

# THE NEVADA TRAVERSE

Journal of the Professional Land Surveyors of Nevada

Institutional Affiliate National Society of Professional Surveyors • Member Western Federation of Professional Surveyors

Vol. 44, No.2 • June 2017



**2017 NALS Conference Wrap Up...Page 11**



**Wood Rodgers' Experience with UAS Technology...Page 8**

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# The Nevada Traverse

This publication is issued quarterly by the **Nevada Association of Land Surveyors (NALS)** and is published as a service to the Land Surveying profession of the state of Nevada. *The Nevada Traverse* is an open forum for all Surveyors, with an editorial policy predicated on the objective of NALS and Bylaws, Article II, which reads:

"The purpose of the association shall be to promote the common good and welfare of its members in their activities in the profession of Land Surveying; to promote the common good and welfare of the public in terms of professional land surveying activities; to promote and maintain the highest possible standards of professional ethics and practice; to promote public awareness and trust in Professional Land Surveyors and their work.

This organization, in its activities and in its membership, shall be non-partisan, non-sectarian, and non-discriminatory."

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# The Editor's Corner



by Carl C. de Baca, PLS

**W**elcome to Volume 44, Issue No. 2 of the Nevada Traverse. The first surveying magazine to offer a music review is now the first surveying magazine to offer a snippet of hard-boiled detective fiction... or is it a parable? You decide.

So uh, wow! The conference ended a couple weeks ago, as I write this, and it was a great one. We had awesome attendance, tremendous speakers, and a genuinely great time. Shame on you if *skipped it, incorrectly assuming it would be the same old speakers presenting the same old tired topics.* (We don't do that anyway, so next time, hop on the clue bus and take it all the way to the conference, amigo...)

One of the better features of the last three or four conferences has been the round table discussion. The topics are free-ranging and the talk tends to be immediate, refreshing and unguarded stream-of-consciousness brainstorming by anyone who attends. Got an axe to grind? Got a solution to a problem? Got a problem without a solution? Want to talk big-picture issues or zoom in to the microscopic level on a particular issue? The round table is the place to do it. And we take notes, not names. This is all done in an informal effort

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to generate ideas. No organization can survive without them.

Details of the 2017 NALS Conference are covered herein, and a gaggle (technical term) of photos is provided to jog your memory or make you wish you had attended. The 2018 conference, in Las Vegas will be a generational event and you'd better not miss it. At the time of this writing, we have three states and WFPS on board, with invitations out to two more states. This baby will harken back to the mega-conferences of yesteryear. And NALS is the lead dog on this particular sled, baby.

In this issue we present Part III of Paul Pace's epic "The Power of Ideas". I hope you've been following along because the story is riveting and relevant. It shows how dedicated we are, and our forebears were, to getting the right answer. We also have a contribution from Mike Detweiler of Wood Rodgers, who has put together an article about their foray into the UAS arena. It is a primer on how to get your feet wet in this exciting new technology and frankly, if more material like this had been available as we go to press, it would be tempting to entitle this edition of the Traverse, "Game of Drones – Part Deux", but alas, I must save that title for another day. (Besides NALS doesn't need to hear from attorneys representing HBO or Charlie Sheen.)

Gene Sawyer, the secretary of the Southern Nevada Chapter of NALS, offers up an editorial regarding membership and participation in NALS. A solid message, delivered sincerely and passionately. Thanks Gene- great work!

We make every attempt to give Nevada voices a venue for expression and we try to put some sunlight of issues of every kind. I encourage you to read the various committee and chapter reports and not skip over them. Who we are and what we do for you, is all there – you just have to read it. Happy reading! ☒

## About the Cover...

Thanks to Steve Shambeck of PLS Photography for all the conference photos!



L to R: Lahontan President Justin Moore (standing in for Treasurer Doug Wood), President Alan Dill, President-Elect Jerry Juarez and Secretary Halana Salazar



Wood Rodgers Personnel launching an UAV

# Electronic BLM Manual The Manual of Surveying Instructions 2009

**Currently available on the BLM website:**

[http://www.blm.gov/pgdata/content/wo/en/prog/more/cadastralsurvey/2009\\_edition.html](http://www.blm.gov/pgdata/content/wo/en/prog/more/cadastralsurvey/2009_edition.html)

## NALS Historic Committee Search

The Historic Committee is searching for pictures and narratives on past presidents and prominent contributive members.

The presidents are known, but a list of contributive members needs to be developed. This year we hope to collect an overview of recollections, contributions and photos for both categories for future use. Respondents need not worry that two or more reply; information and photos received will be compiled by the committee.

Please respond to:

**NalsHistory@GMail.com**

**Thank you!**



# The President's Message

by Alan Dill, PLS



I would like to begin by thanking all who attended the Conference, and making it a great one! A special Thank You goes to all our Sponsors, Vendors, and Students who helped make it one to remember. We proved that we can do a conference in Nevada with our own members and draw not only top presenters and speakers, but create enough interest to make other State Associations take notice. None of this could have happened as successfully without the experience, and energy of Nancy Almazon, Crissy Wilson, and Dorothy Calegari, our outstanding and talented Conference Committee. Thank You all!

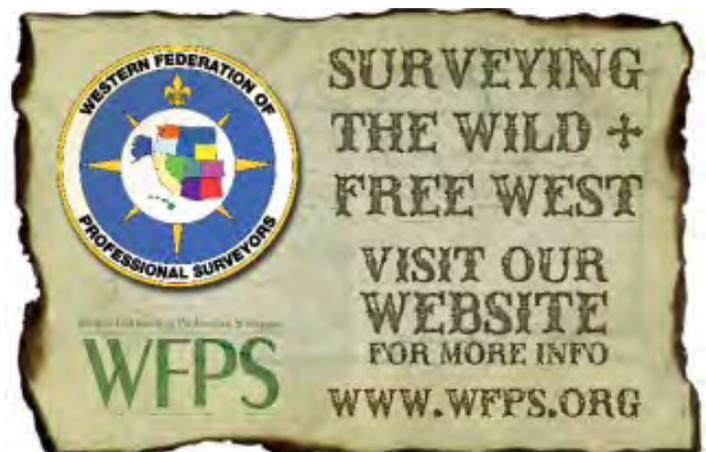
We had many interesting and informative discussions during the conference in many of the panel or round table type gatherings. One of the topics that is bringing up the most discussion is the four-year degree requirement and our current laws relating to professional licensing. There are those that helped created the current laws who are quite passionate and have very strong arguments and reasons why it was necessary and needed. On the other hand, however, there is great concern about lack of new professionals we are currently bringing into the profession. The current group of younger apprentices in our profession is beginning to push for other options and/or ways that professional status could be obtained. The difficulties of working full time, raising families, and then trying to work towards a Bachelor's degree is proving to be a real challenge for most. My feeling is that both sides have good intentions, and I believe both sides have brought up compelling arguments in support of their beliefs. I do feel that the more education directly related to the practice of Land Surveying, and other advanced education a person has, a better professional they will become. It will raise the level and status of our profession, and that was the original intent. I am not saying that those with limited college education can't make great professionals, but in general greater exposure to advanced education does improve our capabilities and should be something a potential licensee should pursue. It also, like it or not, is the current law in this State. This being the case, we fully support and will continue to help and support the program at Great Basin College. Based on the panel discussion with representatives from the State Board of Engineers and Land Surveyors during the conference, there did seem to be a desire to work with the surveying community and find solutions and answers to this growing concern.

A potential Professional Practice Committee was also discussed with our neighbors from California contributing their experiences and the contributions it has made in their state. In general, they reported a positive result overall with this

committee already in place in their state. Our circumstances and the size of our Association and surveying community are very different. Being the tightknit group we are, makes this possible committee in some ways more difficult to justify. My concern, along with several others in our membership, is that a committee of this kind must be limited to a professional opinion, or group of committee members that simply provide that professional opinion in professional practice or ethics issues. Our mission is to promote the profession of Land Surveying and support its future. This committee and its guidelines would need membership support and a membership vote to create. I believe it must fall within this mission. We have distributed some initial guidelines to some of the membership for their opinions and thoughts. We have received some initial concern, and look forward to others contributing their thoughts, contributions, and/or their own support or concerns. If you are interested in this committee, or learning more about it, please contact me for copies of the draft guidelines, and or just call with your ideas. Based on the positive reports from our neighbors about their experiences, we would like to continue possible creation of this committee, so your contributions and involvement are important and needed.

Those of you who did not attend the Conference either by choice, or because of other commitments missed out. The presentations, activities provided, and food were all excellent. All in all it was a great success, with great opportunities to network, socialize, and raise over Fifteen Thousand Dollars for the NALS Scholarship Fund. We would like to thank everyone who generously contributed to the cause. Next year's conference will be in Las Vegas, with Utah, Arizona, and WFPS all committed to join us. California had also expressed interest in joining us so it may be quite a Conference next year. It is bound to be a great one as well.

It was also an honor to provide the presidential duties during the conference, which I never dreamed I would ever do. As I mentioned at the conference many of you helped me gain the confidence and abilities to do them, and that is very much appreciated. I have developed many friendships and relationships over these many years, in which this Association played a major role, I am extremely grateful for that. ⊗



# The Power of Ideas

## France's Geodesic Mission to Peru

### 1735-1744, Part III

By: Paul S. Pace, PLS

Despite the numerous setbacks described in Part II, the French carried on with their mission to survey a meridional arc at the Equator. But more hardships awaited them.

#### Surveying Among the Volcanoes

The members of the Peruvian expedition realized that Maupertuis' Lapland survey would lessen the impact of their findings, regardless of the quality of their work, with all its hardships and setbacks. But they knew too that they must finish the project. An accurate model for the true shape of the Earth was still unresolved. In November of 1738, the teams had reached Riobamba, a small town half way through the triangulation network. They had now measured through a degree and a half in latitude.

Further complicating matters was the Academy's sudden and unexpected suspension of funding for the Peruvian mission. The Academy inexplicably deemed the matter closed; the nearly bankrupt expedition in Peru had become merely a financial burden. The members were left to fend for themselves, with much more work to be done. Bouguer believed he now needed something more than the arc measurement to highlight their expedition. His restless, fertile mind went to work to find it.

Bouguer realized that in the decades since Newton published the *Principia*, no one had yet devised a means to test the theory that gravity attracted bodies in proportion to their mass. He reasoned that if a nearby mountain were of a large enough mass, it might deflect a surveyors' plumb bob, with consequences to a survey as yet unknown. Conversely, that attraction should diminish as the square of the distance between the mountain and the plumb bob. In December of 1738, Bouguer and two colleagues prepared a test.

They did not have to look far for a mountain of sufficient size. They believed they were already among the largest mountains in the world. They selected massive Chimborazo volcano, about 90 miles southwest of Quito, thought at the time to be the tallest mountain in the world at 20,564 above sea level.<sup>1</sup> Rising 10,000 feet above the surrounding plains, the towering cone dominates the area in every direction, though the expedition did not occupy it in their triangulation network. Figure 7.

Bouguer, La Condamine and Ulloa packed a quadrant and their camp gear up the side of Chimborazo, into the perpetual snow and ice 5000 feet below the summit. They checked the rate on their clock and began taking meridian altitudes of six stars to the north and four to the south. They remained on the mountain twelve days, battling the cold, the wind and the constant threat of being buried in drifting snow. Concluding their observations, they descended Chimborazo and set up a new camp four miles

west and slightly south of the first camp. They then re-observed the same ten stars. But despite being at a lower elevation, they were in a more exposed place. High winds and severe cold exhausted the men and degraded their observations.



Figure 7. View of Chimborazo and Carihuairazo volcanoes, from Alexander von Humboldt's *Researches Concerning the Institutions and Monuments of the Ancient Inhabitants of America*, published in 1814

Bouguer estimated that the plumb bob's angular deflection might be as large as  $0^{\circ} 01' 43''$ . But after applying corrections for the slight differences in latitude and refraction between the two camps, the results showed a difference of only  $08''$ . Bouguer suspected that this might be due in part to a large difference in the density of the mountain's volcanic rock. But he recognized too that the weather conditions had adversely affected the results. While he expressed a certain lack of confidence in the numbers, close as they were to the precision limits of the instruments, he nevertheless reported the results to the Academy. He was disappointed when the Academy all but ignored his groundbreaking experiment.<sup>2</sup>

The expedition conducted a range of other experiments. An investigation into the speed of sound was accomplished by firing a cannon against a mountaintop. Two distant points were selected, at 6.9 miles and another at 8.3 miles, from which to time the explosions. Measuring in half seconds, they reckoned the mean at 1126 feet per second. La Condamine continued experiments with pendulums, hauling the delicate clocks to numerous locations. They brought mercury column barometers with them, for meteorological observations and to experiment with carrying elevations barometrically through the work. They also made observations for magnetic dip and to refine the value for the obliquity of the ecliptic, the imaginary plane through the sun's apparent path across the sky, for use in nautical almanacs.

The survey continued through 1739, with both teams making good progress. Between February and July of that year they closed fifteen triangles. But external forces were at work around them. The vast Viceroyalty of Peru had proved simply too large to administer. The Viceroyalty of New Granada was reestablished, with Quito as its capitol. Tensions between Spain and England over trade issues, and repeated treaty violations by both parties, were increasing. A war between the two powers could only hinder the Peruvian expedition. During March the surveyors watched as the nearby Sangay volcano erupted, pouring lava down the steep sides of the 17,400-foot mountain. In April, both teams reached the station on the Sinasaguàn volcano. It was the highest mark in the network, at

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14,950 feet above sea level. They spent two disagreeable weeks camped there.<sup>3</sup>

The survey worked southward and finally the teams relocated to Cuenca. It was the largest town near the southern terminus of the triangulation, some 190 miles south of Quito. Jean Seniergues, the expedition's assistant surgeon, continued to enjoy his status as a doctor, and profited handsomely in the process. While the surveyors labored on, he conducted a lucrative private medical practice. Arrogant and quarrelsome, Seniergues soon became romantically involved with a young woman recently scorned by the deputy attorney general of Cuenca.<sup>4</sup> Their relationship grew complicated. The situation deteriorated as growing ill will between the doctor and the local townspeople developed.

Seniergues was unabashed about his behavior and eventually tensions reached a breaking point. At a large festival, to which the members of the expedition were invited, an argument erupted between Seniergues and friends of the woman's former lover. Seniergues pulled his pistol and attempted to shoot, but the gun misfired. A riot broke out. Amid cries of "Kill the French foreigners!" the expedition members fled for their lives. In the ensuing melee, Seniergues was mortally wounded and Bouguer was seriously injured.

Seniergues lingered on for a week before succumbing to his wounds. Bouguer recovered, but the whole affair was a setback. Compounding their troubles, open warfare broke out between Spain and England. Bouguer had been reluctant to go to Peru in the first place. But now, after four and a half years of enormous effort and mounting expense, with his personal reputation and, he believed, that of the Academy on the line, he found himself responsible for a mission teetering on failure.

Despite the setbacks, they completed the triangulation work. Figure 6. Several tasks remained: measurement of the southern baseline to provide a check on their triangulation; tie the network to sea level; complete the astronomy, measuring latitude at each end of the net. Jussieu meanwhile, continued to amass a huge botanical collection, which he described in detail in his manuscripts. Morainville assisted, painted the specimens in delicate watercolors.

Everyone was tired, on edge and more than ready to go home. And the personality conflicts continued to burn, which only impeded progress. The Frenchmen not only insulted each other, but also angered their easygoing Spanish colleagues. Complicating things further, Godin refused to use the agreed upon southern baseline and decided to measure his own. Using a common baseline had obvious advantages, but Godin was unmoved, despite vigorous protests from the others. Frustrated, La Condamine and Bouguer proceeded with the measurement of the original baseline at Tarqui, which came to 6.4 miles in length. Godin stubbornly went his own way and, with help from Juan and his cousin Jean-Baptiste, measured a separate baseline at Baños, somewhat closer to Cuenca.

Calculations to adjust horizontal angles in the scheme were completed. Next they determined the trigonometric elevations at each station, reducing the heights of the stations to the elevation of the lowest end of the northern baseline. Further calculations were needed as the chain of triangles was not in a north-south line, but angled 14° west of south. Bouguer and La Condamine carried out calculations separately, as a check on one another. Bouguer found his distance along a north-south line to be 162,965 *toise*, while La Condamine arrived at 162,995 *toise*.

The 30-*toise* delta came to about 191 feet, through the network of 33 triangles spanning 215 miles.<sup>5</sup> Godin insisted on using his own calculations, to the exclusion of all others. Furthermore, he enciphered his results so only he could read them.

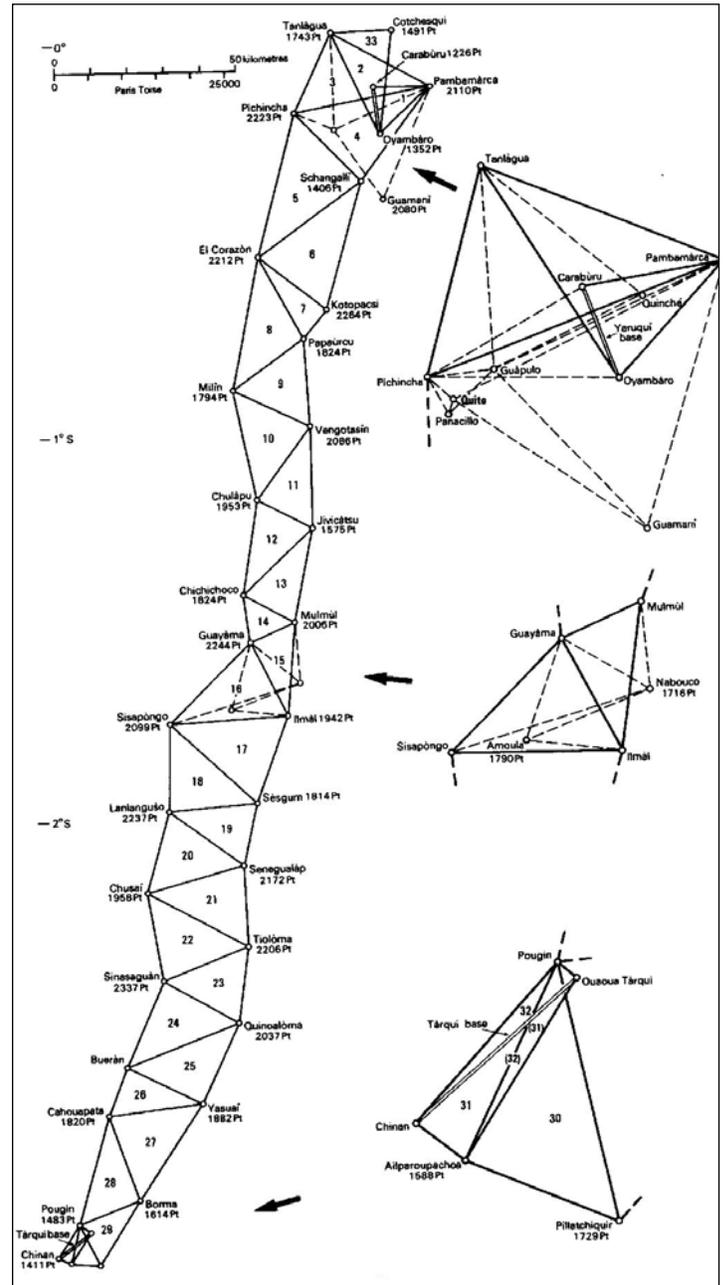


Figure 6. The triangulation scheme of Bouguer and La Condamine. The numbers below the stations are elevations in *toise*. From Jim R. Smith, *The Meridian Arc Measurement in Peru 1735-45*

With the initial adjustments complete, and the flap over the southern baseline behind them, Bouguer and La Condamine next moved to finalize the astronomy. This required the latitude at each end of the meridional arc. For this work they would use the Graham zenith sector, similar to Bradley's 12.5 foot sector at Greenwich. Figure 7.

A mounted sector points directly overhead, toward the observer's zenith. Moving a telescope along the scale to a nearby star, it measures the zenith distance, or the angle between the observer's zenith and the star, as it crosses the observer's meridian. At the Greenwich Observatory one was

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used in the 1740's to discover the aberration of light and the nutation, or wobbling, of the Earth's axis. The zenith distance, together with the published angle of declination, would determine the observer's latitude. The sectors were by far the most expensive instruments on the Peruvian expedition.

But in the field, this large and ungainly instrument was difficult to use and needed particular care in mounting. An observatory had to be built to accommodate its unusual length and in which it could be suspended from heavy ceiling beams. A hole was opened in the ceiling to observe the sky. It could be gimbaled to allow reversing in azimuth, in order to eliminate any collimation error. Angles were read from the graduated limb at the bottom of the instrument, while the observer lay on the floor looking up through a 90° eyepiece into the telescope. A wire plumb line was suspended from the ceiling and used to reference the plane of the meridian inside the observatory.

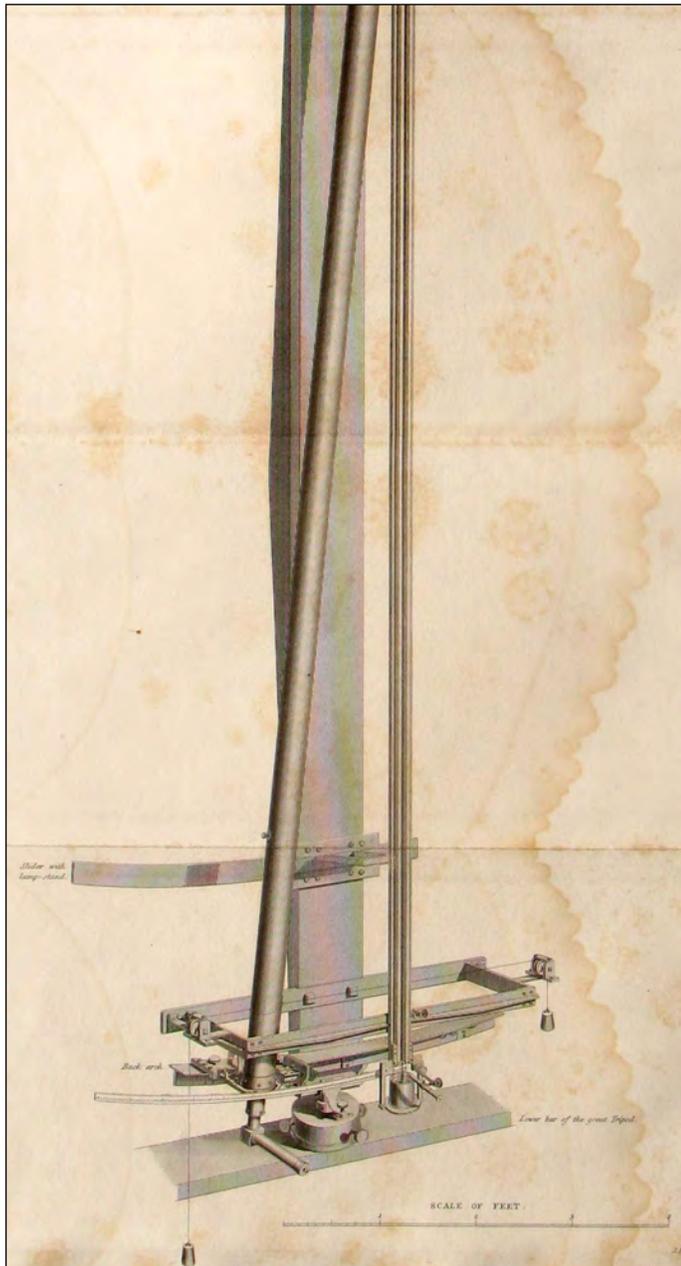


Figure 7. Bradley's 12.5-foot zenith sector, Greenwich Observatory, Greenwich, England6

The original English instrument came with an engraved limb of 30°. This proved to be too awkward for their circumstances, so Hugo shortened the limb to 3° or 4°. Both the quadrants and the zenith sector were constantly field checked to ensure accuracy. The sector could take weeks or longer to adjust, despite the straightforward appearance. With the long radius of the instrument, temperature changes could impact the observations, so efforts were made to keep the observatory at a more or less constant temperature. But changes in temperature and humidity, the frequent earthquakes and the rigors of moving the delicate instrument over rough country all took a toll on it.

Since Godin and Bouguer measured different baselines, they would use different observatories for solving the latitudes. This would effectively give them two arc lengths through the net, though using the same triangles for the most part. Consequently, in the autumn of 1739, Godin instructed Hugo to build a new sector, this one with an eighteen-foot radius. Hugo set to work immediately building the new instrument, grinding lenses and crafting the instrument's precision components.

When Hugo was done with the new sector, Godin, Juan and Ulloa rigged the instrument in a house in Cuenca. Bouguer, La Condamine and Verguin set up the Graham sector in an unfinished chapel farther from town. Both teams, hoping for good weather, prepared to observe stars and tie their observatories into their separate base lines.

From October to December of 1739, the teams adjusted their sectors and, on those rare clear nights, observed *Alnilam*, the brilliant, blue supergiant Epsilon Orion, the middle star in Orion's Belt. Godin finished at the end of December, while Bouguer continued into mid-January of 1740. Both teams had their results notarized. Bouguer now had his sector hand-carried by porters to Quito, for latitude observations on the north end of the net.

Bouguer's sector arrived in Quito in February, after its painfully slow transit from Cuenca. Hugo made minor repairs on the instrument and set it up at the country home of an acquaintance. Bouguer and La Condamine then commenced two months of observations on *Alnilam*, and tied their observatory into the northern base line. Having finished their observations they quickly calculated the delta in latitudes, north to south, and arrived at 3° 06' 43" for the length of their meridional arc.

At this juncture, La Condamine declared the work complete and began efforts to memorialize the project. The team had already decided to build large monuments at the ends of the northern baseline, in commemoration of their survey. La Condamine took charge of the project to construct large pyramidal buildings at the baseline's termini. These would be twelve feet square at the base and fifteen feet high. But as it so often does, ego trumped common courtesy. On the marble commemorative plaques for the pyramids La Condamine omitted the names of Verguin, Morainville and Jean-Baptiste Godin. After all, he reasoned, they were not true academicians. Further, he planned to top the monuments with the French fleur-de-lis, a political statement certain to offend the Spaniards and the Peruvians. Finally, La Condamine described the Spanish officers Juan and Ulloa as mere "assistants".

All this caused more strain in an already tense situation. Ulloa, who was there as a representative of the King of Spain, was angered and insulted by these slights. So angered in fact, that he sued La Condamine in

CONTINUED ON PAGE 36 ►

# Wood Rodgers' Experience with UAS Technology



by Michael Detwiler, LSI –Photogrammetrist

## Introduction

Wood Rodgers recognizes that our clients' needs vary depending on the demands of each project. With this in mind, and knowing that accurate data is crucial for each and every project, we have embraced a new technology that is capable of collecting precise survey data. Unmanned aerial systems (UAS) expand our capabilities beyond our already extensive list of traditional surveying. By utilizing a UAS and the unique aerial perspective, we can capture accurate 3D survey data, using traditional photogrammetry principles, and use it as a tool to generate precise topographic and planimetric information to support the development of comprehensive civil, architectural, mechanical, and structural design aspects of every project. Wood Rodgers is an FAA commercially licensed UAS operator, holding a valid 333 Exemption and operating simultaneously under the Part 107 framework. Additionally, our fleet of aircrafts have the ability to capture oblique imagery, model surfaces, produce cross-sections, compute volumes, survey existing bridge structures, monitor construction sites, and detect changes in vegetation. The system is highly efficient in the management of 3D data collection and can produce a point cloud (3D dot matrix of the subject's reality). This information can then be converted to a CAD or GIS product that can be used for design and/or analysis purposes. Having a knowledgeable staff of licensed land surveyors, certified photogrammetrists, and competently trained technicians in the industry's latest technologies allows Wood Rodgers to constantly improve the quality and accuracy of our deliverables to our clients. This is just another reason why our clients come back to us time and time again.

## How is Wood Rodgers developing internal operating and accuracy standards with regards to UAS?

Over the last 12 years of my career in aerial mapping, I've been exposed to the aviation industry as a bi-product. Taking that experience working with commercial aircraft operators installing large camera mounts and camera systems on helicopters and in airplanes, I've learned many of the FAA standards required for the commercial operation of manned aircraft. These industry standards include technical logs of all maintenance, repairs, and alterations. Following manufacturer recommended maintenance programs, and of course following the rules of the sky in what is called the National Air Space.

We've implemented many of these same industry standards into our flight operations. We have a system of checks for determining if a site can be flown legally with a UAS, considering weather, terrain, airspace, and other UAS regulations. We keep detailed logs of flight activities and maintenance for each aircraft. This data tracking also allows us to keep tabs on the need for scheduled maintenance per manufacturer recommendations. All this information allows us to adhere to a standard level of safety.

Just the same as any other survey data is collected and verified, we do the same with our UAS captured data. We see the UAS as just another survey instrument, similar to a GPS or a total station. There are several government and industry organizations

which publish accuracy standards, the two most recognized being the United States Geological Survey and the American Society of Photogrammetry and Remote Sensing. Every project is unique, in what the end user product needs to be, but using this standards and guidelines we can ensure that we are using the appropriate survey practices to collect and assure the data is where it needs to be. We routinely collect ground verification points for vertical accuracy checks, as well as defined features for horizontal accuracy checks for our elevation models and ortho imagery. We've developed some automated processes which compare data collected from the ground and from the air to quickly assess accuracy and precision.

## Problems we've encountered?

The regulations determining where you can and where you can't commercially fly a UAS have been the biggest single restriction. That has been relaxed quite a bit by the newer Part 107 rules which became effective in August of 2016. The FAA provides a waiver process for flying in more restricted airspace, but these waivers take at least three months to be granted, so that is a challenge to stay commercially viable for clients who need their projects moved along much quicker.

Just keeping pace with the technology is often times a job in itself. Manufacturers update hardware and software several times a year and staying alert to these changes and how they affect the systems' operation can be a challenge.

An unmanned system has varying levels of automation, and learning how this automation works in the real-world environment takes training and a lot of practice. It is a lot easier if you're operating from a flat, wide open grassy field, on a calm, warm, and sunny day. But as soon as you throw in variables such as steep terrain, cold temps, wind, trees, and other vertical structures that are immovable to your small UAS, flight operations become very dynamic and there is quite a bit of human interaction needed to oversee the automated flight process. The flight characteristics and operation of a multi-rotor aircraft is much different than that of a fixed wing, every aircraft system is unique.

Every project site is distinctive, and brings its own challenges with it for a UAS survey. For a site with a lot of topographic relief, you can't just pick one flying altitude above your highest point and fly the entire site at that altitude, as you could exceed the 400-foot flying height limit (Part 107 rule) over the lower elevation areas. There are size limitations as well, a UAS is perhaps not the best option for mapping a site of several thousand acres. Flying height and battery endurance are limitations to how much land can be mapped in a single flight.



The surveying and engineering market is also being challenged



by UAS start-up companies. The great thing about an unmanned system is that it can allow a low-price point entry into the market, giving many professionals a new tool for data collection. However, this can also be a negative thing as we have seen directly; many of these start-up companies advertising surveying services are employed by people who are not educated, certified, or licensed in photogrammetry or land surveying. People tend to think you can fly projects off of airborne autonomous GPS and that will produce an accurate map. There are some that are ignorant and some that blatantly ignore state statues with regards to performing land surveying services. Ultimately I believe these people will be exposed over time by delivering sub-standard products and I hope that peers in the engineering and surveying profession self-police these people.

**Types of projects and best use of the technology?**

There are a wide range of projects where we have utilized the UAS for thus far. The most common being topographic mapping. We've found that having the ability to fly a site ourselves creates the opportunity to fly sites we wouldn't have in the past, because of cost or schedule concerns. Topographic mapping and digital elevation models will continue to be our main use and end product. Imagery is also very valuable, whether it be an oblique image or an orthorectified mosaic; the ability to capture the existing conditions of a site is very valuable to our engineers who are responsible for designing something at a site which they may or may not see in person.

Some types of projects we've deployed the UAS on consist of:

- ◆ Topographic mapping projects for subdivision and commercial buildings civil site design.
- ◆ Mine sites for volume measurements, permitting updates, and reclamation work.
- ◆ Post construction vegetation remediation and monitoring.
- ◆ Levee video inspection.

**Future plans with types of projects and technology?**

We're optimistic we can further the application of the technology. More work means more staff, more pilots, more photogrammetrists, and obtaining more aircraft to fly projects. Therefore, as you build a business or a new department within a business, you obviously need to have the revenue to justify employing more staff and buying more equipment. Of course, this is all dictated by the economy. As long as the economy is running well in Northern Nevada, developers and builders are busy moving forward with projects and we can utilize the UAS to help with the permitting, and design of these projects. We'd also like to pursue more consulting work to the mines, with that being a major economic engine in the state of Nevada. The UAS offers itself to be very useful and economical instrument. Mines are very dynamic places, with so much activity and site conditions constantly changing, the ability to deploy a UAS to capture updated data is a huge benefit.



As an engineering and surveying firm, topographic mapping is the most common use of the UAS. But we have also had the opportunity to capture data in a non-traditional aerial mapping

sense. We've had several projects where we captured oblique imagery to document construction progress of a bridge or large industrial building. We have used video capability for inspection and documentation of a natural gas pipeline, and we've deployed the UAS to collect data of levees for condition inspection, and 3D modelling of the structure on the land and water sides. So there is a lot of opportunity we would like to develop and put in use, other than just the traditional aerial topographic mapping.

**About the Author**



Michael Detwiler has been in the surveying and geospatial field for 13 years, with the majority of those years specializing in aerial mapping, LiDAR, and photogrammetry. His work experience has taken him to 31 states and 12 countries, with projects ranging from transmission power line LiDAR mapping, multi-oblique cityscape photogrammetry, and unmanned aerial systems (UAS) mapping at mines. Michael

is skilled in the capture, processing, and analysis of accurate geospatial data, helping Wood Rodgers lead the industry in UAS applications for commercial and residential land development, and many other uses which this technology lends itself to. Michael is a Certified Photogrammetrist, a Land-Surveying Intern, and an FAA certified Remote UAS pilot. ☺

**Education/Training**

B.S./2002/Regional Development, University of Arizona, Tucson  
M.S./2014/Gemotics, The University of Florida, Gainesville

**Registrations/Certifications**

Land Surveyor-in-Training Certificate #8119 (2011)  
University of Florida, Geospatial Analysis Certificate (2014)  
ASPRS Certified Photogrammetrist #1587 (2015)  
FAA – Unmanned Aerial System (UAS) Remote Pilot Certification (2016)

**About Wood Rodgers**

Built and sustained on the firm belief to provide quality services, Wood Rodgers, Inc. was founded in 1997 by two engineers, Rich Wood and Mark Rodgers. The company has since grown into a unique firm in which innovation and precision are equally as important as the ability to deliver projects on time and within budget. Wood Rodgers takes pride in the fact that each project we undertake is equally as important to us as it is to our clients. Our staff includes professionally registered civil, water resources, structural, geotechnical, and transportation engineers, professional land surveyors, geologists, hydrogeologists, floodplain managers, project management professionals, geographic information systems professionals, transportation and land planners, landscape architects, and LEED AP staff who have extensive experience with maneuvering through highly political processes and successfully completing both public and private projects with a high rate of measureable success. Our versatile and reliable team has worked seamlessly with other designers, engineers, public agencies, and private clients to provide quality engineering services, while meeting the environmental constraints of each project. Wood Rodgers is headquartered in Sacramento with additional offices located throughout California and Nevada. Wood Rodgers company structure is slightly different than most with the fact that our principals and management staff are closely involved with the work product and are responsive to clients' needs. Our existing relationships with federal, state, and local agencies, as well as our partnering sub-consultants, ensure the successful completion of our projects. We believe that our clients' success is our success.

## Flash Poll No.2

**What, in your opinion, is the most urgent legislative challenge that NALS faces?**

Identifying the corollary effects on existing state law as a result of proposed revisions to NRS.

For instance; if I were to:

- Propose language specific to sUAS regarding the production of maps, reports, displays, etc. for commercial purposes or;
- Propose language specific to the practice of construction staking and project control/network control creation for machine grading by unlicensed personnel or;
- Propose language that would require anyone seeking licensure in the State of Nevada who does not already possess a recognized baccalaureate degree from an accredited university or state college, regardless of whether or not they are currently licensed in another state, to conform with current state statute and the four-year degree requirement or;
- Propose new language that would specify amounts and impose fines against licensed Nevada contractors who provide land surveying services without a NV PLS in responsible charge;

The affected chapters of NRS would be myriad. Retired Legislative chair Brett Lane made clear the need for review of, and revisions to, the current state statutes pertaining to Land Surveying years ago. It is no small endeavor. It will take the collective efforts of many people to effect these changes and, unfortunately, many years. Our most urgent legislative challenge isn't necessarily our biggest professional challenge. Requiring out-of-state surveyors to meet the same requirements for licensure as non-licensed aspiring professionals in Nevada should be priority number one. No more comity and/or reciprocity. Identifying and prosecuting non licensed professionals performing professional services should be priority number two.

*Editor's Note:*

*Sorry, but we now are taking an abrupt about-face from this poll. Eight upstanding NALS members spread across the state were polled with this question and only one individual found the time to respond. More disturbing was that none of the other seven even bothered to acknowledge receipt of the question. The editor is left with trying to determine whether this is a widespread collapse of basic courtesy or a symptom of how busy we all are these days. The Traverse prefers the latter to the former for obvious reasons, but as the editor is busy putting this magazine together as well as holding down a full time job as a surveyor, he doesn't have time to plumb the depths of that conundrum (or to feel very sorry for the harried...). However, this set of circumstances plays nicely into the editor's own opinion of what is the most urgent legislative challenge NALS faces:*

Indifference to, apathy about and general complacency regarding the erosion of and encroachments into the profession.

*Think about that and if it makes you mad, then do something about it. If it makes you say "meh" then join the club along with our non-respondents. We'll start putting in crossword puzzles and articles about gardening for you guys. ☺*

## A Letter from Gene Sawyer

Nevada Association of Land Surveyors Southern Chapter

March 14, 2017

Dear friends, fellow Nevada Professional Land Surveyors at large, and all dedicated current members of the Nevada Association of Land Surveyors:

First, to all of you who are actively participating in your Professional Association; let me say thank you. Through your involvement and commitment, this organization continues to succeed in its mandate under the original NALS charter to protect the health, safety and welfare of the public and to uphold the high standards of practice and professionalism within the professional land surveying community of Nevada.

Since its inception, NALS has been an institution comprised of likeminded, driven professionals with high expectations of each other and Nevada licensed professionals as a whole. The forefathers of our Association had big challenges ahead of them in a state experiencing rapid growth, the likes of which would be unparalleled in the United States for many years to come. They developed the State Statutes and Administrative Codes that would serve to govern our profession. In the years that followed, they worked together to address needed revisions to those laws and codes, effecting changes that would shape the future of the profession, as well as the lives of many young people pursuing land surveying as a career here in Nevada. We've all been lucky to have known and to have been mentored by these men and women through whom we acquired our experience, expanded our knowledge, honed our skills and abilities and eventually became licensed professional land surveyors. We owe them a debt of gratitude.

Our vision includes the likened efforts of those who came before us, our hope for the manifest future of this profession and our commitment to the men and women who will become our successors. This should not vary from the ideals of our predecessors. It is our duty to uphold the highest of standards; our duty to place integrity above all else; and our duty to be a part of the association that put us upon this path. There are many licensed surveyors and hopeful, aspiring future land surveyors among us who are not actively involved in NALS whom, for whatever the reasons, have chosen not to be members, have chosen not to attend sponsored events, and have chosen not to be a part of the continuing evolution of the profession. We need to change this mindset. This also, is our duty.

To all of you wanting your voices heard, to all of you wanting to effect change, to all of you with hopes and plans for your future; I offer you an invitation to come sit with us. Talk with us. Join us in making a difference. Be a part of the future of Nevada Professional Land Surveying. Become a member of the Nevada Association of Land Surveyors. We look forward to seeing you again and working with you to ensure the profession of land surveying transitions seamlessly into the future.

Sincerely,



Gene H. Sawyer, P.L.S.  
SNALS Secretary 2017



# 2017 NALS Conference Wrap Up

By CRC

## Preconference Saturday April 1

The 2017 Conference, the first in quite some time to be a complete solo affair, kicked off on Saturday, April 1. The activities started with a pre-conference workshop by Jeff Lucas, ESQ and the first three-quarters of the OPUS Projects workshop presented by Dana Caccamise and Bill Stone of NGS.

## Preconference and Conference Sunday April 2

Sunday morning saw the balance of the OPUS Projects workshop and a pre-conference workshop on the 2009 BLM Manual by one of the giants of Publics Lands, Dennis Mouland.



Pondering, puzzling, pontificating and praying

Concurrent with these, we held the latest series of round table discussions. Informal and sometimes passionate talk from any and all present, ranged from the importance of the bachelor's degree to the ways we can improve our outreach, both to students and to the public. Suggestions for creating new committees and



NALS President tells us how it is

for streamlining the committee structure of NALS were logged. The proposed Professional Practices Committee was discussed and guests from next door with recent and very relevant

experience with their own PPCs gave us their thoughts on the matter. Urgent activities needed by the Legislative Committee were discussed as well. It's going to be a busy year and rounding up volunteers (like you) is critical.

The afternoon saw the kickoff of the conference proper with Erica Miller, a guest of Lahontan Chapter President Justin Moore, beautifully singing the national anthem. After introduction of officers and honored guests, President Alan Dill turned the lectern over to incoming NCEES President Pat Tami. Pat gave a moving presentation on how he sees the current status of the profession, where he thinks it is going, and what we can do to stay both strong and relevant. It was good to hear such a positive outlook! He will be an outstanding leader for NCEES. Pat, a professional surveyor in private practice in California, spent 10 years on their licensing board, the longest tenure in their history. Ric Moore, another PLS, who happens to be their Board's Executive Officer chose the end of Pat's speech to make a presentation recognizing that tenure and thanking him for his service to the board. A very moving moment!



Ric Moore Congratulating Pat Tami

The conference workshops then kicked off with Dennis Mouland discussing Basic Logic for the Land Surveyor, Aaron Smith covering Legal Descriptions and Dana Caccamise and Bill Stone giving an update on NGS activities and resources.

## Monday April 3

Joe Paiva hosted a three part discussion on UAV technology throughout the day. The presentations can be summarized as



Joe Paiva - Philosopher General

CONTINUED ON NEXT PAGE ►

**Conference Wrap Up...** *continued from previous page*

1) How to fly UAV's legally; 2) How to fly UAV's safely; and 3) How to fly UAV's profitably. Paiva rounded out the day with a wide-ranging discussion on Professional Ethics.

Aaron Smith gave a talk on Business and Marketing for Surveyors, The Nevada Board of Professional Engineers and Land Surveyors hosted a panel discussion and a Forum of local agency surveyors hosted an open-ended and very enlightening discussion.

David Paul Johnson, a crowd favorite and solid presenter with a humorous take on geodetic topics, presented 3 Keys to GPS followed by GPS and Geodesy.

**Tuesday April 4**

Joe Paiva led a two-session discussion on the difference between measurements that we all experience and what they mean... and what they don't. A very engaging discussion on the reasons why measurements often don't agree.

Sarah Owens of the Federal Emergency Management Agency gave a two-session workshop on FEMA Flood Certification. Everyone should attend one of these workshops and given FEMA's propensity for change, you should definitely consider taking one of these in, especially if it's been awhile.

Shane Gardner hosted a two-session presentation on field-to-finish procedures involving both advice on data collection and how to process the data in the office to make the most of the F2F functionality that most surveying software contains.

And saving the best for last, NALS put on a free-for-all discussion with a panel made up of a surveyor: our own Dan Church, a title officer: Reno native Lisa Quilici, Chief Title Officer for First Centennial Title and an attorney: Stephen Silva Esq. from Reno firm Fennemore Craig Attorneys. The talk was wide-ranging and lively. The crowd worked up their nerve and peppered the panel with questions for three hours on many topics. The panel fielded them all with good-natured and absurdly detailed answers. This was a great opportunity to think about the work we do and the products we provide from a whole new perspective. A special shout out to President-Elect Jerry Juarez who probably got his ten thousand steps ferrying the microphone around the room.

**Social Activities**



Bowlers Assembled! 1st Annual NALS Education Foundation Tourney

Saturday evening the first annual NALS Education Foundation

Bowling Tournament took place at the National Bowling Stadium. We had enough bowlers for five teams and the gutterball tickets were flying around. For the most part, if you came to bowl a serious game, you were in the wrong alley. There were exceptions however. The winning team from Manhard had a bowler who still rolled a 220+ with not one but two gutterballs cruelly thrown into his game. Congratulations to Manhard to taking home the trophy for 2017 and starting a new tradition! And thanks to Armand Marois for donating the trophy, a garish bowling pin mock-up of a surveyor with a painted on orange vest. I'm sure you will all want to take this baby home next year. This event was outrageous fun and I'd better see you there for the second annual tournament!



The Winners! Manhard Bowling Team

Sunday evening the Exhibitors Icebreaker Reception was held in the Exhibit Hall – a great opportunity to catch up with old friends, corner speakers for more information, and visit each of the exhibitors to see the latest products and services.

Monday's luncheon was exciting as Doug Mishler of Nevada Humanities portrayed Teddy Roosevelt in a moving and hilarious monologue regarding the President's experiences, opinions and outlook on life. Over the years we've seen several of these historical portrayals and this might have been the best of all of them - certainly the most lively!



Teddy Roosevelt a President for our time! (Actor Doug Mishler)

Monday night saw the annual Scholarship Auction with auctioneer and friend of surveyors Lightnin' Williams in fine form as he conned, challenged

**CONTINUED ON NEXT PAGE ►**

and cajoled tentative bidders into spending way too much on every item offered. As usual, your writer was victimized, but only for a few hundred dollars this year, almost like not attending at all! GBC students Nick Montoya and Sarah Walker paraded the merch up and down the catwalk but a special guest, a garish broad on wobbly high heels and bearing an uncanny resemblance to our president-elect had a go at sashaying down the catwalk with one particular item. Too bad there are pictures. The live auction brought in some \$12.5K and with the silent auction items included, the NALS Education Foundation added over \$15,000 to its funds, guaranteeing that scholarship funds will be available to surveying students in and/or from Nevada. Thanks to Lightnin' for continuing to be one of our greatest friends! Thanks to Marty and Rhonda Crook for all the hard work they do taking in the donated items, cleaning them up and cataloging them and making the auction run so smoothly! And thanks to everyone that donated items and everyone that bought items after being pushed into bidding by their table mates (and that crazy look in Lightnin's eye)!

Tuesday the Awards Luncheon took place in the Silver Baron Ballroom. Congratulations to the 2017 awards recipients including new NALS Life Members Paul Pace and Bill Nisbet, Meritorious Service and Article of the Year recipient Carl C.de Baca and Surveyor of the Year Paul Burn!

The room was packed for the closing ceremonies and a chance to celebrate a very successful 2017 conference. And thanks to all of the over 200 attendees from 14 states who attended this years conference! Thanks to GBC students Nick Montoya and Sarah Walker for doing the heavy-lifting (literally) at the conference! A special thanks to NSPS President Jan Fokens and his lovely bride Charlotte for not only attending our conference but staying for the entire event and manning our NSPS booth!

And a hearty and sincere Thank You to the vendors who made this possible! The 2018 conference will be in Las Vegas as our friends from Utah and Arizona join us for a three-state extravaganza. Stay tuned for the when and where. See you there! ☺



Lightnin' on the Prowl!



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Geraldine hocks her wares

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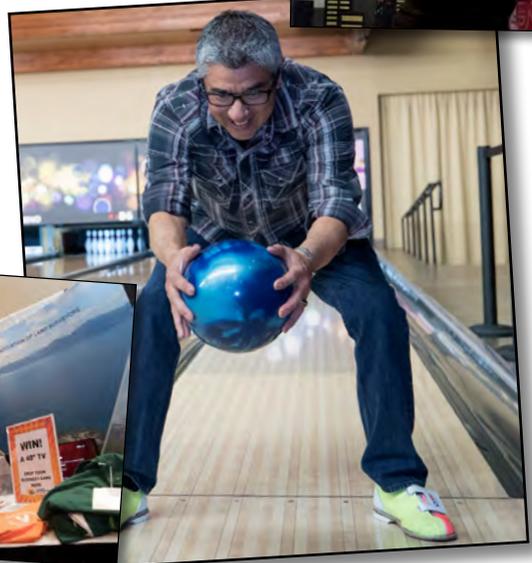
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## Thank you!



# CONFERENCE PHOTO GALLERY

Conference photos courtesy of Steve Shambeck, PLS Photography





Conference photos courtesy of Steve Shambeck, PLS Photography

# 2017 NALS Awards

By Alan Dill

The Nevada Traverse is our quarterly magazine. It is a great resource for members and it is important that we recognize the authors that contribute to the magazine. This year Article of the Year is presented to Carl C.de Baca for his article Saga of the Sage Grouse which was featured in Volume 43, Number 1 of the Nevada Traverse.

Next up are our life member awards. Life membership is awarded to a surveyor who has shown exemplary service to the Association and the Land Surveying Profession. This year we are awarding two life members. The first is someone who has participated in many aspects of NALS. He is an author, a presenter, a leader and a friend to many. Paul was a practicing Land Surveyor in Northern Nevada and Eastern California for 45 years. Paul was an adjunct professor at the Mackay School of Mines at UNR for 23 years, where he taught mine surveying. As anyone who has read any of the over 20 articles Paul has published, or attended any of his over 30 presentations, would be aware, he has is an avid interest in history. Paul also served as President of the Lahontan Chapter in 1988, and a State Board Member later.

As Surveyors we are often tasked with “following the footsteps” of a previous Surveyor. Anyone hoping to follow in Paul’s had better bring some big shoes. It is my pleasure to award Life Membership to Mr. Paul Pace.

William (Bill) Nesbit LS 3805 has been a NALS member from the beginning. Bill is a longtime Elkoan and was a founding member of both the Elko and the Great Basin Chapters. He occupied all the chairs in both. Bill has made numerous contributions to NALS legislative activities over the years. It is my pleasure to award life membership to Bill Nisbet.



Surveyor of the Year is someone who has shown distinguished leadership qualities. This person has done just that. He has served as Nevada’s Director to National Society of Professional Surveyors for many years where he has represented Nevada’s interests on a national level. In addition, he has served on national committees including the ALTA/NSPS standards com-

mittee. One of the things I admire most about this recipient is that he always has a smile and greets you with enthusiasm, and that’s not always easy to do. I am very happy to award Surveyor of the Year to Mr. Paul Burn.

This next award recognizes an outstanding sustaining member. As defined in our bylaws, a sustaining member is any individual, company or firm, who by their interest in the land surveying profession, is desirous of supporting the objectives of this Association. Our Sustaining Member of the year has continuously supported NALS for many years. Through sponsorships, exhibiting, and through endless hours spent to make our scholarship auction a success, this sustaining member betters not only the association but also the profession. How about a round of applause for Monsen Engineering.



Our last award is the meritorious award. Meritorious means: Admirable, commendable, exemplary, praiseworthy, deserving honor and recognition. This is NALS highest achievement and is not given lightly. We are awarding this to someone who has demonstrated over a long period of time a love for not only the surveying profession but of NALS as well. Dedicated, focused, tenacious are words I would use to describe this person. His passion for the profession is demonstrated in the many hats he wears including past president of NALS and chair of numerous committees. Not to mention Editor of the Nevada Traverse. *I found out just how passionate he is about our profession over the last two nights til 1 am.* We owe Carl C.de Baca a debt of gratitude for his hard work and dedication. Thank you Carl! ☺





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CONFERENCE & EXPO**  
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# LSG PROGRAM HIGHLIGHTS



## Program Statement

The Land Surveying and Geomatics program is committed to addressing the diverse and constantly changing needs of students throughout Nevada and in other locales who are preparing for a geomatics career by improving teaching methods, techniques, and content for delivering high quality educational experiences and achieving student success.

- **2 year AS Degree in Land Surveying and Geomatics**
- **4 year BAS Degree in Land Surveying and Geomatics**
- **Quality of Instruction: 100% pass rate on the NCEES Fundamentals of Surveying Examination**
- **Competitive Wages: average graduate mean salary \$50,000 - \$75,000**
- **Affordable: average graduate student loan debt 0\$ - \$5,000**
- **Accessible: program offers 100% of the courses online and through mentoring programs.**
- **2015 LSG graduate survey ranked the quality of this program as “excellent”**



### Great Basin College

Land Surveying/Geomatics Program  
Great Basin College  
1500 College Parkway, HTC 130  
Elko, Nevada (USA) 89801  
Phone: (775) 753-2344  
[www.gbcnv.edu](http://www.gbcnv.edu)



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# NALS Board of Directors Meeting

Friday, April 4<sup>th</sup>, 2017 • Silver Legacy, Reno, NV

## MINUTES

### CALL TO ORDER

The meeting was called to order by President Alan Dill at 5:15 PM.

### ROLL CALL

Alan Dill, President  
Jerry Juarez, President-Elect  
Halana Salazar, Secretary  
Carl C.de Baca, Immediate Past President & Director, Great Basin Chapter  
Jason Fackrell, Director, Southern Nevada Chapter  
Jeff Miller, Director, Southern Nevada Chapter  
Justin Moore, Director, Lahontan Chapter  
Greg Phillips, Director, Lahontan Chapter  
Dorothy Calegari, Executive Director

### Absent:

Doug Wood, Treasurer  
Jeff Miller, Director, Southern Nevada Chapter

### Guests:

Nancy Almanzan, Past President, Conference Chair & WFPS Delegate  
Crissy Willson, NALS Executive Office

### APPROVAL OF MINUTES

**MOVED** by Carl C.de Baca and **SECONDED** to approve the minutes of the January 2017 minutes. **MOTION CARRIED.**

### PRESIDENT'S REPORT

Report included in agenda.

President Alan Dill congratulated and thanked Nancy Almanzan, Conference Chair on a successful conference.

Alan indicated that as the many of the Board members have flights to catch, the Board meeting will be brief. It was discussed that Board meetings following conferences are difficult and instead, the Board meeting should be held via conference call a few weeks after the conference.

### TREASURER'S REPORT

Financial statements included in the agenda.

**MOVED** by Jerry Juarez and **SECONDED** to accept the financial statements as included in the agenda. **MOTION CARRIED.**

### EXECUTIVE OFFICE REPORT

Crissy Willson reported that NALS membership has increased to over 250. New members and dues renewals continue to be received.

### CONFERENCE

Nancy Almanzan reported that the feedback received by attendees has been positive. The speakers were well received, the vendors were happy, and overall the conference was a success. The number of full paid registrants surpassed our expectation which was exciting to see.

Nancy reminded the Board of Directors that their involvement in the conference is crucial to its success. It is important that the Board participate in the conference activities such as moderating sessions, attending optional activities, etc. It is also important for Board members to solicit vendors and sponsors.

It was suggested that a Board Handbook be developed so that Officers, Directors and Chapter leadership understand the roles and requirements of their position. Dorothy Calegari reported that a handbook had been developed but was in need of updates.

**Action Item:** NALS Executive Office to update the Board Handbook and distribute.

The 2018 Western Regional Conference planning is well underway. Arizona, Utah, and WestFed have reviewed and agreed to the Memorandum of Understanding (MOU). Nancy reported that several leaders from CLSA expressed interest in participating in the 2018 Conference. Nancy has contacted both Utah and Arizona and they agreed to again extend an invitation to California, under the same MOU, as long as a deadline is in place so that planning can continue.

**Action Item:** Nancy to send a formal invitation to California for participation in the 2018 Western Regional Conference with a deadline of two weeks to respond.

### RENO ADMINISTRATIVE CODE

Code included in agenda.

The Board of Directors reviewed the Reno Administrative Code, Section 12.18.010 – 12.18.060. It was determined that the code violates Nevada Revised Statutes.

**MOVED** by Justin Moore and **SECONDED** that NALS send a letter to the City of Reno with a copy to the Nevada Board of Registration. **MOTION CARRIED.**

**Action Item:** Alan Dill to draft a letter to the City of Reno with copy to the Nevada Board of Registration for Board review.

### ADVANCED EDUCATION

Report included in agenda.

Advanced Education Chair Carl C.de Baca reported that the Great Basin College continues to have good enrollment. As Bryon is the only professor it is important for NALS to support him as much as possible.

- Research ability to reimburse Byron for out-of-pocket expenses for the student competition
- Offer assistance in completing application for NCEES Education Grant
- Start a letter writing campaign to Board of Regents requesting a second professor

**Action Item:** Carl C.de Baca to provide a sample letter to the Board of Regents.

CONTINUED ON PAGE 36 ►

# I Am A Native Nevadan

*Editor's Note:*

*The Nevada Traverse has heard unwarranted reports that the Land Survey Geomatics program at our own Great Basin College in Elko has no Nevada students attending or destined to be working in the future as Nevada Licensed Land Surveyors. Nothing could be further from the truth! Let us introduce you to some of the Nevada survey students enrolled in Great Basin College.*

**Shane Trotter, Dayton Nevada**



I am a native Nevadan. I was born in Carson City Nevada in 1983. I graduated from Carson High School in 2001, and 6 years later I married my wife Nichole Trotter. Nichole and I have two daughters, Kyla and Zoie, and we currently reside in Dayton NV. I have been employed by N.D.O.T. for 10 years, where I serve as a survey party chief and currently supervise five people. I will be graduating Great Basin College in May with a 3.51 GPA. I am currently an LSI, and I passed the National PS exam in January 2017. I am hoping to be approved by the board to sit for the Nevada state exam and obtain licensure after I receive my degree. My degree from Great Basin College will allow me to become a professional land surveyor in the State of Nevada. I would like to stay at N.D.O.T., as my PLS will allow for upward mobility into a position that will help me serve the citizens of Nevada in a greater capacity. I am grateful that this degree was made available completely online, because I travel a majority of the time at my current position, I would not be able to attend college otherwise.

**Mark Van Slyke, Elko Nevada**



I first became interested in surveying in the late 1970s when I went to work one summer day with my Dad, who worked for Nevada Department of Transportation. I watched him doing measurements and calculations. This impressed me immensely and I did not forget it when I became an adult. I went to work for NDOT in the mid-1980s, moving to construction administration in 1991. I started taking college courses in 2002 with the intent of improving my work skills for the betterment of the Department and the state's highways. I acquired enough general credits by 2012 that I qualified for an Associate of Science through Great Basin College, transferring credits from Western Nevada Community College in Fallon. I decided to continue the courses in the Land Surveying/Geomatics program at GBC to improve my skills for the greater good of the department and my community. The LSG program at GBC is very thorough in preparing the student for the LSIT licensure exam as well as developing the other skills needed for the surveyor to create, own, and manage their own business, or to be a productive member of another's team. The ability to have a meaningful dialog with engineers and designers is only one benefit of having gone through the program. Moving into the future, the skills and confidence I have gained through the LSG program at GBC will benefit my community, and has already benefitted NDOT, and the state of Nevada through the experience gained with on the job utilization of the skills acquired.

**Leland Johnson, Carson City Nevada**



I was introduced to the land surveying profession while working as an intern at NV Energy. While working with the survey group, I gained an appreciation for the work that surveyors do. I found that I enjoyed the mix of office and fieldwork, and the opportunity to work in locations throughout Northern Nevada. Ultimately, a position opened in the survey group at NV Energy and I was hired as a full-time employee. I enrolled at Great Basin College (GBC) and began taking classes in 2012. The online program at GBC has allowed me to earn a degree in Land Surveying/Geomatics while working full time and remaining involved with family activities. The knowledge I have gained at GBC has allowed me to succeed in my current position at NV Energy. Additionally, earning a bachelor's degree in the Land Surveying/Geomatics program will allow me to gain licensure as a Professional Land Surveyor in the state of Nevada.

*Okay Dear Readers, you've met three native Nevadans who will all graduate this spring with the BS in Land Surveying Geomatics and who will all enrich the professional surveying within our state boundaries. Now let us introduce you to a student who has asked for and received financial aid from the Nevada Association of Land Surveyors and who is a credit to our profession:*

**Norman 'Scott' Weese, Raton New Mexico**



I started this program because I applied for licensure in Texas and New Mexico in the spring of 2013. Having been licensed in Colorado and Oklahoma and surveying for many years, I didn't think there would be problems. I quickly learn that both of those states required of a bachelor's degree in surveying to be accepted. Being already employed and raising a family, the option of going back to college was very grim. I just didn't have the resources or time to quit work and move near a college that offered a surveying degree. I started looking on the Internet for possible online classes. Quickly, I discovered Great Basin College and its complete online Land Surveying/Geomatics program. After speaking with Dr. Elithorp, I was convinced that this program would benefit me even though it could possibly not meet the education requirements for licensure in New Mexico. I started part time in the fall of 2013. The program exceeded my expectations and taught me many things that I have applied to my job as a Land Surveyor. Because my finances were tight, I applied several times to the NALS Scholarship Program. The NALS scholarship was a huge blessing to help me continue my education. Taking the Land Surveying/Geomatics program at GBC was the best decision I made.

*Editor's Note:*

*Dr. James Elithorp established the program and developed the curriculum for GBC and taught there for several years. The current teaching staff, the students, and we of NALS, all owe Dr. Jim a debt of gratitude! And we would like to take this time to offer heartfelt thanks to Professor Byron Calkins, who has taken a great thing and made it even better! If you think you might be interested in joining the program or you know someone else who is, given Professor Calkins a call. ☺*

# A Capitol Hill Experience

By Paul Burn, PLS

So, being a veteran of several NSPS “Lobby Day” visits, I was excited to learn that this year I had been paired up with Byron Calkins, Program Director for Surveying at Great Basin College (GBC). I had met Byron a few years ago and had wanted to spend time with him again. On the evening before Lobby Day, we met at the preparation class, and took it from there. After digesting the planks and talking points for the meetings with the Senators, we made plans to meet at Union Station the next morning.

Since there was a rather major snowstorm the day before, I left early to find my way to the nearest train station to where I was staying. It seemed that many people were doing the same, but my station was the extent of that line, so the train cars were relatively open. But, a few stops later, as the car was filling up, in comes Byron to the same car I’m in! Not just the same train, but the same car! It was then that I knew it would be a great day.

When we got off at Union Station, we had to orient ourselves to find the Hart Senate Building. Being surveyors, we were looking around to determine north, knowing we need to walk south toward the Senate building. But we realized that we had no idea where north was, as we were subterranean. As we made our way up to the main floor, a second realization began to be realized. It was very, very cold. East coast cold...biting moist air. And we’re dressed in clothes that represent how Nevadans see mid-March- he in a sport coat and tie, me in a shirt and tie with a light jacket (the kind that works fine through a Las Vegas winter!). So we go outside to ask directions, and here we realize that it’s also windy. Not breezy, but major wind that blows signs off their moorings!

We walked the two or three blocks to the Senate, finding that, because of the immense traffic volume, one must wait at every light to get a green to walk across. When we finally got there, we felt as if we’d completed a trek to the South Pole. We made a pact to stay in that building all day, even though it had appeared that we’d have a couple hour break with which we could have visited the Library of Congress or one of the Smithsonian museums.

We headed directly to the cafeteria, where we found hot coffee, and warmed up. Now, feeling better, we prepared for our first meeting with Senator Heller’s office. I learned that Byron was a rookie at this, and had never been in D.C before. I assured him that in my past office calls to Heller’s office, I found a very good audience, and, in fact, once Sen. Heller himself had joined the discussion. It turned out that I was correct. We met with Scott Riplinger, the Senator’s Deputy Legislative Director, who was very impressive. He was interested, truly, in everything we had to discuss, and actively sought answers to very detailed questions. Byron caught on immediately, and we had a meeting of 30 to 45 minutes that was very fulfilling to our desire for information distribution. Past meetings with Congress members and staff personnel have been 15 minutes or so, sometimes 20. When we were done, I pointed out to Byron how unusual this was, and emphasized how well the meeting had turned out.



Byron, Scott Riplinger, and Paul

Later in the day, we met with Trevor Dean, Legislative Assistant to Senator Cortez-Masto. This meeting was much more typical, and proved to Byron that I hadn’t been misconstruing my scenarios. Although he listened, we just never reached the point of feeling the understanding of our issues with him. I told Byron that we could just hope that he relayed the high points to the Senator, and that she would have some interest in our perspectives.



Byron, Trevor Dean, and Paul

The walk back to Union Station was every bit as windy and cold as in the start of the day, but we made it. The train ride back north toward Silver Spring was warm enough, and we reflected on a good day. Byron had another appointment the next day with one of our Representatives, and he was sure that he now had the organization of thoughts and materials to conduct a good discussion. ⊗



Byron and U.S. Rep Mark Amodei



# Lahontan Chapter Report

by Justin Moore, PLS, President

With great pleasure I would first like to introduce the 2017 NALS - Lahontan Chapter Board:

## 2017 Officers:

President: Justin Moore, P.L.S. | justin@odysseyreno.com  
President Elect: Doug Larson, P.L.S. | dl Larson@nvenergy.com  
Secretary: Todd Enke, P.L.S. | tenke@lumosinc.com  
Treasurer: John Gomez, P.L.S. | johngomez@qdconstruction.com  
Chapter Rep: Greg Phillips, P.L.S. | gphillips@lumosinc.com  
Director: Kevin Almeter, P.L.S. | kalmeter@woodrogers.com  
Director: Dan Church, P.L.S. | sierrasurveying@sbcglobal.net  
Director: David Crook, P.L.S. | dcrook@tristateltd.com

The first three months of 2017 have been pretty exciting for the Lahontan Chapter. Despite our wet and cold winter, our monthly membership meetings have been well-attended and full of enthusiasm.

Our monthly meetings are held the 2<sup>nd</sup> Wednesday of each month at the Twisted Fork. In January we were fortunate to have the NALS State Board Officers attend and our President Alan Dill deliver his State to the State address. February we had an interactive presentation from Nick Johnson with NDOT discussing the partnerships, design issues, and construction constraints of the multi-use path in Lake Tahoe. In March our very own Paul Pace gave us an education on the Evolution of the Western Boundaries. Also in March, it was my honor as the Lahontan President to present Nick Montoya with the Barry Hickerson Scholarship. Nick is currently enrolled at Great Basin College and sponsored by the Lahontan Chapter as a Student Member. As an association we look forward to the opportunity to mentor and guide Nick through his schooling and future employment endeavors.

The next three months will be just as busy. In April we will all be gathering at the Silver Legacy in Reno for our yearly conference. The Lahontan Chapter will be hosting this year's hospitality suite and in true fashion that room will be full of libations and more fake news than the internet. In May we have our monthly membership meeting. Our guest speaker will be Mark Morberg from Roseville, CA, topic to be announced at a later date. And finally on June 2<sup>nd</sup> in lieu of our family picnic we will be having a NALS Family Night with the Aces. NALS has reserved 60 seats to our local AAA baseball team. The night will include reserved seating, BBQ, Aces hat, craft beer, and ... Aces VS. Las Vegas. It should be an exciting evening. To reserve your tickets today contact Justin Moore at justin@odysseyreno.com. Adult price is \$15 and child (3-10) \$10.

Seating is limited so reserve ASAP.⊗

# Southern Nevada Chapter Report

by Jason Fackrell, Chapter President

## January

January 5<sup>th</sup> Board meeting  
January 19<sup>th</sup> General Membership Meeting at Arizona Charlies  
Guest Speaker: Josh Greer

## February

February 2<sup>nd</sup> Board meeting  
February 16 General Membership Meeting at Arizona Charlies  
Guest Speaker: Bill Desjardins

## March

March 2<sup>nd</sup> Board meeting, Erin Jamison from Hyde Park School attended and spoke to us about funding the school with tablets for their students. The Board has approved and SNALS will be a sponsor for Hyde Park.

March 16<sup>th</sup> General Membership Meeting at Arizona Charlies and guest Speaker Alan Dill NALS President, we had a great discussion about the four-year degree and major of the member in attendance would like to see a change in the four-year degree program. We also spoke about the PALS committee.

## April

April 1<sup>st</sup>-4<sup>th</sup> NALS Conference in Reno Nevada. Was well attended.

## May

May 13<sup>th</sup> We are having our 41st annual picnic at Tule Springs. There will be a band, Survey games, bounce house, face painting, great food and drinks. We welcome family and friends to this event.

## June

June we will have Leo Torres from Aerotech Mapping as a Guest Speaker.

## October

October 20<sup>th</sup> and 21<sup>st</sup> SNALS will be having its annual Golf Tournament in Mesquite. Started it off with a Pool Party on Friday night and Golf of Saturday. All are welcome and come join us for some fun. ⊗

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# Great Basin Chapter Report

by Christopher S. Konakis, PLS, WRS, President

## PAST ACTIVITIES

January Meeting: January 17, 2017 at the Gold Dust West Casino, Elko, NV; 5 members present.  
February Meeting: February 13, 2017 at the Gold Dust West Casino, Elko, NV; 8 members and 1 guest present.  
March Meeting: March 10, 2017 at Wingers Restaurant, Elko, NV; 7 members present.

## PLANNED ACTIVITIES

April Meeting: April 10, 2017 at the Gold Dust West Casino, Elko, NV.  
May Meeting: Time and Place TBD  
June Meeting: Time and Place TBD

## FUTURE ACTIVITIES

Great Basin Chapter Picnic: Saturday July 22, 2017 at the Nisbet Cabin in Lamoille, NV.⊗

# NEVADA ASSOCIATION OF LAND SURVEYORS SOUTHERN NEVADA CHAPTER

## Meet the Board

### President

Jason Fackrell, PLS

Mr. Fackrell is a native Nevadan. He is a graduate of Bonanza High School and a member of the Boy Scouts where he earned the rank of Eagle Scout. He remains active in leadership roles in the community by serving as a Charter Representative for local scout troops. He has been active in the Land Surveying profession for 22 years, beginning his career as a chainman for VTN Nevada in Las Vegas. He received his Nevada professional license in in 2006 and is also a State Water Right Surveyor. Mr. Fackrell has been a member of the State and Southern Chapters of the Nevada Association of Land Surveyors for nearly 14 years and has served on the Southern Chapter board since 2011. He is currently employed with Poggemeyer Design Group as Survey Manager.

### President Elect

Jeff Miller, PLS, WRS

Mr. Miller has been a part of the Land Surveying profession for over 25 years. He started his career surveying in Detroit, Michigan and continued on to the Tampa Bay, Florida area before arriving in Las Vegas in 2005. Mr. Miller received his professional license in Nevada and is also a Nevada State Water Right Surveyor. Mr. Miller has been an active member of the State and Southern Chapters of the Nevada Association of Land Surveyors for 8 years and has served on the Executive Board of the Southern Chapter for two years. Mr. Miller is employed with Wallace Morris Kline Surveying as the Director of Business Development.

### Secretary

Gene H. Sawyer, PLS, WRS

Originally from Minnesota; Mr. Sawyer is a 32 year resident of Las Vegas and began his land surveying career with the Nevada Department of Transportation 1993. He has been an active member of the State and Southern Chapters of the Nevada Association of Land Surveyors for nearly 18 years, has served on the Executive Board of the Southern Chapter for six years and currently serves as the Southern Chapter Secretary. Mr. Sawyer is currently employed with Clark County Public Works as a Deputy Clark County Surveyor.

### Treasurer

Rusty A. Wonders, PLS

Mr. Wonders is originally from California and has also lived in Colorado. He has lived in Las Vegas for over 26 years and has been surveying in the Las Vegas valley since 1999. He is a

licensed Professional Land Surveyor in the state of Nevada. Russ has been an active member of the State and Southern Chapters of the Nevada Association of Land Surveyors for 8 years, has served on the Executive Board of the Southern Chapter for 5 years and currently serves as the southern Chapter Treasurer. Mr. Wonders is currently employed with GCW, Inc. as a Senior Land Surveyor and Mapping Manager.

### Director

Russ Jamison, PLS, WRS

Mr. Jamison has been land surveying for over 20 years. He attended the University of New Mexico (UNM) as a civil engineering student and began his career in land surveying working on a mining survey crew in Questa, New Mexico during semester breaks from school. After four years at UNM, Russ joined the U.S. Coast Guard where he served for eight years as a deep-sea diver. Russ returned to surveying in Las Vegas, Nevada and became a Professionally Licensed Surveyor in 2000. In 2008, he returned to New Mexico and finished a Bachelor of Science degree in education with a minor in mathematics and taught math in a Gallup, New Mexico middle school until September of 2015. He returned to Las Vegas last year and currently serves as a Director on the Executive Board of the Southern Chapter of the Nevada Association of Land Surveyors. Mr. Jamison is employed with Wallace Morris Kline Surveying as Project Manager.

### Director

Russell Hyatt, PLS, WRS

Mr. Hyatt is originally from Texas where he started his survey career and has resided in the Las Vegas Valley for over 27 years. He has been surveying for over 35 years and has been a member of the State and Southern Chapters of the Nevada Association of Land Surveyors for 17 years. Russell is licensed as a Professional Land Surveyor in Nevada, Utah and Arizona and is currently employed with the Poggemeyer Design Group.

### Director

Dustin Crowther, PLS, WRS

Mr. Crowther is a native Las Vegas. He began his full-time surveying career in 1992 at a local Las Vegas, Nevada engineering and surveying firm. He has continued to make surveying his passion and profession for the past 25 years. Mr. Crowther has been a Professionally Licensed Surveyor since 2009 and has been a member of the State and Southern Chapters of the Nevada Association of Land Surveyors for approximately 20 years. Mr. Crowther is currently employed with Clark County Public Works as a Deputy Clark County Surveyor.

### Director

Randy W. Mrowicki, PLS

Mr. Mrowicki began his survey career in Texas within the oil and gas industry in 1981. A resident of Las Vegas for 27 years and an active member of the State and Southern Chapters of NALS since 1992, Randy has served on many committees and events over the years and presently serves as a Director for the

CONTINUED ON PAGE 36 ►



# NSPS Report



by Paul Burn, P.L.S., Nevada NSPS Director

## Spring Business Meetings – Silver Spring, MD

The NSPS Board of Director's Spring Business Meetings were held at the Sheraton Hotel in Silver Spring, MD the week of March 13, 2017.

In a full week of events including both NSPS and the MAPPS groups, some items of note:

The national student competition was held, with categories in both 4 year and 2 year programs.

Results of the Student Competition –

Four (4) Year Program:

1. Texas A&M Corpus Christi
2. Oregon Institute of Technology
3. Penn State University Park

Two (2) Year Program

1. Central New Mexico Community College
2. Dunwoody College of Technology

Lobby Day was held mid-week, with nearly 100 delegates in attendance. The three main topics of discussion were Infrastructure, Flood Map Reform, and Private Sector utilization. The main point of the Infrastructure plank was to try to get the language of the bills to include "professional surveying and mapping." Since we're all aware that Flood Maps contain information up to 35 years old, we suggested legislation to fund new program to improve FEMA Flood Mapping in a national flood insurance program. In privatization, we pointed out that there are currently 1.2 million government employees doing competing commercial work. We asked them to sponsor legislation to change that trend back to private surveyors and mappers being contracted to do that professional work.

## ALTA/NSPS Survey Committee

The committee discussed many issues that have arisen from the adoption of the 2016 Standards. This will be the main content of discussions going forward, along with additional comments received as time goes on, in preparation for the Standards of 2021. It was encouraged to have as many comments as possible sent in, so that all opinions can be considered. A discussion was also conducted regarding the HUD issues, which continue. Some interesting accounts of the recent HeroX competition were related, as the chair was one of the several judges in the competition. Not surprisingly, none of the solutions offered a viable way around a real boundary survey executed at the site under the auspices of an actual P.L.S.

## Western States Director's Council

Old business was discussed first at this meeting, including a possible increased involvement in the Skills USA program, that actually employs the use of surveying and mapping in its competitions. A discussion was held regarding the situation at New Mexico State, where funds are desperately needed to try to keep the survey program from being eliminated from the engineering college. Another discussion of import was held on the Alaska situation with DPPS. From this discussion, a motion was produced to be submitted at the BOD to have the President send another letter to the director of the BLM to underscore the disappointment with the Alaska BLM in continuing their coordinate-defined corner program, and be clear that the NSPS

report *did not* in any way support the program, as they had said. This motion was created and presented.

One of the items that I want to share was the discovery that the 2017 Boy Scout Jamboree, now re-located to West Virginia, is in severe need of funds and physical surveyor help to continue the Scout Surveying Merit Badge program. This is one of the original merit badges, and many hundred scouts qualify for it at each Jamboree. However, due to less manpower available at the new site, funds and people are needed. Please consider a donation, and send to: **National Society of Professional Surveyors 5119 Pegasus Court, Suite Q, Frederick, MD 21704**

## NSPS Board of Director's Meeting

The NSPS Board of Director's Spring Business Meeting was held at the Sheraton Silver Spring Hotel and Conference Center in Silver Spring, MD on Friday, March 17, 2017.

### HIGHLIGHTS OF THE MEETING INCLUDE:

President-Elect Kim Leavitt's report included:

- Committee communication continues to be a challenge
- Assignment of sub-committee chairs and participants ongoing
- Goal of better committee structure, communication and follow-through
- Participation through committee work is paramount to the success of our organization

Vice President Lisa Van Horn provided the following items:

- The meeting agenda listed all the committees and current chairs for opportunity to provide updates on their work
- All directors have been requested to provide three (3) committees/subcommittees in which to participate. The purpose of the organization is based upon the work of the committees and everyone needs to contribute.

Secretary Tim Burch reported on the following:

- Diligently working on making the organization paperless
- Suggestion/comments/questions regarding content and formatting should be forwarded to the Secretary (tburch.iplsa@gmail.com)

Past President Tony Cavell provided the following notes:

- Recognized the challenges of a rapidly growing association while trying to keep our profession's relevancy in the public eye.
- Ongoing bylaws review and revisions will be necessary to keep up with technology and current communications environment

Treasurer Bob Miller reported on the following:

- "It's a great day to be a Surveyor!"
- Current statement of accounts along with past and future budgets were previously submitted
- NSPS Accounting Manager Bob Jupin has been working to improve our accounts for better ROI opportunities and should be commended for his efforts to structure our investments for security

Executive Director Curtis W. Sumner spoke on the following topics:

- Fall meeting will be in conjunction with the Texas Society of Professional Surveyors in Frisco, Texas on October 4-7, 2017
- Quarterly Executive Director report will be posted shortly on the NSPS website
- HeroX contest for replacement of ALTA/NSPS Land Title Survey has received 70+ submittals, none of which cover the actual duties under surveyor purview
- Young Surveyors Network is growing quickly and will become a great asset to our association



- Boy Scout Jamboree will be held in West Virginia in July, and will continue to request funds for supporting that event
  - Discussions ongoing with CFedS to evaluate NSPS taking on the management of the program
  - FIG 2022 Congress bid continues to be evaluated and securing cost estimates for Orlando hotel and conference space
- Bylaws and Resolutions Committee will now be chaired by Tom Berkland:
- Will be finalizing a position statement on our 100% membership policy
  - Revisions to the bylaws based upon technology and environmental changes are now on the docket for addressing Education Committee member Rich Vannozzi provided the following on behalf of Chair Stephen Gould:
  - Committee thank you to Past Chair Andy Sturgeon for his dedication to the Committee during his lead
  - University of Maine is developing a degree program for surveyors to be available online

External Affairs Committee Chair Patrick J. Beehler reported:

- Ongoing coordination with all subcommittees under External Affairs
- Creation of secure file exchange system for committee communications is being sought

Executive Director Curt Sumner gave a special presentation for the original members of the Certified Surveyor Technician board:

- CST board formation began in 1986
- Original members: Clay Adams, Dick Bull, David Scott, Ron Torrence, Bob Moynihan
- Ron & Bob were in attendance and received commemorative paperweights

Government Affairs Committee Chair Patrick A. Smith reported on the following activities:

- Very active Lobby Day w/MAPPS on March 15 with three (3) main topics for discussion with legislators
- Ongoing correspondence w/ USDOL on Davis/Bacon memo reversal
- Workforce development continues to be a hot topic, but focusing on how individual states need to take the lead on creation of programs
- Political Legislation Action TaskForce (PLAT) continues to grow but asks that all Directors request their state members to sign up with the registry to provide better coverage
- Creating more interaction with state affiliate's G/A committees so issues are addressed nationwide
- Constant review of new legislation to stay abreast of opportunities to address surveying issues
- Successful in promoting the passage of FLAIR Act, Digital Coast Act and PIPES Act
- PAC will require additional funding for continued support of legislators

NSPS Young Surveyors Network Vice President Christopher Glantz gave short presentation:

- NSPS YSN Officers:
  - o President Dan Kvall (MN)
  - o Vice President Chris Glantz (OR)
  - o Secretary Heidi Jackson (WA/OR)
  - o NSPS YSN Delegate Amanda Askren (WA)
- Currently have members in all 50 states and districts
- Still looking for YSN Representatives for the following states:
  - o Arkansas, Massachusetts, Mississippi, Nebraska, South Carolina
- Participating with NSPS on Future of Surveying and Workforce Development Task Forces

- Working monthly to continue building group goals and unity
- Next full gathering will be at NSPS Fall Business Meeting in Frisco, TX during October, 2017

Surveyors Historical Society Chair Rich Leu offered:

- Gave a short presentation of the Fall 2016 event in the Adirondack Wilderness, New York
- Next event - Concord, MA at Walden Pond – Sept. 14-15, 2017

FEMA Chair Dan Martinez provided the following updates:

- New elevation certificate is now available for use
- Tennessee will be holding CFS training and exams in Sept. 2017

NSPS Political Action Committee Thomas W. Brooks, Jr. requested that every member consider contributing to the PAC to sufficiently fund the efforts of our GA Committee.

Public Relations Committee Chair Lisa Van Horn and subcommittee chairs discussed the following:

- Communications Chair Patti Brooks reported on the ongoing progress of committee interaction
- Workforce Development Chair Emily Pierce provided an update on the groups formation and goals of interaction with the individual state's programs
- Michigan Director Craig Amey noted that the reciprocal program with other states helping cover NSPS activities helps the host director tremendously
- TSPS Executive Director DJ Kyle spoke of the success with attending the School Counselor's conferences
- Chair Van Horn shared YouTube videos of the "augmented sandbox" and how it could be utilized as a centerpiece for a conference display

Miscellaneous Committee Updates:

- New NSPS Fellows – Bob Akins, Bob Miller
- NSPS Foundation Appointments – Joe Dolan & Gerry Curtis
- Private Practice Subcommittee is working on manual for guidance
- POLC Chair Bill Coleman reports average age of LS test taker is 38 years old, with a 49% passing rate
- NCEES is looking for reviewers to help with evaluating exams
- UAS Committee is now formed and working toward creating goals
- NSPS Model Standards and Definitions will need to be updated

**NEW BUSINESS**

- Motion – 3DEP State Legislation Template (Passed)
- Motion – CIBORG Program (Passed)
- Motion – Spring Meeting / Lobby Day (Passed)
- Motion – Officer Elections (Failed)
- Motion – Conference Schedule (Failed)
- Motion – PAC Appointments (Passed)
- Motion – Opposition of Alaska DPPS (Passed)
- Committee Appointments – Vice President Van Horn to complete within 30 days
- ExCom Director Election – Mark Sargent & Bob Akins - two (2) year term

**Service Awards**

- 5 Years - Jim Sens
- 10 Years - Larry Graham & Rick Howard
- 15 Years - Cotton Jones & Rich Leu

**Next Meeting:**

To Be Held During the Texas Society of Professional Surveyors Fall Conference in Frisco, TX – First week October, 2017

Report submitted April 30, 2017 ☺



# Nevada Traverse Advanced Education Report

Prepared by Byron Calkins, Program Advisor,  
Land Surveying/Geomatics Instructor Great Basin College

*The Land Surveying and Geomatics program (LSG) is committed to addressing the disparate and constantly changing needs of students - throughout Nevada and beyond - who are preparing for a geomatics career. Great Basin aims to deliver a high quality and relevant educational experience that prepares LSG students for professional success.*

## Program Goals and Objectives:

### Land Surveying and Geomatics Program Goals

1. Proficiently apply sound measurement methods, mathematics, science, and surveying tools to collect, analyze, and edit spatial information in professional applications.
2. Develop a sound background in the humanities, social sciences, and the arts, to function in multicultural and diverse environments.
3. Provide fundamentals in business management to enable graduates to understand business environments and decision-making processes.
4. Convey spatial information in graphical, textual, and verbal forms as an individual or as a collaborating member of a professional team.
5. Prepare to take and pass the Fundamentals of Land Surveying examination developed by the National Council of Examiners for Engineering and Surveying (NCEES).
6. Satisfy the educational requirements for licensure required by NRS.625.270 as a professional Land Surveyor in Nevada and recognize the benefit of life-long learning by participating in continuing education as students or as instructors.

### Land Surveying and Geomatics Program Objectives

Objectives to assist the Land Surveying and Geomatics program achieve stated goals include:

- A) Evaluate and implement appropriate new teaching technologies for delivering high quality educational experiences to our remote students we are:
- I. Reviewing and applying new strategies in distance education that are relevant to our teaching environment.

B) Improve and advance the level of our expertise within the disciplines we cover. To achieve this goal we are:

- I. Reviewing, learning, and utilizing new techniques in our individual areas of expertise.
- II. Developing new classes or revamping older classes to meet the new industry standards as new technologies become accepted practice.

### Fall 2016 Surveying/Geomatics Education Summary

- 3/3 students passed the LSIT during the Fall 2016 semester
- One student passed the national Principles and Practices of Land Surveying examination
- One student failed the P.S. in New York State (retake spring 2017 semester) (100% pass rate on LSIT and 50% pass rate on the P.S.)
- MGT 441 Operational Quality Control and Problem Solving was replaced by CADD 421 Advanced CAD for Land Surveyors in the BAS LSG Applied Science Core beginning fall 2017 catalog
- 78 total students enrolled in SUR classes fall 2016 semester
- New text books for SUR 320, CADD 121, CADD 421 to be introduced spring 2017
- All drafting, GIS, and surveying related software is updated to 2017
- The development of a new one credit SUR 456 Advanced Mine Surveying course will begin spring 2017 based on the text by John O. Ogundare, titled *Precision Surveying: The Principles and Geomatics Practice*. First Edition. Wiley, 2015, (ISBN 978-1119102519)
- 2<sup>nd</sup> instructor recruitment and appointment for the LSG program is scheduled to begin fall 2017 pending the outcome of the 79th (2017) Session of the Nevada Legislature

### Spring 2017 Surveying/Geomatics Education Summary

- 2<sup>nd</sup> instructor officially requested by LSG department on Feb 27<sup>th</sup>
- 80 total students enrolled in SUR classes spring 2017 semester
- 90-120 students estimated to be enrolled in SUR classes for fall 2017



- All geomatics related software is updated to 2017
- 24 Students enrolled from Nevada

**Program Goals and Objectives: Fall 2017**

Objectives to assist the Land Surveying and Geomatics program achieve stated goals include:

A) Improve and advance the level of expertise within the disciplines we cover. To achieve this goal, we will:

- I. Officially request that GBC adds a second instructor for fall 2017/spring 2018
- II. Request an ABET Readiness Review (RREv) by August 25, 2017
- III. Submit an ABET Preliminary Self-Study Report by September 25, 2017
- IV. Complete ABET Readiness Review by Oct 25, 2017
- V. Submit ABET Request for Evaluation by Jan 25, 2018

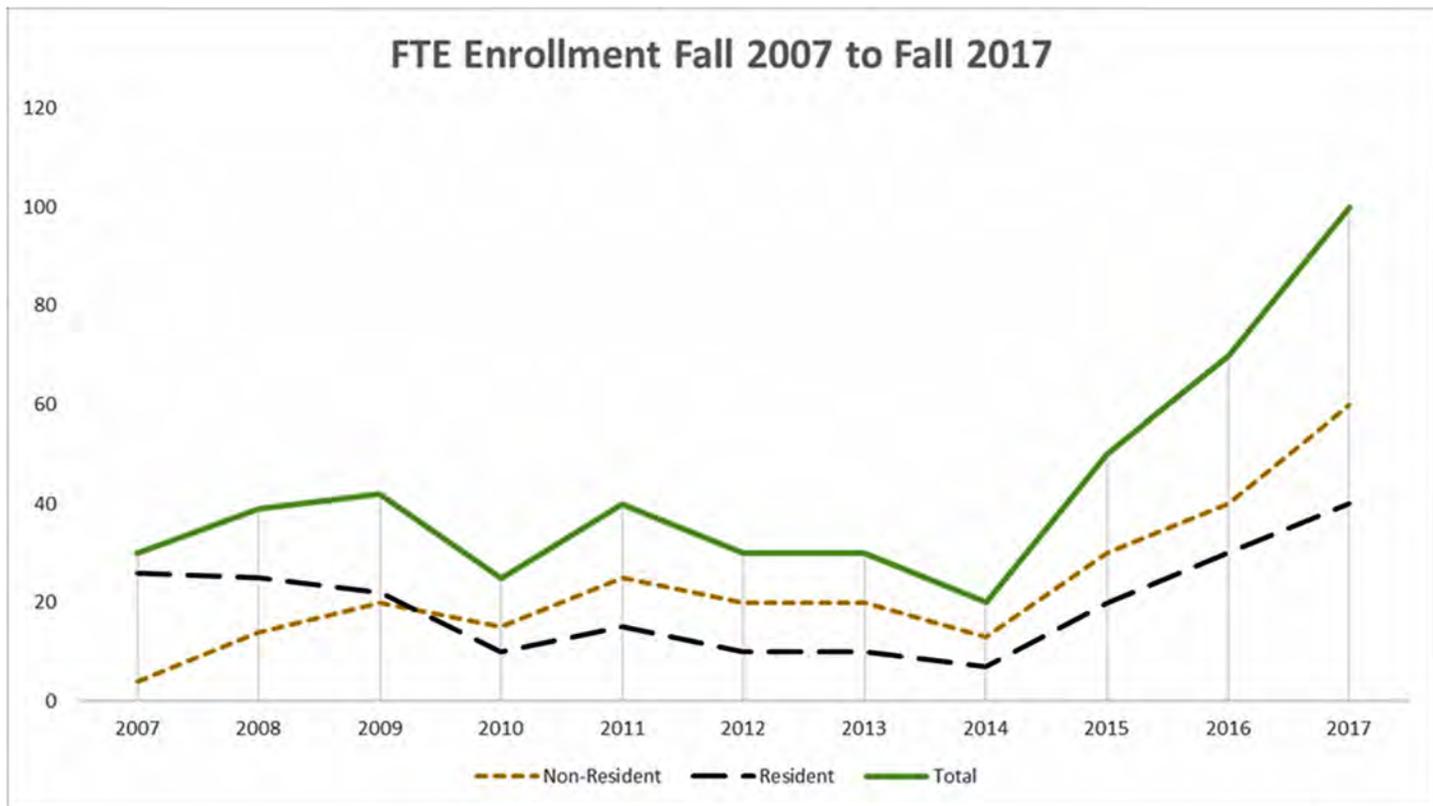
Interest in the GBC Land Surveying and Geomatics (LSG) program continues to grow. Estimated enrollment numbers are projected to be extremely strong for fall 2017. The program has requested that GBC add a second instructor.

When I attended the NSPS conference in Washington, D.C. this past March, I had the opportunity to discuss higher education with many different stakeholders within the profession. Here are the bullet points.

- Enrollment in geomatics related curriculum is down across the country
- Kennesaw State’s Land Survey program has been deactivated (3/14/17)
- GBC’s LSG program has been identified as the NSPS educational model moving forward
- At least four large schools are currently moving their traditional program model online including University of Maine, and New Mexico State University, which are both slated for Fall 2017 or Fall 2018 launches.

Funding for higher education at the state level (including NV) is under intense scrutiny as financial resources are limited. Clearly, each school has the obligation (legislative directive) to cut and remove programs that underperform. Unfortunately, geomatic programs typically have low enrollments and even lower graduation rates. GBC has been fortunate to increase enrollment as the program was an early adopter of the online model. My concern is when the online model is deployed by larger colleges, our enrollment numbers will dip. To address the increased competition in the online segment, GBC must become ABET accredited.

The entire ABET process takes 18 months to complete, unless the petitioning school has not gone through an ABET review, then the process takes 30 months. In a typical program setting, all program instructors would begin *CONTINUED ON NEXT PAGE* ►



This chart illustrates Nevada Resident and Non-Resident enrollment is trending in an upward direction  
\*2017 Fall enrollment estimated

aligning their assessments with program and course objectives, while also collecting and organizing the required materials needed for the review. This aspect of the ABET process is the most time consuming; I estimate 384 hours of the work is needed to complete the Readiness Review (Rev) portion of the application.

To gain ABET accreditation, the LSG program needs a second full-time instructor. I have officially requested we add a second instructor to begin either Fall 2017 or Spring 2018. This of course is contingent on the outcome of the 79th (2017) Session of the Nevada Legislature.

As of today, 80% of all students in all LSG related classes are earning a 70% or higher. These statistics meet all program assessment outcomes that I implemented last year for each class.

**Spring 2017: New Course Updates**

**GBC SUR 320 – GIS for Surveyors**

GBC’s Land Surveying/Geomatics department is pleased to announce that our new SUR 320 – GIS for Surveyors will be offered in spring 2017.

SUR 320 – GIS for Surveyors curriculum focuses on a variety of tools for editing the data to create new or derived polygons from the parent, adding the record data for lines, and correcting or adding attribution and labeling. The editing tools include working in true bearings or grid bearings, and computing closures with acreage. The parcel fabric allows the land surveying student to work in

various units such as feet, chains, links, meters, etc.; the ability to traverse metes and bounds (bearings and distances); and create new polygon parcels, that can rest on top, store to history, or replace existing parcels.

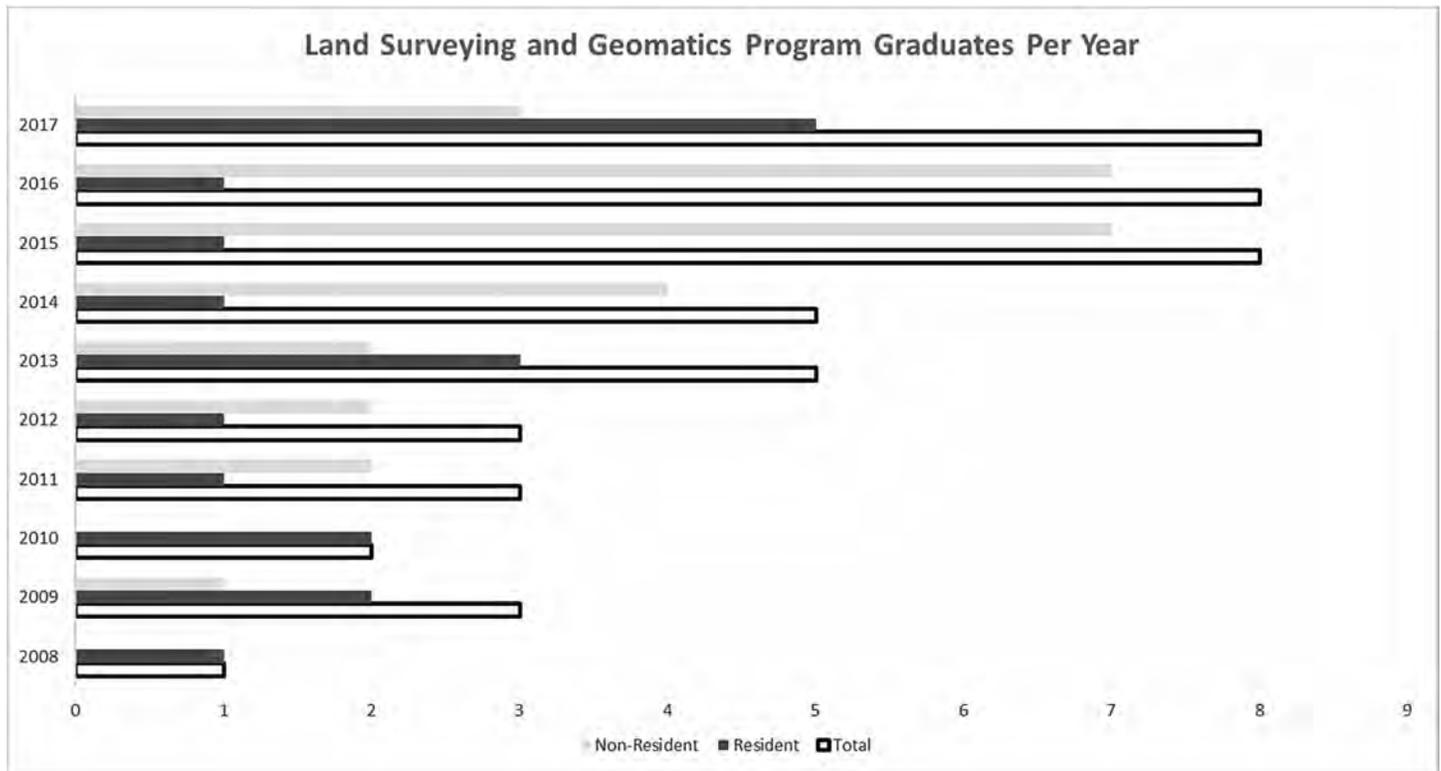
**GBC CADD 421 – Advanced CAD for Land Surveyors**

GBC’s Land Surveying/Geomatics department is pleased to announce that CADD 421 – Advanced CAD for Land Surveyors will be offered in spring 2017 as the follow up class to CADD 121 – CAD for Land Surveyors and will replace MGT 441 (from the Applied Science Core).

Students in CADD 421 will use computer-aided drafting (CAD) software to create survey plats and topographic maps. Instruction will focus on learning COGO tools, the Command Prompt, use of deed data to create a deed file, perform deed correlation with field data, create and edit lots and areas and generate lots and setbacks, setup Field to Finish codes, generate 2D and 3D geometry, utilize point history, use special linetypes for map creation, execute advanced AutoCad commands to create survey drawings, and setup Field to Finish codes.

**GBC SUR 255 – Introduction to Mine Surveying**

GBC’s Land Surveying/Geomatics department is pleased to announce that the LSG department will again offer “Introduction to Mine Surveying” in spring 2017. The impetus of the new surveying course is to demonstrate that the LSG program is motivated to add curriculum that aligns with professional jobs in Nevada.⊗



\*N = 46 Total Degrees, BAS Degrees = 38, AS Degrees = 8  
 \*N assumes all students eligible for degrees will graduate spring 2017

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# FAKE NEWS!!

We'd Like to see...

## SURVEY POPULATION SURGES

*As college Surveying programs across the nation become increasing clogged with new students, new poll indicates that more and more high schoolers are looking to become geomatics professionals...*

## AVERAGE AGE OF SURVEYOR DIPS BELOW RETIREMENT AGE (BRIEFLY)

*According to demographic research, the average of a professional surveyor fell back into the fifties today, for almost half an hour before trending back upwards...*

## ATTORNEYS, DOCTORS, ENGINEERS INVITE SURVEYORS INTO SECRET CLUB

*Only stipulation is that the old trucks have to park in the back and boots must be removed before entry...*

## LENDERS, DEVELOPERS, ATTORNEYS AGREE: A.L.T.A. SURVEYS ARE TOO INEXPENSIVE

*Industry leaders say that such surveys should be awarded based on qualifications rather than cost...*

## BUREAU OF LAND MANAGEMENT SAYS DPPS JUST A PRANK

*We were just trying to see if surveyors are paying attention...*

## NGS ANNOUNCES HUGE BLUNDER IN COMPUTING SHAPE OF EARTH

*A spokesman for the agency said today that actually the earth's shape almost perfectly matches a particular part of Kim Kardashian's anatomy. Datum 2022 will conform much closer and will also look better in Spanx. NGS will roll out Geoid Badonkadonk concurrently with the new datum.*

## NEVADA TRAVERSE WINS PULITZER, MAN BOOKER PRIZE AND NOBEL PRIZE (FOR ASTROPHYSICS)

*Editor invited to Mar-A-Lago for long weekend of geopolitical strategy and relaxation. ☒*



## Has Your Contact Information Changed?

Change in your address, email address, or telephone? Please contact NALS with your updated information.

You may log onto the NALS Website at:

[www.nvlandsurveyors.org](http://www.nvlandsurveyors.org)

Go to: Update Contact Info.

Fill in your information and submit.

Help your NALS Board to keep you current.

**Thank You!**

# Out of Adjustment

## From the Wild West

### Chronicles

Future of Surveying was a nice enough fellow. Kept to himself mostly, no close friends and he had become estranged from relatives, that much was clear. But I'm getting ahead of the story. Someone took advantage of poor Surveying and in a most profound way. I had the unenviable task of figuring out how Future of Surveying ended up in the desert, just out of view of the city lights, buried in a shallow grave.

I'm Rick Danger, and I'm the lead investigator for CSI-Professions... and this is the story of the mystery that was the murder of Future of Surveying.

It was the third week in March, (later I reflected how fitting indeed that this was National Surveying Week) when a lone mountain biker came across the partially decomposed body of Future of Surveying. The rider used his cell phone to call 911-Lite to report the grisly discovery. A drone investigative unit was dispatched to the locale – down a lonely dirt road that ran off into the sunset. The drone unit sent back photographic evidence that this was in fact a crime scene and my team was immediately called into action.

To say the grave was shallow was an understatement, more like some dust blew over the supine corpse. The victim's pants pockets had been turned out indicating perhaps, that he had been robbed. There was no I.D. on the body and so we had to first solve the mystery of who he was before we could begin to establish what he was doing out here helping the cactus grow. Clearly it would be a long arduous process if we were ever to bring the killers to justice.

Examination of Future of Surveying's corpse in situ, revealed a gaping puncture wound, indicating that someone or ones had stabbed the victim in the chest. The likely murder weapon, a 4-inch long brass object, resembling the counterweight on an old-style grandfather clock, but with a threaded steel point, was found beneath the body. It fit nicely in a leather holster on the victim's belt. It looked like he was undone with his own implement. I made a mental note to find out what this object was.

The victim, still a John Doe at this point, was unnaturally thin, as though he had been starved for quite some time before he met with his end. His clothes were nicely tailored but threadbare, not dirty really, but just worn out and they fit too loosely on his body, suggesting that he had once been more robust. Straight teeth and calloused hands separated the victim from the anonymous vagrant professions that turn up from time to time like the guy who used to pump gas for a living or radio disk jockeys. The victim had the look of someone who had been living lately in much diminished circumstances. Here was a profession that had once been made for finer things. Did he know his killer? Was he lured out here and killed and was he killed elsewhere and just dumped here? As the red sun sank into the black mountains west of the crime scene, I thought to myself, "What a low-down dirty rotten shame."

During the forensic analysis of the crime scene, the team made a discovery. The victim was clenching a small, crinkled piece of

paper in his right hand. A checklist it would seem, but who or what were the items, lined through in bold black ink, and why was the last word on the list not lined out? We entered the names from the list into the police-issue Apple pinky-ring computer, hoping to get a hit. "Gis / Stking / Topo / Asblt / Bdry". Were these code words, anagrams, names, initials, abbreviations, or something else? Something more...sinister, perhaps?

A description of the victim was circulated. Soon enough some witnesses popped up. One, a shoe salesman from Des Moines on vacation with his family, was particularly helpful.

"I seen this guy, aimlessly wandering down the street, muttering to himself and his shoes were untied. I always notice the shoes. He seemed confused and acted like maybe he didn't know where he was or even maybe who he was. He had nice expensive shoes, or at least, they used to be nice – kinda worn out now. Hard times, I guess. He went into a coffee shop on Main Street. He looked real confused. I don't think he was homeless, more like he just forgot where he was." He told us where the coffee shop was located. His description of the muttering stranger fit our victim to a tee.

A waitress at the coffee shop – that's way too generous a term, 'greasy spoon' was more like it, recalled our man coming in and ordering coffee and saying something about an identity crisis. "He complained that he used to be better off but others had stolen everything he had. He paid for the coffee with what he said was his last dollar. He kept mumbling something about 'needing more outreach' and I heard him say 'awareness' more than once, but I really didn't pay too much attention. He stiffed me on the tip but he left me his business card – would that help you guys?" Yes ma'am, it certainly would. Our first concrete lead: a business card with "Future of Surveying" embossed in gold letters and a blue logo with the letters "NSPS" in one corner. Pretty tony card for a homeless guy. Something didn't feel right. We ran the name through all the criminal databases, and got a hit in the FaceBook-Interpol database. Future of Surveying had been reported missing some time ago by members of his family. The Geospatials, a big wealthy, famous family from back east somewhere. They had their fingers in everything. I thought to myself as I reflected on the Facebook hit, "Someone didn't 'like' this guy. They didn't 'like' him a lot."

I made arrangements to travel to Southern California to see Ezri Geospatial, a prominent member of the west coast branch of the family. Ezri, as it turned out, was Future's cousin and at one time, the two had been quite close. Ezri was a friendly chap, although it was clear he was playing his cards close to the vest. He said that Future was once a prosperous profession that was admired by one and all, but he had fallen on hard times and had lost much of his fortune during the last couple economic downturns. "Each time the economy got better, there seemed to be less of him, if you know what I mean." I didn't. "Future was in hock up to his eyeballs to a loan shark named Advancing Technology and when he couldn't pay, the shark started divvying up Future's things to some shady characters. A fellow named Machine Guidance was one of them, and as I recall, a guy named Something Drone or Drone Something was another. I never caught his full name - he never stayed around long enough to strike up a conversation, always flitting around here and there."

I asked Geospatial if the words on the crumpled note meant anything to him. It was a long shot but sometimes longshots pay off big. This was one of those *CONTINUED ON NEXT PAGE* ►

court. All the while, the cost of constructing the pyramids was skyrocketing, surpassing the cost of the expedition's surveying instruments. La Condamine fought back in court, wasting more time and money. When the court ruled against him, he relented on a few issues, but simply ignored others.

**(Endnotes)**

<sup>1</sup>In fact, Chimborazo ranks 37<sup>th</sup> in the 40 tallest peaks in South America. However, its summit is the farthest from the center of the earth, eclipsing even Mt. Everest, because of the equatorial bulge the French were trying to prove or disprove.

<sup>2</sup>Bouguer's experiment was a breakthrough despite the Academy's indifference. Much later, many successful gravity experiments were carried out using the same procedure that Bouguer pioneered. Scientists eventually came to realize that the Earth's crust is complex, riddled with areas of high and low densities that naturally effect local gravity. These areas are now called Bouguer Anomalies.

<sup>3</sup>London, *A Voyage to South America*, 5<sup>th</sup> edition, Vol. 1, Don George Juan and Don Antonio de Ulloa, 1805

<sup>4</sup>La Condamine did not lack for company in Cuenca, either. He fathered two children during his stay there.

<sup>5</sup>New York, *Measure of the Earth, The Enlightenment Expedition That Reshaped the World*, Larrie D. Ferriero, 2011, page 160.

<sup>6</sup>Reproduced under the terms of the Creative Commons Attribution-Non-Commercial-Share Alike (CC BY-NC-SA) license, courtesy of the National Maritime Museum, Greenwich, London.

Southern Chapter. Mr. Mrowicki is currently employed as a Land Surveyor within the City Engineering Division of the City of Las Vegas Department of Public Works.

Director

Nicholas Ariotti, PLS, FAA 107

Mr. Ariotti became a resident of Clark County in 1988 at age 5 after his father, Richard Ariotti PLS, who had been seeking new employment, was hired by Elmer Radig RLS, of Boulder City (E.G. Radig Inc. est. 1967). When Elmer passed away in 1995, Richard acquired the business and kept the name in honor of Mr. Radig. Nicholas began to help out on the survey crew at age ten and, for the next eight years, worked weekends as well as summer and winter breaks. At age 18 he briefly left surveying to pursue working as a union concrete mason. It only lasted a month, at which time he decided to make land surveying his career. Nicholas became professionally licensed in 2013 and continues to work side by side with his father as partners of E.G. Radig. Mr. Ariotti stays up to date with current land surveying technologies and has recently obtained FAA certification Part 107 allowing him to pilot unmanned aerial vehicles (UAV). Mr. Ariotti also worked closely with Monsen Engineering to bring the TURN GPS VRS Network to Southern Nevada. This year is Mr. Ariotti's first, of many years to come, serving the Southern Nevada Association of Land Surveyors. ⊗

*Out of Adjustment... continued from previous page*

times. "Oh yeah, sure." Said Geospatial. "These were his prize possessions when he was still a big shot. I think the loan shark took all of these and sold them on the street. The last time I saw my cousin, all he had left was an ugly sweater and his precious Boundary." Thinking he needed the money, I asked if it was by any chance for sale, but he said he'd rather die than give that up. Sounds to me like that's what happened. I wish I could help you more, officer Danger, but I've got to go to the office and check on some cadastral data. If I think of anything else, I'll call you." He drove off in his Bentley hover-car. It seemed a far cry from the holes in the soles of Future of Surveying's shoes.

When I got back home it was raining, and hard. "Like a cow pissing on a flat rock" is how the old cowboys in my hometown would have described it. I stepped into my shabby apartment building and walked the six flights of stairs to my place. I turned on the electric tea kettle and took off my soaking wet fedora and my trench coat. I knew I had to solve this case. I pulled back the curtains and dropped into the ratty wicker chair that was my only furnishing and sipped dirty chai from a cup with a chip in it. I stared out the window at the rain, at nothing, at my reflection in the pane. The world seemed a little worse off without Surveying.

*Editor's note:*

*So is the Future of Surveying really dead? If so, who killed him? Maybe the body in the shallow grave was misidentified. Danger made no mention of DNA or fingerprint data. That Future had fallen on hard times is indisputable. What happened? ⊗*

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*BoD Meeting Minutes... continued from page 23*

**NEXT MEETING**

The next Board of Directors meeting was planned to be a telephone conference call. It was suggested that NALS hold a Board meeting in Elko in July as the Nevada Board of Registration is meeting in Elko and Great Basin Chapter usually holds their picnic in July. Limitations of the travel budget were discussed.

**Action Item:** Board members to review their calendar and notify the Executive Office of their availability to meet July 21<sup>st</sup> in Elko, NV.

**ADJOURNMENT**

President Alan Dill adjourned the meeting at approximately 6:00 PM. ⊗

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The Nevada Association of Land Surveyors

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