

**Elevations Geospatial Summit Saratoga, WY**  
**May 2-4, 2018**  
**PRESENTATION and POSTER ABSTRACTS**

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**Using the USGS vector topo for Colorado Geological Survey's STATEMAP program**

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**Abstract:**

Historically, the Colorado Geological Survey (CGS) used sepia-toned tif images of the USGS 7.5 minute quads as base maps for the STATEMAP geologic mapping program. With the release of the vector topo option from the National Map, the CGS opted to give the use of the vector topo as the base map a try in 2017. This talk will address the process for preparing the vector topo for use by the CGS, the good, the bad, and the ugly, lessons learned, and some insights from both the GIS/mapping perspective and geologist's perspective.

**Building Compelling Open Data Sites**

Matt Bullock  
Esri  
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**Abstract:**

While Open Data itself can be about transparency, at a greater scale it's about building a better and more informed society. With ArcGIS Hub powered by Open Data, organizations can create websites and pages that report progress via dynamic visualization capabilities as well as solicit feedback regarding the initiatives that matter most to their constituents. Come learn how organizations around the world engage with their communities to turn data into knowledge, after unlocking the data they work with every day.

**Metadata Tips and Tricks**

Rich Chamberlain  
AECOM  
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**Abstract:**

Most GISers dread creating metadata. And let's face it, we'd all much rather be creating maps or performing an analysis of some sort. Well have no fear and listen with an open mind. Metadata, yes even metadata, can be (sort of) fun! Some tools and tips/tricks will be presented to make your data and process documentation less painful, more straightforward, and useful during the course of your project.

## ***Machine Learning and Surface Tuning for Mobile Access***

John Coe

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### Abstract:

Google has revolutionized is filled with SketchUp and Google Earth they know release tensorflow a second generation interface for machine learning. Presentation will discuss list turn into data services so they can be downloaded for mobile access. One example would be a phone list surface for the entire city. The surface tuning of phone numbers by like fields, such as area code. Buy tuning the surface for a complete list, a sub list can be downloaded as a WebGL mesh.

## ***Contours – More than Just Lines***

Lindsay Decker

U.S. Geological Survey

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### Abstract:

The National Geospatial Technical Operations Center currently generates 1:24,000 scale contours from Digital Elevation Model's (DEM's) which are used on the US Topo product. An in-depth quality assurance/control process is performed by the Contour Support unit to ensure accurate topographic representation. Contours are generated using an in-house program called ASCEND, which uses Lidar derived DEM's provided by the National Geospatial Program's 3D Elevation Program (3DEP). The high resolution and quality of Lidar data introduces problems when representing the data on a 1:24,000 scale topographic map including excessive noise and contouring of manmade features. Additionally, conflicts between contours and the National Hydrography Dataset can occur during contour generation which requires visual inspection and manual editing. This presentation shows examples of conflicts and discusses the geoprocessing tools and editing techniques used by the Contour Support unit to amend problems, resulting in high quality and usable data for public use.

## ***Elevating to a New Frontier: Crowd Sourcing and New Datums***

Pam Fromhertz

National Geodetic Survey, NOAA

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### Abstract:

The National Oceanic and Atmospheric Administration's (NOAA) National Geodetic Survey (NGS) is responsible for the foundation of all mapping, engineering and surveying in the U.S. They define the most accurate geospatial reference frames in the U.S., typically known as horizontal and vertical datums. This talk will explain the basics of what this all is and how they have changed over time and why they are important to you. Then we will discuss new frames being developed that will change things on the order of 3 feet by 2022. We will conclude with demonstrations of various tools and how crowd sourcing will assist with the transformation from the existing datums to the new reference frames. Pam's goal of this talk is for you to walk away having a much better understanding of what you need to know and how you can assist with the crowd sourcing. For accurate geospatial mapping you need to know how to accurately reference your data and NGS provides the keys to do that.

## ***A Water GIS for the Future, New path forward for Water Development Projects***

Peter Gill

Wyoming Water Development Commission

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### **Abstract:**

Over the last decade, the Wyoming Water Development Commission (WWDC), the state agency tasked with funding water infrastructure, has spent over \$83 million on water planning projects. The majority of these projects are completed through Consultants. Lacking formal agency standards, the results have been inconsistent GIS formats, accuracy, and documentation. We now have standards. Join us for a demonstration of the new Wyoming Water Development Data model. This data model is complete for the Bear River Basin and will be the standard for future planning projects through our agency. Consultants now have access to data conversion tools, base data, and geodatabase templates. In our presentation we highlight new connections between water infrastructure, streamflow, and water use. We'll also discuss how to utilize the data to get the information you need for your projects. Come by and let us know what these standards might mean for you and your organization.

## ***Communicating the Broader Impacts of Research with GIS and Story Maps***

Doug Haller

Front Range Community College

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### **Abstract:**

GIS tools and resources provide subject matter experts of many disciplines the opportunity to visualize, analyze, and communicate findings of their work to diverse audiences. This presentation will demonstrate the application of GIS to explore the relative health of Denver neighborhoods based on the cumulative incidents of chronic diseases. In addition, the presentation will model the use of Story Maps to communicate broader impacts of research to diverse audiences, with a focus on public health examples.

## ***Explore Wyoming's Climate, Snowpack, and Water Information Using the Wyoming Water and Climate Atlas***

Rosemary Hatch

Water Resources Data System

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Additional Presenters: Christopher Nicholson, Tony Bergantino

### **Abstract:**

Due to the growing demand for accessibility to geospatial data, online web-mapping tools are becoming popular platforms to provide data to the public. The Water Resources Data System (WRDS) at the University of Wyoming, in conjunction with the Wyoming Water Development Office, has compiled numerous water and climate-related spatial datasets into the Wyoming Water and Climate Web Atlas. This Web Atlas, utilizing customized ArcGIS Server Maps, allows users to visualize multiple water and climate data resources in specific geographic regions, and retrieve information related to that area. Recent additions to the Web Atlas include several more WACnet climate stations, new administrative boundaries, and instream flow data and layers. These additions highlight a commitment to continual enhancement of the Web Atlas by providing water users, managers, consultants, governmental officials, and interested individuals a resource to explore water and climate systems simultaneously, regardless of individual mapping software or experience.

### ***A people's GIS about what works***

Paddington Hodza  
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#### **Abstract:**

There is growing interest in using GIS to investigate the elements which inspire and support local communities to operate at their full potential and thrive. Motivating this interest is increasing research which suggests that there is a greater chance of creating a long-lasting better future if more emphasis were placed on expanding a community's strengths than on seeking to rid the community of perceived problems. This talk presents the framework for a GIS that can help communities better exploit what works. The GIS shows promises in bringing hope and happiness to local people and their communities, and empowering them to engage in self-reliant, sustainable development.

### ***Z in the Real World***

Brady Hustad  
Argis Solutions, LLC  
[brady.hustad@argissolutions.com](mailto:brady.hustad@argissolutions.com)

#### **Abstract:**

As the geospatial industry adopts more accurate devices, Z will become a larger player in generating accurate data. Right now is the time to improve your data sets with a relative Z. Find out how you can improve your depth and elevation models and be ready for the future of geospatial data.

### ***Step into the Map: AR Application in One Call Support***

Brady Hustad  
Argis Solutions  
[brady.hustad@argissolutions.com](mailto:brady.hustad@argissolutions.com)

#### **Abstract:**

What if you could "step into" the map, placing yourself in the center of your data, allowing you to scan the horizon to locate underground facilities? Augmented Reality is now providing this new visualization of geospatial data for One Call Departments with impressive results. This talk will go over a brief case study of how adding AR visualization has improved a local petroleum companies one call department's documentation workflow as well as adding another level of quality assurance to locating underground assets.

## ***The Escalante Game Drive (5DT192): Re-investigation of a Game Drive Site on the Western Slope of Colorado with Drones and GIS***

Connor C. Johnen  
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### **Abstract:**

The Escalante Game Drive Site is a unique archaeological resource located in the Western Slope of Colorado. Previous investigations documented a series of hunting blinds and game fences that were believed to be used in the procuring of game. Alpine Archaeological Consultants, Inc, in conjunction with the Chipeta Chapter of the Colorado Archaeological Society, received a State Historic Fund Grant to re-investigate the site. Alpine put together a series of objectives to accomplish during this re-investigation. One objective was to create a geospatial model of the site using drone photography and ArcGIS. This talk will present information about drone mapping, processing of drone data, model creation from processed data and discuss results from a least-cost path analysis and an analysis of viewsheds from various locations on the site. We hope to show how drones and the data they produce can be used to tackle archaeological questions and help provide new ways of documenting archaeological resources.

## ***GIS and web applications for Flood Risk Communication***

Madeline Kelley  
University of Denver  
[maddy.kelley@du.edu](mailto:maddy.kelley@du.edu)

### **Abstract:**

My work explores the application of GIS in flood risk communication. Specifically, I am implementing a proof-of-concept project in Boulder County, Colorado that explores the synergisms of quantitative and qualitative data from various sources. First, I present my methods and results for collecting and combining the different datasets incorporated into an online web application. Secondly, I focus on the steps, advantages, and limitations encountered while using ESRI's Web AppBuilder for ArcGIS (Developer Edition). The application provides a framework for developers to create custom widgets and themes necessary to fit the needs of various users. Developing a communication tool that communities can replicate and modify

## ***Practical Considerations and Uses of USGS 3DEP Lidar Data Products***

John Kosovich  
U.S. Geological Survey  
[jjkosovich@usgs.gov](mailto:jjkosovich@usgs.gov)

### **Abstract:**

What types of lidar products are available from the USGS 3D Elevation Program (3DEP), and how might these specific products be used for various user applications? This talk covers some basic and advanced uses and practical considerations of lidar point cloud (LPC), digital terrain model (DTM), digital surface model (DSM), and derivable intensity data that are freely available from the USGS National Map website. Newer technology Geiger-mode and single-photon lidar data and their roles in 3DEP will also be addressed.

### ***Project Management Professional (PMP) Certification - What is It?***

Mary Lackner  
Pitkin County  
[mary.lackner@pitkincounty.com](mailto:mary.lackner@pitkincounty.com)

#### **Abstract:**

What is the Project Management Professional (PMP) certification, held by over 770,000 individuals worldwide, and how can it benefit you? In order to take the exam, you must attend a 35-hour boot camp, document 4,500 hours of project work, apply to take the exam and study (a lot). This process consumed a fair amount of time, energy and effort, but was it worth it? I will share my experiences, observations and answer questions.

### ***Locating Patented Mining Claims in San Juan County Colorado***

Nathan Tyler Lowry  
Pangaea Geospatial LLC  
[Nathan.Tyler.Lowry@gmail.com](mailto:Nathan.Tyler.Lowry@gmail.com)  
Additional Presenters: Kim Buck, Assessor, San Juan County Colorado

#### **Abstract:**

San Juan County drastically improved the location of patented mining claim property boundaries for assessment and public use purposes. In August 2015, discharge from the Gold King Mine drained through the Four Corners region. Determining which private lands had been affected was difficult. Previous efforts converting patented mining claim property boundaries to GIS were found to be 1 ¼ miles off. Georeferencing historic maps didn't redefine these boundaries in a cadastral GIS. San Juan County improved these property boundaries using survey and GIS boundary data as reference. Coordinates for monuments from survey records and other sources led to a subsequent revision for at least 40% of these properties via coordinate geometry. San Juan County improved its treeline boundary, developed slope zones and measured proximity to roadways for reassessment purposes. Training to divide, combine and adjust property boundaries in GIS and recommendations to obtain additional funding for continued efforts were provided.

### ***GIS Data Floating In The Sky***

Sean Maday  
[smaday@google.com](mailto:smaday@google.com)

#### **Abstract:**

GIS data is literally floating around in the air. This presentation will showcase the use of a Raspberry Pi (\$36 on Amazon) and a software defined radio (\$20 on Amazon) to grab imagery and vector data that is being streamed from planes and satellites. Come see how to capture and visualize the bits and bytes freely floating around our world.

### ***Collaboration Across Borders - Tax Lien Parcel Sales***

Pete Magee  
San Luis Valley GIS/GPS Authority (SLV GIS)  
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#### **Abstract:**

Utilizing AGOL, Zeus and County Treasurers, SLV GIS assisted in realizing 100% of tax lien parcels sold. A combination of online parcel viewing, taxation values and online bidding, Saguache and Alamosa Counties experienced 100% of the tax lien parcels sold.

## ***Making the Best Out of Nothing: Success as a GIS Professional with Few Resources***

Lindsay Major

[lindsay.walker.k@gmail.com](mailto:lindsay.walker.k@gmail.com)

### **Abstract:**

GIS professionals are often asked to complete projects without budget, guidance, or resources. Further, GIS professionals often have to complete projects for, and deliver results to, clients without a spatial or technical background. With such demands, how can someone in the GIS industry hope to successfully navigate workplace expectations and deliver a quality product? In this panel GIS professional from all stages in their careers will share presentations and answer questions on this subject. Topics covered will include analysis on a budget, setting project related expectations, effective communication, GIS-centric project management, and more.

## ***Common Challenges Faced in Creating Standard Data Products for the 3D Elevation Program***

Kimberly S Mantey

U.S. Geological Survey

[kmantey@usgs.gov](mailto:kmantey@usgs.gov)

Additional Presenters: Josh Nimetz

### **Abstract:**

Availability of nationwide standardized high resolution elevation data continues to be a growing need for Federal, state, and local governments, as well as the public. The Department of the Interior's U.S. Geological Survey (USGS) and other partner agencies have launched the 3D Elevation Program (3DEP) to meet this need, using airborne lidar as the primary mechanism for elevation collection in the conterminous U.S. A major challenge of the 3DEP is to produce standardized elevation products from a variety of lidar source data. Lidar data is acquired by different contractors using different sensor technologies, processing software, and at different times. As this industry is still fairly new, standards are constantly evolving and changing to accommodate growth in lidar technology. A natural consequence of this is that the data that come to USGS for the 3DEP are often not meeting minimum published standards. In order to publish 3DEP products, USGS must identify these issues and ensure the data are brought up to specification, either by utilizing contracting mechanisms or completing the fixes in-house. Some examples of common challenges seen at USGS in lidar data include incorrect file formats, proper file formats that are corrupted, problems with spatial referencing of data, geometrically unsound lidar data, improperly classified lidar data, and non-topographically correct Digital Elevation Models. This presentation will identify these common issues and provide examples on how they are fixed and what the correct results should be.

## ***WPLI a Resource Mapping Tool***

Jalynda Mckay

Wyoming Geographic Information Science Center - WyGIS

[jmckay6@uwyo.edu](mailto:jmckay6@uwyo.edu)

### **Abstract:**

Have you ever wanted to create a sweet public lands map to share with your friends or co-workers but don't have access to ArcMap and Google maps won't cut it to tell your story? Well then, lets explore a public geospatial web application designed & created by WyGIS to tell your story.



## ***USGS Elevation Data Products and Services***

Barry Miller  
U.S. Geological Survey  
[bymiller@usgs.gov](mailto:bymiller@usgs.gov)

### Abstract:

The U.S. Geological Survey's (USGS) National Geospatial Technical Operations Center (NGTOC) is working to improve user access to 3D Elevation Program (3DEP) products through both The National Map (TNM) and cloud-based services. 3DEP is focused on high resolution lidar data for the conterminous United States, Hawaii, and the U.S. territories, and interferometric synthetic aperture radar (IfSAR) over Alaska. The program addresses mission-critical requirements for high-quality topographic data, leverages the capability and capacity of private industry mapping firms, and refreshes national elevation data holdings with new products and services. This presentation will describe 3DEP and discuss the elevation products USGS provides such as nationwide, seamless digital elevation models (DEM) in various resolutions as well as project-based 1-meter DEMs and lidar point clouds. We will also discuss our 5-meter IfSAR derived products in Alaska. Finally, we will demonstrate USGS elevation-related web services and prototypes, and present current cloud distribution activities.

## ***Building Mobile GIS Workflows with Mobile Applications from Esri***

Joseph Peters  
Esri  
[joseph\\_peters@esri.com](mailto:joseph_peters@esri.com)

### Abstract:

ArcGIS field apps help you use the power of location to improve coordination and achieve operational efficiencies in field workforce activities. Reduce or even replace your reliance on paper. Ensure that everyone, in the field and the office, uses the same authoritative data so you can reduce errors, boost productivity, and save money. See how several applications can be used together to create a mobile workflow, from assigning work to field workers, to collecting information in the field and gauging results in real-time.

## ***Understanding Tourism: Spatial Analysis of Squished Penny Machines***

Jaclyn Phipps  
University of Denver  
[jaclynhipps@gmail.com](mailto:jaclynhipps@gmail.com)

### Abstract:

People travel across the United States to see various attractions such as recreational, culturally significant, and historic locations. Understanding how these sites are distributed is important for travel planning and understanding peoples' movement. Tourist destinations can be single destinations off a roadside or clustered in a downtown region. Cities, Counties, and States need to understand the tourism potential of their area and the relationship it has to nearby infrastructure, so they may plan the long-term success of tourism that their communities rely on for commerce, employment, and other human factors. Here, we will look at squished penny machines as a representation of tourist attractions, their relevance to tourism and infrastructure, and what this data tells us about the influence tourism has across the USA.

### ***GIS in Public Safety***

Karen Rogers  
Wyoming Game and Fish Department  
[karen.rogers1@wyo.gov](mailto:karen.rogers1@wyo.gov)

#### Abstract:

I propose a panel discussion on public safety to include topics such as Next Generation 9-1-1, emergency preparedness, and emergency response. I can help with rounding up people to speak to some of these topics.

### ***GIS as a Platform for Natural Resource Management***

Karen Rogers  
Wyoming Game and Fish Department  
[karen.rogers1@wyo.gov](mailto:karen.rogers1@wyo.gov)

#### Abstract:

WGFD is working on several high profile wildlife management issues where stakeholder buy-in and feedback are critical to the process. The Department is using story maps to engage the public and build collaborative processes for project implementation, potentially including contributive funding opportunities.

### ***The National Map Corps - Interactive Challenge Map***

Rachel Stevenson  
U.S. Geological Survey  
[rstenenson@usgs](mailto:rstenenson@usgs)

#### Abstract:

The National Map Corps (TNMCorps) is a US Geological Survey (USGS) citizen science effort which supports the National Geospatial Program by providing volunteered geographic information (VGI) in support of The National Map and US Topo Maps. Using an online mapping application, volunteer editors confirm or update structures including hospitals, cemeteries, post offices, schools, law enforcement, and fire stations. The Challenge map is an Interactive web map that focuses volunteers on specific areas that need editing. Often the challenge area selected is chosen based on upcoming US Topo revisions. Mapping challenges provide direction for new volunteers who may not be sure where to start, as well as providing a new challenge for experienced volunteers. This presentation will give an overview of how the challenge map was created, what challenges existed in creating the web map, and how developing additional tools for citizen science projects can provide new ways to engage with volunteers.

### ***What do you do with a bunch of lidar?***

Nick Viau  
Allpoints GIS  
[nick@allpointsgis.com](mailto:nick@allpointsgis.com)

#### Abstract:

Interested in exploring the use and potential of 3D Lidar data? If you're interested lidar data and you'd like to get ideas on how to take advantage of it, this is for you! This presentation introduces several examples of lidar in real world projects, the potential value of lidar to various types of work, and key resources for locating quality data (free!).

### ***Safety? Yes it Applies to You too!***

Tina Woodrum  
Pangaea Geospatial  
[dirtjumper77@gmail.com](mailto:dirtjumper77@gmail.com)

#### **Abstract:**

This dynamic safety presentation will cover many topics relevant to those working in the geospatial industry from office ergonomics to what PPE to wear when out in the field. When you are out on a hot summer day with your trusty Trimble in hand do you think about preventing heat stroke or if drivers can see you? What about those who spend all their time in the comforts of the office who suddenly have to help move a desk or worse just sit there hour after hour? Think a safety presentation does not apply to you? Come and test the presenter and see how safety matters to everyone as much as location!

### ***SuiteWater: Development of an Online Geospatial Watershed Planning Tool***

Teal Wyckoff  
University of Wyoming, Wyoming Geographic Information Science Center  
[wyckoff@uwyo.edu](mailto:wyckoff@uwyo.edu)  
Additional Presenters: Cathy Rosenthal, Jalynda Mckay, Jason Writer

#### **Abstract:**

Substantial amounts of financial and human resources are annually expended in the development of natural resource planning to meet conservation objectives. Planning efforts on watershed scales require the compilation of large amounts of spatial and tabular information. In the past the tools and information for completing these plans were located in disparate formats and locations, requiring significant inputs of time, effort, and money to bring them into the planning process. Watershed level planning often used data sources and information that differed significantly from plan to plan, thus making compatibility and comparisons over large spatial extents difficult. In rural environments where organization staff are few, geospatial expertise is limited. We developed a robust web-based interface that integrates a wide-array of spatial information and is designed to support the natural resource planning process. The main driver of data sharing is through an online map application, which provides direct access to a variety of resources including soils, water, and state-level designations for impaired waters. The application also provides access to online geospatial tools, bringing spatial analysis and mapping abilities to all districts, regardless of experience level. The "SuiteWater" application was designed and developed for the Wyoming Association of Conservation Districts to support watershed planning in Wyoming. The application provides a centralized location for data and access to planning materials and serves as a support and information-rich framework for natural resource planning.

### ***POSTER: City of Littleton: Zoning Map***

Jackie Phipps  
City of Littleton  
[jhipps@littletongov.org](mailto:jhipps@littletongov.org)

#### **Abstract:**

Zoning sets the standards for growth and development in a city, so just like a growing city how do you improve and modernize your zoning map and data to keep up with your cities growth. The City of Littleton just revolutionized their zoning map by taking it into the GIS. By creating a GIS zoning layer we opened up a world of possibilities. The benefits include links to files in our document management system for easy research, in-depth analysis, in the form of build out analysis to see the max growth based on current zoning, and lastly creating accessible web applications for internal and external users.

**POSTER: *Understanding Tourism: Spatial Analysis of Squished Penny Machines***

Jackie Phipps  
University of Denver  
[jaclynhipps@gmail.com](mailto:jaclynhipps@gmail.com)

**Abstract:**

People travel across the United States to see various attractions such as recreational, culturally significant, and historic locations. Understanding how these sites are distributed is important for travel planning and understanding peoples' movement. Tourist destinations can be single destinations off a roadside or clustered in a downtown region. Cities, Counties, and States need to understand the tourism potential of their area and the relationship it has to nearby infrastructure, so they may plan the long-term success of tourism that their communities rely on for commerce, employment, and other human factors. Here, we will look at squished penny machines as a representation of tourist attractions, their relevance to tourism and infrastructure, and what this data tells us about the influence tourism has across the USA.

**POSTER: *Name that Irrigated Parcel with NDVImax***

Tammi Renninger  
ElephantFish, llc  
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**Abstract:**

Irrigated parcels within the Arkansas River Basin are currently being delineated as part of the Spatial System Integration component of the Arkansas River Decision Support System (ArkDSS). Irrigated status is evaluated remotely by historic aerial imagery; however, limitations exist since the images are collected at a discrete moment in time. To overcome this limitation, the Colorado Division of Water Resources (CDWR) has processed multispectral satellite imagery to calculate a Maximum Normalized Difference Vegetation Index (NDVImax) GIS raster data layer for given years. By using the CDWR's NDVImax raster data layers in conjunction with aerial imagery a broader and more accurate representation of the land is taken into consideration when evaluating whether fields have been irrigated or not. This poster presentation displays tricky examples and the importance of the NDVImax raster data layers with a game of "Name that Irrigated Parcel".

**POSTER: *Ski Trail Mapping with UAV***

Kyle Wise  
Casper College  
[geowise360@gmail.com](mailto:geowise360@gmail.com)

**Abstract:**

Casper Mountain Nordic ski trail and Bridal trail maps. Surveyed using a phantom 4 quadcopter and with Juno handheld devices. The UAV allowed me to complete this job efficiently and in a fraction of the time, it would have taken on foot.