CONFERENCE PROCEEDINGS

2014 Washington GIS Conference

Communicating Our World

May 12 - 14 , 2014
Greater Tacoma Convention & Trade Center
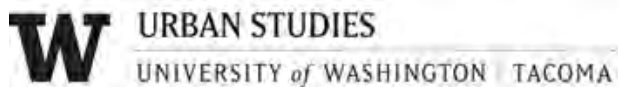
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Proceedings of the 2014 Washington GIS Conference

This proceedings document is published by [WAURISA](). It reflects the events and presentations that occurred during the 2014 Washington GIS Conference, May 12-14, which experienced record conference and workshop attendance.

STATEMENT OF REVIEW

All presentations reproduced in these proceedings were reviewed and accepted based on their abstracts, and met the requirements as set forth in the 2014 Call for Presentations, Panel Discussions, and Lightning Talks.

DISCLAIMER

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ACKNOWLEDGEMENTS

CONFERENCE FOCUS AND GOALS

The focus of the 2014 conference was "Communicating Our World". This focus was chosen to encourage greater communication in general and active attendee participation specifically, and was reflected in the opening and closing plenary sessions as well as incorporated into several activities throughout the conference.   The idea was put into practice in lunch theme tables, contribution collection stations where attendees wrote their thoughts on large easels which were then rated by other attendees, communication-specific presentation tracks were offered, and "thought leaders" engaged the attendees with questions about communication. The emphasis was on the following three questions:

1. How have you communicated the value of GIS to your organization or clients?
2. How has your use of GIS supported a communication effort?
3. How have you improved communication between participants in your GIS projects?

The "Thought Leaders" were present and active throughout the conference to promote and enhance discussions centered on this theme and the specific questions. They connected with attendees and gathered contributions from them that later inspired additional discussion in the closing plenary session where specific communication goals were discussed and set by the attendees.

Thank you to the following "Thought Leaders"!

- Breece Robertson - The Trust for Public Land
- David Howes - David Howes, LLC
- Geoff Almvig - Skagit County
- Parker Wittman - Aspect Consulting, LLC
- Steve Beimborn - Seattle Public Utilities
- Tami Faulkner - Thurston County GeoData Center
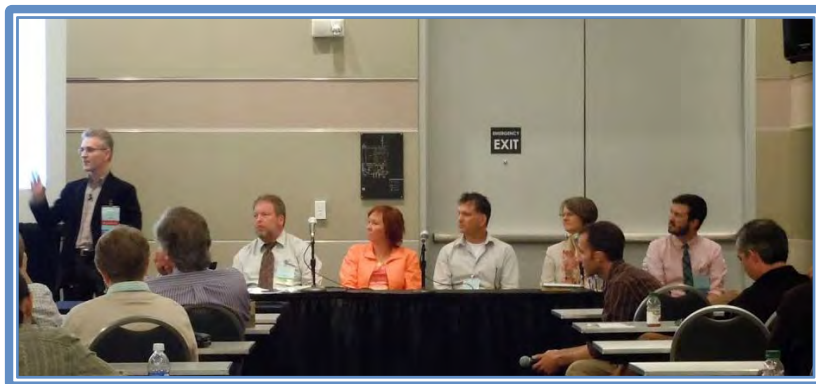
From left - David Howes (standing), Steve Beimborn, Tami Faulkner, Geoff Almvig, Breece Robertson, Parker Wittman

KEYNOTE SPEAKER

Breece Robertson is the National Geographic Information Systems (GIS) Director for [The Trust for Public Lands](). Robertson joined The Trust for Public Lands in 2001 to create a comprehensive, coordinated GIS program. Today she provides leadership for the organization's Conservation Vision and GIS service - the leading provider of "Land for People" science in the country, managing a cutting-edge team of GIS staff and consultants nationwide. She inspired the attendees to not just be an attendee, but to dialogue and be an active part of the conference, contributing their ideas and goals clear through to the closing session.

AWARDS PRESENTED

Summit Award (GIS Person of the Year)

The Summit Award is presented each year to a person in the GIS community who has shown a long-term commitment to the field, who gives significant volunteer time or been an outstanding mentor or role model in the GIS community. This year WAURISA honors:

Dr. Sabbah Jabbouri, Green River Community College

Dr. Jabbouri has been a significant influence in the GIS community and especially through his commitment to his students at Green River Community College (GRCC) since 2002. His obvious passion to not only help students reach their educational goals but to integrate them into the GIS community through networking, job shadowing, partnerships and internships have made GRCC and his students a great asset to the community. He has been a role model to GIS professionals as well, setting the standard for what a GIS mentor should be. We applaud his long and passionate career in our community and his legacy will be with us for many years to come.

Dick Thomas Student Competition Winners

The 8th annual Dick Thomas Memorial Student Presentation Competition & Award was quite successful and drew numerous entries. This award was established in 2006 to honor Washington State GIS pioneer and mentor Richard 'Dick' Thomas. The intent of this award is to honor Dick by continuing his work of encouraging students to excel in their studies and transition successfully into careers in the field of GIS. WAURISA's objective is to inspire students to present their original work related to GIS, geography, or geographic research at the annual Washington GIS Conference. Congratulations to our student winners with their outstanding project presentations. These projects showcase GIS technical skills, analytic thought, and real-life application of GIS in our environment and lives.

1st Place

Anna Yost, Central Washington University *(receives $1000, Dick Thomas Plaque, one year membership in WAURISA, free registration to the 2015 Washington GIS Conference, and publication of her paper in* <u>The Summit)</u>

[Modeling Elk Habitat Suitability in the North Cascades](#)

The Washington State Department of Fish and Wildlife (WDFW) would like to adjust the distribution of elk on the landscape in the North Cascades to reduce negative impacts to private property while maintaining a healthy population of elk. Elk management goals can be achieved through a combination of practices, such as forage enhancement that encourage elk in tolerated areas, and fencing, hazing, and/or hunting of elk in areas of low tolerance. This project focused on mapping elk habitat suitability across the 8,000 km2 North Cascades elk management area and then identifying potential areas of high elk tolerance which would be suitable for forage enhancement. GIS tools were leveraged to evaluate elk home ranges using Kernel Density Estimation, classify key landscape vegetation parameters using satellite imagery, calibrate a custom elk habitat suitability model, and evaluate the landscape for potential elk forage enhancement locations. Outputs from the GIS analysis were communicated to WDFW and the Elk Forage Enhancement Working Group, a collaborative multi-stakeholder committee who evaluates the predicted elk habitat suitability within the context of various resource management constraints. Landscape scale elk resource management issues were quantified using GIS tools, and the realities of land ownership, land use limitations, seasonal variability, and the dynamic nature of elk herds were all considered in order to produce final recommendations for elk forage enhancement in the North Cascades.

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2nd Place

</div>

William G Jonsson & Haley J. Duke, University of Washington, Bothell *(split $300, Dick Thomas Certificate, one year membership in WAURISA, and publication of their paper in* The Summit*)*

[Flow Accumulation and Runoff Volume of Three Watershed Basins in the City of Bothell](#)

This study combined vector overlay techniques and raster modeling within a geographic information system framework to analyze water infiltration and flow in three of the twenty-two watershed basins in the City of Bothell. Based on two and one-hundred year maximum precipitation values during six hour periods for the greater Seattle area, and saturated infiltration rates for known surface soils and slopes, this study tried to specifically estimate runoff volumes and flow accumulation values for the Blythe Creek, Horse Creek, and Maltby Hill Creek watershed basins in the City of Bothell.

Results show that flow accumulation during a maximum rain event with a frequency of two years, when assessed as a function of rate versus total area of the basin, in Horse Creek basin experienced approximately 4x the amount of accumulation (per square foot) than Blythe Creek basin, and 1.7x the amount of accumulation (per square foot) than Maltby Hill Creek basin. The methods, data sources, and equations this study is based on can be used by the City of Bothell to complete run off and flow accumulation models of the remaining nineteen sub-basins in order to assess which areas are at a critical stage for intervention in case of a large scale rain event.

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3rd Place

</div>

Emily Spahn, Sara Shores, Sara Kate Allen, University of Washington, GIS Certificate Program *(split $200, Dick Thomas Certificate, one year membership in WAURISA, and publication of their paper in* The Summit*)*

[Development of a Tree Inventory and Tree Data Collection Framework for Seattle Parks](#)

Tree inventories are useful tools for cities to monitor the current urban forest to meet future canopy goals, track maintenance history, assess wildlife habitat, plan work, document memorial trees, plan volunteer events, and assess tree values. Though the City of Seattle's Parks and Recreation Department [Parks] has a fair amount of data on existing trees in parks, the department does not have a tree inventory. For our student project, we developed a tree inventory and data collection framework for Parks. Parks has started developing tree inventories several times, but no efforts were maintained, and only sporadic GIS tree data are currently available for Parks trees. These past efforts highlight the importance of making a tree inventory simple to use by many people.

The project required the review of other tree inventories in the region, and we worked with University of Washington, City of Seattle's Transportation Department, and Seattle Audubon Society to gather this information. We met with Parks staff, including arborists, GIS professionals and field crew personnel, to determine what data should be collected and

to what level of detail. We developed a framework for field work assignments and data collection, based on ArcGIS Online and Collector. We plan to test the system and tools by developing the inventory for a small Seattle park as a proof-of-concept. Project deliverables will include a tree inventory which combines the data we collected along with that collected during earlier efforts, in addition to the mobile tool framework. We hope that we have made the tools straightforward and easy to use and that Parks will adopt our efforts to meet their needs.

Map/Poster Contest Winners

Maps vs Apps? Apps are most often how we communicate our world today, but hardcopy map construction is a fine art that is too often undervalued within web apps. For any GIS'r it is a pleasure to peruse a creative, well-constructed map for its cartographic artistry, informational detail, and the story that every good map has to tell. The map contest is a friendly battle of the cartographers to present the best information in an attractive format that not only gets our attention, but holds it long past the first glance. Congratulations to the following winners of the Map Contest with their mix of maps and apps:

Analytic Presentation Category

Emilie Healy, Aspect Consulting
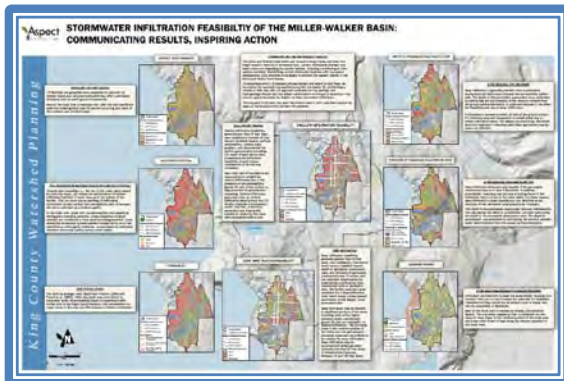
"What is stormwater infiltration and how can we identify and communicate where opportunities exist for stormwater retrofit projects? The Miller and Walker Creeks are located in King County and drain into Puget Sound in the City of Normandy Park. The aquatic habitat in the creeks is highly degraded due to urbanized hydrology, down-cutting, road crossings, outfalls, channelization, and lack of native vegetation. Stormwater retrofit projects, with strong reliance on low impact development (LID) elements, are necessary in order to improve the streams more quickly."

## Cartographic Design Category

Patrick Jankanish, King County

"The Tahoma School District Stormwater Neighborhood Atlas, a Client Services project of the King County GIS Center for, and in collaboration with, Sustainability Ambassadors, uses expressive maps along with inspiring text and photographs to engage and ultimately involve readers in actions that can protect, preserve, and improve the world around them. As part of a tool for both classroom and community, the maps provide geographic context and reveal environmental characteristics for the district schools and their neighborhoods. As works that are visually and intellectually stimulating, the maps communicate compelling, curiosity-arousing perspectives on the school district's world."

Online Interactive Map Category

Janice Baird, Skagit County
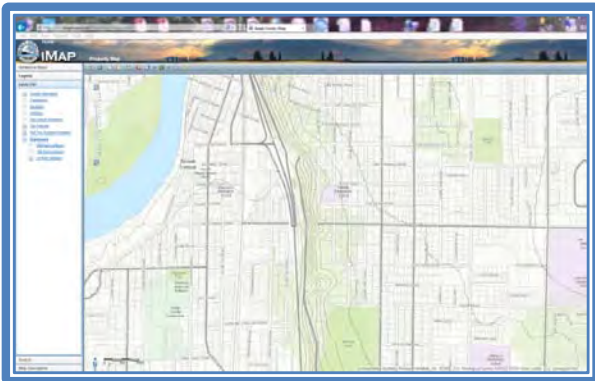
" [iMap](#) allows interactive viewing of Skagit County geographic information. A simple set of tools allows users to "quickly" view different maps, such as, property, crime, aerials and much more. A strong set of search tools makes it easy to navigate to an address, parcel id number, or street."

Data Integration Category

Liz O'Dea, WA State Department of Ecology
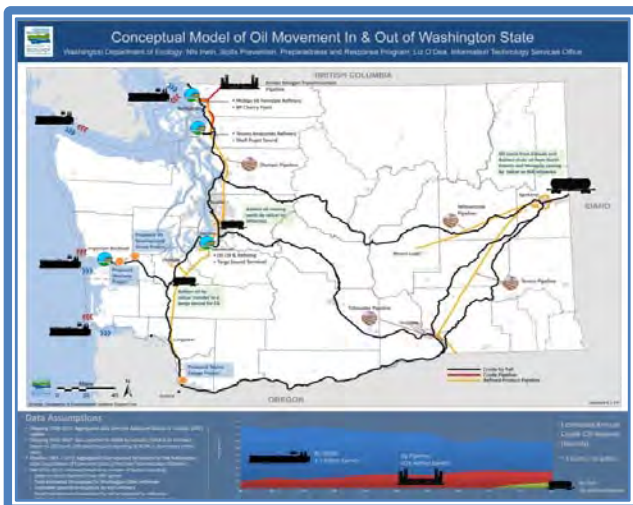
"This map displays the movement of crude oil from Canadian oil sands and North Dakota/Montana Bakken shale via railroad and pipeline through Washington State to refineries and export terminals."

WAURISA BOARD ELECTIONS RESULTS

The following WAURISA members were elected and entrusted by their peers at the conference to represent them and help guide WAURISA's future direction. We thank them in advance for their time and effort.

Board Officer – Treasurer: Don Burdick, Salish Coast Sciences
Member-at-Large: Joshua Greenberg, PhD., GISP, Skagit County GIS
Renee Quenneville, Pierce County Public Works
Cort Daniel, Pierce County Information Technology

WORKSHOPS

Several opportunities to acquire additional training were provided during the conference.

An Esri Hands-On Learning Lab was provided that included 19 self-paced, one-hour lessons ranging from *Intro to ArcGIS for Desktop* to *Designing Web Applications using ArcGIS for Server*. The lessons included a recorded lecture followed by a hands-on exercise, and the lab was staffed by Esri instructor Jack Horton.

Half day and full day technical [workshops](#) were also attended by record numbers of attendees. Topics included:
Data Capture for Asset Management Using Smart Phones/Tablets
An Overview of SQL Reporting for GIS
ArcGIS Online "Unconference"
Extending ArcGIS for Desktop Using Python and .NET Add-Ins (Part l)
Asset Management: Planning, Strategy, and Implementation
Intermediate Python: tips and tricks to take your programming to the next level
ArcGIS WebApp Builder: JavaScript Apps Made Easy
Extending ArcGIS for Desktop Using Python and .NET Add-Ins (Part II)

SPECIAL SESSIONS

There were numerous focus meetings including a Leadership Meeting, WA Women in GIS meeting, and themed lunch tables where attendees could discuss topics of common interest over a buffet lunch.

SOCIAL EVENTS

Events were many and varied so there was something for everyone!

They included the vendor reception, a 6:30 AM Fun Run through downtown and Oldtown Tacoma, and a more reasonably-timed evening Social, held where else than [The Social Bar & Grill](#) in downtown Tacoma. Activities and prizes were provided, and the theme of Communicating Our World was experienced and practiced by all on a warm spring evening on the waterfront within clear view of Mt Rainier.

CLOSING PLENARY SESSION

Throughout the conference, the "Thought Leaders" and the "Contribution Collection Stations" were gathering ideas regarding the conference theme, **Communicating Our World.** Attendees recorded ideas on the public idea boards and then rated them throughout the conference. The closing session was the culmination of all of these opportunities to share ideas, discuss issues, and highlight opportunities for each attendee to grow and share their knowledge with others. David Howes was the Master of Ceremony for the closing session, encouraging participation and guiding the conversation forward to the following takeaways:

1. **Standards and best practices**: Document business needs and practices; also as important, document what not to do (lessons learned); learn effective project management and prioritization; apply executive decision making; do ROI's to help decision making; ensure good communication!
2. **GIS turf wars**: In some cases, issues exist between IT and GIS professionals. These are often caused by lack of understanding or knowledge about the requirements they each face. Similar differences can exist between GIS and CAD users. In both situations, GIS professionals can set the example by "walking a mile in their shoes", taking courses to increase knowledge about these fields, and in general, learning to work toward positive resolutions.
3. **Become the GIS Yoda**: Calling all GIS evangelists! Your mission: to expand GIS to a broader audience; show people how they can use it (or already do use it and don't realize it); remember GIS is very diverse; avoid esoteric GIS jargon; create metadata and documentation; facilitate interagency cooperation; and inspire and encourage others to become GIS leaders.
4. **Education and interaction**: Obviously this is critical to individual growth both for students and mentors, as well as the field itself. GIS professionals should serve as course advisors, and present real-life topics like how to find a GIS job; work with local schools to get GIS into the K-12 classroom; seek out GISr's who need mentors and create opportunities to share knowledge; and ensure that conferences like WAURISA continue to include professional development and opportunities for continued learning.

In short, GIS is a career of lifetime learning with its ever-changing technologies, and no limit on the fields and research that it can contribute to. GIS certification and ethics require that each GIS professional contribute to the field, grow its use and explore the limits of its applicability, and share knowledge with others. Key points that the attendees determined should guide their efforts over the next year were:
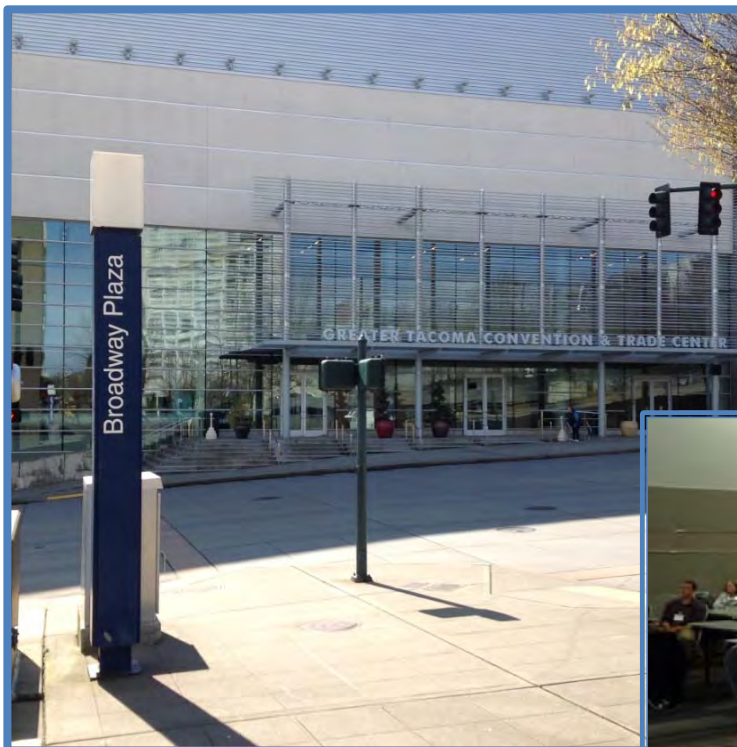
- Walk a mile in their shoes
- Create an inspiring teachable moment
- Be a mentor to the education community

Thanks to everyone that participated in the closing session and made it a lively discussion that wrapped up a great conference. See you next year!

CONFERENCE PHOTOS

Additional Photos

PAPER/PRESENTATIONS

Citation format (Ordered by presentation title):

Paper title (presentation/paper hyperlinks provided)
> ***Author(s), company*** *(in alphabetical order and email address hyperlinked if available)*
> Author(s) Biography
> Abstract

A proposal for national GIS data sharing - What does it mean for Washington State? (Panel discussion)
> ***Greg Babinski***, *King County*
> Greg Babinski, GISP, is the Finance & Marketing Manager for the King County GIS Center in Seattle, where he has worked since 1998. Previously he worked for nine years as GIS Mapping Supervisor for the East Bay Municipal Utility District in Oakland. He holds an MA in geography from Wayne State University. Babinski is Past-President of URISA and Chair of URISA's GIS Management Institute Committee. In 2005 he founded The Summit – the Washington GIS Newsletter. In addition to GIS consulting, he is a GIS researcher, author, and instructor. He has spoken about GIS across North America, Europe, Asia and Australia.
>
> ***Tom Carlson***, *USGS*
> Geographer - Geospatial Liaison NW Region, United States Geological Survey
>
> ***Josh Greenberg,*** *Skagit County GIS*
> Senior GIS/RS Analyst, Skagit County
>
> ***Karl Johansen,*** *Port Madison GIS*
> Principal, Port Madison GIS
>
> ***Nancy Tosta,*** *USGS*
> United States Geological Survey
>
> ***Ian Von Essen,*** *Spokane County*
> GIS Manager, Spokane County
>
> *Abstract:*
> This panel session will discuss a new proposal to develop a national data sharing infrastructure and what it might mean for Washington state at the Federal, state, and local levels.
> In March 2014 the URISA GIS Management Institute published URISA GMI Discussion Paper #1 titled *A Distributed Model For Effective National Geospatial Data Management: Building A National Data Sharing Infrastructure.*
>
> This paper was authored by:
> • Jim Sparks, Geographic Information Officer, State of Indiana
> • Philip Worrall, Executive Director, Indiana Geographic Information Council
> • Kevin Mickey, GISP, CTT+, Director, Geospatial Technologies Education, The Polis Center

The paper abstract states, in part:

• Geospatial professionals have developed vast quantities of data, but the potential value is often unrealized.

• Congress has recognized the challenge of coordinating and sharing geospatial data from the local, county, and state level to the national level, and vice versa.

• Congress explored issues of geospatial information in hearings during the 108th Congress. However, the issues were not resolved.

• The paper examines impediments to effective data development and data sharing and offer solutions that reflect the employment of effective coordination, carefully directed funding, and the application of current information technology tools and strategies.

• The paper examines the various roles of Federal, state, and local governments in regard to data creation and maintenance, and link these roles to strategies that have produced successful initiatives. It suggests a national strategy for geospatial data that benefits local agencies, states, and the Federal government.

This is an extremely important paper and the ideas deserve understanding and discussion at the national, state, and local levels. The paper authors are soliciting comments which will be discussed during the URISA Annual Conference GIS-Pro 2014 in New Orleans.
To develop and refine comments for the authors, this 90 minute panel session brings together perspectives from across each level of the state.

An Introduction to Geocortex and Building Esri-based Mobile and WebGIS Applications

James van Dyk, *Latitude Geographics*
Since 2008 James van Dyk has been the Pacific Northwest Account Manager for Latitude Geographics. Founded in 1999, Latitude Geographics is an Esri Platinum Partner with over 1,000 clients around the world that use Geocortex software to quickly deploy feature-rich, off-the-shelf mapping applications using ArcGIS.

Abstract:
Hundreds of organizations rely on Geocortex software from Latitude Geographics to simplify building and maintaining ArcGIS mapping applications using technology like Silverlight and HTML5. Geocortex is used on desktops and mobile devices, providing both simple and sophisticated applications for users to easily interact with an organization's spatial data. In this introductory session learn how Geoocortex accelerates desktop and mobile application deployment and see a live demonstration of the out-of-the box tools that ship with Geocortex. Learn about recent product developments and cutting-edge features like disconnected feature editing on mobile devices, integration with ArcGIS Online web maps, and more.

Analyzing the Effectiveness of Deforestation Policies within Mount Halimun Salak National Park

Stephan Gmur, *University of Washington*
Stephan is a PhD student in the School of Environmental and Forest Sciences. His studies center around the understanding of what drives the growth of tropical forests. His latest studies explore the link between policy and deforestation within a national park on the island of Java in the country of Indonesia.

Abstract:

Studies seeking to understand deforestation within tropical forest protected areas (PA) have shown that targeted policies have effectively slowed the overall rate of deforestation. Spatial analysis was used to explore deforestation within the Mount Halimun Salak National Park (MHSNP), located 60km from the world's second largest metropolitan area, Jakarta, the largest PA on the island of Java in Indonesia.
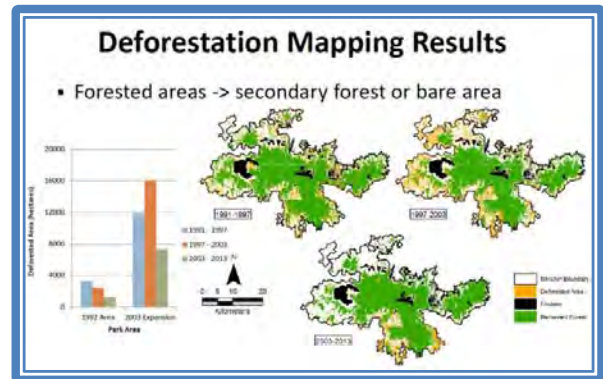
The MHSNP area was first protected by the Dutch colonial administration in 1929 then formally created and managed by the Ministry of Forestry in 1992. In 2003 the park was expanded to its current day boundaries and 2005 policy implementation sought to involve stake holders in a collaborative management paradigm to increase conservation effectiveness. Land use zones within the park: core, culture, rehabilitation, special training & research, use and wildlife have been designated to meet these interests.

This study tested the relative performance of policy implementations against deforestation using passively collected remote sensing data to map the extent of forest cover from before the creation of the park in 1991 to 2013. The rate of deforestation within the park from 1992 to 2003 slowed relative to the rate of deforestation in the surrounding production forest. Comparison of deforestation from 2003 to 2013 between strict conservation areas of core and wildlife areas versus all other uses was undertaken.

Results characterize how policy within PAs can meet the conservation needs while still meeting the needs of local people. Specific zones within PAs allow for utilization of resources to be contained, allowing other forested areas to regenerate. Use of passive remote sensing and spatial analysis methods helps communicate the additionality of deforestation policies implemented by forest managers.

ArcGIS for Open Data

Scott Moore, *Esri*

Scott Moore is a Solution Engineer with Esri and currently works in the Olympia regional office. He earned a bachelor's degree in Geography with a focus on GIS from the University of Washington in Seattle in 1998. Prior to joining Esri, he was a Senior GIS Analyst and GIS Manager for the City of Chandler, Arizona.

Abstract:

The principles of Open Data mandate that data should be; discoverable, explorable, accessible, and easy to use for collaborative purposes. ArcGIS Online is ideally positioned to support the principles of Open Data.

Beginning in March, a new application will be available with ArcGIS Online providing GIS professionals with the tools to deploy and support Open Data web sites. ArcGIS for Open Data is a customizable web application that enables data publishers to make their data discoverable, explorable and accessible by public users, business users, and software developers.

[Asset and Infrastructure Mobile Mapping](#)

Chris Aldridge, *David Evans and Associates, Inc*
Chris is a certified photogrammetrist with 29 years of experience in photogrammetry. He is the current President of the Columbia River Region of the ASPRS, and a member of the Professional Land Surveyors of Oregon and the Society of American Military Engineers.

Abstract:

This presentation will focus on AIMM, which is a photogrammetry-based, terrestrial data collection system.

[Cartography and Composition of Interactive Maps](#)

Karsten Vennemann, *TerraGIS*
Karsten Vennemann is a GIS professional with a background in Geography and Soil Science. His work mostly focuses on GIS in the context of natural resources, sustainable development and social justice. In 2007 he started his own company, Terra GIS based in Seattle. He teaches classes in Open Source GIS and a good portion of this consulting work involves creating and supporting Open Source based Web GIS solutions. Karsten has been a frequent speaker at GIS conferences and is currently writing a workbook about Open Source Web GIS.

Abstract:

Web mapping and associated technologies have been evolving rapidly over the last two decades and especially quickly over the last several years. With the advent of free and commercial services map services and APIs such as Google, Yahoo, Bing, MapQuest, and Open Street map it became easy for an entire generation of web map designers and developers to quickly spin out web maps, mash-ups and spatially enabled apps for use on a growing number of digital output devices.

While the technology to create ever growing numbers of applications and interactive maps has been mastered by this community, there has been a lack of comprehensive resources and research that cover aspects of cartography and composition of maps that are specific to the respective output devices, especially the differences compared to traditional cartographic media (paper maps). Several freshly published articles and books are targeting to close this gap and building on these new resources the talk will focus on summarizing general principles and considerations of interactive map cartography and composition related to interactive media.

Composition in this context refers not only to the graphical design, layout and map element placement (e.g. legends, scale bar, map tools) of the map, but also includes the considerations regarding choice of map elements and their functionality on the interactive map. Differences in map design and cartography as they apply to
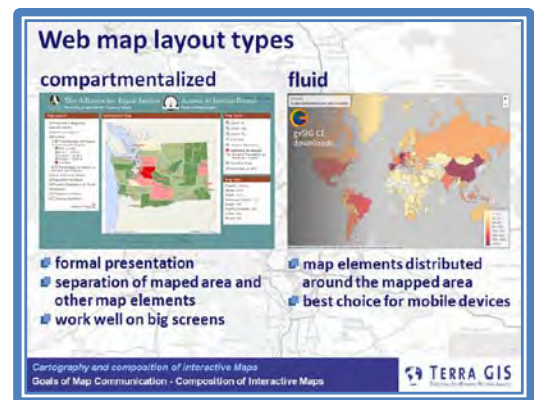
traditional (static and paper maps) and interactive maps will be discussed without going into detail about specific software to be used in their technical implementation.

In order to create useful interactive maps it is essential to design the map, its cartography, map element composition & functionality, and layout in a way that clearly communicates the purpose of the map to the expected user audience.

Central Pierce Fire Goes Mobile with Fire Hydrant Inspections

Greg Heintz, *Pierce County GIS*
Greg is a native of Washington and attended WWU in Bellingham majoring in Geography with a minor in business. He is happily married and has two sons, and has been employed by Pierce County GIS for almost 19 years specializing in asset collection and its integration with GIS.

Chief Radcliffe McKenzie, *Central Pierce Fire & Rescue*
Chief McKenzie has been married for 17 years, employed with Central Pierce Fire & Rescue for 20 years, and is a US Army Veteran. He grew up in New York City, and is an avid Seattle sports fan.

Abstract:

Central Pierce Fire in Pierce County, WA needed a paperless and affordable mobile solution for fire hydrant inspections. Their current process of using paper inspection forms for inventorying hydrants proved to be burdensome and inefficient. Many ineffective work processes existed such as managing hydrants in multiple databases, inspecting hydrants unsystematically, inventorying hydrants via paper forms, transcribing hydrant information to office computer, and updating hydrants through multiple databases.

In an effort to eliminate these inefficiencies, Central Pierce Fire contacted Pierce County GIS to help remedy the situation. Considering budget constraints, Pierce County GIS proposed a low-cost mobile solution using ArcPad 10 and a mobile device. Before creating an efficient and user-friendly hydrant inspection process, PCGIS standardized the existing hydrant inventory database, which had numerous look-up codes, inconsistent data values from multiple inspectors, and data entry errors. PCGIS standardized the existing hydrant inventory database by creating attribute domains in ArcGIS. This eliminated the need for paper inspection forms and simplified inspector data entry.

Utilizing ArcGIS's ArcPad Data Manager, the hydrant geodatabase was simply checked out for use on the mobile device at the beginning of the day and checked in at the end of the workday. In addition, the new mobile solution allowed for a logical and systematic hydrant inspection process in the field. After purchasing ArcPad 10 for under $700 and utilizing the software on an existing laptop, Central Pierce Fire recognized a 10-15% increase in hydrant inspections in the summer of 2013.

Finally, after implementing this paperless hydrant inspection process, many work processes have been improved such as tracking crews work progress, tracking workflow by water purveyors, producing accurate hydrant reports by purveyors, and maintaining one data source for all hydrants.
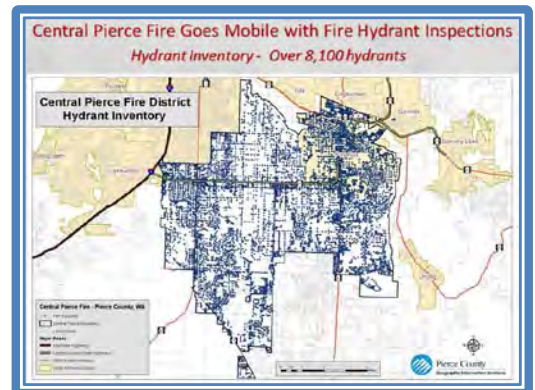
City of Seattle GIS Applications: Meeting Today's Needs

Harvey Arnone, *City of Seattle*

Harvey Arnone is the supervisor of GIS Applications development at Seattle Public Utilities. He has been with the City of Seattle since 1992 and over the years has been involved in GIS implementation, data maintenance, and applications development. Harvey holds a BA in Geography from the University of Washington and is in his seventh year as an instructor in the University of Washington's GIS Certificate Program.

Dana Trethewy, *City of Seattle*

Dana Trethewy received her Master's in Watershed Resources from the University of Arizona and has spent the last 15 years working as a release manager, product manager and GIS analyst in various domains including software development, natural resources, consulting services and transportation. Her role as a GIS Lead for City of Seattle's Department of Transportation includes data, application and service support within the organization.

Reuben Omelanchuk, *Seattle Police Dept*

Abstract:

Communication of accurate, current and meaningful information has been central to the purpose of the City of Seattle's GIS since its inception in the late 1980s. As technology has advanced, and as the City's business needs have changed, the communication role GIS plays has broadened significantly. The central communications issue of the 1980s and early 1990s was that of communicating across departments and between office and field staff.

In addition to these needs, the contemporary application of GIS at the City of Seattle addresses a variety of communication opportunities not possible in earlier years. The focus of GIS in recent years has been to:

- blend and present data from a variety of business systems,
- enable one-way and two-way communication with the public, and
- encourage communication and collaboration between the City of Seattle and other agencies.

This presentation will discuss these aspects of communication and demonstrate several custom applications developed by Seattle Department of Transportation, Seattle Police Department and the Seattle Public Utilities.

Classifying Data – the Challenge of Managing Statewide Data on Recreation and Culture in a Singe Framework

Jennifer Hackett, *Manastash Mapping*

Jennifer Hackett lives in Ellensburg, WA. She runs Manastash Mapping and is currently launching a new project, Washington Hometown, devoted to helping people explore, share, and learn about Washington State. She has a BA from Carleton College, an MS in Resource Management from Central Washington University and spent 16 years working for the Department of Defense as an analyst and manager before moving to Ellensburg. Her primary interests are data management and using GIS to help

communities share their stores. She is also involved in promoting the use of GIS in K-12 schools.

Abstract:

In order to make a map, you need to be able to symbolize information meaningfully, which means that you have to group your data into relevant categories. This can be challenging. Schools or campgrounds can be mapped with a single icon, but you still have to decide what constitutes a school: is it just K-12, or does it include a dance academy. Is a campground any spot where you are allowed to camp or just places with specific camping facilities? Are a primitive campsite, a fishing access point that allows camping and a formally designated campground all campgrounds?
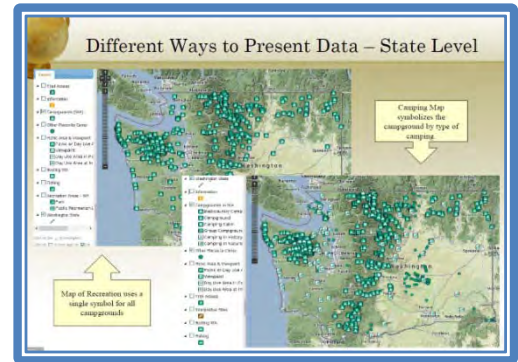
Dividing a single category (K-12 education or campgrounds) into smaller categories becomes even harder. If you classify K-12 schools as elementary, middle/junior or high school, what do you do with a school that is K-12, K-8, or an alternative school? Should you base classifications on the terminology of the managing agency?

In Wenatchee National Forest, a horse park is a road-accessible campground that has facilities for horses, but in North Cascades National Park, a horse campground is a backcountry campground with horse facilities that cannot be reached by road. The same terminology refers to a very different type of camping experience.

At Washington Hometown, we are building a single data set of recreation and cultural resources that covers all of our state. In order to do this, we have to organize places managed by different agencies and in different regions into a single framework. We will talk about the classification system we are developing, the challenges we have encountered and how this system will help us create maps that meet the needs of many different users.

Communicating Quality Part 1- How Good are Your Data and Analyses? (Framework)

***Duncan Munro**, Seattle Public Utilities*

Duncan is a Technology Program Manager with Seattle Public Utilities (SPU), a department of the City of Seattle. He has worked as an acquirer, steward and manager of information in support of business processes in various organizations ranging from international government agencies to small start-up technology companies. Duncan's current focus is on leading engagement between business process owners and technology enablers in managing and governing the information life-cycle.

Abstract:

Presentation of geographic information in map form assumes that underlying elements of information have known bounds of quality. While cartographic presentation may purposely compromise some elements of information quality, such as locational accuracy, in the digital era we expect that we can drill down to specific attributes of our information and retrieve a representation of the true position and nature of an object.

Early geographic information quality paradigms focused on locational and thematic quality but alternative models of quality have emerged in the context of the discipline of enterprise information management. These models are more holistic in their approach to defining and measuring information quality. We consider here how one such model may be developed for the geographic information resources of Seattle Public Utilities, focusing on the capability to communicate the fitness for purpose of the available information resources.

A set of data quality dimensions (e.g., McGilvray, 2008) allows the management of information quality throughout the information lifecycle and the measurement of performance against quality benchmarks for the specification, acquisition, management, application and retirement of information resources. In this way, we can deal with the complexity of modern GIS implementations. For example, the approach allows us to define a Data Specifications quality dimension that measures the existence, completeness, quality and documentation of data standards, data models, business rules, metadata and reference data. A consumer can reference this dimension to explain how real world objects are represented.

Once information is acquired, in the management phase of the information lifecycle, the Consistency and Synchronization dimension measures the equivalence of information that is used across various data stores, applications and systems and the processes for making information equivalent. In the application phase, the Timeliness and Synchronization dimension communicates to consumers the currency of information and the expected time frames in which they become available.

Communicating Quality Part 2- How Good are Your Data and Analyses? (Data)

Stephen Beimborn, *Seattle Public Utilities*

Steve got his start in GIS as a summer work-study student in 1983. Following twelve years in the environmental consulting business, he moved to Seattle Public Utilities, where he has served as a cartographer, analyst, developer, and supervisor. He currently serves as Manager of the GIS Section. In thirty-one years working in GIS, Steve has never experienced a dull moment nor a lull in the demand for GIS to meet the needs of any complex organization or inquisitive individual.

Abstract:

Within the GIS Section of Seattle Public Utilities, maintaining and enhancing the quality of the Utility's GIS data has always been a top priority, though our practices for doing so have evolved organically. From customer surveys, service desk calls, user group discussions, consultant reviews, and other means, we have a good sense of where we are doing well and where we could improve, but we still have difficulty answering the basic question: How good are the GIS data?

What is the basic vocabulary for communicating about data quality? How can one measure it or manage it? The McGilvray Data Quality Dimensions provide a standard framework for assessing the current state of our GIS data and our practices for maintaining and enhancing the quality of the data.

This presentation will focus on each of the individual data quality dimensions and give examples of our current management practices for addressing each dimension. We will also present a preliminary assessment of where gaps exist and what actions should be taken to address them.

[Communicating Quality Part 3- How Good are Your Data and Analyses? (Analysis)](#) & [(paper)](#)

David Howes, *David Howes, LLC*

David specializes in the development of GIS tools, processes and supporting infrastructure for a variety of clients from small operations to multinational corporations (www.dhowes.com). With 23 years of academic and private sector experience in the UK and US, including an M.Sc. in GIS from the University of Edinburgh and a Ph.D. in Geomorphology from SUNY Buffalo, David's background is well-suited to developing innovative solutions to spatial problems. He is the founder of the Lone GIS Professional Initiative, helping GIS professionals working on their own or in small groups help each other, and is a Washington URISA Board member.

Abstract:

If you're in the business of providing clients or members of the public with the results of GIS-based analysis, it's in your interests to maintain records of exactly how your deliverables were developed. Public scrutiny and the threat of litigation are strong motivators for keeping such records, yet, fortunately, many of us are rarely, if ever, faced with them. Of course, that doesn't lessen their importance and, if a request did come up, how effective would you be at explaining precisely what you did months or years ago? The reality is that, compared to generating a map or creating an application, documenting processes is not very stimulating. A framework for thinking about the requirements may help.
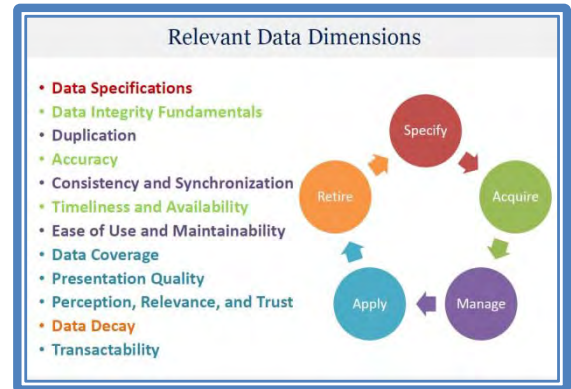
In "Executing Data Quality Projects: Ten Steps to Quality Data and Trusted Information" (Morgan Kaufmann, 2008), Danette McGilvray provides a set of "data quality dimensions," each of which may be used to "define, measure, and manage the quality of data and information." Examples include "ease of use and maintainability", "accuracy" and "perception, relevance and trust." Would it not make sense to apply this way of thinking to our analyses and processes, as well as to our data? Could such an approach help us be more accountable to ourselves and those we serve? Could it make us more efficient? The purpose of this presentation is to explore these questions and, potentially, help prepare us for the moment when the call for details comes. That call may not be a legal one, which could be rather frightening, but could be just an attempt to remember what we did a couple of weeks ago. Regardless of the situation, any attempt to make the response less onerous and more efficient seems worthwhile.

[Communication Breakthrough with Web Maps](#)

John Edwards, *Seattle Public Utilities*

John has 7 years of GIS experience and is a new team member at Seattle Public Utilities.

Albert Gonzales, *Seattle Public Utilities*

Albert has 18 years of GIS experience at Seattle Public Utilities, starting as an intern and now managing the GIS Products & Services team.

Abstract:

Using Esri's ArcGIS Online, the City of Seattle has implemented a platform that enables webmasters, GIS professionals, and business users alike to easily develop web maps and sophisticated mapping applications. This presentation will recap the steps the City took to develop an operational ArcGIS Online environment and show examples of how users throughout the City are taking advantage of that work to easily communicate with each other and their customers.

This presentation will appeal to anyone looking to learn from the experience of an agency that has successfully implemented a full-featured ArcGIS Online for Organizations site.

Creating a Watershed Acquisition Suitability Model - Lake Whatcom Watershed, Bellingham WA

Kate Newell, *City of Bellingham*

Kate Newell is a GIS Analyst with the City of Bellingham in the Planning and Community Development Department. Kate has 12 years of GIS experience and earned her GISP in 2012

Abstract:

The City of Bellingham Watershed Acquisition program began in 2001 with the directive to purchase available land in the Lake Whatcom Watershed to insure pure drinking water.

Prior to creation of this GIS-based acquisition model, multiple boards and agencies had evaluated properties on an individual level using a very confusing, non-technical and time consuming "Ranking Sheet". This ranking sheet failed to look at the properties as a whole and effectively and equally compare properties to one another.

The model uses real-time and objective GIS data to score and ultimately rank appropriateness of property acquisition on a watershed-wide level. Values assigned to data/criteria were derived from qualified staff and advisory board members. Finding consensus on the included data and associated values was one of the most difficult portions of model development.

This talk will discuss the processes of building consensus, working with multiple departments/agencies, creating the model, effectively communicating the technical aspects to non-GIS staff, and will look into the technical details of the model. The Watershed Acquisition model was created in python and run as an interactive script tool in ArcGIS Desktop.
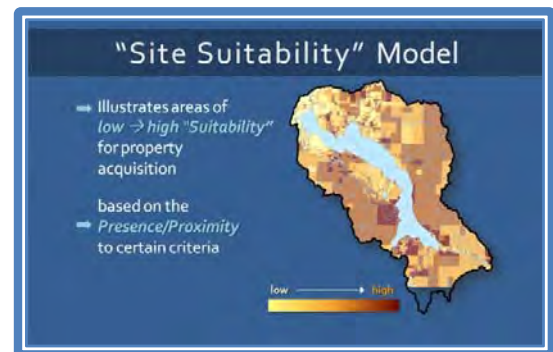
Creating Evidence with GIS for Environmental Planning

Joel Masselink, *Earth Logic LLC*

Joel Masselink is a Principal with Earth Logic, LLC, a new consulting company in Seattle. His expertise is using GIS, modeling, and remote sensing for conservation, environmental assessment, and resource management applications.

Abstract:

Starting with examples from Cambodia and DR Congo, cursory analysis of freely available land use data provokes important questions related to development priorities and processes. Analysis and subsequent decision-making is seriously inhibited by the lack of available baseline data.

In contrast, GIS analysts in the Pacific Northwest have an abundance of spatial data available and opportunities to conduct analyses on complex data in order to address environmental sustainability issues. Whereas spatial data creation may be of generic value, further data analysis and development of scenario models adds value to GIS by efficiently highlighting important sustainability issues.

This presentation will demonstrate examples of how GIS data has been analyzed and used to develop models of future development to better inform decision-making. Furthermore, this presentation will highlight gaps where environmental assessment efforts have been limited to spatial data collection and basic mapping, and thus GIS is under-utilized as an analysis and decision making tool.
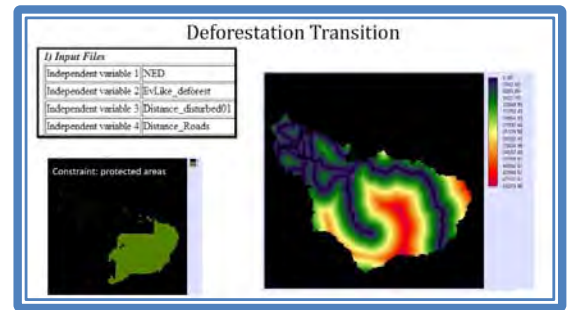
Crowdsourcing Invasive Species Data in Washington using Native Mobile (iOS / Android) Apps

Mike Leech, *Spatial Development International*

Mike is a Project Manager for Spatial Development International (SpatialDev), a Seattle-based custom geospatial software solution development company that uses mapping technology in support of sustainable environmental, social and economic development locally and internationally. Mike has been working closely with state agencies and local jurisdictions in Washington to implement web and mobile solutions for natural and water resource applications. Mike received his Master's of Science in Geography from Western Washington University.

Abstract:

Invasive species can devastate biological diversity and the natural resource-based industries that rely on it. These species threaten biodiversity, habitat quality, and ecosystem function and are believed to have contributed to the decline of 42% of the endangered and threatened species in the United States. In Washington, the realized and opportunity costs of non-native species invasions are in the millions of dollars each year.

While invasive species inventories provide State agencies, local governments and tribes with vital data to consult when managing their watersheds and natural resources, creating and keeping an up-to-date inventory is a time consuming and resource intensive process. Additionally, local governments (specifically County-level noxious weed boards) often do not have sufficient financial backing to support survey, monitoring and control of invasive species in the region.

[Data Collection using ArcGIS for Mobile](#)

Harkeerat Kang, *King County*

Harkeerat Kang is a GIS Specialist, Senior with the King County Information Technology (KCIT). She's worked with the county since 1999 as a GIS professional. Her projects include GIS web based applications using AGS Javascript API, ASP.NET and SQL Server web applications. Some of her key projects with the county are Groundwater Program application, Flood Photo viewer, Salmon Watcher monitoring site viewer, Transfer Development Rights property map, developing and managing Park Facilities and Properties applications and Rivers Facility Inventory applications.

Abstract:

       Stormwater facilities are engineered facilities designed to convey storm runoff, remove pollutants and control flow rates. These systems contain pipes, ditches, filters, ponds, underground tanks and vaults. This infrastructure works together to control and treat storm runoff, which reduces flooding and prevents pollutants from entering streams and other water bodies.

       King County staff inspects facilities periodically to ensure safety and proper function. Field staff performing inspections will benefit from accurate location and attributes on a mobile device.

       The King County Stormwater Services section wanted to create a complete GIS inventory of their facilities and chose to use ArcGIS for Windows Mobile for field data collection. Field staff collects data for over 20 layers. The staff uses Windows tablets, which feature bigger screens.

       The basemap, imagery caches and project data are saved on the devices, allowing field personnel to work in a disconnected environment. Data is synchronized daily with a SDE database when the staff returns to the office.

       I will discuss the development process, challenges and lessons learned through the implementation of the project.
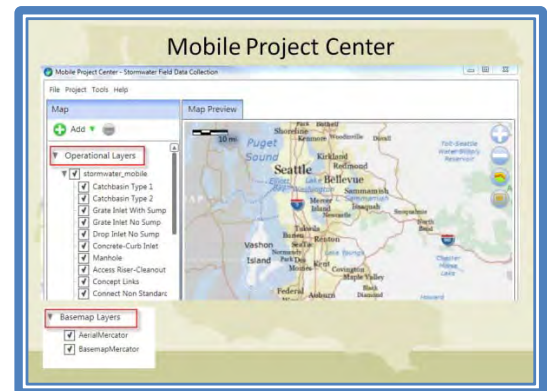
[Easy Data Visualization and Interactivity with Google Tools](#)

**Jeff Holcomb**, *Thurston Regional Planning*

Jeff has a B.S. in Geography from Utah State University. He is a self taught HTML & Java Script programmer. He has almost 20 years of GIS and map production experience back to the AML days. He also has more than 10 years of web map development experience. He has an interest in data visualization techniques to make data more compelling and understandable to the general audience. He has worked with Google's mapping and data tools for the past few years to create such products as the Thurston Co. Bicycle Map and the Sustainable Thurston Searchable Actions Database.

Abstract:

       Data visualization and interactivity are becoming more expected and valued in presenting data via the web. The days of static PDF maps have long ended and most GIS organizations now have at least some interactive mapping capability. This is not true, however, for most tabular data which is often available for download only as a simple Excel file with values in rows and columns. These spreadsheets while perhaps useful tend to be rather boring and don't really convey the story or narrative one is trying to present with the data. User interaction with the data is often limited and

unsatisfying.

Commercial products available for data visualization are expensive and developing your own solution requires advanced programming skills. Free, open source data tools provided by Google including Google Docs, Google Fusion Tables and Google APIs for Charts, Visualization & Maps are an easy & cost-effective resource. You can create appealing and illustrative charts, interactive filtering & querying capabilities, and spatial mapping abilities relatively quickly with only basic HTML and Java Script.
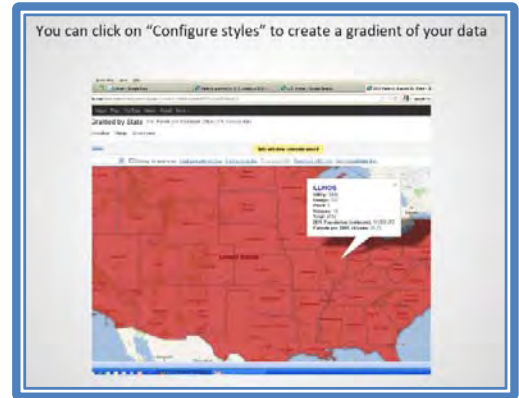
Fusion Tables provides geocoding abilities to add a mapping component to any dataset with a coordinate or address field and can be exported as a KML file for use in other GIS software. All datasets are stored in the cloud allowing for viewing over the web by anyone with a browser. The Visualization and Charts APIs provide the ability to create interesting and informative charts and graphics from your tabular data. The Maps API allows you to easily display your data over Google's basemap and imagery (including Street View), and also provide address search and directions capability.

Data visualization using Google's tools can significantly improve user interaction and satisfaction with your data making it more likely to be understood and appreciated.

Equity, Social Justice & the King County Way: Systematically Measuring Access to Community Resources

***Mary Ullrich**, King County*

Mary is an instructor of Esri software at King County, and enjoys keeping folks current with ArcGIS products. When not teaching, Mary is a GIS Specialist tasked with everything from creating project planning ArcGIS Online web maps to making Census data reveal its secrets. When not at work, Mary loves spending time with her family at the beach during low tide. Their goal: find (and map!) moon snails that are the size of cantaloupes.

Abstract:

King County joined the STAR network as a Pilot Community in November 2012. By using the GIS analysis techniques suggested in the STAR Communities' Technical Guide, which includes "Equity & Empowerment" among its goals, King County learned how well its services were reaching the community.

In turn, through its role as a Pilot Community, King County helped refine the Technical Guide so that similar communities throughout the country can benefit from a systematic measurement of their services.

[Ethics of GIS: Just Because You Can, Should You?](#)

Kelly Alfaro Haugen, *Thurston County Geodata Center*

Kelly is a GIS Analyst II for the Thurston County GeoData Center, 2007 to present, with over 10 years of experience in both the private and public sectors working with GIS data, analysis, cartography and education. Kelly graduated from Central Washington University in 2000 with a B.A. in Geography, focusing on GIS.

Abstract:

This talk highlights the ethical issues we face as GIS professions being asked to produce maps and data to support, defend, oppose or question a myriad of potential positions. It is a quick peek at the things we know, think we know and may not have thought about. It asks the viewer to think about how to identify ethical issues, and communicate them to our project partners and customers, ultimately resulting in how we "Communicate our World".

This talk incorporates topics addressed in "How to Lie with Maps" by Mark Monmonier, The GIS Certification Institute "Code of Ethics", and cases of GIS ethical dilemmas.

## [Evolution of a map - The Tacoma Smelter Plume](#)

Ian Mooser, *WA Department of Ecology*

Ian is the GIS Manager at the Toxics Cleanup Program within the Washington Department of Ecology.   He is a professional geographer (GISP) who has broad range of interests that focus on the application of GIS and remote sensing, environmental analysis, and GIS application development. Currently, Ian teaches an introductory GIS class at a local college. Prior to working for the Dept. of Ecology he worked as a contractor for the Environmental Protection Agency (EPA), taught as a GIS graduate assistant, and worked for several agencies in Oregon.

Abstract:

The Washington Department of Ecology uses maps for public outreach about Arsenic contamination and to work with local jurisdictions. Where did this Arsenic come from? It came from the Asarco copper smelter. That operated for almost 100 years in Ruston, Washington.

This is a look at Arsenic maps used by the Department of Ecology this includes "Dot maps" (2003 Credible Evidence Report), "Voronoi diagram"(2005 PGG Report) and the new "Geostatistical model & Monte Carlo Simulation" map (2014), as well as some historical Arsenic maps (circa 1970's to 1980's).
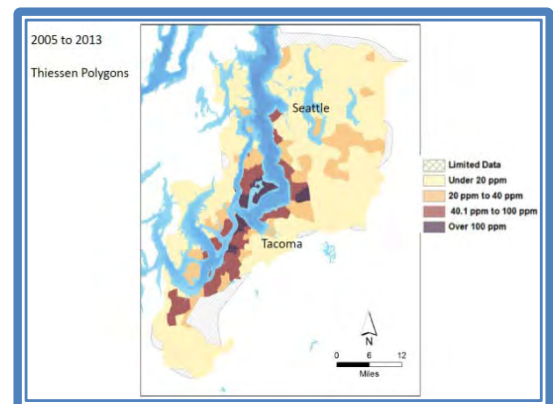
Grappling with Goliath

Craig Hanson, *Windward Environmental*

Craig Hanson has 18 yrs experience in GIS analysis, spatial statistics, geographic data management, and cartography, applying his GIS skills in the fields of health research and environmental regulatory and compliance support. He currently manages the GIS operations for Windward Environmental, a full-service environmental consulting firm in Seattle, in addition to serving as the GIS lead on several of Windward's large and small projects.

Abstract:
1 Report
271 Maps
100 Featureclasses
58 Data Tables
3 Raster Data Sets
5 Orthophotos
3 GIS analysts

How did three GIS analysts at a small environmental consulting firm build the largest map folio in the company's history and then double it without ending up in the psychiatric ward? By relying on the fundamentals: organization, standardization, and communication.

Windward Environmental LLC submitted the 800-plus-page final remedial investigation report (RI) to the Washington State Department of Ecology and the US Environmental Protection Agency. The initial draft of this report had 112 maps. Prior to the production of the draft RI report, the average number of maps included in a Windward document was around 20, with the majority having fewer than 10.

The process of scaling up to 112 and then to 271 maps – with all of the attendant data exploration, analysis, reviewing, commenting, data and file management, quality assurance/quality control, and cartographic issues – involved establishing layout, symbolization, and data handling standards; a rigorous but flexible map, data, and comment tracking system; and constant communication between the clients, the project scientists, and the GIS team.

How M2M Technologies add Value to GIS

Elizabeth Marshall, *MarshallGIS*

Founding Chair of WAURISA, CEO of northwest-based GIS software development company for 20 years. Esri Foundation partner and Verizon M2M partner.

Abstract:
Many agencies that use GIS do so because the resources they manage are complex and cover large areas. This paper explores the value added by bringing 'machine to machine' or 'internet of things' solutions to GIS. Typically our distributed resources are being managed by staff that are mobile for a significant part of their day. We will review methods for integrating vehicle locations, staff locations, and real time vehicle engine and onboard system data to GIS. In addition we will explore what level of GIS integration is needed for this machine data to be useful.

How to Setup and Manage Spatial Assets with ArcGIS Online for a Mobile Workforce

Matt George, *Pierce County*

GIS Programmer Engineer GISP - Pierce County GIS IT Applications / PW Road Operations. Focus on GIS mobile operations with iOS smart devices; planning and operations with core infrastructure roadside assets; integration of CMMS work order systems with spatial datasets; Emergency Operations planning and tactical applications and first responder teams; and mobile deployments for large work crews covering Pierce County Public ROW. Accomplishing all this using ArcGIS, spatial databases, GPS, ArcGIS Server, ArcCollector and ArcMap for iOS, Trimble, Pathfinder Office, and custom Sencha Touch mobile applications.

Mike Johnson, *Pierce County*

Pierce County Public Works and Utilities Road Operations. Focus on GIS mobile operations with iOS smart devices; planning and operations with core infrastructure roadside assets; integration of CMMS work order systems with spatial datasets; and mobile deployments for large work crews covering Pierce County Public ROW. Accomplishing all this using ArcGIS, spatial databases, GPS, ArcGIS Server, ArcCollector and ArcMap for iOS, Trimble, and Pathfinder Office.

Abstract:

How to choose a spatial asset GIS content management system to responsibly maintain core assets with so many options to choose from? Are you ready to extend the reach of your mobile workforce to allow real-time database connectivity without sacrificing data integrity or security?

With so many platforms, cloud choices, and mobile devices to choose from it can become confusing what is needed. What do you look for in a GIS system to accomplish the task of editing and updating asset data in real-time with the least impact to your workflow without present limiting factors for your organization down the road? How do you get data in and out of one system if you want to use it in another or in a different capacity? How do you setup a central database so your mobile workforce can use Smart devices securely on your network with ArcGIS Online?

Advances in technology have allowed Pierce County Public Works Road Operations to migrate standalone map layers into an enterprise spatial content management system using ArcGIS Online and Server.

Want to know how to share your data for operations, peer and public view? In recent years making your data available for public outreach has become a planning requirement to promote transparency.

We can show you where the dollar is being spent down to the asset level with ArcGIS Online. This occurs in reports, live dashboards, and interactive map views. All of these elements combined together in one system are what make ArcGIS Online a perfect platform for Pierce County Public Works Road Operations to manage their core assets in an effective and responsible way.

HPMS Network and ARNOLD

***Thomas A Blake**, WSDOT Transportation Data and GIS Office (TDGO)*

I have a Bachelor of Science degree with a major in Geology, minor in Geography from Murray State University. I have 27 years of experience working as a Photogrammetrist, Cartographer, and GIS Specialist for the Defense Mapping Agency, private industry, and now at the Washington State Department of Transportation (WSDOT). I am currently the GIS Data Products Supervisor in the GIS and Roadway Data Branch of the Transportation Data and GIS Office. Our team maintains the various GIS Linear Referencing Systems (LRS) used at WSDOT to provide locations along our state's highway system.

***Pat Whittaker**, WSDOT Transportation Data and GIS Office (TDGO)*

Prior to becoming the HPMS Manager for WSDOT in 1992 I worked for WSDOT performing surveys, project design, project inspection, records control (project documentation and contract payment), and various planning functions. I began working with FHWA in the mid-1990's as WSDOT helped FHWA in creating the first PC-based HPMS program. I began using GIS when Washington created a GIS for state highways in 1995 and also worked with FHWA as they created their first GIS HPMS software in 2008. I currently manage HPMS as well as the Federal Functional Classification System.

Abstract:

In 2010 FHWA required annually reported Highway Performance Monitoring System (HPMS) road inventory and traffic data to be reported in a spatial format – GIS network with LRS for all Arterial and Collector public roads. For 2013 reporting this requirement was expanded to include all public Local Access roads. This spatial network is known nationally as ARNOLD – All Roads Network of Linear Referenced Data.

This is the story of the steps WSDOT progressed through to create the first all public roads GIS LRS for Washington – known as WAPR. As of March with help and input from local agencies WSDOT has completed 56% of the ARNOLD Local Access roads (This will be 77% by the time of the conference). We are projected to complete the network by the end of the year.

Since much of WSDOT's work with local agencies is related to the road network, WAPR has allowed us to collect and share information that can be seen and understood in web maps. As this potential is leveraged, the WSDOT Transportation and GIS Data Office (TDGO) has brought together customer's data into a single GIS network which serves multiple data needs. These results can be seen in the WSDOT GeoPortal as well as the increasing use of ArcGIS Online maps.

WSDOT is continuing to expand on the use of GIS-based maps as a tool to collaborate with local agencies whose roads and data must be accurately represented by WSDOT and presented to FHWA as the Washington component of the FHWA national network.
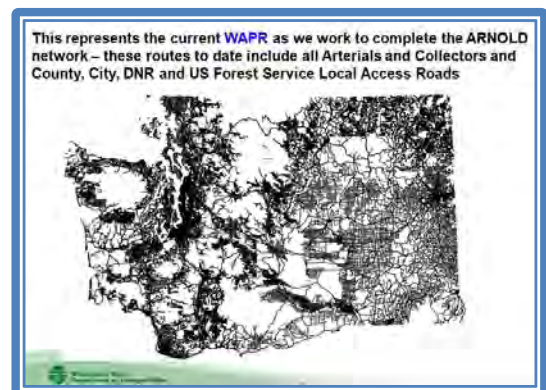
Independent GIS Professional Networking and Business Building *(Panel discussion)*

David Howes, *David Howes, LLC*

David specializes in the development of GIS tools, processes and supporting infrastructure for a variety of clients from small operations to multinational corporations (www.dhowes.com). With 23 years of academic and private sector experience in the UK and US, including an M.Sc. in GIS from the University of Edinburgh and a Ph.D. in Geomorphology from SUNY Buffalo, David's background is well-suited to developing innovative solutions to spatial problems. He is the founder of the Lone GIS Professional Initiative, helping GIS professionals working on their own or in small groups to help each other, and is a Washington URISA Board member.

Joanne Markert, *Leon-Environmental*

Joanne has more than 15 years of experience leading and directing complex technology projects, including web-based solutions, database management and GIS applications. Her science-based background allows her to understand the technological and analytical issues that her clients face and recommend approaches that include technologically sound solutions. Joanne enjoys organizing complex GIS projects that require significant coordination, complex spatial analysis and implementing enterprise-wide GIS systems. These projects have included strategic planning, development of conceptual architectures, data design and application development. She has extensive experience managing and delivering large projects with sub-consultants and a team of developers on time and on budget.

Maria Sevier, *NW GIS Consulting*

Maria has worked in the GIS industry for over 18 years with experience ranging from State, County and City to small business and non-profit focused projects. She worked within the government realm for over 16 years and most recently has owned and operated her own independent GIS consulting company which specializes in creative mapping and project solutions for small business and non-profit organizations. Maria is solutions focused with experience in project management, database management/development, research and documentation and business start-up. She has also shared several years of time volunteering with WAURISA.

Abstract:

Are you an independent GIS Professional working on building a business or are you considering starting your own GIS practice? Have you found yourself challenged with networking, time management and navigating the nuances of growing a business?

Join us for this panel session and connect with other GIS professionals to discuss strategies and techniques for building a strong and successful GIS business as an independent professional. Learn what resources are available for developing and growing a business, such as helpful data sources, tools for collaboration and mechanisms to support your operation.

A small panel of independent GIS professionals who have enjoyed their own successes and faced their own challenges will share their experiences with you and invite you to participate in an engaging and constructive discussion.

Come prepared to connect, brainstorm and find solutions!

Leveraging GIS in the World of Traffic Fatality Prevention

Gary Montgomery, *Washington Traffic Safety Commission*

Gary A. Montgomery is a GIS Analyst for the Washington Traffic Safety Commission, a state agency charged with analyzing traffic injuries and fatalities, and creating and implementing programs to mitigate traffic dangers. He supports program managers and partner agencies with spatial analysis and custom map and graphics production. Gary graduated from Penn State's MGIS program in 2012, and has worked in GIS, cartography, and graphic design since 1998.

Abstract:

In November 2013 the Washington Traffic Safety Commission, in an effort to further its Target Zero goal of eliminating all traffic fatalities and serious injuries by 2030, expanded its analytical capacity by recruiting a GIS analyst. Up until that point, the data WTSC used was represented by charts and graphs, driven by statistical analysis. Now, with a mapping professional on board, WTSC can demonstrate with point maps, density analysis, and other forms of visual spatial information transmission both the good trends and the troubling ones in the yearly count of fatal and serious injury crashes on Washington public roads.

We focus on three case studies and the challenges associated with information conveyance presented by each scenario.

1. A brief examination of fatalities vs. millions of vehicle miles traveled (VMT) choropleth maps, and some discussion of ways to mitigate the perceptual skew of rate maps – specifically, counties such as Island and Wahkiakum that have very low VMT numbers appear to be highly unsafe.
2. Using GIS to demonstrate change over time and space with animated GIFs. Point maps are created in GIS and 'tweened' in Photoshop to enable visualization of temporal and spatial changes in fatal crash location. Definition queries and data-driven pages are used to speed image generation.
3. Displaying public-facing data through 3rd party portals: WTSC's experience with Google Maps Engine and displaying pedestrian fatality data.

Mapping your Unique Value, a Roadmap to Personal Branding *(Panel discussion)*

Christina Gonzales, *GeoEngineers, Inc.*

Christina recently graduated from Western Washington University, spending the first year after graduating working for the western Washington tribes in a GIS capacity. She has been at GeoEngineers for almost a year now where she specializes in cartography for a variety of earth science projects and is enthusiastically learning new skills.

Tonya Kauhi, *GeoEngineers, Inc.*

Tonya has background in Environmental Science and GIS Analysis has worked with GeoEngineers for over 13 years. She is an expert in Enterprise Architecture, data management best practices and GIS. Tonya provides value to her clients by truly understanding their business needs and implementing the best solution for those needs.

Amber Raynsford, *The Watershed Company*
Amber has a background in landscape architecture and natural resource management. With a decade of GIS experience, her specialty is using GIS as a tool for design projects, including land planning and development. She works as a Landscape Designer and GIS Analyst at The Watershed Company, an environmental consulting firm, in Kirkland.

Abstract:

When someone asks you what you do for a living, what do you say? Do you say 'I work with GIS'? Do you quickly define the acronym 'GIS' hoping this will provide clarity but often spurs more confusion? You finally surrender and say 'You know...I make maps.'

How clearly can you define what you do? Your job title is only the beginning. How do you communicate your value and set yourself apart from other GIS Analysts, Technicians, Developers, and etcetera?

You do this through your personal brand. Your brand is your reputation. Your personal brand matters. It's the secret to describing your key attributes, defining your unique value, and telling your story. It's about bringing who you are to what you do and how you do it. Having a personal brand is essential for explaining your value and the applicability of your skills and expertise. This is especially true for complex and technical disciplines, like GIS, where it can be difficult to explain one's profession without glossing-over your specialization or burying it with technical jargon.

This session provides an opportunity to start defining and talking about your personal brand. Through guided activities you will have the opportunity to identify your skills, talents, values and passions that make you unique, start defining your personal brand and create a plan to share your story.
The session will cover the basic criteria to start creating your personal brand, for example:

• What are the key attributes that describe you?
• What distinguishes you from your colleagues?
• How to develop brand advocates and where do you tell your brand story?

Delivering your brand clearly and consistently creates memorable interactions with colleagues and clients and potentially opens the doors to new opportunities. Your brand is working 24 hours a day, let's makes sure it is communicating what you want.
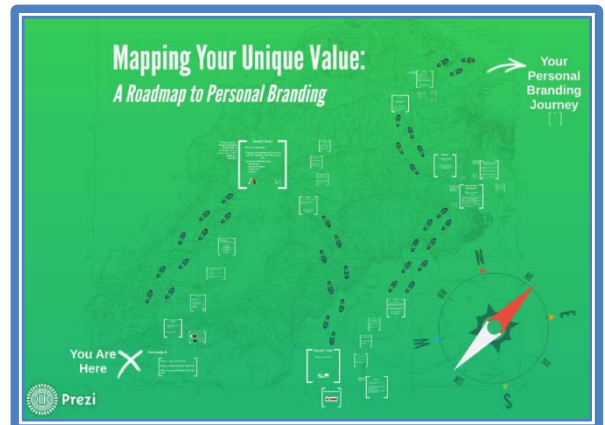
Mobile GIS with ArcGIS Online and Collector

Scott Moore, Esri
Scott Moore is a Solution Engineer with Esri and currently works in the Olympia regional office. He earned a bachelor's degree in Geography with a focus on GIS from the University of Washington in Seattle in 1998. Prior to joining Esri, he was a Senior GIS Analyst and GIS Manager for the City of Chandler, Arizona.

Abstract:
ArcGIS Online includes pre-built applications ready for you to deploy immediately. One of those is the Collector for ArcGIS application. Esri staff will step through mobile GIS workflows currently supported by this app and also the new disconnected workflows for Collector.

• Capture, update, and report spatial and tabular information directly from your Android or Apple device.
• Plan routes and get directions.
• Improve your data quality with data-driven forms.
• Capture photos and video.
• Integrate information into your organization's GIS.
• Configure the app to fit your organization's workflow.

No longer just Pass or Fail: Grading Spatial Metadata Improves Data Communication to Users

Mike Leathers, *King County GIS Center*
Mike Leathers has been with the KCGIS Center for 11 years. His role as Data Coordinator involves working with contributing agencies in publishing their data and metadata to the KC Spatial Data Warehouse.

Frank Whitman, *King County GIS Center*
Frank Whitman has been an employee of the King County GIS Center for the last 15 years. His areas of work include parcel data maintenance, Geodatabase design, ArcGIS software training, and Python programming.

Abstract:
The distribution of greater and greater amounts of GIS data and increasingly complex data sets require complete and descriptive metadata. Good metadata eliminates questions, quells frustration, advertises your data, and helps communicate the message of your enterprise operation.

King County GIS is working toward improved metadata content through a defined workflow and a detailed metadata 'grading' system. Tailored metadata templates serve as the starting point for data stewards, who are supported by instruction and classes to help them update key subjective information. Metadata is permanently wedded to its data set - from its initial ArcCatalog import and upgrade, through editing and/or geoprocessing steps, with final posting to the internal production library and external GIS data portal. During production posting, metadata is exported to stand-alone FGDC-formatted files. Prior to final check-in to the master metadata library, the metadata is 'graded'.

A custom-designed python application evaluates the metadata's completeness in over 30 areas, ranging from key elements like the abstract and purpose to minor elements containing KCGIS-specific hyperlinks and data set name references. The application also performs a detailed investigation of the entity attribute section of the metadata, comparing attribute domains, where they exist, to a real-time snapshot of the data set's contents.
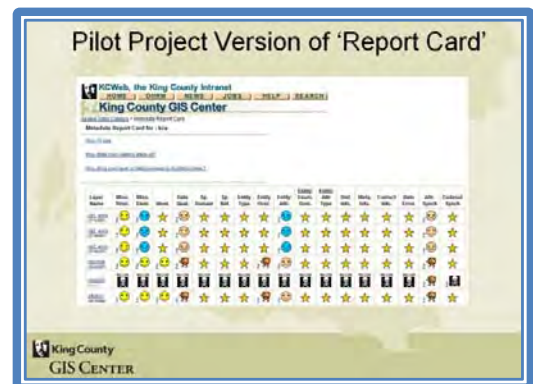
Once the analysis is completed, a summary 'report card' is generated for each data set informing the steward of how complete their metadata is, along with an additional report illuminating where gaps or issues may still require remediation. Agency summations are created to give managers a measure of their workgroup's status, and a running enterprise summary tallies a friendly scoring competition between agencies. Comprehensive data dictionaries, derived coincidently during the metadata grading, provide a searchable database of the entire enterprise library, field attributes, contact information and other extractable information.

Open Source Solution for Component Based Web GIS

Xiongjiu Liao, *Pierce County*

Xiongjiu Liao is a senior GIS developer at the IT department of Pierce County. He received "Presidential Fellowship" from MIT and completed his PhD study there. In Pierce County, he has designed and implemented multiple GIS projects including PublicGIS, Where Does the Water Go, MapView, Pierce County Right-Of-Way Information Coordinating System (RICS), Pierce County Rivers Flood Forecast System, etc.

Michael Payne, *Pierce County*

Michael Payne is a Geographic Information Systems Programmer with Pierce County Information Technology Department. As a dedicated resource for the Department of Emergency Management (DEM), he has been the lead developer of software systems supporting public safety disciplines for the past 15 years. Michael helped establish the Pierce County DEM Portal and currently manages the primary Information Systems used in the county's Emergency Operation Center.

Abstract:

In 2013, to adapt to current technologies, Pierce County completed a rewrite of its emergency management web GIS application, MapView. MapView allows the responders to browse and query spatial data layers, report and manage incidents, interactively draw incident symbols on the map, and overlay county data layers on multiple regional base maps.

The new MapView was developed on mainstream open-source technologies like ExtJS, OpenLayers, GeoServer and Java, with a unique difference from previous Web GIS applications: all UI elements including the layer tree, tool bar, and map window are implemented as components, which can be flexibly assembled into a web GIS application, but are maintained or extended independently.

This component-based design has introduced enormous convenience in maintenance and code sharing across projects. In this presentation, we are going to introduce the implementation details behind the component design and discuss further research directions.
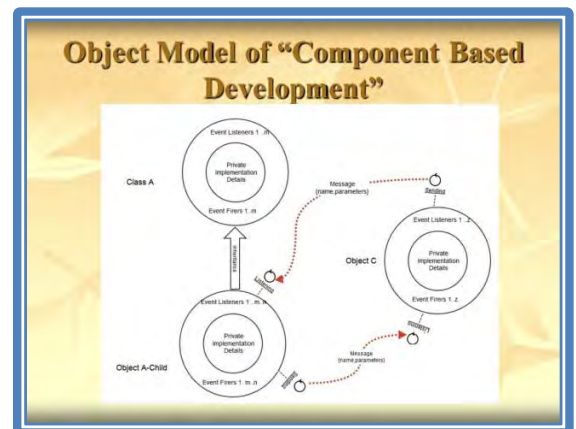
Pierce County Annual Levee Assessment Program Using Esri's Collector Application

Renee Quenneville, *Pierce County*

Renee A. Quenneville, GIS Specialist for Pierce County Public Works & Utilities Surface Water Management, 2008 – Current. Prior to joining Public Service, Renee earned her

B.S. from Evergreen State College. After college she served as a Primary School Science Teacher resource for Peace Corps in Uganda East Africa in 2005. In 2008, Renee contributed to her professional portfolio by completing her GIS Certification from University Of Washington, Tacoma.

Abstract:

Pierce County, Public Works and Utilities, Surface Water Management (SWM), Washington is tasked with managing 69 miles of levees and revetments that protect the life and public infrastructure of its residents. Annual inspections of these levees are an integral part of this task. Previously, this process relied on a paper inspection form that was entered into Excel, which had no ability to link photos or GIS data related to the inspection. It was time consuming to implement quality control. Only damage locations were captured and the overall condition of the levees and revetments were not assessed. A more efficient and thorough workflow was needed.

Levee and revetment assets were mapped using a GPS and stored in file geodatabases as feature classes and divided into 1/10 of a mile segments. A levee inspection map service was built in Arc Map and published to ArcGIS Online with inspection forms attached to the levee or revetment segments with the ability to upload photos. The ArcGIS Online map service was then published to esri's app Collector. Field staff accessed the Collector app on their ipad, performed a condition assessment of each levee segment and attached photos of damages/work order needs to their inspection form. The project manager could see real time locations of field staff, and their inspection results. Taking levee inspections from a static paper based system to a real-time process has raised situational awareness and the level of service provided by Pierce County.

Points from Photos – Trimble V10 Imaging Rover

Jeff Whittaker, Geoline, Inc.

I began my career in 1974 with Surveyors Service Co. in Costa Mesa, CA as an apprentice instrument repairman. Over the past 40 years I have had the opportunity to work with survey professionals, company principles, government agencies and educators. I have been responsible for establishing 3 successful repair facilities, represented a major manufacture as their Western Regional Manager and owned my own Survey Supply Company. Just last year we successfully merged with Geoline, Inc. in November 2013.
Over the past 5 years, I have been supporting the GeoSpatial industry through attending various workshops and training seminars, conferences and events. I am always happy to assist those around me be successful in their own endeavors and help them accomplish their goals or projects they are working on.

Abstract:

When you hear the word photogrammetry, most of us think about airborne images. I want to change your thinking a bit and insert the word "terrestrial" in front of photogrammetry. Terrestrial photogrammetry is an old principle that a guy by the name of Leonardo came up with in the 1400;s. Mr Da Vinci didn't have the luxury of a computer, yet he figured out how to merge two equal distant objects together and create a measureable image.

Trimble's V10 Imaging Rover has taken this principle into the 21st century and we are now able to collect, capture & process geo-referenced images and use them to create accurate points from digital images. For the first time we can add context to our data. By context I mean that instead of simply geo-referencing a feature we can now take surrounding objects in a photograph and put them into relationship or context by creating additional points from the imagery. Trimble's V10 Imaging Rover precisely captures 360-degree digital panoramas used to visually document and measure the surrounding environment.

I would like to introduce you, via a short powerpoint presentation, to the V10 Imaging Rover and how it can change the way you think about digital imagery.

Precision Street Panoramas in GIS

Paul M. Burrows, *Cyclomedia Technology, Inc*
Paul is a 19 year veteran in GIS databases. He has been in both the vector and raster data industries for the entire time. He is more than qualified to talk to this audience base.

Abstract:
The goal is that attendees gain new insight into street-level surveying technologies and their application in asset management, site visualization, and transportation
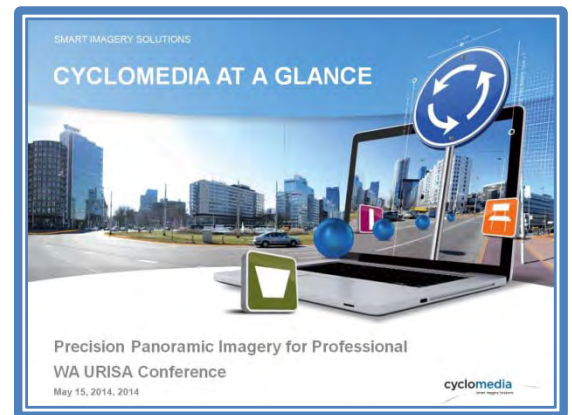
Put the WHERE in Your Organization – Everywhere in Your Organization

Shane Clarke, Esri
Shane Clarke is the Solution Engineer Manager for the Esri Olympia regional office, and is part of a team who provide pre- and post-sales technical support to Esri's customers. Shane has worked with a number of organizations to help them maximize their GIS with ArcGIS Online. Previously, Shane was the ArcPad Product Manager, and has been part of Esri's mobile GIS efforts since the initial release of ArcPad in early 2000. He joined ESRI in 1993.

Heather Glock, Esri
Heather Glock is a local government account manager for the Esri Olympia regional office, and is part of a team who provide pre- and post-sales account management for Esri's customers. Heather has worked with dozens of organizations to help them maximize their GIS using Esri's ArcGIS solution platform. Heather joined Esri in 2001.

Abstract:
There is a brave new world of analytics waiting to be used everyday business life – across all sectors. Turn mountains of unstructured and structured data into powerful intelligence. From simple to scientific, you can ask new questions of your data and get the right answers using location as your new analytic. We make maps to answer a

question, to solve a problem, and to advance our understanding. And therein lies the power of the map.

Even the best maps have no power by themselves; they just exist, like the maps you hang on your office wall, or the maps in the world atlas sitting on your bookshelf. But depending on how they are created, and how they are used, maps can have tremendous power. Maps can help turn abstract issues into tangible, understandable, solvable stories. Maps can inspire action. Let's use them not only to measure and observe the world, but to change it.

Reducing Costs and Raising Effectiveness with a GIS-centric Asset Management System

Jay Clark, *City of Shoreline, WA*
Currently Jay Clark is the GIS Specialist at the City of Shoreline, where he manages and coordinates the City's geographic information system (GIS) since 2000. Prior to that, Jay served the same role at Puget Sound Council Regional from 1992 to 2000. He earned his undergraduate degree in Chemistry in 1987 and a graduate degree in Environmental Science in 1989 from Indiana University, Bloomington. His first application of GIS was for the analysis and management of Indiana lakes and streams and their watersheds.

Chris Brussow, *CityWorks*
Chris Brussow is the West Coast Client Relations Account Manager for Cityworks® at Azteca Systems Inc., covering the 150 clients from Colorado and west. Chris graduated from the University of Utah with degrees in Emergency Management and Geography. Chris also earned a 2 year GIS Certificate. Chris resides in Sandy, Utah, where Azteca Systems Inc. is headquartered.

Abstract:

The City of Shoreline implemented a GIS-centric asset management system, Cityworks, in 2013, and has realized many benefits as a result of this investment. By directly integrating asset information in the GIS, work flows have been simplified and response times have been reduced for the maintenance and repair of the City's stormwater facilities.

Cityworks offers a set of tools for staff to more easily interact with asset information by directly leveraging the power of GIS. Traditional asset management systems lack this "GIS centric" capability. This ease of use has led to reliable stormwater maps, work order history and condition information. Further improvements will be gained as the City migrates other City divisions, including streets and traffic in 2014.

Also, as the City continues to collect asset condition information, we will be able to evaluate the effectiveness on how we manage our City infrastructure. Advanced analysis tools in Cityworks allow all levels of user to be able to get more out of GIS. Heat Maps, condition analysis, maintenance analysis, Asset Analytics are available with a few clicks allowing management to make quality business decisions more quickly. This presentation will highlight the key points and ROI pieces, as well as the analysis tools.

Snohomish County SR530 Slide GIS Response

Suzy Brunzell, *Snohomish County*

Suzy Brunzell is the Principal GIS Analyst for Snohomish County's Public Works Department Surface Water Management Division. She is the lead of a team of four GIS analysts which generally supports any GIS need of the division. In addition, the team supports Snohomish County's Department of Emergency Management Emergency Operation Center during an event.

Abstract:

On Saturday, March 22, 2014, at 10:37 a.m. local time, a major mudslide occurred 4 miles (6.4 km) east of Oso, Washington, United States, when a portion of an unstable hill collapsed, sending mud and debris across the North Fork of the Stillaguamish River, engulfing a rural neighborhood, and covering an area of approximately 1 square mile (2.6 km2).

Within hours, GIS resources were mobilized from Federal, State and Local agencies to respond at multiple Emergency Operation Centers and Command Posts. This presentation will outline the GIS roles the presenting agencies played, highlighting successes, lessons learned and suggestions on what would better prepare us for a similar event in the future.
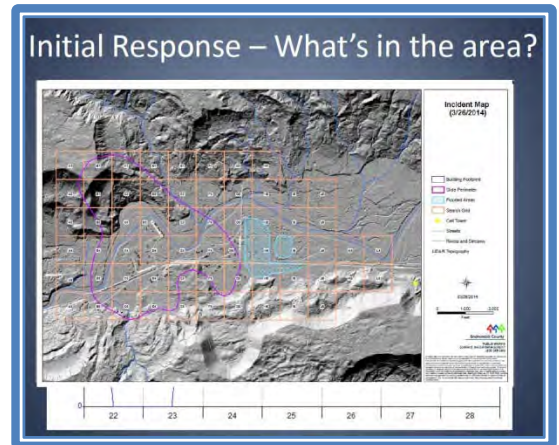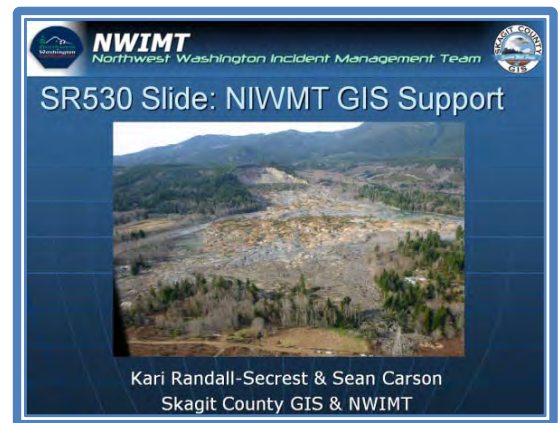
SR530 Slide: NWIMT GIS Response – Part 1

Kari Randall-Secrest, *Skagit County*

Kari Randall-Secrest is a GIS Software Engineer with the Skagit County GIS department. She received her Master degree in Geography from Western Washington University in 2007 and her GISP in 2008. Kari began her GIS career 19 years ago with Skagit County as a GIS Specialist, but spent the majority of it as a GIS Analyst working on various local government projects involving spatial data design, analysis, cartography, task automation and software development.

Additionally, she has been a GIS Specialist for the Northwest Washington Incident Management Team (NWIMT) since 2007. When she isn't GIS'ing, you'll probably find her boating in the San Juan Islands.

SR530 Slide: NWIMT GIS Response – Part 2

Sean Carson, *Skagit County Geographic Information Services (GISS – Northwest Washington Incident Management Team)*

Sean Carson is a GIS Analyst at Skagit County. For the last 13 years, he has served in various roles at the County, performing GIS maintenance, analysis, cartography and GPS support. He has also served on the Northwest Washington Incident Management Team as a GIS

Specialist since 2007. He began his geospatial career as a Survey Technician in the private sector. Prior to pursuing his geospatial interest, Sean worked in the Home Health Care industry, and served in the United States Marine Corps Reserve (Tanks!). Sean earned a degree in Surveying and Mapping Technology from Bellingham Technical College in 2000.

### *SWAC's – A Workflow for Simulating the Effects of Sediment Remediation*

Jason Taylor, *Floyd | Snider*

Jason Taylor joined the Floyd|Snider team in 2012 and primarily works to assist both GIS and database efforts. Jason has a wide range of experience including water quality laboratory and field work, enterprise and small government database development, and all things GIS. He is an avid R programmer, loves to work with Python, and is a regular CUGOS attendant. Jason holds an undergraduate degree in Environmental Science with a minor in GIS from Western Washington University.

Abstract:

Surface weighted average concentrations (SWACs) are used to determine the risks to organisms exposed to contaminated sediment and soil. This talk will discuss a work flow to generate SWACs using Python, ArcGIS, and a handful of open source tools. A very simple and effective way of simulating remediation options using R will also be demonstrated.

This talk should appeal to users who work with data concerning contamination of soils and sediments or users interested in batch processing interpolation tools.
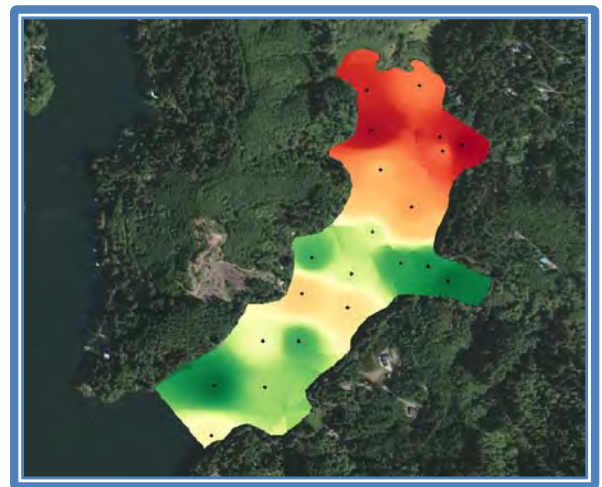
Tacoma's Green Living Guide: Promoting Tacoma's Environmental Assets

Mike Murnane, *City of Tacoma*

Mike Murnane is a Senior Technical GIS Analyst working for the City of Tacoma the last 18 years creating maps, reports and applications primarily for the planning and economic development departments. Previously, Mike worked over 10 years for natural resource agencies (private, state, federal) on data inventory, mapping and analysis. He has two bachelor degrees (forest management, range management) from Washington State University.

Abstract:

Tacoma's Green Living Guide is an innovative way to educate community members about what sustainability-related efforts exist within Tacoma. It communicates the numerous measures that have been taken to increase sustainability throughout the city, from agriculture and education, to open space and transportation. This interactive story map provides information to the public in a way that may be more appealing than information on a website alone, and allows a visual
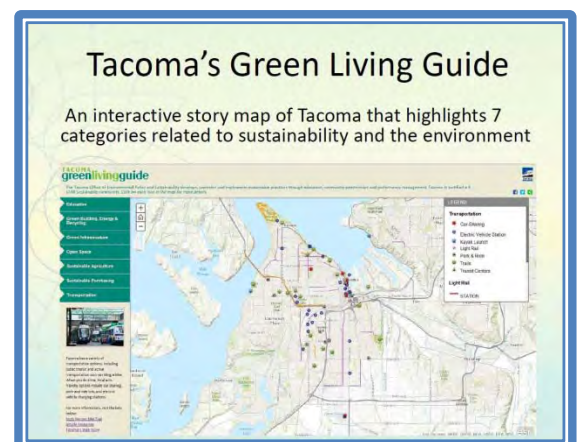
representation of Tacoma's environmental assets. The intended audience for this story map are: community members hoping to learn more about what is available to them personally, environmentally-minded people hoping to learn about what sustainability-related efforts have been taken in Tacoma, and people who may be interested in moving to Tacoma who want to learn more about what the city offers.

The map was created from over 300 individual points in seven categories, and will continue to grow. After the data was compiled in a spreadsheet, Esri's ArcGIS Online provided the format to easily create a story map that will be simple to update and add to in the future, as necessary.

Learning Objectives for this presentation include: how to communicate both a vision and existing efforts towards sustainable practices, how to organize and review data, and how to use ArcGIS Online to create a story map.

The GIS Analyst as an Institutional Resource *(Panel Discussion)*

Chris Behee, City of Bellingham

With 20+ years experience as a public-sector GIS Analyst, Chris has worked on projects spanning a wide variety of topics including, urban planning, resource management, transportation modeling, and economic forecasting. The projects he enjoys most are those that use spatial data as a means to connect stakeholders in collaborative discussions to solve problems. In particular, his ongoing interest in effective cartography provides many opportunities for bringing clarity to complex issues for City staff, elected officials, and the public.

Tim Dewland, Pennsylvania State University

Tim has been working in the geospatial industry since completing his undergraduate degree at James Madison University in 2004. In the Spring of 2013 he completed his graduate studies with The Pennsylvania State University's MGIS program. While living in the Washington, DC area he worked on federal government contracts creating and maintaining digital nautical charts. Most recently, he worked as a planner at a utility distribution company in New England utilizing GIS for asset management and expansion projects. Freshly relocated to the Northwest, Tim is interested in projects concerning conservation, resource management and urban planning efforts in the region.

David Howes, David Howes, LLC

David specializes in the development of GIS tools, processes and supporting infrastructure for a variety of clients from small operations to multinational corporations (www.dhowes.com). With 23 years of academic and private sector experience in the UK and US, including an M.Sc. in GIS from the University of Edinburgh and a Ph.D. in Geomorphology from SUNY Buffalo, David's background is well-suited to developing innovative solutions to spatial problems. He is the founder of the Lone GIS Professional Initiative, helping GIS professionals working on their own or in small groups help each other, and is a Washington URISA Board member.

Mark Joselyn, Seattle Public Utilities

Mark has spent his career in government settings where breadth of knowledge about GIS, geospatial data, and related technologies is critical. Working in settings focused on natural resource management and research, Mark supports wildlife biologists, hydrologists, forest ecologists, and other departmental staff. Mark was responsible for developing and managing spatial data for the Illinois Natural History Survey before joining Seattle Public Utilities in support of the ambitious Cedar River Habitat

Conservation Plan. Trained as a cartographer, the production of maps and the manipulation of spatial data are at the core of the pleasure Mark derives from his professional career.

Grete Roeckers, *Thurston County GeoData Center*

Starting in a structural test lab for the space shuttle, getting into networking and then specializing in GIS technologies in 1994, Grete has seen quite a range of desktop and server technology evolvements over the years. Started City of North Charleston, SC's GIS from scratch. Migrated to the Northwest when working for ESRI and did site evaluations, teaching, demos and site installs. For Thurston County, she mainly supports the server technology, but also works closely with the customers to understand how to best support them. Always optimizing the GIS infrastructure needed for Thurston County's internal and external customers – the public.

Abstract:

As GIS analysts, most of us find ourselves in a daily race to keep up with the continuous stream of system upgrades, with weekly production schedules, and helping our colleagues figure out how to set up projectors, fix jammed copiers and locate extension cords. While it's true that we all will likely continue doing these things for the foreseeable future, there is a broader role and a larger responsibility we all share.

This facilitated panel will focus on the role of the GIS analyst across the institutional landscape. The discussion will cover a range of issues centered around the idea that the analyst's job is a multi-faceted one of data-steward, modeler, statistician, cartographer, advisor, and educator, to name a few. We are responsible for helping maintain the health of what used to be a series of disconnected GIS databases and have now become the integrated data backbones of our respective agencies.

As GIS has become pervasive across many disciplines, there has evolved a critical need for informed, articulate communicators who know enough about the data, the applications and the end-user's needs to provide help when needed, and to maximize the resource value. Panelists in this discussion will share from their unique experiences, highlighting successes, evaluating failures and illustrating how the role of the analyst in their organizations continues to evolve.

The Secret Mix of Successful GIS Project Management

Geoffrey Almvig, *Skagit County*

Geoff has been the GIS Manager for Skagit County for 23 years, and has worked in local government for over 30 years, working with and managing ever evolving spatial technologies. In 2007, the GIS Department was recognized by ESRI for innovative use of GIS technology with a Special Achievement in GIS award. Geoff received the WAURISA "GIS person of the year" in 2005. Geoff is a member of LSAW, URISA, and on the board of the Northwest Incident Management Team. He continually strives to provide the best possible service for county employees and the general public.

Don Burdick, *Skagit County*

Don brings over two decades of experience in surveying, engineering, GIS and technology management. He has worked as a survey technician, engineering designer, GIS analyst, GIS programmer and GIS and Technology manager over that time. Don brings over a decade of project management experience on projects ranging from data acquisition and conversion to application development and system integration. He prides himself in understanding all levels of local government and how to leverage GIS to make business systems and processes more efficient. Don is the Treasurer of the

Washington chapter of URISA (Urban Regional Information Systems Association) and URISA international member.

Abstract:
GIS is no longer that silent technology evolving on its own and targeted to its own user base. With projects ranging from complex web applications to simple court presentations, GIS has become the "go to" tool for solving problems; particularly in government.

As GIS professionals, we need to insure that the services we provide to our customers are on schedule and on budget. Regardless of the project, there are a set of "best practices" for successful project management. In this presentation, two long-time GIS project managers will discuss the fundamentals of good project management. Learn the steps necessary to effectively communicate project requirements with your customers, establish a project plan, and avoid project risks. Project management skills are a vital component for any successful GIS project. Don't miss this chance to find out the secrets of success!
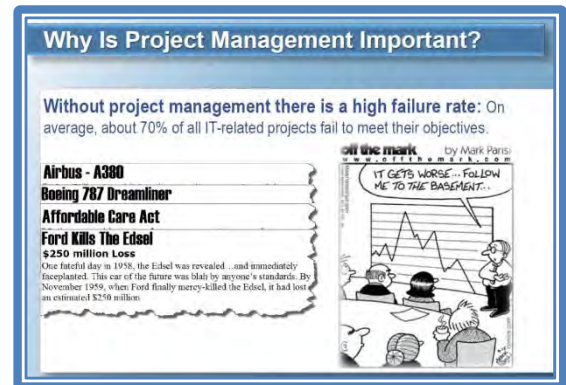
They'll Stone You When You're Trying to Build Your GIS: The Multi-Dimensional Role of the GIS Coordinator (Panel Discussion) & (Paper)

Jason Eklund, *Kittitas County*
Jason Eklund, has a B.S. in Natural Resource Management with a minor in Spatial Information Systems Management from Colorado State University. He worked for the Oregon Water Resources Department for 8 years in GIS application development and database design and has been Kittitas County's GIS Coordinator for the past 7 years. Jason has recently become a foster parent and likes to spend his summers in his canoe or RV with his wife of 16 years and 8 year old son.

David Howes, *David Howes, LLC*
David specializes in the development of GIS tools, processes and supporting infrastructure for a variety of clients from small operations to multinational corporations (www.dhowes.com). With 23 years of academic and private sector experience in the UK and US, including an M.Sc. in GIS from the University of Edinburgh and a Ph.D. in Geomorphology from SUNY Buffalo, David's background is well-suited to developing innovative solutions to spatial problems. He is the founder of the Lone GIS Professional Initiative, helping GIS professionals working on their own or in small groups help each other, and is a Washington URISA Board member.

Chris Owen, *City of Walla Walla*
Chris Owen, GISP has a B.A. in Geography from the University of Washington and an M.S in Information Technology Management from Colorado Technical University. Chris started working in the GIS private sector in 1996, and began working in the public sector in 2000. Chris began working for the City of Walla Walla in 2002. Chris and staff support all of the GIS activities for the City of Walla Walla, including database design, application development, mobile GIS and system integrations. Chris has 3 kids, bikes to work, coaches, and loves to travel.

Jennifer Radcliff*, Port of Tacoma*

Jennifer Radcliff, GISP, has a B.S. in Geography with a secondary major in Natural Resources and Environmental Sciences (NRES), and an M.A. in Geography, both from Kansas State University. She has been getting paid to use GIS since 1996, working mostly for local governments in Kansas, Colorado and Washington. Jen enjoys variety, and has worked on everything from database design and data creation for assessor's offices, to analysis for Emergency Management, to application development for Planning. She has also worked on multiple enterprise solutions. Jen is currently the GIS Coordinator for the Port of Tacoma.

Matt Stull*, City of Tumwater*

Matt Stull, GISP, has a B.S. in Cartography and a B.S. in Geography, from the University of Idaho. He also holds a Master's certificate (MSc) in GIS from Simon Fraser University. He started his GIS career in 1997 with a startup software company in Oakland, CA. Later, he moved to the Puget Sound area where he has worked for: Genwest Systems, ESM Consulting Engineers, Mason County and the City of Tumwater. He has extensive experience working with GIS in City and County Government, especially in the areas of public works and 911. Matt is a native of Astoria, Oregon.

David Wallis*, Cowlitz County IT/GIS*

David Wallis, GISP, graduated Magna Cum Laude with Honors from Western Washington University with a B.A. in Technical Writing. He began his GIS career in 1994 with Cowlitz County and holds the IAAO CMS (Certified Mapping Specialist) designation. He is a certified National Instructor for IAAO, teaching mapping and GIS courses around the U.S. and legal description courses for the WA State DOR. David has been married for 27 years and has the 4 best kids on the planet. He enjoys producing music in his recording studio, collecting Disney items, reading classic literature and spending time with his family.

Abstract:

Maybe your boss quit. Maybe you applied for the job. Or, maybe the workload just grew to the point where the position was necessary. One way or another, you became a GIS coordinator in a public agency. So what's your story? What are the characteristics that helped you be successful? If you could start again, what advice do you wish you'd been given? What difference does it make if your GIS operation is a separate entity as opposed to being part of, say, an IT department?

There are many questions one could ask of a GIS coordinator and in this panel session you'll have an opportunity to ask and answer some yourself. To get you started, five GIS coordinators from different types of agencies and different parts of Washington State will share their experiences and the nature of their roles, especially as they relate to communication. For example, they often have to sell the benefits of GIS to other departments. They have to apply the appropriate technology to represent and express the state of spatial phenomenon. In addition, they have to help ensure that participants in their projects keep each other informed in such a way that they can, collectively, be as successful as possible. Please join us for what will certainly be an engaging and informative conversation.

Understanding Breeds Success: Better Questions Mean Better Maps

Parker Wittman, *Aspect Consulting*

Parker Wittman leads the GIS and Data Services group at Aspect Consulting, a 60(ish)-employee Seattle/Bainbridge Island-based environmental consulting firm. Though a technical generalist at heart, if it can be said Parker specializes in anything it would be the integration of environmental chemistry and water resources databases in analytical map products. Though he's been hacking away at GIS and database applications for the past 10 years, his educational background is in physics and communications. Ever on the lookout for pursuits involving both sides of the brain, Parker feels fortunate to have stumbled into a career in GIS.

Abstract:

Whether part of large organizations, small consulting firms, underappreciated municipal departments, or single-shingle shops, GIS analysts are almost always working in highly-collaborative environments. But in the litany of skills we imagine as drivers of professional GIS success (Python! Design Chops! Web Development! Servers! GISP!), it's far too easy to undervalue the ability to ask great questions and make use of the answers.

Drawing on the wisdom of documentary filmmakers, design consultants, architects, and others, this paper/presentation provides its audience with strategies and methods for asking better (and more!) questions at all stages of the project life cycle. Asking better questions is about reframing your collaborative project planning as research unto itself—attempting to uncover blind-spots, misunderstandings, biases, and unspoken expectations. It's about turning what you unearth and what you learn into better work.

As collaborators, we're often downstream of a project or request. Your clients or colleagues may need a beautiful paper map. Perhaps they need some gnarly analysis. Maybe they're looking for a piece of custom software. Maybe they need a web map application. These work products and related analyses are inherently complex. Our targets are rarely clear. In almost every case, a GIS project stands a better chance of success when we ask better (and more!) questions of our collaborators and seek to think critically about the answers.
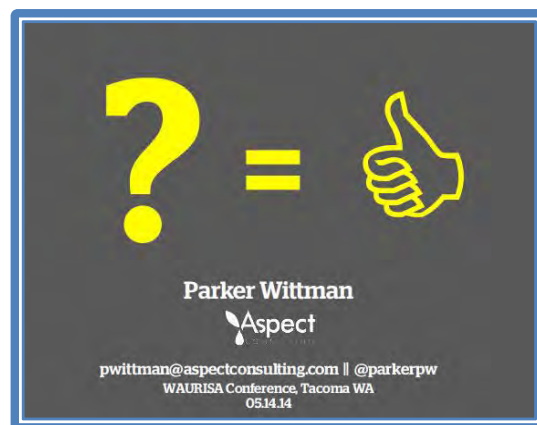
US Census Bureau Geographic Program Update

Michaellyn Garcia, *US Census Bureau*

Michaellyn Garcia has been a Geographer with the US Census Bureau for 12 years. She has an undergraduate degree from Western Washington University and a Masters in Public Administration from UW. She is the primary Census Bureau geographic contact for the State of Washington.

Abstract:
Update on Census Geographic Programs and the Geographic Support Systems Initiative
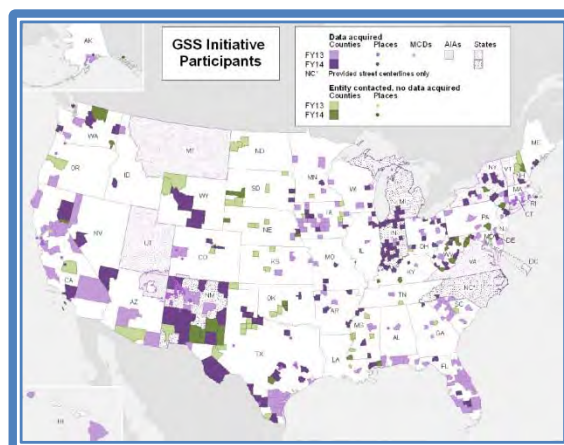
(GSSI). The GSSI is an effort to streamline geographic data collection in preparation for the 2020 Census and future census programs such as the Local Update of Census Addresses (LUCA) and the Boundary and Annexation Survey (BAS).

Using Python Dictionaries To Do Raster Math

Jason Taylor, *Floyd | Snider*

Jason Taylor started with Floyd|Snider in 2012 and primarily works to assist both GIS and database efforts. Jason has a wide range of experience including laboratory work, field sample collection, enterprise and small government database development, and all things GIS. He is an avid R programmer, loves to work with Python, and is a regular CUGOS attendant. Jason holds an undergraduate degree in Environmental Science with a minor in GIS from Western Washington University.

Abstract:

Performing math across multiple rasters can be a tricky process. ArcGIS Desktop offers a tool called Raster Calculator that enables user to do complicated math across multiple rasters relatively easily. This tool however requires a Spatial Analyst license. What is a GIS Analyst to do when this tool is not available? My talk will introduce a method that performs a similar task using Python dictionaries.

## Utilizing ArcGIS Online as a Communication Tool for the Puyallup School District

Brian Devereux, *Puyallup School District*

Brian has worked for the Puyallup School District since 2008. Previous work experience includes working with Apex Engineering in Tacoma as a Land Use Planner and as a real estate agent/land use consultant in the residential new construction sector. Brian graduated with an Urban Planning degree from BYU in 2000. Brian is a proud husband and father of 4 boys, 3 of which currently attend PSD schools and the oldest a recent graduate from Emerald Ridge HS, where Brian's wife teaches high school Spanish. Brian is die-hard Boise State football fan and believes that all fields should be blue.

Abstract:

The Puyallup School District is the ninth largest (enrollment) district in the state of Washington, and second largest school district in Pierce County, serving a population of approximately 119,000 residents within a 54 square mile jurisdiction. The district is located six miles east of Tacoma, 30 miles south of Seattle, and is situated in the heart of the Puyallup Valley.

The district has 21 elementary schools, seven junior high schools, three comprehensive senior high schools, and an alternative school, all of which serve more than 20,500 students. The district employs approximately 1,255 certificated, 1,388 classified staff, and 750 substitute personnel.
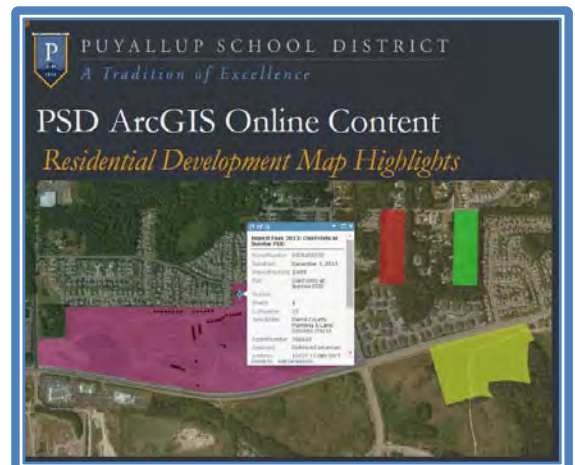
With a district of this size, it can be challenging to communicate with all stakeholders and residents. In an effort to more effectively communicate with staff and the general public, the Puyallup School District Planning Department has looked to ArcGIS Online as a web-based solution to disseminate information that was relatively isolated within the department previously.

Within the past year, the district's ArcGIS Online website has educated decision makers, including our superintendent and school board members, on the power and potential of GIS. This is a significant accomplishment, considering we have been using GIS for nearly a decade with little recognition given to its use or purpose. Furthermore, this was accomplished with a modest budget and didn't require additional staffing. In summary, we have now created an organizational appetite to view common data sets geographically, which has been an incredibly rewarding experience. We plan to widen our use of GIS as a communication tool via ArcGIS Online to better inform our corner of the world.

Washington Shoreline Habitat Classifications Now Online

Kris Symer, *UW Tacoma - Puget Sound Institute*
Kris works on web, data, and GIS projects with a focus on the Encyclopedia of Puget Sound. She earned a Bachelor of Arts in Business Administration and a certificate in Geographic Information Systems from UW Tacoma. In her spare time, Kris co-chairs the City of Tacoma's Bicycle and Pedestrian Technical Advisory Group so that folks may safely choose active modes of transportation.

Abstract:

The Encyclopedia of Puget Sound and NOAA's Pacific Northwest ERMA® mapping system now feature a collection of 60 WA shoreline habitat classifications. The dataset is an adaptation of the 2001 Washington State ShoreZone Inventory linear shoreline data. It introduces new attributes describing the original deth_class field, a numeric code based on the 1990 Dethier habitat classification system. All of the 60 Dethier classes occurring in Washington State have updated and enhanced descriptions, physical characteristics, frequency of occurrence, example locations, and related species.

This 2014 update was conducted by Megan Dethier, author of the original 1990 WA DNR publication "A marine and estuarine habitat classification system for Washington State" created for the Washington Natural Heritage Program. The 2014 fish species analysis was conducted by Charles Si Simenstad. The project was commissioned in 2013 by the UW Puget Sound Institute.

Washington State Department of Transportation's Community Planning Portal

Kyle Miller, *Washington State Department of Transportation*
Kyle Miller has worked for the Washington State Department of Transportation for just over thirteen years. A majority of this time was working in the Collision Data and Analysis Branch supervising analysts who produce the state's collision data. Now as the one of the newest Transportation Planning Specialist within the Community Transportation Planning Office, Kyle has been tasked in leading the business end of development of the Community Planning Portal.

Abstract:

The Community Planning Portal was developed by WSDOT for use by state, regional and local transportation planners. Built using ArcGIS Online, the Portal gives planners easy access to WSDOT data for use for general planning purposes anytime, anywhere. Through the Portal, WSDOT has compiled select state transportation data that we think will help local and regional planners, decision makers, and citizens better understand the story of the state transportation system within their jurisdictions.

The goal of the Portal is to foster a closer partnership with local and regional planners so that together, we can identify opportunities to operate our transportation system more efficiently, manage demand and where appropriate, fund strategic capacity improvements. In this presentation, we will share:

- The reason for creating the Community Planning Portal
- How the Portal was developed
- Key features of the Portal
- The lessons learned
- Plans for the future

Where's Our Stuff?: City of Des Moines Cityworks Server AMS Implementation and Application

Steve Schunzel, *City of Des Moines, WA*

Steve Schunzel is currently a Senior GIS Analyst for the City of Tacoma, but was the GIS Administrator for Des Moines. During his 7 years there, he oversaw the digital capture of assets into the GIS and the subsequent asset management system. He has been in the GIS field for over 20 years.

Chris Brussow, *Cityworks® (Azteca Systems Inc)*

Chris Brussow is currently a Client Relations Account Manager for Cityworks® (Azteca Systems Inc.). He has been with the company 4 years and specializes in technical implementations and support. He is a lover of all things GIS and geography.

Abstract:

The City of Des Moines is a city of 30,000 and is charged with maintaining its stormwater, traffic and parks assets. Insurance audits in 2009 recommended that the city maintain an active inventory of these assets. After completing collection of these assets in the GIS in 2011, the city decided to implement Cityworks Server AMS as their maintenance management system. The system went live in August 2012 and has been using the system to successfully manage their assets.

This presentation will detail the implementation process; from system setup, to designing workflows to meet the system, to practical examples of its use. The objective of the presentation will be to examine the ingredients chosen for this solution and to demonstrate the path of implementation, including challenges overcome (limited budget & staff, limited technology skills) as well as future opportunities (advanced reporting, inspections).

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