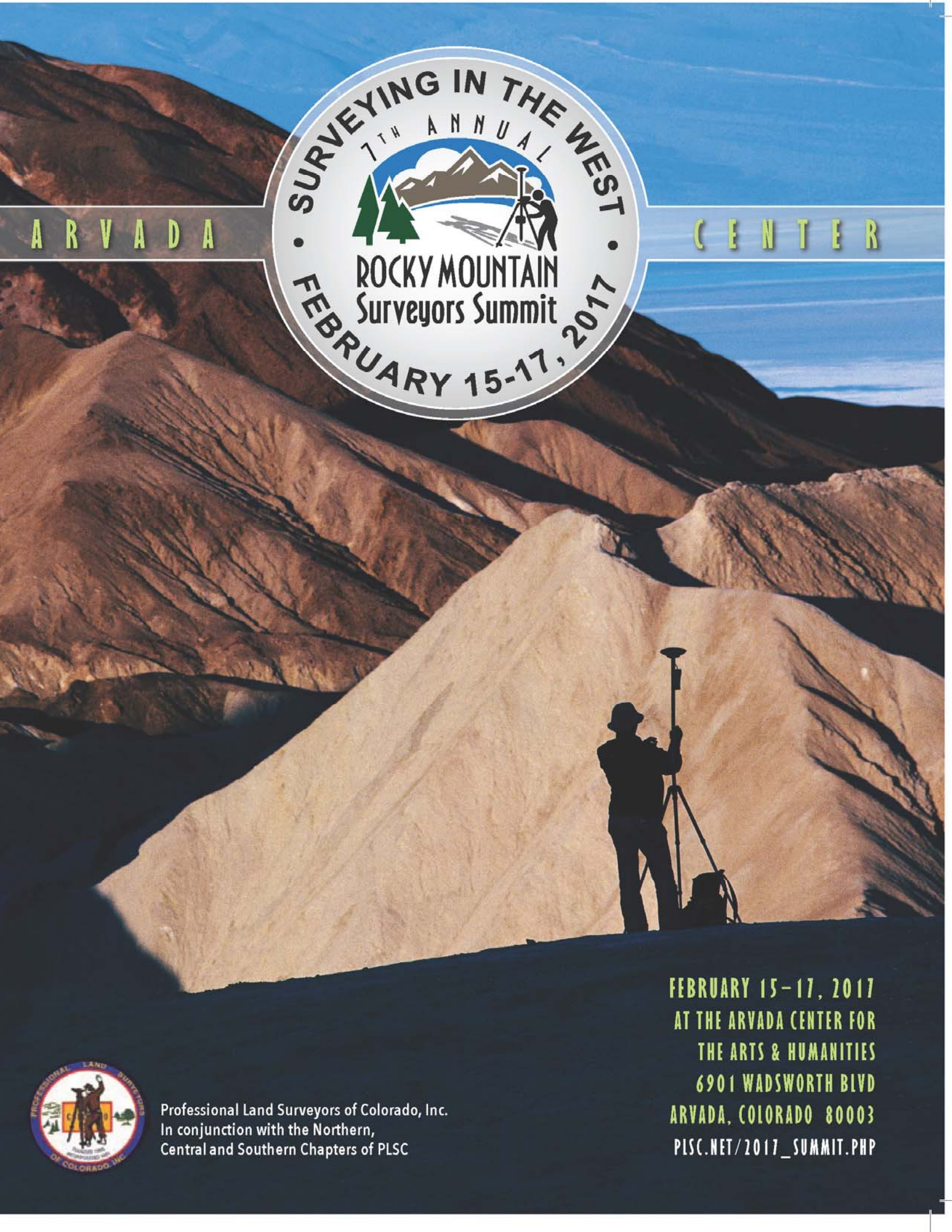
SURVEYING IN THE WEST
7TH ANNUAL
ROCKY MOUNTAIN
Surveyors Summit
FEBRUARY 15-17, 2017
ARVADA CENTER
FEBRUARY 15-17, 2017
AT THE ARVADA CENTER FOR
THE ARTS & HUMANITIES
6901 WADSWORTH BLVD
ARVADA, COLORADO 80003
PLSC.NET/2017_SUMMIT.PHP
Professional Land Surveyors of Colorado, Inc.
In conjunction with the Northern,
Central and Southern Chapters of PLSC

7th Annual Rocky Mountain Surveyors Summit
Speaker Biographies and Abstracts
Master Track

(Listed in chronological order. Multi-speaker presentations listed by first speaker.)

WEDNESDAY MASS SESSION PRESENTER: TBD

Speaker Biography:

John B. Stahl, PLS, is a registered professional land surveyor in the states of Utah and Montana, currently owning and operating Cornerstone Professional Land Surveys, Inc., and Cornerstone Land Consulting, Inc., in Salt Lake City. Mr. Stahl specializes in surveying land boundaries, resolving boundary conflicts, performing title and historical research, land boundary consultation services, mediation and dispute resolution. He has been qualified as an expert witness in numerous boundary, access, and negligence cases. He has furthered his mediation education by participating in a state-qualified training program. He has also completed a training program to earn the recognition as a Certified Federal Surveyor. Mr. Stahl has served his profession as state chairman of the Utah Council of Land Surveyors and a Utah delegate to the Western Federation of Professional Surveyors. He is an adjunct instructor for the Salt Lake Community College and the Utah Valley University, where he teaches an extensive course in land boundary law. Mr. Stahl has authored numerous articles and publications covering topics on boundary laws, research, and resolving conflicts of evidence.

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TOPIC TITLE: *SURVEYOR'S ROLE IN CONFLICT RESOLUTION*

Speaker Biography:

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Abstract:
We will begin with an examination and comparisons between the role of the surveyor and the role of the courts. We will look at problems with deeds, common transcription mistakes, conflicts in writings, and conflicts in evidence. We will discuss the distinct differences between written conflicts, adjoiner conflicts, and occupational conflicts. Statutory and common law presumptions, rules and principles which provide direction to the surveyor for conflict resolution will be reviewed and discussed. We will discuss tips and techniques to assist the surveyor in contracting for resolution of unforeseen problems. We will also review some real life examples of projects and court cases.

TOPIC TITLE: *REMEDIES TO RESOLVE PROPERTY LINE PROBLEMS*

Speaker Biography:
John B. Stahl, PLS, see above.

Abstract:
Surveyors are often the first to discover a boundary problem. When the surveyor discloses the problem and walks away, what other remedies are available to the surveyor? What knowledge, skills and expertise can the surveyor bring to the resolution table? We will discuss the various remedies which can be used to deal with property line problems, whether caused by a failure in the title documentation or a failure in the location of the boundary. We will discuss the surveyor's role in applying the laws designed to assist in the resolution process from mediation to litigation.

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Speaker Biographies and Abstracts
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TOPIC TITLE: *UNDERSTANDING THE RISKS: SURVEYS, DESCRIPTIONS AND PLATS*

Speaker Biography:
John B. Stahl, PLS, see previous page.

Abstract:
This presentation will encompass an overview of various types of surveys designed to fulfill the intended purpose of the client. We will discuss various elements for consideration when determining the scope of services to be provided. Recognition and disclosure of easements and encumbrances in property will be considered along with the impact of regulatory interests imposed by local, state, and federal agencies. The participants will discuss a few of the potential pitfalls which might arise from existing and proposed improvements. Gathering and depiction of evidence of prescriptive and adverse use will also be discussed.

TOPIC TITLE: *SUBDIVISION OF FRACTIONAL SECTIONS (CFedS PROGRAM—2 CFedS PROGRAM CE CREDITS)*

Speaker Biographies:
Robert W. (Bob) Dahl retired in October 2016 from the Bureau of Land Management Cadastral Survey Program. His experience includes 18 years stationed at the Headquarters Office in Washington, DC, working for the BLM Chief Cadastral Surveyor providing technical support and policy development. Prior, he spent 22 years conducting dependent resurveys for Cadastral Survey in California, Oregon, and Washington. Before the BLM he surveyed for a private surveyor and the U.S. Forest Service. He is a licensed land surveyor in the States of California, Oregon, and Washington and a Certified Water Rights Examiner in Oregon. He holds a Bachelor's degree in Surveying from the Oregon Institute of Technology. He is a member of National Society of Professional Surveyors, an instructor for the Certified Federal Surveyor (CFedS) Program, and was the Chief Editor of the 2009 edition of the Manual of Surveying Instructions.

Mike Boeckman began his career in surveying in 1979 running a chain saw on a boundary marking crew near Delta, Colorado, for the U.S. Forest Service. Since that time, he obtained a A.A.S. degree in Civil Engineering Technology at Mesa State College in 1980, a B.S. degree in Surveying and Mapping from Metropolitan State College in 1990, and is currently enrolled in the Masters of Engineering program at University of Colorado, Denver, in GIS\Geomatics. After numerous temporary field seasons and a Cooperative Education Program with Cadastral Survey, he became a permanent employee with the BLM in 1988. He has been assigned to the Tres Rios Field Office in Durango, Colorado, since 2001, performing dependent resurveys for several federal agencies in the area and has performed numerous retracement and resurveys of mineral surveys near Silverton, Colorado. He is licensed in the state of Colorado since 1992 and assists in teaching a PLSC Refresher course.

Sean T. Mullen graduated from the Oregon Institute of Technology with a Bachelor of Science degree in Geomatics. While enrolled in college, he worked seasonally for the Bureau of Land Management in the Student Temporary Employment Program (STEP) and Student Career Experience Program (SCEP). He has spent the past five years as a Cadastral Surveyor working for the Colorado State Office. He is a member of the Professional Land Surveyors of Colorado and currently serves on the Board of Directors for the Western Colorado Land Surveyors Chapter. Sean is licensed in the State of Colorado.

Abstract:
The complex, but common, problem of subdivision of sections will be discussed by 3 Cadastral Surveyors. They will start will the fundamentals of subdivisions of regular sections; work through "protection of the plat" principles; opine on the considerations to be made when following a previous or many previous subdivisions of a section; move to how to determine whether a section is regular or fractional for subdivisional purposes; and finally how to subdivide fractional sections. Topics touched on will include: What is the role (duties and responsibilities) of the Surveyor? When is the Manual of Surveying Instructions relevant to the practice of land surveying by Private and County Surveyors? How the determination of the Court of Competent Jurisdiction; Source of Law; Bona Fide Rights and Good Faith Location can affect the section subdivision. Classroom time will include breakout and problem solving sessions.

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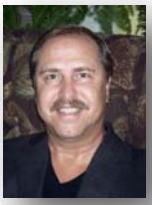
7th Annual Rocky Mountain Surveyors Summit
Speaker Biographies and Abstracts
Professional Track

WEDNESDAY MASS SESSION PRESENTER: TBD

Speaker Biography:



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TOPIC TITLE: *RACE TO THE COURTHOUSE—THE IDIOTS GUIDE TO WHY THERE IS SUCH A THING AS TITLE INSURANCE, AND WHY SURVEYORS WANT TO KNOW*

Speaker Biography:

Don Whitmore has more than thirty-five years' experience in title insurance. He has been a Chief Title Officer serving the Colorado Springs market since 1987, with responsibilities including high liability underwriting, commercial transaction consulting, escrow/underwriting coordination and title plant operations. He has been a key member of the Commercial Services Team at Land Title Guarantee in Colorado Springs for the past six years.

Mr. Whitmore has developed and implemented training programs in title insurance examination for in-house use by a major underwriter. He regularly participates in training programs for clients and customers.

Abstract:

This presentation will review:

1. What constitutes Ownership of Land in the USA
2. Colorado statutes controlling how title to land is recognized
3. How the public records work and why
4. Discuss real estate transactions and the necessity of Surveys and Title work
5. Provide insight to the Terms of the Title Insurance Policy and types of Policies
6. Dissect a commitment for a Title Insurance policy
7. Review survey related endorsements and issues.

TOPIC TITLE: *SURVEYING IN DENVER: REQUIREMENTS, RESOURCES, AND REVIEWS*

Speaker Biographies:

Jeff Jones, PE/PLS, is the City Surveyor for the City & County of Denver. Jeff's surveying career began in 1979 working for a surveying firm in Denver, while attending the University of Colorado at Boulder. Jeff obtained a B.S. degree in Civil Engineering and was a Teaching Assistant for the Surveying courses at the University of Colorado at Boulder. He was a volunteer in the US Peace Corps in the late 80's in Nepal. As a District Technical Engineer in Eastern Nepal, he worked on various civil engineering projects and drank a lot of tea. Jeff has been employed by Denver since 1990 with various responsibilities including a decade of civil engineering/project management and a decade and a half of surveying. One of Jeff's passions includes working with Engineers Without Borders at the University of Colorado Student Chapter and their work in Jeff's former Peace Corps village.

Warren L. Ruby, PLS, is a Land Surveyor Supervisor for the City and County of Denver. Licensed in 1987, Warren has 40 years of land surveying experience spanning the State of Colorado. Warren worked in the private sector as the head of surveying for CLC Associates in the metro area and as a project surveyor for Foley Associates in Telluride before coming to the City of Denver in 2007. Since being at the City Warren has researched and attempted to answer the question "What authority does the City have to regulate surveying in Denver?" In this presentation he will present some of the results of that research.

Ralph Pettit, PLS, is a Land Surveyor Supervisor for the City and County of Denver. Ralph has 30+ years of experience in the surveying profession. The first 25 years were in the private sector focused primarily on residential and commercial development. Through working in four states, holding current licenses in Colorado and North Carolina, and employing as many as 33 people, he has acquired a wide array of knowledge, skills, and experience. During Ralph's five years in the public sector working for the City and County of Denver, he has drawn on that private sector experience to help streamline the review process by developing and implementing policies and procedures that aid the City reviewers and developers alike. Ralph takes great pride in our surveying profession and works relentlessly to help ensure the products we produce are of the highest quality and professional care to the benefit and betterment of our customers, ourselves, and our profession.

7th Annual Rocky Mountain Surveyors Summit
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Professional Track

Abstract:
The City of Denver employs a very robust Survey Department made up of 26 people, 12 of whom are licensed professional surveyors. The Department is involved in design surveys, boundary and ROW work, monument preservation and restoration, GIS implementation, and addressing. Our biggest interface with the professional survey community is in the review of surveys submitted as a part of the Site Development Plan process. In this presentation we will discuss the origin and duties of the City Surveyor in the City Charter, the requirement in Municipal Code that additions to the City conform to the City grid, that they be surveyed by the City Engineer (Surveyor) and monumented by a rangeline system, and that all related records be maintained by the City Engineer. We will discuss how these duties and requirements impact our review of survey submittals to the City and County of Denver.

TOPIC TITLE: *SYMPOSIUM ON CONTINUING EDUCATION REQUIREMENT—PANEL DISCUSSION*

Abstract:
This year the survey symposium is going to address continuing education. If you believe that the skills and knowledge we used 20 years ago do not need to be updated, then you really need continuing education. The days of NAVD 29 are over, we change projections constantly now, we use satellites and gain more information from that source daily. If you balance a traverse with Crandall's they will hand you a walker.
If you were to poll all of the lower 48 states west of a line from North Dakota to Texas you would find that only Arizona, Colorado and California do not have continuing education, and Arizona is looking into it. All of these states with the exception of Texas follow the same formula and as such we do not have to have a unique set of classes for each state.
This is not to say that they are all the same. Each state puts their individual touch on the rules, customizing them to their needs and requirements. This is your opportunity to have your voices heard.

TOPIC TITLE: *WHAT TO KNOW AND HOW TO PREPARE FOR A MINERAL SURVEY RETRACEMENT*

Speaker Biography:
Gene Kooper resides in Lakewood with his wife Clara. He is self-employed as a land surveyor and geologist. Gene has been licensed as a Professional Land Surveyor in the state of Colorado since 1985. He specializes in mineral survey retracements, underground mine surveying, conventional and GPS control surveys, and satellite image processing for mineral and oil and gas exploration clients. Gene received a B.S. degree in Geological Engineering and a Professional degree in Hydrogeology from the Colorado School of Mines.

Abstract:
For those that have attended one of Mr. Kooper previous seminars on mineral surveys these two sessions are new in both content and approach. The morning session is a nuts and bolts workshop on what to do before beginning the field survey. The afternoon session covers several important Land Office decisions and case histories that illustrate the problems often encountered during the field work.
This session will cover the topics of research and preparation for conducting mineral survey retracements. The session will begin with a short question and answer session on the different types of mining claims, mining laws and regulations. A downloadable primer on mineral surveys will be provide to attendees before the course as a refresher. Attendees are also encouraged to read the BLM guide, "Mineral Survey Procedures Guide", by John V. Meldrum, 1980. A downloadable copy is available from this BLM web page. http://www.blm.gov/cadastral/minprocedures/mineralguide.htm
Currently, the BLM has color scans of the Colorado mineral survey plats and connected sheets available on the GLO Records web site along with b/w scans of many of the patents. There are a handful of connected sheets and approx. 3700 mineral survey plats that remain to be hosted on the site. Digital scans of these plats and 700 volumes of the 786 volumes of mineral survey field notes are available on a 1 TB hard drive that can be purchased at the Colorado BLM state office's Public Room.

Techniques on how to find these records will be covered along with how to prepare CAD drawings and create preliminary search coordinates prior to the field work.
The next topic will cover a General Land Office administrative policy that affected nearly 4000 surveys of the mineral lands in Colorado. Several techniques will be discussed on how to identify the practice where original monuments of prior official surveys were ignored in favor of the positions described in the patent. These theoretical positions can create confusion and mistakes if relied upon to reestablish lost corners.
The morning session will end with a discussion of the Act of April 28, 1904, which declared that the original, undisturbed monuments set by the U.S. Deputy Mineral Surveyor shall be regarded as the supreme evidence of what land has been patented.

TOPIC TITLE: *MINERAL SURVEY RETRACEMENTS/DEPENDENT RESURVEYS—CASE HISTORIES AND BEST PRACTICES*

Speaker Biography:
Gene Kooper see previous page.

Abstract:
The afternoon session will include several cases histories that show some of the situations that can be encountered when retracing mineral surveys. Attendees should be familiar with Chapter X of the 2009 Manual, esp. the sections related to resurveys of mineral surveys. Download links will be provided prior to the seminar that contain the field notes, plats, patents, drawing files and other materials for several case histories, At the beginning of the session, attendees will be asked to select which case histories to discuss In addition to the case histories, there are three Dept. of Interior Land Decisions that will be covered in detail.
The case histories will cover topics such as when it is appropriate to bend senior lines through junior corners as allowed in the 2009 Manual, how to document and monument lost corners in unstable terrain, easements related to mineral lands in Colorado, how to use mining improvements to reestablish lost corners and the importance of original accessories.
Participation is encouraged throughout the presentation. The goal is to highlight what a PLS should consider as appropriate and/or best practice by sharing the situations encountered and methods employed to deal with the unique aspects of mineral survey retracements/dependent resurveys.

TOPIC TITLE: *DORA PRESENTATION*

Speaker Biographies:
Joyce J. Young has been with the Division of Professions and Occupations for 10 years. Before her promotion as Program Director for the Architects, Professional Engineers, and Professional Land Surveyors (AES), the Landscape Architects (LA) Board and the Colorado Passenger Tramway Safety Board, Joyce was the Enforcement Unit Supervisor for the state's Plumbing and Electrical Boards for five years. During that time she assisted each Board in their review of complaints and the applicable statutory authority for compliance and discipline. She also prepared policy and rule language based on Board directives for revisions. The prior five years were spent doing much of the same work under the direction of the previous AES Program Director, Angie Kinnaird-Linn, with the AES Board and the LA Board.

Earl F. Henderson, PLS, started his survey career with a brief term of employment in Maryland before gratefully spending nine more years in the colloquial system of surveying in the shadow of the Blue Ridge Mountains in Central Virginia. In 1999 he moved to Boulder and the PLSS. He became licensed to survey in the State of Colorado in 2000. After five years of employment in an engineering/surveying firm in Boulder he started his own business, Zenith Land Surveying, in 2004. He remains happily a “solo surveyor”. He has been a staff writer for Professional Surveyor Magazine since 2004 writing fictional stories under the byline “The Humor in Surveying” and “Gigglebytes” while recently venturing into non-fiction. He has also been a contributing writer to Side Shots with his recent contributions there about the Colorado State Statutes and Board Rules. Earl was appointed by Gov. Hickenlooper to the AES Board at DORA in 2011 and is currently serving as Board Chair.

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Speaker Biographies and Abstracts
Professional Track

Abstract:
Mr. Henderson and Ms. Young from the Colorado Board of Licensure for Architects, Professional Engineers, and Professional Land Surveyors (Board) will be presenting information about the Board and the Board's upcoming activities. They will also discuss some of the common issues that the Board sees when reviewing land surveying cases that can get you in trouble - and how to stay out of it!

TOPIC TITLE: *SUBDIVISIONS IN COLORADO*

Speaker Biographies:

Dave Pehr, PLS, began surveying in 1965 and was licensed as a Land Surveyor in 1972. He received a BA from The University of Colorado, evening division, in 1970 and graduated from the evening division of the University of Denver Law School in 1976. Dave has practiced law in Westminster since 1976, emphasizing real estate and boundary litigation, as well as representing land surveyors in disciplinary proceedings and civil negligence suits. Dave taught Legal aspects of Land Surveying at Red Rocks Community College and at Metropolitan State College for ten years and has presented many seminars for PLSC and its chapters over the years. He is currently retired and farming near Fort Lupton, Colorado.

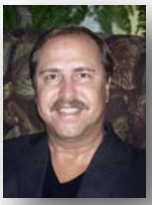
Paul Bacus, PLS, is a Colorado native. Born in Denver but moved to Trinidad where he graduated from High School in 1975. He served in the U. S. Army from 1975 till 1978. Posted to Fűrth West Germany Paul worked as a Field Artillery Surveyor and enjoyed the work so much he decided to stay in that field after his honorable discharge. While in Germany he met and married his wife Alison who is from East Kilbride Scotland. Returning to the US he worked for Drexel Barrell while attending the University of Colorado where he studied Geography and Cartography. Offered a job in Green River Wyoming he moved there in 1985 working for William H Smith & Associates for over 3 years. Returning to Colorado in 1989 he continued surveying achieving his license in 2001 at which time he started his own company, Bacus Land Surveying of Lafayette, Colorado. In 2002 while preparing for testimony in court he realized that there were no current publications concerning boundary law in Colorado. He began to produce a document compiling the regulations governing surveying in Colorado. Every year he would compile a booklet for his personal use until in 2010 he offered to produce the book for the Northern Chapter of PLSC. Since 2010 “Colorado Land Surveying Laws” has become a yearly publication.

Abstract:
Surveyors do not subdivide land. But the role that the surveyor plays is so essential it seems that we do. This class is concerned with the process of subdividing land and the relationship the surveyor has with the creation of boundary. From the 35 acre rule to see exhibit A what is the responsibility of the surveyor. This not only gives insight into what we do but it will also help with the interpretation of records.

7th Annual Rocky Mountain Surveyors Summit
Speaker Biographies and Abstracts
Technical Track

WEDNESDAY MASS SESSION PRESENTER: TBD

Speaker Biography:



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7th Annual Rocky Mountain Surveyors Summit
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Technical Track

TOPIC TITLE: *THE GEOID SLOPE VALIDATION SURVEY 2017, WALSENBURG—DURANGO, CO: THE BASIS TO EVALUATE THE NEW VERTICAL DATUM IN MOUNTAINOUS TERRAIN*

Speaker Biography:

Pamela Fromhertz has been the NOAA National Geodetic Survey Colorado State Geodetic Advisor and transitioned to the Rocky Mountain Regional Advisor January 1, 2016. As a geodetic advisor, she interacts with the geospatial community at the local, state and federal levels, as well as with private industry, to educate and advise on the benefits of the National Spatial Reference System (NSRS) and how its datums, models, and tools may be utilized for user's programs and projects. Pam organizes numerous workshops and training opportunities, including training in Continuously Operating Reference Stations (CORS), NGS' Online Positioning User Service (OPUS), DS-World, precision digital leveling and Height Modernization (HT MOD). She has her M.S. in geodesy, photogrammetry, and GIS from the Ohio State University and a B.S. in geology with a math minor from Long Island. She has worked for the federal government for over 30 years.

Derek van Westrum joined NGS in 2014, and is based at the Skaggs facility in Boulder. He has a PhD in physics from the University of Colorado, and prior to his time at NGS, spent 15 years working for Micro-g LaCoste in Lafayette. There he worked extensively on the development and operation of absolute and relative gravity meters. He is currently focused on the acquisition and analysis of terrestrial gravity data in support of the GRAV-D project.

Abstract:

NGS is conducting the third of three extensive field campaigns called Geoid Slope Validation Surveys. Two have already been completed and the last one is being conducted here in Colorado from Walsenburg to Durango in 2017. Marks have already been set every mile along US 160. GPS, gravity, 1st order leveling and Deflection of the Vertical data will be collected all along this route.

NGS is planning on new datums to be implemented around 2022. Both horizontal and vertical will differ by nearly a meter here in Colorado. The new vertical datum will be based on a gravity survey, GRAV-D. The GSVS will validate the method of the new vertical datum. Here in the mountains it will be interesting to see how well things fit. In this talk we will discuss the new datums and the GSVS campaigns.

TOPIC TITLE: *DATUM TRANSFORMATIONS*

Speaker Biography:

Dave Doyle joined the National Geodetic Survey in 1972, and held the position of chief geodetic surveyor at his retirement in January, 2013. He was responsible for the development, technical design and management of plans and programs that enhance the United States National Spatial Reference System. He has provided technical assistance in geodesy to international, federal, state and local surveying, mapping and GIS agencies. Mr. Doyle began his career as a geodetic surveyor in the U.S. Army in 1967, and served on numerous survey campaigns until completion of his military service in 1970. From 1970 until 1972, he worked for a private surveying company near Washington D.C. where he was responsible for completing boundary, topographic and engineering surveys while he pursued undergraduate studies in geodesy, cartography and mathematics at the George Washington University. During his time at NGS his experiences included all phases of geodetic triangulation, astronomic positioning, leveling, GPS data collection, data analysis, datum transformations, network adjustments, and data publication. Mr. Doyle's activities have included extensive efforts on the development and implementation of the North American Datum of 1983, the North American Vertical Datum of 1988, the Puerto Rico Vertical Datum of 2002 and the Virgin Islands Vertical Datum of 2009. He has also provided technical support to various countries for the modernization of national and regional geodetic reference systems in Caribbean and Central America, Africa, and the Pacific. Mr. Doyle's activities include 35 articles on geodesy and geodetic surveying in national and local surveying publications and he has conducted more than 400 workshops and seminars detailing the various aspects of geodesy and the

National Spatial Reference System. Mr. Doyle continues to support education in geodesy for surveyors and others interested in high accuracy geospatial data as a faculty member of GeoLearn and providing seminars at surveying and GIS conferences. Mr. Doyle is a past president of the American Association for Geodetic Surveying, a Fellow member of the American Congress on Surveying and Mapping and a charter member of the Geographic and Land Information Society. He has also served on the U.S. delegation to the International Federation of Surveyors. Mr. Doyle is also an active member of the American Association for Geodetic Surveying, the District of Columbia, Maryland, and Virginia professional surveyors associations.

Abstract:
This presentation covers the relationship of and transformations between the several horizontal/geometric and vertical geodetic datums most commonly used in the United States. These include: The North American Datum of 1927 (NAD 27), the North American Datum of 1983 (NAD 83), the International Terrestrial Reference Frame (ITRF), the World Geodetic System of 1984 (WGS 84), the National Geodetic Vertical Datum of 1929 (NGVD 29) and the North American Vertical Datum of 1988 (NAVD 88). The presentation specifically demonstrates and examines the gridded utilities NADCON, GEOCON, GEOCON11 and VERTCON developed by the National Geodetic Survey (NGS), the commonly used 3-parameter abridged Molodensky transformations computed by the U.S. Defense Mapping Agency (DMA), and the more rigorous 14-parameter Helmert transformations supported by the NGS utility HTDP (Horizontal Time Dependent Positioning).

TOPIC TITLE: *SURVEYING PROFESSION*

Speaker Biography:
Richard Serby founded GeoSearch in 1988 in response to the need for Geographic Information Systems (GIS) Technicians, Photogrammetrists, Aerial Photographers, Remote Sensing Specialists, Surveyors, and related mapping and engineering occupations. Mr. Serby continues to dedicate personnel recruitment and contract staffing services to the geospatial sciences.

Abstract:
The surveying profession is about to undergo major change. The average age of a professional land surveyor is 59 and many 'baby boomers' will be leaving the profession over the next 5-7 years. As a result there will be a shortage of surveyors, especially those who hold a PLS license. There will need to be significant efforts to recruit young people into the profession and a need to re-visit surveying degree and training programs. To begin the discussion we will cover the following topics:

- Overview of the job market
- The state of the surveying profession
- List of surveying programs, and
- Audience participation – What can we do now?

TOPIC TITLE: *MODERNIZATION OF NSRS*

Speaker Biography:
Dave Doyle—see biography above.

Abstract:
During the next several years enhancements and additions to the network of Global Navigation Satellite Systems (GNSS) including: the U.S. NAVSTAR Global Positioning System, Russian GLONASS, European Union GALILEO and China's BeiDou will significantly improve the use of space-based positioning systems for surveying, mapping, charting, navigation and innumerable other applications. In order to meet the anticipated demands for an improved geospatial framework that these developments will require, the National Geodetic Survey (NGS) is implementing a plan for the modernization of the National Spatial Reference System (NSRS). Among the various topics outlined in this plan is the adoption of an entirely new geodetic reference frame with updated geometric (horizontal) and gravimetric (vertical) realizations that will replace the North

American Datum of 1983 (NAD 83), the North American Vertical Datum of 1988 (NAVD 88) and the several island vertical datums. The new framework will be designed such that the geometric component (latitude, longitude, ellipsoid height) will be virtually identical to and aligned with the International Terrestrial Reference Frame (ITRF), while orthometric heights will be based exclusively on a nation-wide high accuracy (1-2 cm) gravimetric geoid model. This presentation highlights the rational for these changes; the various elements that currently define the NSRS and the activities NGS is engaged in to improve the capacity of and access to the NSRS in support of this transition including tools such as OPUS and DSWorld.

TOPIC TITLE: *USING ASCE 38-02 TO REDUCE SURVEYOR'S LIABILITY WHILE PROVIDING BETTER UTILITY DATA*

Speaker Biography:

Andrew Sylvest oversees Cardno's Utility Engineering and Surveying operations provided throughout the Rocky Mountain Region. Prior to relocating to Colorado, Andrew managed operations in the Gulf Coast. In addition to experience in the transportation and water/wastewater sectors, he has an extensive background in providing professional services in the petrochemical industry as well as experience overseeing military base renovations for the Australian and Congolese militaries in Africa and Afghanistan. Andrew has a BS in Construction Management from the LSU College of Engineering and is currently completing his MBA from LSU.

Abstract:

When properly applied to projects, Subsurface Utility Engineering mitigates the risk of change orders and project delays and transfers utility related liability to the Subsurface Utility Engineering firm. Unlike utility locating or potholing, the Subsurface Utility Engineering firm issues signed and sealed drawings backed by professional liability insurance covering errors and omissions for utilities. Information for inclusion in contract language will be available free of charge either electronically or by hard copy. Subsurface utility engineering's technical aspects and FHWA case study findings of documented savings will be presented. The four quality levels of subsurface utility engineering data as defined by CI/ASCE 38-02 will be discussed.

TOPIC TITLE: *POINT CLOUDS WITH AUTODESK PRODUCTS AND GIS FOR THE SURVEYOR*

Speaker Biography:

Ken Martinez started his career working in various aspects of Surveying and Civil Engineering in 1983. He began as a draftsman, hand drafting transmission lines and substation layouts with ink and mylar at Generation and Transmission Utility. Ken has been utilizing the benefits of Autodesk software since the first versions came out to solve his drafting needs, especially making changes and simplifying repetitive tasks. In the early nineties, Ken moved into Surveying. In working with an environmental firm with topography maps and boundary surveys, he was able to do both field and office work. This gave him experience and a better understanding of both surveying and civil engineering. In the mid-nineties, Ken moved into Land Development where he gained the majority of his experience in Autodesk® Land Development Desktop, and then worked his way into Civil 3D. Ken has a wealth of experience and knowledge in surveying and civil design in the utility and construction industries. He brings his vast knowledge of over 22 years experience in Land Development and Civil 3D products to attendees.

Abstract:

In this class we will cover a couple of topics. The first one will be Importing Point Clouds with Autodesk Products. Since this technology seems to be changing daily we will explore how to Geo-Reference, import, Edit ad create Surfaces with Point Cloud data in Re-Cap and Civil 3D. The Second topic on the agenda is GIS for the Surveyor. In the Past CAD data and GIS data was always separated. Why, when they can be used together? An Example of this is a FEMA Floodplain. I still see people digitizing these types of things. My observations of working with Surveyors for the last seven years is that they are not taking advantage of the wealth of information that is out there, and better yet you have the software to do it! This class is intended to start you thinking about the possibilities of enhancing your deliverables.

7th Annual Rocky Mountain Surveyors Summit
Speaker Biographies and Abstracts
Technical Track

TOPIC TITLE: *ARE UNMANNED AERIAL SYSTEMS IN THE FUTURE OF YOUR SURVEYING COMPANY?*

Speaker Biography:

Don Hulsey, PLS, obtained his PLS license in Colorado in 2011 and has worked in the surveying/engineering field for 24 years. Don is currently serving as President for the Southern Chapter Professional Land Surveyors, and has served on the board in many capacities for 6 years. Don has worked for Lawrence Construction Company for the past 5 years, and recently started the UAS department in early 2016. Most of his spare time is spent enjoying the outdoors with his Wife and Sons and enjoying many fishing/camping trips around the beautiful state of Colorado and planning the next Big Game hunting trip.

Abstract:

Topics will range from the many changes in FAA regulations over the past year. Obtaining a Private Pilot's license to an online safety exam. Do I start a UAS department or hire an outside firm? The accuracy you can expect from the data, and how long it takes to complete a project from the signed contract to a deliverable. The types of software needed to view the models, orthomosaic photos, and digital elevation models? The role the weather plays in everyday scheduling? The different systems available to keep all the batteries fully charged and balanced? The privacy act also has a role in the UAS operations? In the end, it's just another tool in your toolbox of surveying equipment.

TOPIC TITLE: *UAS SURVEYING AND MAPPING*

Speaker Biography:

Robert Rubino:

- 40 years' experience as a Colorado Professional Land Surveyor
- 30 years' experience as a commercial pilot
- 15 years' experience as a commercial architectural photographer
- 5 years' experience as a drone videographer

The above qualifications / experience has put me in the unique position of using my professional Land Surveying experience together with my passion for flying and photography enabling me to be one of the first land surveyors to use this new drone technology to produce extremely accurate and precise topographic surveys. We have been using drones for surveying and mapping for almost two years with excellent results on every drone project.

Abstract:

- Large format prints showing typical / example projects
- Multiple drones and associated equipment on display
- Discussion of pros / cons of surveying with drones
- Discussion of typical workflow and software applications
- Video presentation of a typical drone survey project
- Brief drone flight for demonstration purposes
- Question and answer session
- Close up inspection of drone equipment