto:colocentralsurveyors@gmail.com) and we'll add you to the ballot. Just let us know what position you would like to run for and provide a brief bio to include on the ballot. The golf tournament was a big success, with 39 people participating. There was a lot of positive feedback so we're definitely planning to hold another tournament next year. We'll give more advanced notice on the next go around and implement some of the lessons learned to improve the event. Hopefully you've received your bumper sticker with the new chapter logo by now, but if you haven't, be looking for that in your mailbox (it might be going to your work address). In case you didn't get the word already, we are planning on postponing the next general membership meeting. The last virtual meeting had a low turnout and the consensus at the moment is that we're not quite ready to return to in person meetings. We plan to keep discussing and watching the current state of events and will hopefully have a meeting sometime later in the fall.

Robert Boehm, PLS  
President, CCPS

## NC – PLSC

Over the summer we took our normal break from meetings to stay caught up with the busy work season. We met in September at Betta Gumbo for dinner and refreshments to discuss upcoming meetings as well as candidates to fill our vacant positions on the Northern Chapter Board.

The October meeting was held at the Larimer County offices. We had an open discussion regarding Standard

of Care. Some of the topics that were talked about included the benefit of parole evidence, various locations to search for information, value of contacting other surveyors, and searching for roadway information in County Commissioner notes and minutes. Laine Landau has also volunteered to get certified as a proctor for our CST exams. Thank you, Laine!

In November we will be welcoming Kirsten Muncy from IRWA. Kirsten will be speaking on important topics regarding expectations of surveyors from a ROW perspective, how ROW agents use surveyors, and how surveyors can help and ways to not hinder projects.

We have also discussed possible activities for our chapter, and guests, for our December Holiday Party. Some of these ideas include a bonfire at YMCA of the Rockies, going to the Fraser Tube Hill, Zoo Lights, or snowshoeing. We will be discussing these options in our November meeting.

The candidates for the Northern Chapter election are:

Dave Berglund (President)

Vacant (President Elect)

Heather Lassner (Secretary/Treasurer – Rerun)

Steve Varriano (Director)

Tony Fendick (Director)

Stay safe and healthy everyone!

Tony Fendick,  
President, NC-PLSC

## NW 1/4 PLSC

Due to some slight revisions to Routt County's Coronavirus restrictions, the NW1/4 was able to meet with less than 10 people at the Hayden Dry Creek Park on September 24th. The two main topics for the evening were improvement location certificates and the surveying situation in Stagecoach, an outlying growth area in Routt County. We had members present from Garfield, Routt and Moffat County.

Most of the West slope communities perform improvement location certificates (ILC's) that are significantly different than those for the Front Range. We typically find at least two if not three or four property corners to establish the location of the improvements. We do stop short of resolving any boundary corners, or finding/setting all of the corners of the property as that would make it an Improvement Survey with some other additions.



# CHAPTER NEWS

Our issues with the ILC's are mainly focused around their misuse. Despite all the language on them stating very clearly that they are not to be used for future improvements or fencing, architects, designers, builders and homeowners frequently call asking for a CAD drawing of an older ILC so they can do just that. The City of Steamboat Springs has required an improvement survey for at least 15 years now. In the best of cases, we upgrade the older ILC to a true improvement survey, but many times we see one of our ILC's attached to a building permit. Given the surging real estate market we are in, many of the survey orders are for improvement surveys, but the ongoing issue of misuse of the ILC's continues. Although we recognize ILC's are done differently on the Front Range, there were suggestions from members that we look at a formal motion to recommend eliminating them altogether at the state level.

The other main topic was Stagecoach. This has been an ongoing issue for at least 15 years now in Routt County. In a nutshell, survey crews in the early 70's were setting a dozen corners a day in four (4') feet of snow. Almost 50 years later, we are discovering instances of survey blunders of 70'! Then we have had a local surveyor setting duplicate corners 5-10' from the original corner. The discussion centered around solutions and some of the lots in Stagecoach and Steamboat Lake have been "redflagged" by County Planning due to the boundary disputes. A building permit is not issued until the boundary issue for that particular lot is resolved. More on this later!

Respectfully submitted,  
Brian T. Kelly  
Vice President, NW1/4

## SC-PLSC

We had our first meeting in August since our last meeting in February of this year. We met at our usual location held at The Academy Hotel in north Colorado Springs. We put away some great food from the restaurant and enjoyed catching up with the survey field happenings. The topic was brought up about the life insurance plans NSPS offers. Several of our members have the policy and I encourage others to take advantage of these group rates for term life insurance. We mostly had conversations about current survey methods and problems in the field with specific projects. The Annual Christmas Party at The Miramont Castle in Manitou Springs has been locked in and confirmed for December 4, 2020. We all compared notes about

the demanding survey load here in El Paso County. Everyone is very busy and the COVID-19 has not slowed down the pace here in Colorado Springs. Feel free to join our monthly meeting every 3rd Tuesday of the month. Everyone stay safe and healthy.

Don R. Hulse, PLS  
President, SC-PLSC

## SWC – PLSC

The SWC held an in-person/video/call meeting on September 22, 2020 at the Holiday Inn in Durango. This was our first meeting since January 21, 2020. Despite having some technological issues (seems common for these times) we had a decent turnout and great discussion. We all practiced social distancing and wore masks. We did not have a topic presenter at this meeting and focused on going over old/new Chapter business, which we sorely needed to do!

Some highlights of this meeting were:

- La Plata County Surveyor's report - Discussed new La Plata County land use code as it pertains to plat review and monumentation.
- Treasurer's Report - Account balance \$11,585.40.
- We did not have any nominations for Chapter Treasurer, but there was some interest generated. We hope to have nominations and hold an election at the next meeting.
- We discussed donating to a college scholarship fund and possibility donating survey equipment to a college survey program.
- We did not have any volunteers to work on the SWC website and decided to explore the cost of having a third party create a website template.
- There was a motion to move the SWC meetings to the last month in each quarter (March, June, September, and December). This would follow the publication of Side Shots and we can take advantage of the "Chapter News" to announce our upcoming meetings. The motion was seconded and passed.
- The 2020 SWC Surveyor Rendezvous will be postponed. It was suggested having the Rendezvous in February/March 2021 or even holding it as a BBQ in Spring/Summer 2021. More to follow as the Covid-19 situation develops.

# CHAPTER NEWS

Our next meeting will be held on December 15th, 2020 at 5:30 PM at the Holiday Inn & Suites Durango Central. The meeting will begin at 5:30 PM and it will be in-person with video conference/call in options. Brian Shaw (NGS Rocky Mountain Regional Advisor) has graciously agreed to speak at this meeting and will provide updates on the NGS programs.

Everyone stay safe and healthy!

Todd C. Johnston, PLS  
President - SW Chapter PLSC

## WCLS

WCLS had our September meeting on Wednesday the 9th. We welcomed guest speaker, Corporal Denny O'Leary with the Colorado State Patrol. Denny

walked us through single vehicle safety in the roadway, pertaining to what a surveyor might encounter. He left us with some great information to apply in the field. WCLS is planning on moving forward with its Spring Seminar in May pending any restrictions. More information will be on the way as we get closer.

The WCLS Membership Committee made up of Alex Lheritier, Kurt Shepherd, and Tom Sylvester, who worked on giving us options to think about on how to increase memberships at the Chapter level. We will be going over these in more detail at our next meeting and coming up with some action items.

Brian K. Bowker, P.L.S.  
President, Western Colorado Land Surveyors

*A masterful documentation and historical perspective of each initial surveying point for federal public lands in the United States. Published in 9x12 format, Initial Points of the Rectangular Survey System features a 4-color section with more than 130 photos depicting monuments and landmarks.*

Number of copies	Price
1	\$89
2-5	\$79
6-10	\$69

**Call 303-428-9529  
to order**



C. Albert White's second book,  
**INITIAL POINTS  
OF THE RECTANGULAR SURVEY SYSTEM**

**Never before, in the history of surveying, has so much pertinent and interesting material been so meticulously compiled in one publication. (White personally visited EVERY Initial Point.)**

Mr. White's first book, *A History of the Rectangular Survey System*, published by the BLM in 1983, is considered the definitive work on the U.S. Public Land Survey System. Arguably the most distinguished authority on the history of nineteenth and twentieth century public lands surveying, White began his career with the General Land Office in 1946. Both as BLM and a private surveyor, he applied his zeal to a wide range of activities. White's expertise represents a bridge between the wisdom and experience of the American heritage of land settlement and the contemporary uses of surveying technology.

Published by the Colorado Professional Land Surveyors Educational Foundation, Inc., a non-profit foundation, Initial Points of the Rectangular Survey System is undertaken in the spirit of, and dedication to, Mr. White's remarkable contributions to his field. Net proceeds from its sale will be returned to the Professional Land Surveyors of Colorado Inc. Scholarship Fund.

# S U S T A I N I N G M E M B E R S

## **ASSURANCE RISK MANAGERS, INC.**

Lisa Isom  
10651 E. Bethany Drive, Suite 300  
Aurora, CO 80014  
303-454-9562  
lisom@arm-i.com

## **ALTURA LAND CONSULTANTS, LLC**

Jesus Lugo  
6950 S Tucson Way Unic C  
Centennial, CO 80112  
720-488-1303  
marissa@alturaland.com

## **CARDNO, INC.**

Andrew Sylvest  
Branch Manager  
14142 Denver West Parkway  
Suite 280  
Lakewood, CO 80401  
720-556-5245  
andrew.sylvest@cardno.com

## **CARLSON SOFTWARE**

Jim Reinbold  
Regional Sales Director  
1412 W Powder Ct.  
Eagle, ID 83616  
303-482-1836  
jreinbold@carlsonsw.com

## **DIVERSIFIED UNDERGROUND INC.**

Richard Chuapoco  
2851 S. County Rd. 137  
Bennett, CO 80102  
720-490-1321  
richard@diversifiedunderground.com

## **ECAD**

Kelly Marrill  
12130 N. Pennsylvania St.  
Thornton, CO 80241  
303-427-2231  
Kmarrill@cad-1.com

## **FARNSWORTH GROUP**

Christopher Brooks  
5613 DTC Pkwy., Ste. 1100  
Greenwood Village, CO 80111  
303-692-8838  
cbrooks@f-w.com

## **FLATIIONS SURVEYING, INC.**

John B. Guyton  
3825 Iris Ave., Ste. 395  
Boulder, CO 80301  
303-443-7001  
jguyton@flatironsinc.com

## **FRONTIER PRECISION INC.**

Mel Philbrook  
5480 W 60th Ave., Unit A  
Arvada, CO 80003  
720-214-3500  
mel@frontierprecision.com

## **GEOSHACK**

Jay Halverson  
7000 E 47th Ave., Ste. 900  
Denver, CO 80216  
303-853-0311  
jhalverson@geoshack.com

## **HIXON MFG. & SUPPLY CO.**

Ken Perry  
1001 Smithfield Dr.  
Fort Collins, CO 80524  
303-694-0012  
ken@hixonmfg.com

## **JACOBS**

Robert Boehm,  
9191 S Jamaica St  
Englewood CO 80112  
720.286.2914  
robert.boehm@jacobs.com

## **KINETIC ENERGY SERVICES, LLC**

Dustin Muir  
PO Box 530  
Milliken, CO 80543  
720-442-1162  
dustin.muir@kineticindustry.com

## **MERRICK & COMPANY**

Todd Beers  
Survey Project Manager  
5970 Greenwood Plaza Blvd.  
Greenwood Village, CO 80111  
303-751-0741  
todd.beers@merrick.com

## **NV5, INC.**

Eric White  
5445 Mark Dabbling Blvd., Ste. 100  
Colorado Springs, CO 80918  
719-268-8535

## **R&R ENGINEERS-SURVEYORS, INC.**

Andy Maggioro  
1421 S Joplin St.  
Aurora, CO 80017  
720-390-5526  
amaggioro@aol.com

## **SKLD INFORMATION SERVICES**

Kelly Mulé  
Sales Representative  
9540 East Jewell Ave  
Suite A  
Denver, CO 80247  
(303)695-3850  
kmule@skld.com

## **SURVEYING AND MAPPING, LLC (SAM)**

Mark Hall  
555 Zang Street #210  
Lakewood CO 80228  
303-988-5852  
Mark.hall@sam.biz

## **SYNERGY MAPPING, INC.**

Kent Travis  
6551 S Revere Pkwy., Ste. 235  
Centennial, CO 80111  
303-478-3866  
tgkent@synergymapping.com

## **TERRAMETRA RESOURCES**

Lynn Patten  
2919 Bryn Mawr Place  
Longmont, CO 80503  
303-709-2903  
lynn.r.patten@gmail.com

## **TOM RICHARDSON LLC**

2771 S Pagosa St.  
Aurora, CO 80013  
303-699-3524  
Gwen@TomRichardsonLLC.com

## **UNDERGROUND CONSULTING SOLUTIONS**

Kelly Goff  
2701 W. Oxford Ave., Suite 6  
Englewood, CO 80110  
303-904-7422  
ucs@totalspeed.net

## **VECTORS, INC**

Chuck Hutchins  
Sales  
10670 E Bethany Dr.  
Bldg. 4  
Aurora, CO 80014  
303-283-0343  
chuckh@vectorsinc.com

## **WESTWOOD PROFESSIONAL SVCS.**

Ty Trammell  
4514 County Road 5  
Erie, CO 80516  
806-678-5540  
ty44trammell@yahoo.com

These firms support our organization.  
Please show them your appreciation with your  
patronage. To become a Sustaining Member,  
please contact Becky Roland at  
broland@plsc.net, or 303-551-3266.



# SURV-KAP<sup>®</sup>

## No Boundaries On Customer Service

We manufacture a full line of brass survey markers for all of your surveying needs.



**MONUMENTS, MARKERS, CAPS & ACCESSORIES**

**ORDER NOW: 800-445-5320 • SURV-KAP.COM**

Custom Survey Markers & Monuments • Signs & Witness Posts • Flagging & Targets • Nails & Washers

# Survey Marker

Custom Survey Markers & Monuments • Signs & Witness Posts • Flagging & Targets • Nails & Washers



**Berntsen<sup>®</sup>**  
Marking the Infrastructure of the World<sup>™</sup>

877-686-8561 | [www.berntsen.com/colorado](http://www.berntsen.com/colorado)





# HIXON

Mfg. & Supply Co.

[www.hixonmfg.com](http://www.hixonmfg.com)

SALES SERVICE - RENTAL

TWO CONVENIENT RETAIL LOCATIONS

SURVEY, CONSTRUCTION, AND ENGINEERING  
INSTRUMENTS AND SUPPLIES

LARGEST GNSS RTK REFERENCE  
NETWORK IN COLORADO AND WYOMING

LOCAL SUPPORT, TRAINING, AND SERVICE

24/7 WEB STORE - [www.hixonmfg.com](http://www.hixonmfg.com)



# IMAGINE

Imaging Power

when it has to be right

**Leica**  
Geosystems

## Leica GS18 I

Mapping just got simpler, safer and more efficient than ever before. Meet the Leica GS18 I GNSS RTK rover with Visual Positioning. With it you can effortlessly measure points you couldn't reach before. Capture the site with GS18 I and map points from images. A GNSS RTK rover so innovative, that you can accurately measure facades and corners without needing to switch tools.

Once you capture the site, you can measure every detail whenever you want to.

**Call Hixon Mfg. & Supply Co. at 800.762.5252 for additional information**



### FORT COLLINS

1001 SMITHFIELD DR  
FORT COLLINS, CO 80524  
970.482.0111 800.762.5252

[www.hixonmfg.com](http://www.hixonmfg.com)



### DENVER

8775 E ORCHARD RD, #807  
GREENWOOD VILLAGE, CO 80111  
303.694.0012 800.475.3422

