

Dan Austin – Mapping the Unknown: Adventures in Exploration at Jewel Cave

Jewel Cave National Monument

Abstract: Jewel Cave is currently the third longest cave in the world, with more than 189 miles of explored and surveyed passages. Currently, the cave hosts one of the most active exploration programs in the country. On average, 5 miles of new passages are discovered every year and added to the existing cave map. There are many challenges associated with keeping the cave map up-to-date, from actual data collection to cartographic representation. With the help of numerous dedicated volunteer cavers and park managers, these challenges have been met and solutions have been found that have allowed better understanding of the complex relationships between the surface and subsurface in the southern Black Hills.

Biography: Dan grew up in the Rapid City area, and has been involved with cave exploration at Jewel Cave since the late 1990's. Dan has personally been involved with finding more than 25 miles of the cave system, and is now responsible for managing the data from exploration trips and drafting the final cave maps.

Lydia Austin – Adobe creative cloud map making enhancements

South Dakota Game, Fish and Parks - Custer State Park

Abstract: Taking ArcGIS's technical data and interpreting it for the general public. See one method Custer State Park has taken to market our products through maps.

Biography: Lydia is the Interpretive Programs Manager for Custer State Park in South Dakota. Teaming up with the CSP Resource Division, she has helped produce new and updated visitor maps for the over 2 million guests, using ArcGIS and Adobe InDesign and Illustrator.

Heather Berg – Esri Story Maps Workshop

South Dakota Game, Fish and Parks

Abstract: Get hands-on experience designing and building story maps. This workshop will focus on best management practices and tips and tricks to engage your audience and tell your story. Popular uses for story maps include dissemination of public information, presentations, guided tours of points of interest or annual reports.

Biography: Heather has worked for South Dakota Game, Fish and Parks as a GIS Program Specialist for the last 5 years and has worked extensively with ArcGIS Online and its many applications.

Les Biven - Bathymetric Solutions for Ocean, Lake, and River Systems

Fugro Geospatial, Inc

Abstract: National, regional, state, and county organizations are increasingly searching for solutions to their needs for the acquisition, processing and visualization of underwater topographic data in coastal

regions, lakes and river systems throughout the county. Fugro Geospatial presents a selection of proven methodologies including satellite data, airborne LiDAR, and boat-map echo sounding and side-scan sonar for bathymetric mapping of the earth's oceans, lakes, and rivers, including chronology and project wrap-up for Fugro's undersea technological and marine asset contribution to the deep water search for the Malaysia flight MH 370 lost on March 8, 2014 over the South China Sea.

Biography: Les has been with Fugro Geospatial, Inc. for ten years as the Regional Business Development Manager. He has worked extensively with Fugro Pelagos, a service channel specializing in satellite, airborne LiDAR bathymetry and the Boat-map bathymetry system utilizing echo sounding and side-scan sonar.

Rayma Cooley - Quantifying Early-Seral Forest Composition with Remote Sensing

US Forest Service

Abstract: Spatially explicit models of early-seral forest structure following wildfire disturbance has not been attempted, yet such knowledge is critical for determining successional pathways. We used remote sensing data to model and map aspen structure and vegetative richness two years following wildfire.

Biography: Rayma Cooley is a Forester on the Hell Canyon Ranger District, Black Hills National Forest. She received her M.S. in Forestry from Iowa State University in 2014. Her graduate research examined landscape patterns created by a large-scale, high severity wildfire that occurred in the boreal forest ecosystem of the Boundary Waters Canoe Area Wilderness in north-eastern Minnesota. Her research relied heavily on remote sensing imagery, GIS, and on-the-ground field work. This work was published in the journal, *Photogrammetric Engineering & Remote Sensing* in 2016.

Tim Cowman – Geospatial Data: Where to Find It; How to Use It

SD Geological Survey

Abstract: Data sets for use in geographic information systems (GIS) are available from a wide variety of sources. It is important to know the basics of where these data sets can be obtained and how to integrate them into a GIS project. This presentation will demonstrate various sources of GIS data, from local to national level data sets. The presentation will explain methods for acquiring and using data sets, including stand-alone data sets and data sets available from web services.

Biography: Tim Cowman is a Natural Resources Administrator with the South Dakota Geological Survey. He has a Master's Degree in Natural Sciences and a Bachelor's Degree in Earth Sciences and Chemistry, all from the University of South Dakota.

Tim's work includes natural resources data management and implementation of GIS in South Dakota state government. He has been part of an effort to build, acquire, and distribute GIS data sets for the state. He also assists local government entities with GIS projects and is a former board member of the Black Hills Digital Mapping Association. Tim is the South Dakota project lead for the U.S. Environmental Protection Agency's National Environmental Information Exchange Network.

Jeremy Dedic – Avenza PDF Maps

Wyoming State Forestry Division

Abstract: This presentation will focus on getting information into the hands that need it by utilizing Avenza Maps (App) in the wildfire setting. Avenza is used to provide information to the firefighter, simply and easily. Maps are great if you know what you're looking at and where you are. Avenza maps takes a simple map from pdf format and combines it with a smart device's GPS, providing a dynamic custom map with the information a firefighter needs.

Biography: Jeremy is an Assistant District Forester for Wyoming State Forestry Division, District 1 Northeast Wyoming. He has been working in forestry since 1991, helping landowners and agencies manage their forests. Currently he is active in timber management, forest health and assisting with wildfire local county Volunteer Fire Departments. "For me, GIS needs to be practical and helpful on the ground. If it does not help my landowners, contractors or cooperators, then what's the value?"

Jeremy Dedic – MapItFast

Wyoming State Forestry Division

Abstract: This presentation will focus on utilizing MapItFast and a tablet as a data collection system. As a continuation of resilient forests, forest stand data is collected and uploaded in custom forms. The data is processed and valuable information is provided to forest managers and landowners. This joint project has provided stand data on over 10,000 acres of forests. MapItFast is a great tool for generating information for landowners to make informed decisions about their property.

Linda Foster – Pennington County Corner Record Project

Ferber Engineering

Abstract: The Rapid City / Pennington County GIS Division has migrated their parcel layers to ESRI's parcel fabric data model. The next step in leveraging the power of the parcel fabric is to start performing adjustments on the fabric. To achieve high-quality results, it is important to have good land corner data participating in the adjustments. This talk discusses the approach the Rapid City Pennington County GIS Division is taking to accomplish this.

Biography: Linda Foster, PLS, GISP, is the GIS Manager for Ferber Engineering Company, Inc. and has been working in the geospatial technology field for over 14 years. She holds a Bachelor of Science degree in Geological Engineering from South Dakota School of Mines and Technology and a Master's Degree in Geographic Information Systems from Penn State University.

Danielle Guthrie - The Mapping Revolution in State Government

State of South Dakota, Bureau of Information and Telecommunications

Abstract: A showcase of how recent projects in the State have incorporated GIS at the core and the positive impact this has had; from improved data entry experiences, improved data validation, and more open and transparent government.

Biography: Danielle has a B.S. in Political Science and a M.S. in Geography from SDSU. The last few years she has worked as a software engineer developing GIS applications for the State of South Dakota. Recently she took a new position as the State GIS Analyst.

Blaine Hackett – Introducing Carto

RESPEC

Abstract: Formerly known as CartoDB, Carto is a powerful geospatial visualization and analytics tool optimized to quickly display very large datasets. This presentation will give an overview of uses for Carto and focus on Carto Builder, a web based tool intended for non-developers and beginners. We will be covering aspects related to data visualizations, cartographic styles, legend definition and dashboard creation with actionable widgets that interact with the map.

Biography: Over his 25 years in the Industry, Blaine has worked in diversified GIS environments including state and local government, consulting engineering and planning, non-profit and Fortune 500 companies. He has a Bachelor's in Geography from the University of WI-La Crosse and a Master's in Geographic Information Science (MGIS) from the University of Minnesota -Twin Cities. He has presented at local and national conferences as well as instructed college level GIS courses and is active in the GIS community. Blaine is currently acting as a private sector representative and member of the leadership team on the Minnesota Geospatial Advisory Council.

Mike Headley

Sanford Underground Research Facility

Abstract: The South Dakota Science and Technology Authority (SDSTA) operates the Sanford Underground Research Facility (Sanford Lab)—the deepest underground science laboratory in the United States. Mr. Mike Headley, SDSTA Executive Director, will present an overview of the facility and the world-leading science being performed nearly a mile underground at the Sanford Lab in Lead, SD. The facility construction efforts have included the use of geospatial mapping and survey techniques in very challenging environments including mile-deep mine shafts. Mr. Headley will discuss how the use of these techniques has allowed for improved facility operations, construction and safety and has advanced the science at the Sanford Lab.

Biography: Mike is the Executive Director of the South Dakota Science and Technology Authority and the Laboratory Director of the Sanford Underground Research Facility, where he leads the 125-member

team in the development and operation of the newest and deepest underground science laboratory in the United States.

Mike has nearly 25 years of engineering and management experience. Before coming to Sanford Lab in 2008, he served in various roles at the U.S. Geological Survey (USGS) Earth Resources Observation and Science Center (EROS), and was the Deputy Program Manager and Assistant Vice President for the Science Applications International Corporation (SAIC), USGS EROS Center, in Sioux Falls, S.D. Headley earned his bachelor's degree from South Dakota State University and an MBA from Loyola Marymount University. He served in the U.S. Air Force for six years.

Mike Koutnik – Overview of ArcGIS 10.5

Esri

Audience: GIS coordinators, server administrators, GIS professionals, and others who want to understand how the ArcGIS platform is evolving

Abstract: ArcGIS 10.5 continues the evolution of the ArcGIS platform as a modern environment to support entire organizations. 10.5 brings together the ease-of-access, collaborative engagement and drag-and-drop simplicity of ArcGIS Online, and the enterprise-class server capabilities of ArcGIS Server. To do that, 10.5 adds new “server roles” to enhance scalability, ease server administration, and enable powerful new server capabilities: Image Server, GeoEvent Server and GeoAnalytics Server. The impact of these new capabilities has resulted in renaming ArcGIS for Server to ArcGIS Enterprise to better reflect the powerful role Esri server-based technology can now fill. We will also discuss evolving roles at 10.5 for ArcGIS Online and ArcGIS Desktop, including ArcGIS Pro.

Biography: Mike has worked for Esri for the last 23 years and is responsible for sales of Esri GIS software and training services for state government agencies in Minnesota, North Dakota, South Dakota and Nebraska.

Mike Koutnik – 2017 Esri User Conference Recap

Esri

Abstract: The theme for this year's Esri User Conference was “Applying the Science of Where.” This reflects the growing ability of the ArcGIS platform to support diverse workflows across organizations, and among ecosystems of cooperating organizations, distributed across the web. This session will present the highlights from the UC with an emphasis on how Esri is delivering on the promise of applying the science of where to your organization. You will learn about highlights of the latest releases of Esri technology, and what's coming in the next year and beyond.

Mike Koutnik – Insights for ArcGIS

Esri

Abstract: Insights for ArcGIS is a web-based, data analytics workbench where you can explore spatial and non-spatial data. Answer questions you didn't know to ask. And, quickly deliver powerful results.

Chris Leatherman - Drones for Archaeological Research: A New Frontier

Aerial Solutions of Wyoming

Abstract: A presentation on the use of drones for archaeological research.

Biography: Chris is the owner and chief remote pilot for Aerial Solutions of Wyoming, an Unmanned Aircraft Vehicle (UAV) company in Gillette, Wyoming. He is an FAA certified remote pilot and a member of DroneU, a group of professional UAV pilots. He is also adjunct instructor at the University of Denver in their drone studies program.

Mark Lippincott – UAV Flight Planning: “A” is for Autonomous

RDO Integrated Controls

Abstract: Autonomous flights are commonly used both for inspection and mapping. We will look at a common flight planning interface for autonomous UAV flights, what the pilot controls, and what the craft does without input from the ground.

Biography: Mark is a geography graduate of the University of Kansas, with studies at the University of Wyoming. He has worked in the geo-spatial field since 1991 and is a Professional Land Surveyor in South Dakota. He is a Past-President of the SD Society of Professional Land Surveyors, has been the Engineering Surveys instructor at SDSM&T since 2012, and has taught surveying at Western Dakota Tech.

Mark is a positioning account manager at RDO Integrated Controls in Rapid City, SD, specializing in surveying technologies and UAVs.

Mark Lippincott – UAV Output: What do you get from all these fancy toys?

RDO Integrated Controls

Abstract: We have been mesmerized by YouTube videos, sales presentations, and academic whitepapers on the wonders of UAVs for “your application.” What data are you really getting, what can you expect from it, and what use can you make of that data?

Nikholai O’Hara – Survey123 Workshop

South Dakota Game, Fish and Parks

Abstract: Mobile data collection has grown significantly in recent years and having a simple, intuitive workflow is critical for users. Survey123 offers a form based data collection solution that is easily

customizable. In this hour long session, we will be covering survey creation within Survey123 Connect. We will visit different workflows and showcase features such as external selects, choice filters, relevancy, calculations, etc... This session will also touch on survey creation tips and tricks, current limitations, and survey examples that South Dakota Game, Fish and Parks has created.

Biography: Nikolai graduated from Minnesota State University – Moorhead in 2015 majoring in Biology with an emphasis in Ecology & Evolutionary Biology while also obtaining a certification in GIS. Since graduating, he has worked for the National Park Service and California Fish and Wildlife where he developed his GIS skills. He now has returned home and joined the South Dakota Game, Fish and Parks as a GIS specialist and has been with the agency for a little over a year.

Patrick Shaw - Comparisons of EROS Continuous Change Detection Classification System and USFS Forest Health Technology Mapping for the Current Mountain Pine Beetle Outbreak

South Dakota School of Mines and Technology

Abstract: The United States Geological Survey (USGS) Earth Resources Observation Systems (EROS) Data Center is developing the Continuous Change Detection Classification (CCDC), a tool to assess land use changes from 1984 to the current day based on a stacked, standardized free Landsat data cube. The CCDC uses all available Landsat bands to calculate at a 30 by 30 m pixel resolution model to detect land use change or disturbance. A linear regression analysis was performed on 28 subbasins within the upper Rapid Creek watershed in the Black Hills of South Dakota with similar land use type and condition, management, soils, geology, aspect and slope. Within the study area, the United States Forest Service (USFS) has documented in detail the land use changes from forest fires, management practices, and tree mortality due to Mountain Pine Beetle (*Dendroctonus ponderosae*) (MPB). The linear regression was used to validate the CCDC land use change detections with the independent USFS dataset. The Landsat-based CCDC analytical results provided an accurate weekly to bi-weekly record of land use change and disturbance. Results from CCDC can be used for mapping forest altered areas for both anthropogenic and natural processes.

Biography: Patrick is originally from Baltimore, but moved to Gilbert, Arizona (a suburb of Phoenix, Arizona) in 2003. He attended South Dakota School of Mines from 2010 to 2014 studying civil engineering. He gained internship experience with McCarthy Building Companies and KLJ before graduating from SDSM&T with his CEE degree in December 2014. Patrick worked for Kimley-Horn and Associates in Mesa, Arizona working in the land development sector while aiding in the electrical, structural, water, and landscape architecture sectors. Patrick decided to head back to SDSM&T the 2015 fall semester to finish his Master's Degree in Civil Engineering where he continues work on his master's project to the PhD level.

Steve Shivers – New LiDAR technologies for 3DEP

US Geological Survey

Abstract: South Dakota is seeing a huge increase in LiDAR collection through the 3D Elevation Program, an interagency effort to develop a seamless high resolution elevation data layer of the nation. Large acquisitions using Single Photon Counting and Geiger-mode sensors are nearing completion. This presentation will look at these new technologies and highlight some of their benefits and challenges.

Biography: Steve has been the USGS National Map liaison for South Dakota since 2007. He also covers North Dakota, Montana, and Wyoming working on data collection partnerships and representing the National Geospatial Program as a source for information and technical assistance on USGS products and services.

Marcus Warnke - Surveying Private Properties for Mountain Pine Beetle Trees in the Black Hills

SD Dept of Agriculture: Resource Conservation & Forestry

Abstract: This presentation covers the techniques used in geospatial surveying and recording the data associated with mountain pine beetle infested trees on private lands throughout the Black Hills of South Dakota.

Biography: Marcus is originally from Rapid City, SD and graduated from the University of Montana, Missoula with a degree in Forest Resource Management. He is presently employed as the Forest Health Senior Forester with the South Dakota Department of Agriculture's Division of Resource Conservation and Forestry.