



GIS in Action

2017



April 17 and 18
Smith Memorial Student Union
Portland State University
Portland, Oregon

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Conference at a Glance

MONDAY

	ROOM 333	ROOM 327/328	ROOM 238	ROOM 296/298
8 AM-4 PM	REGISTRATION			
8:30-10 AM	WELCOME and KEYNOTE SPEAKER FORMER GOV. JOHN KITZHABER Ballroom			
10-10:30 AM	BREAK			
10:30-12PM		Unmanned Aerial Systems – Part 1	Emergency	Python
12-1 PM	LUNCH and LIGHTNING TALKS Ballroom			
1:30-3 PM	WORKSHOP Introduction to OpenStreetMap	Unmanned Aerial Systems – Part 2	ODOT Crash Dataset	Conservation
3-3:30 PM		BREAK		
3:30-5 PM		Applications in GIS	Data Sharing	R Spatial
5-7 PM	EXHIBITOR SOCIAL Ballroom			

TUESDAY

	ROOM 333	ROOM 327/328	ROOM 238	ROOM 296/298
8 AM-4 PM	REGISTRATION			
8:30-10 AM	WORKSHOP Cartography and Information Design	Web Apps	Utilities GIS - Birds of a Feather	WORKSHOP R - Fundamentals for Spatial Data
10-10:30 AM		BREAK		
10:30 -12 PM		ESRI Licensing	Mobile	
12-4:30 PM	GEOGRAPHIC DATA FAIR Ballroom			
12-1 PM	LUNCH Ballroom			
1-1:30 PM	URISA Business Meeting Ballroom			
1:30-3 PM	WORKSHOP Demographics and US Census Data	WORKSHOP Introduction to Mapbox Studio	Un-Conference	WORKSHOP Advanced Visualization Techniques in R with Spatial Data
3-3:30 PM			BREAK	
3:30-5 PM			Student Presentations	
5:30-7:30 PM	POST-CONFERENCE SOCIAL Rogue Hall			



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Presidents' Message

Welcome to the 25th annual GIS In Action conference!

GIS technology and professionals work 24/7 in countless aspects of our daily lives - sometimes in plain sight but more often behind the curtain. From directing emergency responders to the scene of an accident, to synchronizing trading on Wall Street, geospatial data and technology helps us understand our environment and improves the quality of our lives.

Whether you are a LiDAR analyst working on risk mitigation, a wildlife biologist conducting habitat assessment, or an economic policy advisor modeling for financial stability, the geospatial approach provides a lens to illuminate and advance our diverse interests and goals.

We are excited to have you join us at this year's GIS In Action conference. Former Governor John Kitzhaber will kick off the event with a keynote and set the stage for a truly informative program. Through the conference's sessions, workshops, and socials, you will have opportunities to learn and share with your colleagues and make new professional connections.

GIS in Action is a collaborative effort between the Oregon and Southwest Washington chapter of URISA and the Columbia River Region chapter of the American Society for Photogrammetry and Remote Sensing (ASPRS). We welcome you to join us and make this even more collaborative by sharing your unique insights at the conference.

The value of the geospatial industry grows greater every year, and every year GIS In Action brings together talented, creative people to share what they're working on. Let's share our collective IQ, learn from one another, and build a stronger, more vibrant community. Your participation is critical. We look forward to meeting you!

Jamie Ludwig, President, ASPRS Columbia River Region

Molly Vogt, President, Oregon & SW Washington URISA



Keynote

John A. Kitzhaber, M.D.
Former Governor of Oregon



As Senate President, he authored the groundbreaking Oregon Health Plan. Hundreds of thousands of low and moderate-income Oregon families and their children still have access to health care because of this work. During his third term as governor John was the chief architect of Oregon’s Coordinated Care Organizations, the first effort in the country created on a statewide basis to meet the Triple Aim—better health, better quality, lower cost—with a focus on community and population health.

In 2013 Modern Healthcare Magazine ranked John #2 on list of the “100 Most Influential People in Health Care;” and #1 on the list of the “50 Most Influential Physician Executives. In 2013, Governing Magazine named John “Public Official of the Year.”

Education

South Eugene High School, 1965, B.S. Dartmouth College, 1969, M.D. University of Oregon Medical School, 1973.

Experience

Emergency Physician, 1974-1988; Oregon State Representative, 1979-1981; Oregon State Senator, 1981-1993; Senate President, 1985-1993; Governor of Oregon, 1995-2003, 2011-2015; President Estes Park Institute 2003-2010; Endowed Chair in Health Policy, The Foundation for Medical Excellence 2003-2010; Founder, The Archimedes Movement (Now We Can Do Better); Health Policy Consultant, 2016-present.



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10:30 AM-12 PM – Python

Python for Map Automation

Clark Public Utilities has roughly 150 mapbooks that cover our electric distribution system, and which consist of about 500 total pages of maps. Esri's arcpy and data driven pages enabled us to create a python script tool to streamline the generation of these map books, reducing production time from sometimes days per page to minutes.

Matt Saylor, GISP. GIS Analyst at Clark Public Utilities

Python vs. Model Builder

Model Builder is suited for automating simple processes and a great tool for learning ArcGIS. However, it has inherent limitations: the inability to visualize and edit various parts of the model simultaneously, a lack of complex functions, and a more opinionated framework. You can alleviate restrictions such as these by using Python. Not only can you design the workflow and define your own functions, but you can also save and import modules for convenient and repeated use. Scripts can be run from various environments (ex. from a console, in the ArcMap Python window, or as an ArcGIS script tool). Your scripts can continue to evolve and grow with your knowledge and skills. In this presentation, I will describe some benefits of building Python scripts as illustrated by projects that include automating regular tasks, web scraping, and data analysis.

Alexa Todd

Download Esri REST endpoint data

A quick introduction to using Python to download data from Esri REST endpoints, demonstrated via a custom ArcGIS tool. The basics are applicable to Python in general and will include connecting to web resources (including authentication), accessing the service definition to determine capabilities, and working with JSON data.

Grant Herbert

Grant has over 12 years of international experience in the geospatial industry and currently works as a Senior GIS Analyst/Developer for FLO Analytics, a Portland based GIS consultancy.

Python and GDAL

Free and Open-Source Software has become vital for analysis and visualization of broad-scale geospatial data. This presentation demonstrates a programming workflow in which Python and the Geospatial Data Abstraction Library (GDAL) are used to summarize forest



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disturbance data derived from Landsat time-series. The workflow includes rasterization of vectors representing Northwest Forest Plan land use allocations, and “zonal statistics” - a calculation of the area disturbed annually by each disturbance agent within each land use allocation.

Tyler Harris

Tyler is an experienced GIS Analyst and is currently working on a master’s in Geography at Oregon State University

10:30 AM-12 PM – Unmanned Aerial Systems – Part I

Unmanned Aerial Systems

Inspections of bridges and power equipment are two rapidly-emerging application areas of unmanned aircraft systems (UAS). This presentation will cover two current research projects at Oregon State University (OSU) investigating the performance of UAS-based methods in inspections. The first project, in support of the Oregon Department of Transportation (ODOT), involves investigating the capability to satisfy some aspects of bridge inspection using UAS. The second project, in support of the Bonneville Power Administration (BPA), focuses on use of UAS in inspecting and monitoring substations, towers, and transmission lines. We will present preliminary results from flying four bridges, two communications towers, and one substation in Oregon. Important considerations in conducting inspections with UAS, including aircraft and sensor selection, flight planning, safety, FAA regulatory compliance, and data analysis, will be discussed. Lastly, we will cover a related project at OSU, supported by AmericaView, which involves introducing K-12 students to UAS technology through outreach events and active project participation.

Christopher Parrish, Oregon State University

From Idea to Orthomosaic: flying and processing a UAS photogrammetry mission

The Oregon Department of Fish and Wildlife (ODFW) is evaluating the utility of using Unmanned Aircraft Systems (UAS) to supplement long term monitoring and replace techniques that are dangerous, expensive, or impractical. ODFW relies on maintaining long term datasets on fish, wildlife, and their habitats for their successful management, however, the expense of using techniques like helicopter surveys continues to increase and the risks have also become more apparent. We present feasibility studies where we tested the use of UAS to complement or replace foot surveys in tidal mud flats, float surveys on large rivers, and helicopter surveys of large rivers. In addition UAS can inexpensively provide additional



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data such as georeferenced 3D digital surface maps and orthorectified photomosaics that allow for analysis that would have been impractical to conduct by other methods. I will walk through one recent survey as an example of the steps, gear, hardware, and software that can be used to build an orthomosaic and other spatial products.

Eric Suring

Salmonid Life Cycle Monitoring

Abstract is in development.

Erik Suring, Oregon Department of Fish and Wildlife

10:30 AM-12 PM – Emergency

Emergency Preparedness

Being prepared for emergencies means having access to the right data before an emergency begins. Identifying the right data, finding the authoritative sources, and ensuring access to that data in advance is no small task. A group of people have been working on that task for many years under the auspices of the Oregon Geographic Information Council. The group is called the Emergency Preparedness Framework Implementation Team, or PrepFIT for short. This panel discussion with several members of the PrepFIT will cover the issues and activities of the group, and will engage the audience in finding ways to improve emergency preparedness.

Don Pettit, State of Oregon

1:30-3 PM – Unmanned Aerial Systems – Part 2

What will your Drone Do for You?

Presentation will discuss and demonstrate the application of UAV technology in ArcGIS. Drone2Map for ArcGIS is a desktop app that turns raw still imagery from drones into orthomosaics, 3D meshes, and more, in ArcGIS. Create 2D and 3D maps of hard-to-access areas for land analysis, infrastructure inspection, and monitoring events such as natural disasters and environmental changes. ArcGIS now also supports Full Motion Video (FMV) technology and it's a natural complimentary technology to UAV deployment. Learn how to integrate FMV into your GIS workflow so that you can search on your collection of videos and capture GIS features from them.

John Sharrard, ESRI



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John Sharrard is a GIS Solutions Engineer for Esri and works as part of team supporting Esri customers in the Northwest. He has been working in the GIS field for 29 years. John concentrates on GIS solutions for Local Government, 3D GIS, GeoDesign, Land Records, and Transportation solutions. John is a graduate from the GeoScience program at Oregon State University.

Full Motion Video

Abstract is in development.

John Sharrard, ESRI

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Above the mud: using UAS to visualize small features in Oregon estuaries

UAS can complement scientific field research and natural resource monitoring by enabling more frequent sampling and greater aerial coverage. The Oregon Department of Fish & Wildlife's Shellfish and Estuarine Assessment of Coastal Oregon (SEACOR) Project is tasked with assessing shellfish populations and their habitats in Oregon's estuaries. Typically, an estuary survey takes more than one year to complete on foot, includes areas that are inaccessible or unsafe, and is revisited on a decadal scale. SEACOR launched a study to evaluate the utility of UAS for mapping intertidal mudflats with the unique challenge of visualizing small features over large areas. Described here are initial efforts to use UAS to visualize and quantify features that require sub-centimeter resolution. We present lessons learned from these efforts and provide recommendations and common pitfalls with developing a UAS program from the ground up.

Liz Perotti, Shellfish and Estuarine Habitat Assessment of Coastal Oregon (SEACOR) ODFW Marine Resources Program

1:30-3 PM – ODOT Crash Dataset Panel

Crashes on our roadways are increasingly becoming a focus of GIS, partially because of funding alignments between performance driven planning measures but also because their spatial



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analysis can produce life-saving results. We have brought together a group of 6 panelists from a broad background of technical proficiencies in the data creation, analysis and web development of crash data. Learn details about the structure of crash data, new analysis techniques and best practices for displaying them on the web.

Robin Ness, ODOT Crash Analysis, & Reporting Unit Manager

Chad Brady, ODOT GIS Transportation Framework Project Manager

Alexa Todd, Washington County GIS Technician III

Oana McKinney, Oregon Department of Human Services (DHS) Office of Forecasting, Research & Analysis (OFRA) GIS Analyst

Anthony Buczek, Metro Senior Transportation Engineer

Greg Moulliet, Developer of CrashMap

1:30-3 PM – Conservation

Bringing High Resolution Land Cover Products to the Nation

Understanding current conditions and past change is essential to improving natural resource management in the future. Through its Coastal Change Analysis Program (C-CAP), NOAA's Office for Coastal Management produces standardized land cover and change information for the coastal U.S. Current products include both regionally focused, moderate resolution (30 m) data that is updated every 5 years and high resolution (1-4 m) maps that provide more detail and are better suited for local needs and application. In the past, high resolution data acquisition has been expensive and deriving data products can be labor intensive, but recent increases in imagery and LiDAR data availability combined with improvements in processing techniques are enabling more cost-effective production of high resolution land cover products. This presentation will describe techniques NOAA and its partners are using, as part of the 2016 update cycle, to develop such detailed land cover information across broadening geographies, and how these efforts can be leveraged to better meet management needs at a lower cost.

Melissa Rosa, The Baldwin Group at NOAA Office for Coastal Management

Habitat Patterns and Predictors of Sage-Grouse in Oregon

The distribution and habitat occupancy patterns of greater sage-grouse are well-described at local and regional scales. Unfortunately, information is sparse at the state-level, and variation in habitat measurements in relation to the size and shape of measurement units has been largely ignored. To address these knowledge gaps and inform state-level management of sage-grouse habitat, I analyzed habitat conditions in spatial measurement units used for monitoring and management in Oregon. Habitat conditions were measured



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from remote-sensing-derived land cover, remote-sensing-derived canopy cover, and environmental gradient data sets. I modeled the spatial scaling properties of habitat conditions across a subset of spatial measurement units using area and shape as predictors. I quantified shape using the related circumscribing circle index, a fragmentation metric. Results indicate habitat compositions differed among the spatial measurement units and that spatial scaling of habitat conditions varied by habitat variable.

Theresa Burcsu

Mapping the Oregon Conservation Strategy

The Oregon Conservation Strategy (<http://oregonconservationstrategy.org/>) is the overarching statewide strategy for conserving fish and wildlife in Oregon, providing a shared set of conservation priorities and presenting a menu of recommended voluntary conservation actions and tools. ODFW recently unveiled the 10-year Strategy revision, incorporating new science and updating the presentation format into an interactive, easily accessible website. Concurrently, ODFW has released a significant update to the Compass (<http://www.dfw.state.or.us/maps/compass/>) mapping application, adding more datasets, tools to generate a Strategy report, and additional functionality to create and share customized maps. The Strategy and Compass applications have been developed to provide users the ability to easily navigate between the two, providing additional spatial context for Strategy components. This presentation will cover the 2016 Strategy revision and Compass upgrade, focusing on how GIS and spatial datasets are being used to connect conservation priorities to on the ground actions.

Arthur Rodriguez

3:30-5 PM – Applications in GIS

USGS Updates: The 3D Elevation Program, National Map, USTOPO and Historic Quadrangles

This presentation will provide information on the U. S. Geological Survey's 3D Elevation Program (3DEP), National Map, US Topo and Historical Quadrangle Scanning Projects. The primary goal of 3DEP is to systematically collect enhanced elevation data in the form of high-quality light detection and ranging (lidar) data over the conterminous United States, Hawaii, and the U.S. territories, with data acquired over an 8-year period. The National Map includes a variety of products and services that provide the Nation with access to base geospatial information to describe the landscape of the United States and its territories. The US Topo is the next generation of digital topographic maps from the USGS. The



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Historical Quadrangle Scanning Project has scanned all scales and all editions of approximately 250,000 topographic maps published by the USGS since the inception of the topographic mapping program in 1884.

Tom Carlson, USGS Geospatial Liaison for Idaho, Oregon and Washington

Klamath County, Oregon Uses GIS to Relate Disease Incidence to Local Walkability and Demographic

Patient data from 2012 regarding obesity, hypertension, diabetes, heart disease, high cholesterol, and stroke were obtained from Sky Lakes Medical Center in Klamath Falls, OR. Raster surfaces for these datasets were created and overlaid with an estimate of walkability of the area as well as relevant 2010 census demographic data. These data were analyzed to understand if a properly specified linear regression model existed between disease incidence and any of these variables. Hot spot, cluster and outlier, as well as grouping analyses were performed to identify neighborhoods in greater need, thereby helping to direct resources and interventions.

Properly specified models were found for cholesterol, hypertension, and diabetes. Results revealed several hot spot, cluster, and outlier areas with higher incidence of disease. The message of these results were conveyed via interactive Web maps using ArcGIS Online. The results of this study were used to direct and support the placement of a protected bike lane within the study area.

John Ritter, Geometrics Department, OIT

Aquatic Vegetation Mapping Using Sonar

Abstract is in development.

Olivia Lau

3:30-5 PM – Data Sharing

Data Sharing

Sharing geospatial Framework data between government organizations is the focus of legislation in Oregon's 2017 Legislative Session. That bill will establish a collaborative governance structure enabling all government organizations to work together to determine what, how, and when such data should be shared. But Framework data is a small subset of all geospatial data, and government organizations are a small subset of all geospatial data users. This panel discussion will brief the audience on the proposed legislation, and cover



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the issues involved in broader geospatial data sharing with the private sector and the public. The panel will engage the audience in discussion about the value of expanded geospatial data sharing and ways to improve geospatial data sharing in general.

Cy Smith

3:30-5 PM – R Spatial

R for Spatial Analysis

R is a free and open source utility that runs on Windows, OSX, and Linux. As a standard language for data science and statistics, it is well known in the scientific and academic sector. R has consistently gained traction over the years with its abundance of resources, packages, and applications. Aside from statistical analysis, R functions well as a utilitarian language workbench, complex (or simple) graphics/plot engine, and even a highly-customized and powerful GIS. Using examples taken from research conducted by the SUPR Lab, Jackson will give a broad overview of how R's power can be harnessed for spatial analysis. The conversation will begin with a basic overview of R and continue with vector and raster analysis, interactive web mapping from R, web scraping geospatial data, and more. This presentation is appropriate for people with all programming skill levels, even those with little to no experience with R. Afterwards, all code samples will be provided to the audience.

Jackson Voelkel,

Jackson Voelkel is a Geospatial Research Analyst in the Sustaining Urban Places Research Lab in Portland State University's Toulan School of Urban Studies and Planning. He is currently pursuing his Master's in Urban Studies with a focus on geocomputation, spatial analysis, and predictive modeling. He presented his work on Portland's urban heat island effect at GIS in Action 2016.

Spatial Regression Models in Plain English

Spatial dependence between observations can violate the assumption of independence from regression modeling when applied to geographic data, making regression modeling insufficient in explaining the data. Testing residuals for spatial autocorrelation is just the beginning step for spatial regression modeling. This continues with applying spatial models such as: spatial lag model, spatial error model, and spatial Durbin model, and determining which one is a better fit to the data.

The presentation will explain in plain English the three spatial models, the process of applying them using the R statistical language, and the interpretation of the independent variables'



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coefficients named impacts in spatial regression modeling. It will use the case study of walkability indices and their association to socio-economic demographics in the Tampa Bay area, Florida. Applying spatial regression models shows differences for some census variables in their significance level and in their positive or negative association with the walkability index. This reveals the importance of continuing the regression modeling with the spatial approach.

Oana McKinney, Oregon Department of Human Services (DHS) Office of Forecasting, Research & Analysis (OFRA) GIS Analyst

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1:30-4:30 PM – Workshop: Introduction to OpenStreetMap

This workshop will be an interaction, hands on introduction to Open Street Map (OSM) and the Java OpenStreetMap Editor (JOSM). Students will learn to set-up JOSM, explore the interface, and make actual edits using the software. Students will also learn to extract data from OSM using specified queries and then display the results. The workshop will conclude with ways to connect with the OSM community and additional resources.

Madeline Steele



Monday, April 17 Lightning Talks

Rick Debbout – CSRA International - EPA Office of Research and Development

A short exploration into a few open-source GIS tools in python. This talk will showcase how to do topology checks with geometries using geopandas and shapely which was used as a QA process for the NHDPlus v. 2.1. Accessing coordinates programmatically to clean large datasets improves the publication efficiency and consistency of data and can be used in many types of analysis. A brief mention of setting up a python environment to work in, and a few short examples will hopefully give enough information to start working with these tools.

John Bragg – South Slough National Estuarine Research Reserve

A common theme among GIS users is the need to match data consumers with data resources and providers. The need is particularly acute in Oregon's rural communities, where geographic data can be hard to find, access, or apply. The GIS industry is in a transitional era where professional turnover can lead to the loss of institutional knowledge about local data. Data and data tools proliferate to the point that even experienced data users can find it difficult to keep abreast of emerging sources, services, and technologies, or adapting existing tools to meet new needs. And there is new data, too, data that we need right now to help manage an uncertain future.

Chris Aldridge – OSBEELS Photogrammetry and Remote Sensing Task Force



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8:30-10 AM – Web Apps

Web Application Development - ESRI and/or Open Source Panel

Organizations in Oregon use a wide variety of tools to support web based GIS applications. Knowing what tools are available and the pros and cons of each is important. In this session four panelist will present how they use ESRI or open source technology to solve agency specific problems using custom or out-of-the-box tools. After the short presentations the panelist will compare and contrast the technologies presented.

Tanya Haddad, Eric McAvoy, Joshua Tanner, Eric Bohard

8:30-10 AM-12 PM - Utilities for GIS - “Birds of a Feather”

GIS for Utilities Discussion Forum

The purpose of this forum is to bring together GIS professionals from the utility world to discuss common concerns, solutions, lessons learned, and the road ahead. In addition to the topics proposed for discussion, we intend to gauge attendees’ interest in forming a regional group of utility GIS professionals who would congregate at various events (such as GIS in Action) and locations throughout the year. An online forum will also be proposed and ideas gathered for the best approaches toward opening up communication amongst the group’s members.

Patrick Gronli, NW Natural

10:30 AM-12 PM – ESRI Licensing

Esri will cover the changes that have come in our 10.5 Server and Desktop release, related to licensing, approach, on-premises vs. cloud, and how these changes are impacting our user community. This session will be part technical, part roadmap, and part industry trends that are impacting all users in technology.

Rich L’Esperance, Campbell Global

10:30 AM-12 PM – Mobile

Please Subscribe! – Geospatial Technology Trends in Software, Hardware, and Services

The way we acquire geospatial technology is changing. Following the consumer software as a service (SaaS) model, many professional GIS software applications have gone from single-use licensing to subscription-based price models such as Esri ArcGIS Online or Drone2Map. Enterprise License Agreements, cloud-based field data collection apps, and cloud-based UAS photogrammetry software platforms have followed suit. But what about



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professional services? And hardware? Yes, you can subscribe to these now too. From flat fee annual professional service agreements to new innovative hardware technology such as Trimble Catalyst, service providers and hardware manufacturers are looking to subscription models to enable customers to acquire high-dollar technology for low-cost annual fees. This shift is, in part, an attempt to make budgeting more predictable and palatable. Instead of waiting two years for your budget to come through, then buying technology that is already outdated, subscriptions may allow you to progress your GIS more quickly while remaining flexible year over year. However, they have their limitations as well. Attend this presentation to learn more about new geospatial technology and how industry leaders are giving professionals more options as to how they invest in their GIS.

Jim Lahm, Frontier Precision, Inc.

Using Open Source Software and Tablets to Collect Transit Location Data at TriMet

Traditionally, on-board transit rider surveys have been conducted with paper and pencil. The address data from these surveys typically has a low accuracy rate and usually requires significant geocoding. To address the shortcomings of the paper-based survey, TriMet has been using Open Source software and electronic hand-held tablets for agency-wide transit rider surveys since 2014. We use a series of open source software tools including Open Data Kit (ODK), PostgreSQL/PostGIS and Leaflet.js to collect, monitor, manage, analyze, and visualize survey data. This presentation will introduce you to the tools and processes that we use to collect and manage origin, destination, and on/off stops location data. I will use the fall 2016 transit survey as a case study to illustrate the process and the automated geocoding feature. Lastly, I will discuss some of the data management tools as well as a leaflet map dashboard that visualizes location data in real-time.

Baofeng Dong, Electronic Survey Developer/Analyst

Baofeng Dong currently works at TriMet as an Electronic Survey Developer and Analyst. In this role, he is responsible for managing and overseeing the implementation of agency-wide mobile tablet-based electronic surveys. He is also actively engaged in programming and developing survey instruments for mobile devices, and supervising and training survey staff.

LiDAR at the Oregon DOT

LiDAR (static & mobile) and other technologies is positioning transportation agencies for the next big step in technology. This presentation will provide an overview of ODOT's



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mapping (LiDAR) program and show sample projects from the Oregon Department of Transportation.

Joseph Thomas, ODOT

1:30-3 PM – Un-Conference

The Unconference event will be an opportunity for attendees to share information with each other about topics determined at the beginning of the main Conference. There will be a board near the back of the Ballroom, where the keynote presentation will be made, that will provide an opportunity for attendees to write ideas (with their names attached) for short presentations and discussions to be made during the Unconference. The ideas will be captured until the end of the day on Monday, then the ideas will be organized, grouped, etc., and an agenda for the Unconference will be posted on that same board. Attendees will check there to see if their presentation or discussion idea will be part of the agenda. Each presentation or discussion idea will have a maximum of about 15 minutes on the agenda. The format, however, will be relatively informal. If the participants decide to continue a particularly engaging discussion for a longer period, that can happen.

3-4:30 PM – Student Presentations

Students from Portland State University and Portland Community College present their research or GIS project. Presentations (abstracts follow) range from bat diversity to Oregon white oak distribution, marine protected areas in the Arctic to the livelihood vulnerability index in Nepal, web mapping using ArcGIS Online to volumetric estimates of 3D landscape objects. OR-URISA Young Professionals and ASPRS-CRR sponsored a portion of the student presenters' registration.

Mapping the need for adaptation: assessing drought vulnerability using the livelihood vulnerability index approach in a mid-hill region of Nepal

For effective development interventions in resource-poor regions to take place, it is critical to identify, at the highest spatial scale possible, regions which need immediate attention. The index-based assessment of vulnerability to climate change is typically used to identify administrative-level regions of high vulnerability using various socioeconomic data sets. In regions where climate is an important factor in determining resource needs and community access, climate impact, as well as the sensitivity of the system to climate per-

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turbations, must be additionally assessed. One method that combines both approaches at the community level consists of collecting highly resolved socio-economic data and using the livelihood vulnerability index to assess population vulnerability to climate variability and shocks. We use this mixed-methods approach in mapping climate vulnerability of ten drought-prone villages lying along the Sunkoshi River in the east mid-hill region of Nepal. We identify the spatial patterns of different components of climate vulnerability and test whether the pattern is similar for different components. We then determine whether climatic extremes or people's socioeconomic capacity control vulnerability, and thus development needs at the sub-district scale. We aggregate data from over 900 household surveys into 32 indicators comprising nine different components of livelihood vulnerability. Among them, the seven different groups of data pertaining to household vulnerability components were collected in the field using a standard questionnaire, while topography and climate components were acquired from global and national databases. We find that the majority of our study area falls in the high vulnerability category with significant spatial variation. In some villages, there are different vulnerability classes in different wards, indicating that even within the lowest administrative units, like village development committees and municipalities; there is significant spatial variation in the level of vulnerability. Livelihood strategies, water availability, and topographic components played the most important role in determining the overall vulnerability and we measure strong interconnections among different components. We conclude that adaptation strategies in this highly-vulnerable region should include careful consideration of different livelihoods and environmental components, their spatial patterns, and interconnections.

Janardan Mainali and Narcisa Pricope, Portland State University

The effects of White Nose syndrome on Bat Diversity and Population Density on the Monongahela National Forest

For the past 20 years there has been a long term bat population survey conducted on the Monongahela National Forest. I looked at survey data from 2005 to 2015 to measure changes in the summer bat population since the spread of white nose disease. The Monongahela National Forest comprises over 900,000 acres with only small towns and not much farming or development nearby so not many other factors to decrease population. Since white nose syndrome hit West Virginia in 2007 there has been an estimated 70% to 80% decline in some bat species, based on winter cave surveys. The summer capture data collected from 2005 to 2015, was grouped into pre-white nose 2005 -2007, Mid-white nose 2008 -2010 and post-white nose 2011-2015. I looked at overall population change and changes in habitat designation from the National Land Cover dataset (NLCD). I found a net loss of 5.2% bat roost habitat between the 2006 and 2011 NLCD.

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This small loss in habitat did not account for the 57.19% decrease in bat population and up to a 72.28% decline in one species population since white nose arrived in West Virginia.

Sarah Dewees, Portland Community College

UAV-Based Photogrammetry for Characterizing Topographic Change of Crater Glacier on Mount St. Helens, Washington

The Crater Glacier on Mount St. Helens is rare compared to most glaciers in the conterminous United States in that it is advancing – at a rate approximately 10 cm per day (USGS, 2013). The May 1980 eruption of Mount St. Helens created a deep, north facing crater and consequently provides a perfect environment for this glacier to grow. Yearly measurement and mapping campaigns of the terminus of Crater Glacier are carried out by the USGS (Walder et al, 2009). This study presents a flexible, cost-effective and accurate method for measuring crater glaciers growth as an alternative to aerial lidar or ground GPS surveys. A UAV-based photo acquisition and 3D image reconstruction methodology was used to create 3D models of the glacier terminus. On October 11th, 2016, 237 photos were acquired using a quadcopter platform and GoPro HERO 3 camera. Photos were processed using a Structure from Motion workflow with Pix4D software. An accuracy assessment of the models, using 11 GPS validation points, shows that the most accurate model yielded a RMSE of 0.37 meters at 0.1-meter pixel size. Furthermore, glacier and topographical change was analyzed by comparing the new DEMs to a lidar derived DEM from 2009. This change detection showed the glacier at its terminus has a max depth of 60 meters. In future studies an improved ground control methodology could be used to increase the accuracy and number of both control and test points. Additionally, a time series of 3D models could allow observation of topographic change a glacier movement between summer seasons.

Julian Cross, Portland State University

A GIS Analysis of Ecologically Significant and Marine Protected Areas of the Circumpolar Arctic

Climate change and increased levels of human activities pose a serious threat on oceanic, avian, and terrestrial wildlife, as well as the ecological systems which they rely on. With polar ice retreating, there are increasing opportunities for shipping vessels to utilize Arctic waters, posing additional stress on these already threatened systems. Under such changes, it is critical to assess and challenge the degree to which these ecosystems are protected, and if possible prevent stressing them further. Understanding where import-

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ant ecological and biological marine areas, and the human presence therein is a step toward catalyzing proper conservation efforts. However, data related to conservation in this region is often conflicting, coming from multiple organizations and countries with varying detail and metrics of protection. In collaboration with a nonprofit environmental group Ocean Conservancy, and the Center for Spatial Analysis and Research at Portland State University, we used GIS to analyze ecologically significant areas and marine protected areas. This serves as an assessment of the current conservation efforts in the circumpolar arctic, and an investigation of the veracity of the predominant GIS datasets available for this region. We use datasets from various conservation organizations and agencies including the International Union for Conservation of Nature (IUCN), World Database on Protected Areas (WDPA), Marine Protected Atlas (MPAtlas), Natural Resources Defense Council (NRDC), among others. Using GIS analysis, we determined the distribution, overlap, and levels of protection for ecologically significant areas for the region and bordering countries. We also assessed human presence via the intersection of shipping routes and ecologically significant areas. Several maps were created to demonstrate these various metrics for conservation efforts. While many biologically and ecologically significant marine areas span this region, a small fraction are currently protected. In addition, the number, size, and level of protection varies drastically between countries.

Alec Trusty and Krista Fanucchi, Portland State University

A Comparative Analysis of Volumetric Estimates of 3D Landscape Objects Derived from Pole Mapping and Structure from Motion Photogrammetry

Photogrammetric Multi-View Stereo (Structure from Motion - SfM) is an affordable and accessible technique for building accurate and visually appealing 3D digital models of landscape objects. Citizen scientists use these models to create detailed digital land inventories at a scale and resolution not readily available. But the resulting model accuracy is heavily reliant upon the quality and quantity of its photographic inputs. Time of day, lighting conditions, equipment selection, camera orientation, and object texture and geometry are important considerations when designing data capture methods. How do these factors impact the final model? Are photographs taken from a standard smart-phone camera sufficient, or is more expensive equipment required to create a better model? What determines quality and accuracy? These questions are particularly important to citizen scientists and those interested in the low-cost entry to the SfM workflow. Using the Abraham Lincoln sculpture in Portland, OR's South Park Blocks as the subject, this research explores how photographic data captured from different cameras – a variable that significantly effects cost- impacts the quality of the final digital model. Photographs are taken using 12 MP and 16 MP cameras from the

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ground and the air with an aerial pole. Each set of photographs is prepared, edited and processed with Agisoft PhotoScan, where a dense 3D point cloud is generated and transformed into a textured mesh. Comparative analysis of mesh volume is performed to assess the how photographs from the different cameras effect the quality and accuracy of the final models. Resulting assessments can help citizen scientists determine the minimal requirements for successful 3D model creation when using SfM techniques.

Tim Hitchins, Portland State University

Oregon White Oak (*Quercus garryana*) Survey in Cooper Mountain Nature Park

Oregon white oaks once were spread across the Willamette Valley due to habitat management of Native Americans. Though much of the oak habitats (prairie, savannas, and woodlands) are far less common, the unique landscape is important from a cultural and ecological point of view. Southwest of Beaverton stands Cooper Mountain Nature Park, which has a living example of oak habitats. For my project, I surveyed all trees visible from the trails in the park and noted position in canopy and other trees that could affect crown development. A total of approximately 2100 mature oaks were surveyed. Common adjacent trees were Douglas fir (*Pseudotsuga menziesii*) and Pacific Madrone (*Arbutus menziesii*). With data, I created maps of regarding overview of oaks and clustered habitat type into a hexgrid.

Spenser Kuroda, Portland Community College

Exploring the Advanced Possibilities of ArcGIS Online to Create a Web Map of the Art Located at Portland Community College Sylvania Campus

The use of maps has always been an incredible way to visualize and perceive everything that surrounds us. The way we represent our perspective of the world and environment has evolved through time. The art of cartography has passed from Mapmakers painting caves of Babylon to the 21st century where the mapmakers, “we”, use tools that allow us to look forward in the evolution of the intellectual development of cartography. This is possible with the most recent tool to show and share stories, experiences and historicals moments: “the Web”. By using the web, we can now create interactive web maps.

Because of this, we have decided to explore an alternative. ESRI has made their ArcGIS Online platform, a cloud-based system to create, edit, and share maps, available to be dispersed. Portland Community College Website have an interactive map that provide the option to se-



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lect which campus locate and what kind of features activate in the map. Unfortunately when the art feature is selected there is no data visualize. There is no data collected for Sylvania campus.

We plan to create a detailed map with it own database of art representation and important locations of Portland Community College in the Sylvania campus; with possible use of other campuses as a second phase. Using AGOL as the medium and platform for this practice. Volunteering time from staff for data collection. Combine photography, graphics, and text to create a beautiful cartographic map for the Sylvania campus. Import GIS data taken from various quality and using remote imagery to verify the locations.

The intention of this proposal is to provide a Web map where anyone that visits the web page of Portland Community College is able to see where the pieces of art are located in this place. At the same time this would provide a service for the campus, help to make art data more public, and help to endorse the arts program in PCC.

Gustavo Colmenares Rodriguez and Matthew Sisneros, Portland Community College

Tuesday, April 18 Workshops

8:30 AM-12 PM – Cartography and Information Design: A Sampling of Workflows and Solutions for the Everyday Analyst

This workshop will focus on the visual design of spatial information by reviewing some concepts and exploring several different workflows. Learn how to interpret what the data is trying to tell you and design an appropriate visual product using color, texture and typography that gets the message across intuitively and effectively. This workshop will cover both print and web solutions that are platform agnostic through analyzing different layout options, map improvement solutions, before/after cartographic enhancements and the most appropriate type of visualizations for different types of data.

Ryan Sullivan, Matthew Hampton, and Paige Williams

8:30 AM-12 PM – R: Fundamentals for Spatial Data

In this we will focus on some basics of using the R language, reading and writing spatial data in R, dealing with map projections, and the structure of spatial data in R. We'll explore ways to work with raster data in R – reading, creating and manipulating raster data – and then we'll look at some examples of both vector and raster analysis in R such as subsetting, extracting information, and overlaying data using R packages such as sp, sfr, rgdal, raster, and rgeos. This is an introductory workshop – some familiarity with R is ideal but not required.

Marc Weber and Ben Weinstein

1:30-4:30 PM – Demographics and US Census Data

The most trusted sources of demographic data are free and publicly available, with broad applications for spatial analysis and cartography. By learning what data are available and how to access the datasets, and understanding the strengths and weaknesses of each source, users can become proficient in GIS applications of demographic data. Demographic data may include estimates from survey data, administrative records, synthetic data, or modeled data. This session will explore methodologies and sources, and include demonstrations of techniques for representing sampling error along with estimates. The primary focus will be social and economic data from the Census Bureau's American Community Survey and population data from the Decennial Census. We will also introduce other datasets including Origin-Destination Employment Statistics (LODES) and Small Area Income and Poverty Estimates (SAIPE).

Charles Rynerson and Randy Morris



Tuesday, April 18 Workshops

1:30-4:30 PM – Introduction to Mapbox Studio

Design a map that matches your style and tells a story. Mapbox Studio is the GIS developer's tool for creating custom maps for web & mobile apps. This workshop will cover the basics of Mapbox Studio to build a custom, interactive map with data from the City of Portland's Green Loop initiative.

This is a three-hour workshop where you will learn Mapbox Studio, an online application for creating custom web and mobile map applications. We'll cover:

- Using Mapbox source data - OpenStreetMap, satellite imagery, and terrain data
- Creating a custom style for your map
- Adding custom data from the City of Portland
- Learning the various ways to share your map on your site or as an interactive application

Participants are encouraged to bring a laptop that uses a modern web browser (<https://www.mapbox.com/help/mapbox-browser-support/>) as well as sign up for a Mapbox account

Rafa Gutierrez

1:30-4:30 PM – Advanced Visualization Techniques in R with Spatial Data

This workshop will dive into mapping and visualization with R packages such as ggplot and Leaflet, and we will also cover creating interactive visualizations with Shiny. Familiarity with R or completion of the morning workshop is helpful preparation for this workshop.

Marc Weber and Ben Weinstein

Business Meeting & Social

URISA Business Meeting

Tuesday, April 18th at 1-1:30PM

Oregon URISA will hold a Chapter Business meeting open to all members of the public followed by a short Board meeting. Please join us to learn more about Oregon URISA, vote in the election for open positions, and find out what ORURISA can do to support you in your professional goals.

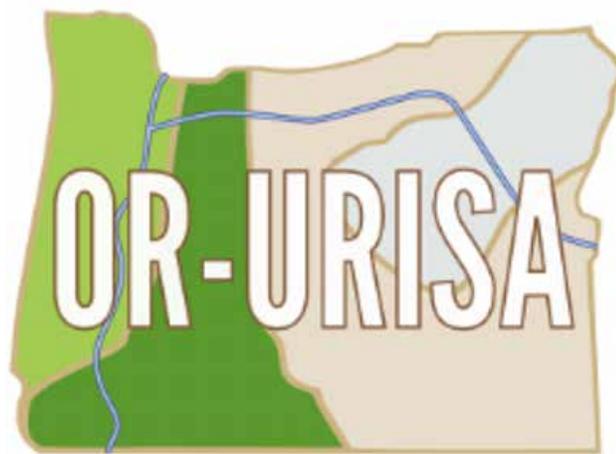
AGENDA

1. Business meeting
2. 2017 goals and vision
3. Elections
4. Board Meeting

Post-conference Social

Tuesday, April 18 at 5:30-7:30PM

Sponsored by Professional Land Surveyors of Oregon, OR-URISA, and ASPRS student and young professional groups. Please join us after the conclusion of the conference at Rogue Hall, 1717 SW Park Ave (across from PSU Smith Memorial Student Union) for a social.



Geographic Data Fair

What Do You Need to Plan For An Uncertain Future?

Whether from earthquakes and tsunamis, flooding and erosion, or deteriorating infrastructure, the Oregon coast faces an uncertain future. To keep visitors and residents safe, community leaders and decision makers depend on access to the best available geographic data to map hazards, protect natural resources, ensure transportation, and protect public health and safety. Unfortunately they can't always find the data they need when it is needed.

The Oregon Geographic Data Fair is an experiment in networking and opportunity where computer mapping specialists, data managers, and leaders may improve their awareness of publicly available data tools and resources. By engaging with public data stewards and providers, they will learn of new tools and resources, and find networking opportunities to resolve challenges and barriers that can limit access to data during an era of rapid climate, environmental, and social change.

Admission to the Data Fair is included with your GIS In Action registration. Participate in several ways:

1. Before the conference. Begin to explore the Data Fair after you register, using Padlet from your smart device or computer. Visit the App Store (iPhone) or Google Play Store (Android) to download the free Padlet app.
 - a. Open the app then enter this link, or open the link in a browser, to begin using the Padlet: https://padlet.com/OREGON_DATA_FAIR/37adema9vm1f
 - b. Use Padlet to communicate with conference attendees about the Data Fair. Posts and responses are seen by Padlet participants in real time. After registration opens, we will monitor the Padlet for activity at least daily to acknowledge or respond to posts, and more frequently as the conference dates approach. Engage with as many users as you like on this common posting board.
 - c. Visit www.Padlet.com for more information.
2. During the conference. the conference. Visit the Data Fair in the Smith Ballroom Tuesday, April 18, from noon to 4:30 p.m. to meet the data specialists from Oregon and federal data management agencies who will be on hand to answer your questions and demonstrate data services and tools. You may also learn about valuable training opportunities or forge links with other data users whose needs or resources align with yours. A smart board at the Data Fair will display the Padlet conversations and also for providing data tool demonstrations

Geographic Data Fair

3. After the conference. After the conference we will keep the Padlet open so you may continue to follow up with the contacts you've made.
4. Evaluation. Pending your evaluations we will look for opportunities to present future data fairs.

For additional information contact John Bragg, South Slough National Estuarine Research Reserve

Telephone: (541) 888-5558, ext. 129

Email: john.bragg@state.or.us



Poster Contest

Participants will have an opportunity to present a poster about map topics. Poster contestants can enter for reasons such as to show their skills, to learn new skills, or to show their finished project after a long time of creating. Posters will be competing in categories for prizes.

Judging

Maps will be judged by conference attendees according to the following categories:

Cartographic - The quality of the visual display

Analytic presentation - Communication of meaningful patterns in data

Data Integration - Combining data from different sources

Public Service - Posters that display for the public

Student - Any enrolled in classes pursuing a degree or certificate

Map Sizes: Posters can be any size, but larger sizes are preferred. The maximum poster size is 4ft x 6ft, either in landscape or portrait layouts.

Map Social: Presenters will have an opportunity to stand by their work during the vendor social and share with everyone your motivation and interest behind your work.

Awards: Awards will be divided amongst the winners of the categories after ballots are counted. The prize amount for the category will depend on how many are entered. The more entered the higher the overall prizes. There may be a second place prize if there are more than four contestants in a category.

Pickup: Please pick up posters after conference to avoid loss of your creative efforts. Posters cannot be removed prior to closing Key Note.

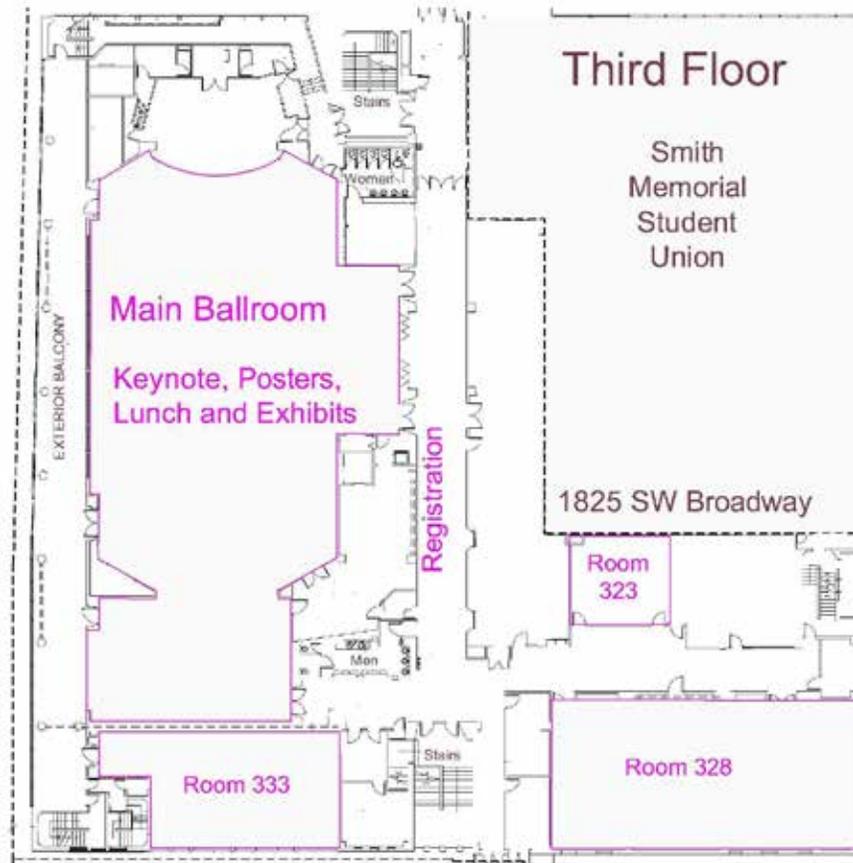
Exhibitors and Sponsors



Planning Committee

Co-chairs	Keith Massie Doug Smith
Program Chair	Rich L'Esperance
Registration	Patty Morgan
Vendor Coordinators	Keith Massie Patty Morgan
Committee Member	Alexa Todd
Poster Session	Ben Brady
Volunteer Coordinator	Tim Hutchins
Workshop Coordinators	Zac Christenson Molly Vogt
Data Fair Coordinator	John Bragg
Lightning Talks Coordinator	Clint Chiavarini
Facilities Coordinators	David Percy Doug Smith
Audio Visual Coordinator	Neil Revello
Website	Keith Massie Joe Dully
Program Design	Shivon Van Allen

Smith Memorial Student Union Maps



Smith Memorial Student Union Maps

