

## SPAR Trip Report and Musings

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TO: WestFed Board of Directors  
NMPS Board of Directors  
NM Board of Licensing for Professional Engineers & Professional Surveyors (BOLPEPS)  
NMSU Surveying Engineering Industrial Advisory Council (SEIAC)  
ASCE Geomatics Division Education Committee  
SPAR Point Group

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RE: Report - 11<sup>th</sup> Annual SPAR 3D Measurement and Imaging Conference

April 14-17, 2014, I attended the 11<sup>th</sup> Annual SPAR 3D Measurement & Imaging Conference at the Broadmoor Hotel in Colorado Springs, CO. The conference included more than 840 attendees from 20 different countries, over 100 speakers/presenters, and a large exhibit hall accommodating sponsors, corporate exhibits, service providers, university pavilions, media sponsors, and supporting organizations. It was like standing before an open fire hydrant to quench a thirst but, I learned a lot and found reasons to question various “settled” assumptions about how spatial data are generated, manipulated, displayed, archived, and used. Surveyors are measurement professionals but surveyors are not the only discipline who makes measurements or who use spatial data. In my opinion, surveyors should aspire to an “equal seat at the spatial data table.” My observation (musing) is that other disciplines have not waited for surveyors to “speak up” regarding use of 3-D digital spatial data. A consequence of that inaction is that we surveyors find ourselves relegated to legislating our legitimacy when we could have more impact by active participation in innovative solutions.

In the interest of full disclosure, Global COGO paid my \$750 full registration fee for SPAR 2014. However, SPAR provided one complimentary registration to the New Mexico Professional Surveyors (NMPS) to allocate as desired. That complimentary registration was given to me and I received a full refund of the registration fee paid. That obligates me to provide this Trip Report to the NMPS Board. The decision to share this report and muse with others is mine alone.

As additional background information - I am neither a traitor nor a mole. The surveying profession has been very good to me for which I am grateful. I am transparent to a fault and have very few secrets. When forced to choose, my loyalty goes down rather than up. My personal policy is not to complain about something unless I have something better to suggest. The primary focus of education is (should be) learning how to learn. Rationalization seldom needs justification. I can't stand intolerance (yes, I am a hypocrite). Agreeing to disagree is acceptable if done respectfully. Integrity is the most important component of my professional reputation. And, I am deeply indebted to many who have mentored me.

With that said, and without asking anyone to agree with me, I am willing to question and discuss the implications and consequences of each of the following:

1. Many seem to embrace the philosophy that rules were made for others.
2. Is it true that breaking the rules is OK if I don't get caught?

3. Some people seem to believe/act like the right to make a decision makes their decision right.

Maybe you've heard that Dwight D. Eisenhower is credited with saying, "You don't lead by hitting people over the head. That is assault, not leadership." In that light, this report should be considered an open invitation for interested persons to participate in the exciting opportunities made possible by the digital revolution. Incidentally, a corollary to Eisenhower's quote is, "the beatings will continue until morale improves."

I've had the opportunity to attend about half of the 11 Annual SPAR conferences and have witnessed the growth of a fascinating industry: 3-D scanning and imaging (most recently called 3D measurement & imaging). The technology continues to mature and it seems that the successful business models increasingly include specialization based upon new developments. For me, it is impossible to keep up with the latest and greatest – the Professional Surveyor correspondent wrote about "A Gaggle of Geo Gadgets at SPAR '14." Even so, I remain convinced that the value of products and services delivered (you know, that for which we get paid) continues to rely upon good risk management and how well we help our client solve their problems. Key components of that success include delivering a quality solution in an atmosphere of accumulated trust and integrity. Yes, we in the surveying profession have a valuable contribution to make. But, (now I'm hitting some over the head) we in the surveying profession also need to recognize and accept the challenges fostered by using new technology in an appropriate manner. That's a bit philosophical – let's be more specific.

Just prior to the SPAR 2014 conference, the SPAR Point Group published, "Confessions of a Hired Gun – What is to become of the Land Surveyor?" written by Sam Billingsley and posted as a blog – see:

<http://www.sparpointgroup.com/Blogs/Confessions-of-a-Hired-Gun/What-is-to-become-of-the-Land-Surveyor-/>

In reading that article I feel as if I've been hit over the head because he tells it like he sees it - the niche of the land surveyor is surveying boundaries and he questions whether there is enough such work to make it worthwhile. He has a point, but I'd like to believe that the surveying profession can embrace and contribute positively to a broader scope than traditional land surveying. That may sound good, but we also need to be aware of what it takes (intellectually, economically, politically) to compete successfully on an equal basis with other talented dedicated professionals. The SPAR conference provided a huge insight into that challenge. I witnessed evidence that many surveyors are choosing to build a successful business by focusing on the techniques and challenges of data collection! That is both good and bad – good in that surveyors are indeed branching out and bad in that, without due diligence, such a focus will overshadow the professional and legal aspects of our profession.

One of the many interesting presentations at SPAR 2014 was given by a talented young man who used a drone and a camera to capture images from which he generated a 3-D digital terrain model for site remediation, earth-work volumes, engineering design (if I remember correctly), and ultimately, condominium construction. As a contractor working on his own property he steered clear of violating the state licensing laws and the FAA jurisdiction of airspace with his "non-commercial" use. Several in the audience took exception to his approach because he was not licensed. This is an issue our licensing boards need to address – how was the public welfare compromised or damaged? Billingsley also raises the issue of licensing and suggests that "some of the worst offenders actually sit on our boards and run our professional organizations." That is putting it pretty strong but I believe many concede that licensing boards (and the profession at large) are facing significant challenges with regard to what constitutes professional surveying practice. In my opinion, part of that challenge is recognizing the impossibility of legislating morality or professional competence without discussing the impact of education at all levels.

Jeff Lucas spoke at the 2014 NMPS Annual Convention in March. He is an energetic speaker who shared insights into many legal aspects of surveying and offered views as to operating a successful land surveying practice. One of the points he made (and which is repeated in his April P.O.B. article – <http://www.pobonline.com/articles/97305-the-future-of-land-surveying> ) is the importance of “maintaining the status quo.” Many arguments can be made for “not rocking the boat” and I am one of those who have really enjoyed surveying hundreds of parcels (for easements and power line R/W’s). The challenge and satisfaction of accumulating consistent evidence in support of an uncontested boundary location is actually fun. But, I believe society deserves more from the surveying profession. Maintaining the status quo may be appropriate but it is not sufficient - especially with regard to establishing and enforcing the qualifications of GIS and CAD operatives who glibly determine boundaries without proper education, experience, and supervision. As a surveying educator I will promote competence in both measurement and evaluation of record evidence. Paraphrasing Milford’s 1912 quote, “it is just as important to measure the right line correctly as it is to measure the right line.” See - <http://www.profsurv.com/magazine/article.aspx?i=185>

In late March 2014 I came across an item in EOS (the weekly newsletter of the American Geophysical Union) in which the National Oceanic & Atmospheric Administration (NOAA) published a request for information (RFI) about how to make better use of “BIG DATA.” The scope of the challenge is huge but, from a surveying and efficient data management perspective, one of the first obstacles to be overcome is to adopt a standard model for 3-D digital spatial data. A copy of the RFI and the Global COGO response to same can be read at [www.globalcogo.com/BIGDATA.pdf](http://www.globalcogo.com/BIGDATA.pdf). I believe it is reasonable to assume that the policies/procedures eventually adopted for BIG DATA will ultimately be reflected in the content of future SPAR conferences and in the way 3-D spatial data are handled at the local level.

And, finally, this muse concludes in pondering parallels with regard to how we use 3-D digital spatial data, with regard to the pervasive impact of the digital computer, and with regard to the system of laws which govern modern society. In each case, the parallel I’d like to draw begins with fundamental (basic) assumptions and adds building blocks that have been thoroughly debated/tested to achieve a well-ordered “whole” on which we can all depend. Various “wholes” are not yet perfected but, for context, consider that anarchy and chaos exist where the “whole” either does not exist or is ignored. Many of the fundamental rights we take for granted had their origins in the Magna Charta, were nurtured in English system of case law, and are more recently manifested in our U.S. Constitution. That “whole” has been evolving for about 800 years and continues to evolve e.g., the Civil Rights Act of 1964. Similarly, the digital revolution and the computers we use are based on the fundamental assumption of using binary (zeros and ones) to represent digital data. Computer history is somewhat younger than civil law but the “whole” of computers, like laws governing society, has undergone extensive discussion/testing and the well-ordered “whole” is now enormously complex. Although one could argue that the computer “whole” is not yet perfected, my point is that the computer body of knowledge is reliable and that it remains true to the original assumptions.

Which brings us to the spatial data “whole.” René Descartes published his “Discourse on the Method” in 1637 in which he laid the ground work of geometry. The rules of solid geometry and manipulation of geometrical elements via computers, vectors, matrices, and linear algebra constitute an important part of the “whole.” But, it has been only recently that the assumption of a single origin for 3-D digital spatial data has been added to the spatial data “whole.” The impact of implementing that basic assumption will take time, but it will be quite profound. The surveying profession has much to contribute in the development and testing of this addition to the spatial data “whole.” See the BIG DATA challenge described above.