WAURISA: The Washington State Chapter of URISA
The Association for GIS Professionals
WWW.WAURISA.ORG

THE SUMMIT

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News From and For the Washington GIS Community

King County Cedar Grove Road Area: Odor Identification & Sourcing

Student Paper By: Melissa Kelly

Abstract: For well over a decade, residents in the Cedar Grove Road area in King County have been plagued by nuisance odors in their neighborhoods. A number of lawsuits and penalties have yet to resolve the situation.

At the center of the situation are two Cedar Grove Composting (CGC) sites. Local residents are convinced that the CGC sites are the source of the odors. However, a reclamation facility and the King County Regional Sanitary Landfill lie next to CGC, thereby complicating the identification of odors.

The regulatory agency responsible for the situation is the Puget Sound Clean Air Agency (PSCAA). Unfortunately, they have been somewhat ineffective because they are required to be accurate in any indictments they may make. In addition, CGC claims that they are not the source of the odor complaints but instead point to the county landfill and the materials site next door.

In collaboration with Atlas, a non-profit organization for the Four Creeks Unincorporated Area Council (FCUAC), and local residents, the objective of this project is to develop a system to effectively identify the source of nuisance odors. Multiple analyses will be performed including mapping odor complaints and the facilities in question, topography analysis, and Spatial Analyst modeling using weather station data for various weather parameters. Geostatistical Analyst will be used to produce predictions of weather phenomena for the unsampled locations. Hot Spot analysis will be generated using all complaint addresses.

Once originated, odor particles are at the effect of meteorological forces and physical blockage including vegetation, topography, and man-made objects. Wind, humidity, and temperature are among the forces that influence the direction and disbursement of odors. Several GIS weather maps will be created for comparison of days with and without odor complaints. The final outcome will be to determine any relationships between weather phenomena and the dispersion of odors, and to identify what is needed to develop a

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Also In This Issue:

President's Column

By: Heather Glock

It's time to prepare for the Washington GIS Conference!

I hope you are enjoying a great start to 2014. Thank you for taking the time to read my column… I'll keep it short and sweet and dive right in with the most important news I want to share: the upcoming 2014 Washington State GIS conference, taking place May 12-14 in Tacoma. The ground work for another excellent conference has been laid: our dynamic conference theme "Communicating Our World" ties in very nicely with our keynote speaker, Breece Robertson of The Trust for Public Land. This year, we're supporting our conference theme by integrating it into our track sessions as well as our keynote event.

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Interview with 2013 Summit Award Winner: Karl Johansen

By: Michelle Lortz, with contributions from Rick Lortz, GISP

The Summit Award is given to the Washington State GIS Person of the Year. It is awarded to a person who has made significant contributions to the GIS community of Washington State. Congratulations to Karl Johansen, GIS veteran and recipient of the 2013 Summit Award.

Summit: *Tell us something about your formative years, leading up to a career in GIS.*

Karl: Let's see…growing up in a large family, first in the Willamette Valley, then western Pennsylvania. I experienced lots of travelling and fun vacations; outdoor activities like camping, hiking, and mountain climbing. Adventure, education, the arts, and work ethic were definitely family values. Looking back, traditional geography was a constant thread and fascinating hobby. I still have some of my treasured National Geographic Magazines from those years. I returned to the Pacific Northwest shortly after high school graduation to study forestry at UW, where fate had some other surprises in store for me (as it often does).

Summit: *What were those events, especially the ones that brought you to GIS?*

Karl: Well, there was a bunch. The turbulence of the 1960s and '70s had quite an effect on my thinking and my life. Certainly the period defined my college career. At UW I dabbled briefly in forestry, architecture, and even engineering; looking for a focus, in other words. Oh yes, also cinema. Cinema! I was not a committed student, my grades were nothing to write home about, and of course I didn't. Then I had a chance encounter with a fellow student in my rooming house that was going through the cartography program at the university's Geography Department. I still remember this individual's sheer joy and enthusiasm in describing his classes, the faculty, and the fun of learning about maps and mapmaking. Since I was on very thin ice to say the least, it was worth looking into, and it is a good thing I did. My college fortunes immediately turned around, with the cartography and geography coursework complemented by first-rate classes in geology, English, and other fields.

Remember: this was *pre*-GIS, although even in that era, UW and other major geography departments knew that the digital revolution was fast approaching. Our superbly designed cartographic masterpieces were done with conventional drafting tools, materials, and photomechanical techniques of the time. All modesty aside, they were impressive pieces of work and got a lot of recognition. But we also dutifully did our punch cards and crude machine-drawn maps, and pondered what would be coming next.

The other event that I should mention was my employment at the New York State Department of Transportation's Cartography Section, right after college. This operation was (and still is) the state's official base mapping agency, and did custom cartographic publications as well. My initial plan was to learn what I could there for a year, and then return to the Pacific Northwest. As it turned out, I was there for over nine years. Toward the end, the agency acquired Intergraph software which I used in designing and managing a major statewide highway inventory project. This was cryptic GIS, compared to today's knowledge base, but it was novel at the time to be linking massage amounts of records – in this case accident and highway inventory reports – to map features, and even do primitive "hot spot" analysis. My time at NYSDOT was probably the most formative phase of my whole career in terms of learning and working in a team environment. If there was a single event or thread that "brought me to GIS," working at NYSDOT was it.

Karl Johansen accepting the Summit Award at the Washington GIS Conference, May 2013.

After NYSDOT I worked in academia and consulting alongside experts in the digital mapping arena, some of them international figures. This included meeting Jack Dangermond and his merry crew which at the time was just a few dozen dedicated souls if that many. It was about then that I started considering GIS folks "evangelists," if for no other reason than their vision, commitment, and persuasive powers, all part of this field's amazing history.

Summit: *You have talked in the past about the subject of Data Quality. What are some of the challenges and opportunities of managing and using geospatial data as far as quality is concerned?*

Karl: This is a huge subject and I think an outstanding topic for a master's thesis…that is, if it explains in plain English what the technical, business, and institutional drivers are and how they relate. We are inundated with geospatial data, and all users need and deserve a logical and rational framework within which they can sort out this topic. I don't think we are there yet, either in terms of existing data, data to be developed, or ongoing maintenance. Really, not even close.

Some GIS professionals also need to articulate issues, positions, initiatives, and take some advocacy role .

I think there is much to be done on framework standards at the local/regional level – i.e., large mapping scales – where metrics, metadata, procedures, automated routines, etc. will inform and govern the use and management of spatial data in particular contexts. Roughly speaking, accuracy of feature geometry, attributes, and current feature state seem to be equally important. Since dollars and cents are involved, managers and decision makers are clamoring for a common-sense explanation of this topic, no surprise; the GIS community needs to step up to this and respond appropriately.

Summit: *What do you see as the most daunting communication challenges facing GIS professionals?*

Karl: Several things come to mind. First, I am reminded of the 2012 WAURISA keynote by former Wyoming Governor Jim Geringer in which his message, broadly translated, seemed to urge GIS professionals to have a story to tell, identify those opportunities where GIS can make a difference, and tell the story succinctly to the right audience. I think some of us struggle with this: thinking on our feet, quickly synthesizing a lot of information, summarizing, and providing useful sound-bite-level feedback to influential people (managers, customers, partners, funding sources, etc.).

Second: the written word. Many, perhaps most, GIS professionals don't have to write much other than occasional metadata, brief technical procedures, and their annual job performance review. If the field is to move ahead, at least some GIS professionals also need to articulate issues, positions, initiatives, and take some advocacy role where it's needed. And do it effectively. This is all in addition to the ongoing reporting of research and project results to inform professional peers and others, as in conference presentations and similar forums.

Also: GIS is so embedded in business applications these days, and it looks like this trend will continue, meaning a quantum shift in how GIS professionals and their IT colleagues communicate. Everyone involved must sign on to a common terminology, project life cycle protocol, database framework, goals, etc. This may be a reach for the two groups who have previously been cast in their own, mostly separated roles. However, this new project implementation model is here, intensely, and not going away by all appearances.

Summit: *What are your thoughts on project planning/management as far as a necessary skill set for GIS professionals?*

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King County Cedar Grove Road Area: Odor Identification & Sourcing

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system to timely and accurately identify the odor source.

Introduction

The Four Creeks Unincorporated Area Council (FCUAC) in King County advocates for citizen participation in the unincorporated area that lies roughly between Renton, Newcastle, Issaquah, and Maple Valley. The members of the FCUAC are all volunteers and have been involved with community issues and the county for a long time. For years residents in the Four Creeks area have been dealing with nuisance odors. Several large processing facilities are located within the FCUAC boundary including Cedar Grove Composting (CGC), King County Regional Sanitary Landfill, and a gas reclamation facility. Residents are convinced that the CGC is to blame for the increased nuisance odors.

GIS spatial analysis tools will aid in identifying odor sources if there is sufficient weather information available.

CGC has been collecting and recycling organic yard waste since 1988. In 2004 they started accepting food waste and in 2009 food scraps recycled by residents increased by 47 percent due to new weekly collection contracts and customer participation. It wasn't until 2004 when The Puget Sound Clean Air Agency (PSCAA) started receiving an increase in odor complaints in the Maple Valley / Cedar Grove area. However, the PSCAA has been unsuccessful in acquiring accurate evidence that would place the CGC as the source of the nuisance odors.

The CGC claims that they are not the source of the odors and have taken measures to prevent such odor offenses. They instead point the blame at the King County Regional Sanitary Landfill and a gas reclamation facility that lie next door. The gas reclamation facility shares a land parcel with the landfill and did not become operational until 2010.

Local residents have been in an ongoing lawsuit with CGC and they have turned to the FCUAC Atlas Program for their help and support. The Atlas Program is a non-profit organization that provides high quality maps and spatial analysis to other non-profits and public organizations. The Atlas Program also partners with Green River Community College (GRCC) students for GIS services. Atlas felt that odor sourcing was a spatial problem and agreed to provide services in collaboration with GRCC.

Dispersion is a term used to describe mixing air by turbulence. Turbulence is caused by heat rising from the earth's surface and by wind moving at different speeds above and below each other. Odors are dispersed when air mixes with the plume and are scattered far and wide under good dispersion conditions. Odor intensity decreases as one moves away from the cause of odors in a well-dispersed plume (Hamilton, 2004).

Several factors influence the way an odor is dispersed. Wind speed and heating or cooling of the earth's surface can affect how far and where the odor travels and its intensity. Higher wind speeds and/or moderate solar radiation striking the earth's surface will yield the greatest dispersion. Terrain also has an effect on dispersion causing the air to move around obstacles such as hills and trees. The rougher the terrain, the more mixing and dispersing of the air during higher wind conditions. During certain conditions of light winds and cooling odors tend to settle in low-lying spots. Odors are pulled down by gravity because they tend to be heavier than air and may travel through valleys and low spots (Hamilton, 2004).

This project will focus on investigating the weather conditions around the site of the odor complaints during such odor complaint events and to develop a system using GIS to determine the best odor identification response. GIS spatial analysis tools will aid in identifying odor sources if there is sufficient weather information available. Together the Atlas Program, GRCC, and the help from the Institute of Neurotoxicology and Neurological Disorders (INND) will provide all parties with research and expertise in this odor sourcing case.

Method

At the start of this project the Atlas Program had provided a 10 meter Digital Elevation Model (DEM) of the Maple Valley / Tiger Mountain area along with a FCUAC boundary and sub area boundaries feature classes. The DEM was used to create a hillshade and 500-meter contour feature classes in order to better understand the terrain of the subject area. The next step was to identify the location of the land parcels

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City of Auburn Wins Digital Cities Award

By: Ashley Riggs, GISP

The City of Auburn was recently honored with a Digital Cities Award, and GIS was an integral component of the award-winning projects.

The press release states "This award was issued by e.Republic's Center for Digital Government and the Digital Communities Program. The core of the survey was identifying the ten technology initiatives across four categories - citizen engagement, policy, operations and technology/data. Auburn ranked number 7 in the classification of cities of less than 75,000 population."

Auburn's Information Technology Department submitted several major initiatives in their application; most of them rely heavily on GIS. Ashley Riggs, the City's IT Operations Manager, submitted the following descriptions of three of these projects.

AVL & Fleet Management

Ever wonder if the street in front of your house has been sanded or plowed during a major snow storm or where they are? Ever wonder if someone is working on that graffiti request you submitted to the City or where the street sweeper is? Well in Auburn, WA you can.

The City of Auburn has implemented an Automatic Vehicle Locator (AVL) system which not only allows staff the ability to monitor several key areas to save money, time and resources, but it also allows for a interactive web-map that shows critical information to residents. Along with that, City staff will be able to utilize location based services and respond to requests more efficiently and effectively.

GIS & Asset Management

The City has integrated two of its enterprise systems so Public Works' assets can be managed efficiently and effectively. Using ESRI GIS with a real-time synchronization to Auburn's robust asset management system staff can track resources (labor, materials and vehicles), asset costs, asset life cycles and predictive failure analysis. This integration has allowed for management to stay informed and field workers to be as efficient as possible with mobile devices, taking a proactive approach to maintenance and repairs.

The City's GIS division within IT stores and manages 217 data layers that are used as the foundation for enterprise integration, development and analysis. This solid GIS and inte-

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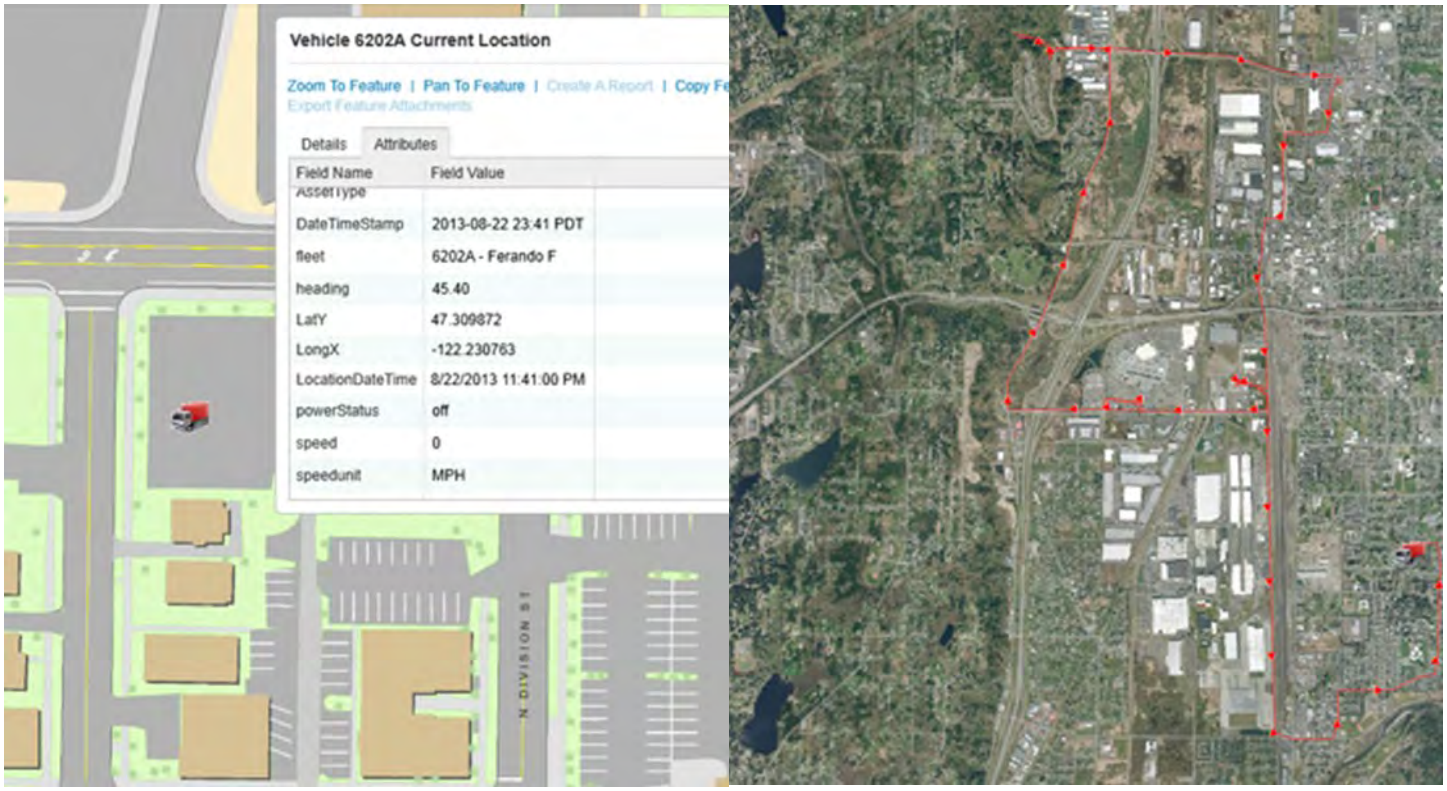


AVL and Fleet Management. Map showing live location of a city vehicle (left), and breadcrumb trail of a vehicle over a 24-hour period (right).

GIS Day Highlights: November 20th, 2013

The Washington State Joint GIS Day event was held in the Capital Building. Primary sponsors for this event were the Washington State Geographic Information Technology (GIT) Committee and the Washington Geographic Information Council (WAGIC). The Washington Stated Department of Transportation, Department of Ecology, and several other agencies organized and provided posters and presenters for this year's event.

-Julie Fogde, GISP

Joint Base Lewis-McChord—Range Support put on this event to showcase the role of GIS within the military.

At the event there was a "Where on JBLM" aerial trivia poster which encouraged and challenged spatial recognition. A Fairchild Stereoscope Binocular Model F-17, made in 1930 and used in World War 2 for enemy spying, provided a demonstration to view 1970 era aerial imagery of the cantonment areas on JBLM. This activity described its historical relevance, as well as its relationship to modern day mapping and GIS.

-Karen Witsell

Kitsap County GIS hosted an event that was open to internal departments as well as the public. There were three structured presentations: Intro to GIS Concepts, GIS at Kitsap County, and a demo of a new application called Parcel Search 2. There was also time set aside for interactive Q&A and hands-on training with four stations: ArcGIS Online, a Kitsap County basemap, new imagery, and Parcel Search 2. A population density map of the County topped the cake.

-Eadie Kaltenbacher, GISP

The Port of Tacoma held a GIS Day Fair in the atrium of their administration building. Employees were able to:

• Get a sneak peek of the redesigned PortView site (internal interactive mapping application)
• Search updated Commute Trip Reduction maps to find a rideshare to work
• See new maps on the external website
• See how some employees are making maps inside Excel (Esri Maps for Office)
• See case studies of what GIS is doing for the Port
• Sign up for GPS training
• Play a map game (label a blank map of the Port)
• Eat cake!

-Jennifer Radcliff, GISP

Loni Shorten (Waldo) shows Diana Meister how to use a customized ArcGIS Online map to find carpoolers. Diana also found Waldo hidden in the map, earning an entry into a drawing for a $25 Amazon gift card.

The University of Washington hosted its 3rd annual GIS Day event in the UW Libraries' Research Commons. It was by far the most successful event of the past three years, with an estimated attendance of over 150 participants. The day consisted of: lightning talks covering the wide diversity of GIS and remote sensing occurring on campus; a feature presentation by Prof. Sarah Elwood of the UW Geography Dept.; a panel discussion on the issue of big data and GIS; a Collaborating with Strangers (CoLAB) workshop; and a very popular demonstration of 3D technologies used in GIS. See the UW GIS Day site for complete information: https://depts.washington.edu/gisday/

-Matthew Parsons

Pierce County GIS celebrated a quiet GIS day in the office with staff only this year. A huge sheet of sugar (cake) was presented to the staff to recognize their dedicated efforts in 2013. The cake originally said "Happy GIF Day", and the cake decorator was completely confused by the big smile she received, and the story about how it was actually quite funny that she had misspelled it. She promptly fixed the words, and a good time was had by all.

- Brandy Riche, GISP

WAURISA Full Day Workshop

in partnership with FEMA

Emergency and Disaster Preparedness for the GIS Professional

February 4, 2014 in Seattle, WA

NOAA Sandpoint facility, Seattle WA

WAURISA and FEMA are hosting a full day workshop designed to inform the GIS professional how to be prepared for supporting emergency and disaster events. This workshop is a lecture style presentation with several key speakers from our region covering both Federal and State level topics as well as local themes. Topics will include overviews of State response systems, HAZUS overview and case examples, concepts and techniques useful for the local GIS technician. The workshop is geared for the GIS professional familiar with using a GIS but interested in being more prepared for supporting responses to a disaster. No lunch is included, however the facility has a cafeteria and people are also welcome to bring their own lunch.

Registration is due by January 30th, 2014

Cost:

Student member:	$15
Student non-member:	$30
Professional member:	$25
Professional non-member:	$40

Late Fee +$10

More Information at www.waurisa.org

Online registration at www.regonline.com/GIS_EmergencyManagement

8:30-9:00am Registration
9:00 -12:30 Morning Session on Federal and State topics
12:30-1:30 Lunch at the NOAA Sandpoint cafeteria
1:30-2:00 Tentative- tour of NOAA Forecast center
2:00-4:30 Afternoon Session on local response topics

GIS Supports Economic Development in Grant County

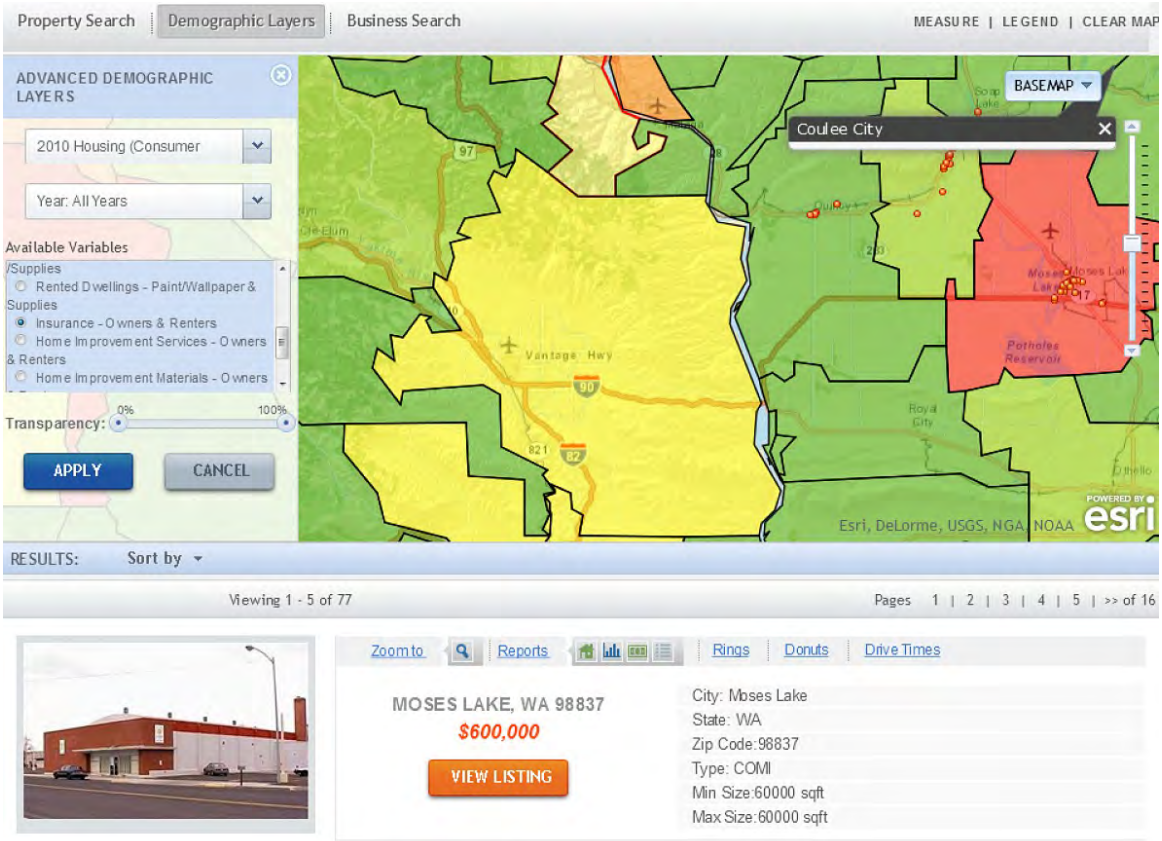
Press release from GIS WebTech

GIS WebTech's Recruit software for economic development is now serving the Grant County Economic Development Council's website in Moses Lake, WA, well known in the economic development industry for its recruitment of major data centers serving Microsoft, Intuit and Dell. Recruit delivers a comprehensive, continuously updated sites and buildings listing on the organization's recruitment website. The application functions in a cloud-based web platform that eliminates many of the pain points for the organization's staff members that must update the website in order to make it more informative and extremely accurate for site visitors researching the county or region. Recruit also provides users with the ability to create custom map reports with extensive data search capabilities in a web browser, removing the GIS restrictions that most users face when viewing GIS files. The software integrates a MLS commercial real estate plug-in for viewing a current listing of sites and buildings on the website. The information can be saved for use in custom reports and integrated to make maps with data from Microsoft SharePoint, as well as maps for MS Office for mapping statistics in proposals that relate to specific assets or inquiries from site selectors.

According to Jonathan Smith, Executive Director of the Grant County Economic Development Council (GCEDC), the organization had struggled with maintaining its online data files with current information and stats that were often difficult to share online, typically supported by GIS data files that were acquired by local county government, department of transportation and other regional authorities.

"By integrating our research tools and website management technologies with Recruit, we have been able to minimize the time consuming work and costs affiliated with maintaining an up to date, accurate listing of available sites, buildings and other commercial properties on the GCEDC website," said Smith. "Our website now functions as an interactive research portal that leverages geospatial technology from Esri, which ensures that our data is always provided via a seamlessly updated data source."

For more information regarding Recruit, please visit GIS WebTech.



An example of a custom map generated by Recruit

About GIS WebTech:

The firm develops GIS-based web software and customizable mapping applications for economic development, tourism, real estate and private industry. The company also provides custom programming and technical GIS consulting for other industries, and continues to expand its GIS offerings to serve a broad range of customers and unique project requirements.

Interview with 2013 Summit Award Winner: Karl Johansen

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Karl: Many GIS practitioners don't plan or manage projects. But GIS projects still need to be planned and managed. These are skill sets that are basic, and should be part of core competencies for a GIS professional. Even if an individual doesn't directly plan or manage projects, having this skill set will enhance communications and collaboration with those who do, and promote understanding of the financial, legal, and logistical issues that surround any project undertaking. Significant issues are expectation management, scope of work drift, resource allocation, quality control, acceptance criteria (for payment purposes), and communications, to name a few.

Summit: *What is a good model for GIS veterans passing on their collective knowledge to peers and/or new entrants to the field?*

Karl: I think this starts when people involved in the same discipline share ideas and information freely, so personal attributes of collaborating, communicating, and being a good and appreciative listener are important catalysts. The sharing can be in the workplace, across a professional network, within social media, at the local brew pub, whatever. When this dialogue starts happening, it is something to see, pure synergy, almost electric. This is regardless of whether or not a GIS veteran is present, but if one is, maybe that individual helps most by stimulating healthy dialogue among others, rather than pontificating on the subject at hand – a struggle for the veteran, but a manageable struggle (and a relief for everyone else). Hopefully the veteran will always be frank and forthcoming about avoiding past mistakes and reinventing the wheel, but again, how this is packaged and presented is all-important.

In a formal sense, the best model for knowledge transfer and keeping the field moving is education in whatever format, professional organizations and activities, and the written word. URISA and its chapters, and the regional educational institutions, certainly promote all of that.

Summit: *Tell us your experience with being mentored and being a mentor yourself.*

Karl: I have had many mentors in my life, my parents, siblings, coaches and teachers have all been instrumental. One high school instructor, Joseph Yount, was a good-natured but super-strict mentor on the nuances of engineering drawing. His lessons have stayed with me to this day. Another individual stands out: Dr. Everett Wingert (now chair, Geography Department, University of Hawaii at Manoa). As a doctoral candidate at UW, Ev was the resident coach and confidant for undergraduates and graduate students alike, including myself, all in addition to his teaching and research (cutting-edge laser analysis of aerial photography). He is one of few academics I know of who promotes a holistic approach to the mapping sciences: land surveying, remote sensing including aerial mapping, cartography, earth sciences, social sciences. As I mentioned before, encountering and working with such people was just plain good fortune and shaped my future to an incredible degree.

We each have at least some skills, interests, and experience worth passing on to others, as well as strengths and weaknesses of course. If we are just candid about what all of that is, and how it can help others, we can make quite a difference. That is a small investment of time compared to how we have been assisted and even rescued in the past.

No question, my own mentoring activities are fairly thin

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Washington URISA invites you to the 2014 Washington GIS Conference!

WAURISA Washington GIS Conference

Communicating Our World

May 12-14, 2014
Greater Tacoma Convention & Trade Center

For more information:
www.waurisa.org
#wagis14

The Washington State Chapter of URISA (WAURISA) invites you to the 2014 Washington GIS Conference, May 12-14 in Tacoma at the Greater Tacoma Convention Center. Come join us for "*Communicating our World*".

Breece Robertson is the 2014 keynote speaker!

Washington URISA welcomes **Breece Robertson**, the National Geographic Information Systems (GIS) Director for The Trust for Public Land, as the keynote speaker for the 2014 Washington GIS Conference. Robertson joined The Trust for Public Land 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, while managing a cutting-edge team of GIS staff and consultants nationwide.

At the 2012 Esri International GIS Users Conference, Breece Robertson and Will Rogers, chief executive officer, accepted The Making a Difference Award on behalf of The Trust for Public Land. The award is given to an organization that has used GIS to bring about meaningful change in the world. The Trust for Public Land has over 50 projects in the Pacific Northwest; over 25 of those are in Washington State. From the deserts of Central and Eastern Washington, to the mountains and forests of the Cascades and the waters of the Puget Sound, the Trust of Public Land has projects that touch much of the conservation work that we as GIS practitioners support.

Call for Workshop Proposals

Proposals for workshops are now being accepted. Proposals are due **February 10, 2014**.

Call for Presentation Proposals

Proposals for presentations or sessions are now being accepted. Proposals are due **March 10, 2014**.

Richard 'Dick' Thomas Memorial Student Presentation Competition & Award

Proposals for the 8th annual Dick Thomas Student Competition are now being accepted. Proposals are due **April 11, 2014**.

Call for Exhibitors

Find information on exhibiting at the conference on the website. NEW this year is the Mt. Olympus sponsorship level. We are offering this phenomenal deal to small businesses that have less than 3 employees and an annual gross of 150k or less. If you meet these criteria don't wait, at just $350, which includes one conference attendee, these spots will go fast. Vendor registration is OPEN!

Check out the Conference webpage for upcoming news!

PARTNERS IN EMERGENCY PREPAREDNESS CONFERENCE 2014

APRIL 22 – 24

THE GREATER TACOMA
CONVENTION & TRADE CENTER
TACOMA, WA

FEATURED Speakers

Sandi Doughton is an award-winning science writer for *The Seattle Times* and author of *Full Rip 9.0: The Next Big Earthquake in the Pacific Northwest*.

David Sanderson is a survivor of *The Miracle on the Hudson*. Sanderson was the last person off of the back of the *US Airways Flight 1549* plane and was largely responsible for making sure so many others made it out safely.

Lacey Croco is a former King County emergency management program manager. She is currently working for an organization development firm to tackle emergency management challenges with a new perspective.

Adrianne Haslet-Davis survived the unimaginable bombings at the 2013 Boston Marathon where she lost her left leg below the knee. She is quickly rising to meet her daily challenges head on with a unique perspective.

The ***Partners in Emergency Preparedness Conference*** (a non-profit 501(c)3 charitable organization) is the largest and most successful regional emergency preparedness conference in the Pacific Northwest. ***Partners in Emergency Preparedness*** annually hosts nearly 700 people representing business, schools, government, the nonprofit sector, emergency management professionals, and volunteer organizations.

REGISTRATION Rates*

Attendee

Early *(Now through 2/28/14)* *Only 300 registrations accepted at this rate. Rate will expire when 300 attendees have registered or 2/28/14 (whichever comes first.)*	$295
Regular *(3/1/14 through 4/1/14)*	$400
Onsite / Late *(4/1/14 through 4/22/14)*	$450
Current WSEMA / IAEM Student Member	$150

Exhibitor

Booth	$875
Additional Booth Staff	$150

**Payment must be received by the rate deadlines.*

WWW.PIEPC.ORG

Interview with 2013 Summit Award Winner: Karl Johansen

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compared to *how much I have been mentored*. A 2014 resolution for me is to revisit with my Old Guard cronies and others the contribution or legacy we have made or *could make*…and then act on this, decisively.

Summit: *What roles do you anticipate in the future for GIS professionals?*

Karl: A broad range, as now, but I hope the typical GIS person will have superb technical skills, a continuing education plan, project management experience, excellent ability to communicate, and strong connections to industry and professional organizations. This person may be multidisciplinary – a generalist – or highly specialized, examining micro-environments or the universe. As mentioned earlier, the person will likely be conversant in business applications that encompass GIS, and an effective team player in such implementations. The opportunities are many: as a discipline we have done some incredible things but have just begun to scratch the surface.

Karl Johansen displaying his Summit Award plaque and "Karl's Fan Club" t-shirt.

Summit: *Can you share with us what inspires you about GIS?*

Karl: At this (late) point in my career, all of this inspires me, as I see people working together to get results using fantastic tools we never envisioned 40 years ago. The breadth and depth of available data is also incredible, both in raw and reformatted packaging. Maybe what is most inspiring is that the technology is now user-friendly enough that engineers, archeologists, executives, and parks planners can routinely create their own maps, analyses, and reports, not to replace the GIS professional's role, but to complement and enhance it.

I am reading two books now: Rachel Hewitt's *Map of a Nation* and Katharine Harmon's *The Map as Art*. The first is a fairly erudite but captivating chronicle of the British Ordnance Survey, with I think some compelling lessons for today's GIS arena; the second is a collage of eclectic, unconventional cartographic creations which has already inspired me to start thinking about some new GIS enterprises and product concepts. The written word, graphics, maps, and other media; what a combination…

Summit: *Thank you Karl for sharing your knowledge, thoughts and insights with us.*

Karl: The pleasure is mine; thank you Michelle and your able assistant. I offer kudos to WAURISA and *The Summit* for your great support of the GIS community, both regionally and beyond.

A Map for a Fireman

By: Anne Stiffler

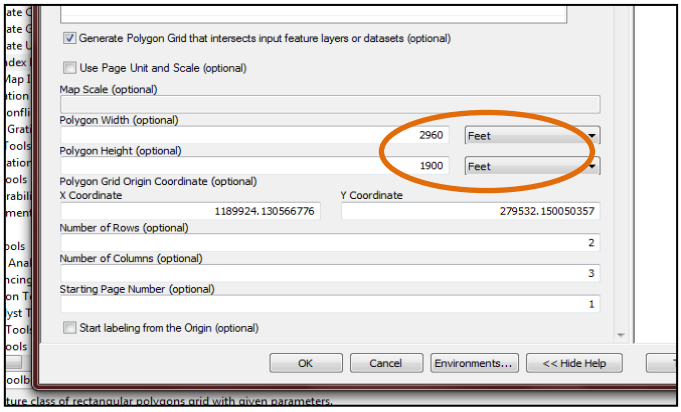
Almost fifteen years ago, North Kitsap Fire and Rescue (NKF&R) fire department in Kitsap County, Washington decided they needed their own custom-made map book that contained local knowledge of roads, driveways and address locations. After tracing aerial imagery, field checking addresses and driveways and using many precious man-hours, the department created hand-drawn maps of the roads, driveways and homes in their jurisdiction. The pages are in different scales, north arrows point in seemingly random directions and notes are scribbled on many pages. They still use it and still update it. It supplements the Mobile Computing Terminals on each department rig. Paper maps don't need batteries, they don't have "glitches", get viruses, or fail.

Paper maps don't need batteries, they don't have "glitches", get viruses, or fail.

Last August, Kitsap County Department of Information Services/GIS offered NKF&R a digitally created map book using ArcMap 10.2 and Data Driven Pages. After two meetings and several emails, we printed a draft copy for them to try and give us feedback on.

I had the privilege of creating the map book. I was given a copy of the fire department's own map book, shown ESRI's Fire Run Map Book Template and given a brief tour through the GIS database, and a link to an online video on using the template. I started by going through the original map book to see what types of information were included and what the book's general format was.

My next task was to figure out how to use data driven pages. There are two online ESRI videos that helped me quite a bit: "Creating Map Books Using Data Driven Pages" by ESRI (http://training.esri.com/Courses/ts_DataPages/player.cfm?c=349) and "Building Map Books in ArcGIS" by Jeff Barrette and Tim Bole (http://video.esri.com/watch/1825/building-map-books-in-arcgis).



Specifying the polygon size in the Grid Index tool.

The Map Pages Document

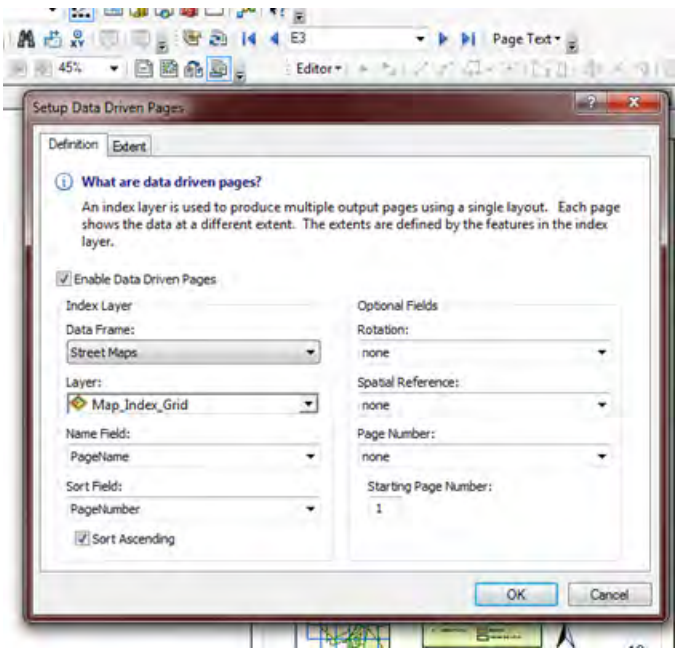
I gathered the necessary shape files from the county's GIS database into an ArcMap document. These included some fifteen different features.

Then I created the Grid Index layer to drive the map pages. During a meeting with representatives from the fire department, it was determined that 11" X 17" in landscape orientation was a good print size. A scale of 1" = 200' seemed to work visually. In order to get the most "map real estate" on the page, I adjusted the Grid Index tool parameters to create a grid with a polygon width of 2960 feet and a height of 1900 feet.

With the Grid Index built, I opened up the dialog to set up Data Driven Pages. I enabled Data Driven Pages and specified the Grid Index layer I built as the Index layer. Then I clicked on the Extent tab and chose to Center and Maintain Current Scale, wanting no margin around the grid polygon.

Then I started symbolizing and labeling. Discussions with NKF&R representatives produced several requirements. The representatives pointed out that the interior light in the cabs of their trucks was red so as not so spoil their night vision, so I could not use red on the map. They requested that hydrant symbols needed to be large and bright, and that roads, driveways and trails be easily distinguishable from each other. I used a piece of red cellophane to lay over printed map pages to help with color and line thickness choices. Most importantly, every single address point and road needed to be labeled. The easiest way to do this was with the Maplex Labeling Engine and Key Numbering, which became crucial on pages that mapped heavily developed areas.

Final touches to the map pages layout included a north arrow, scale text, graticule tick marks around the edges and, as dynamic text, page numbers and adjacent pages notations on each side of the map. I made the graticule tick marks into a graphic so that the tick marks would not shift position with each map page. This allowed me to place a scale bar directly under a set of tick marks and have them always match up.

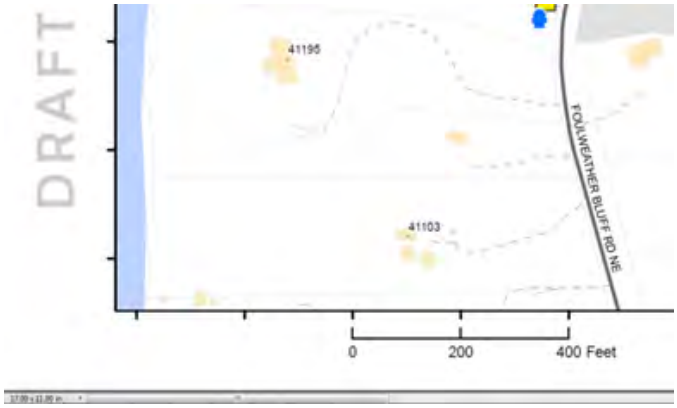


Map Grid Index and Legend Document

Putting the grid index and legend on the map pages would take space away from the actual maps. I decided to put the index and legend on a separate page which meant making a second map document. To cut down on work symbolizing the layers, I simply made a copy of the map pages document and disabled Data Driven Pages. With the page format being 11" x 17", there was plenty of space on a single page to put a grid index map and a legend. I purposely kept the legend simple and intuitive.

Street Index

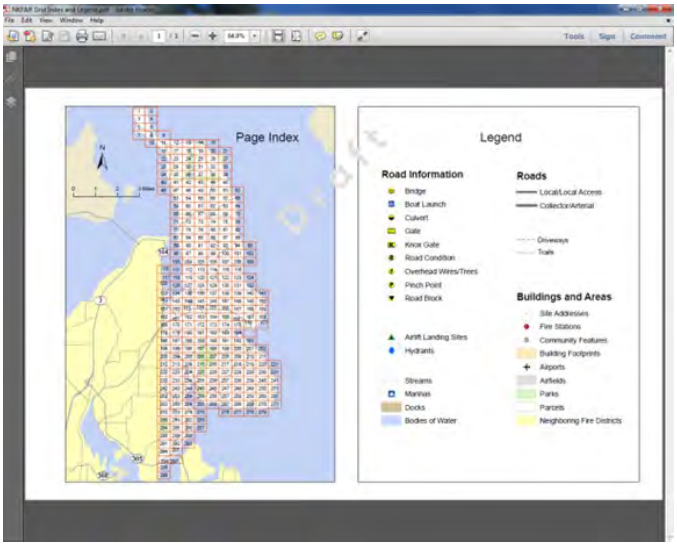
The street index for the map book presented some problems. The script in the Create Map Book toolbox creates a street index formatted for letter-sized paper. It also uses a single data field for the street name. In our case, the best field to use held the full name of a given street and contained prefix, street name, street type and suffix. Unfortunately, many of the street names in the fire district started with the prefix N or NE. When the street index script was run and the street names ordered alphabetically, many were grouped together under the letter "N". Also, the street index script as originally written does not allow for an address range. If a street runs across multiple map pages, it is helpful to know which addresses on that street are on which page. Not having the Python skills for this, I got some help from co-worker Erik Anderson, GISP, who solved both the single street name field problem as well as the address range issue. I made the adjustments that allowed for an 11" x 17" paper size. The output of the street index script is a pdf document.



The Complete Book

I now had a map pages document, a grid index and legend document and a street index document. I exported the map pages and grid index/legend to a pdf. Since the map book was to be printed, I did not export layer information to the pdf which reduced the size of the file. I also created cover and disclaimer pages that contained data set information using Microsoft Word saved as pdf documents.

Within the Create Map Book toolbox there is a script called "Create PDF Map Book" that merges multiple pdf documents. I used this to combine the cover, disclaimer/data information, street index, grid index/legend and map page documents into a single map book document. When we bound the document we included blank pages at the back for comments. We then gave the draft map book to the fire department. They won't give it back…



Map Grid Index and Legend.

WAURISA Representatives Attend GIS-Pro Conference

By: Heather Glock and Sarah Myers, GISP

As representatives of the Washington state chapter of URISA, board Secretary Sarah Myers and President Heather Glock attended the 51st annual GIS-Pro conference in Providence, Rhode Island September 16-19, 2013. Some WAURISA members likely remember the 2012 50th URISA GIS-Pro conference held nearby in Portland, Oregon – due to its proximity our chapter enjoyed strong attendance at that conference. Those of you who attended experienced first-hand the quality and variety URISA invests into its annual flagship conference. In Rhode Island, we joined 350 mostly U.S.-based geospatial professionals, many coming from the New England states and the east coast.

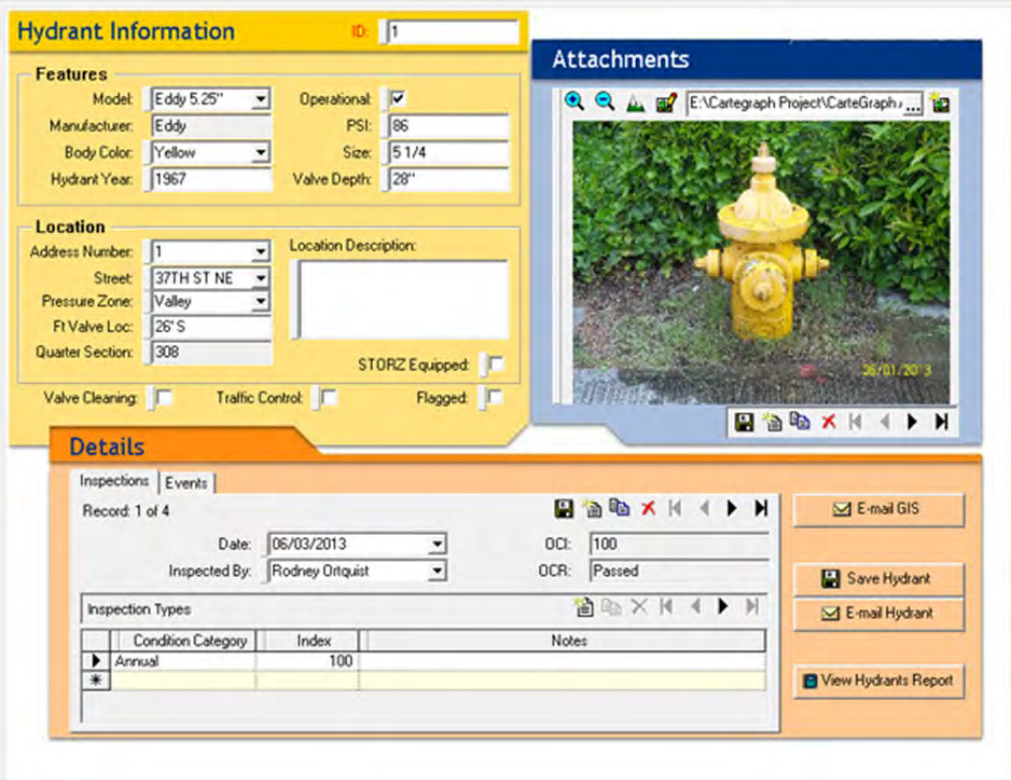
One of the primary objectives of sending WAURISA delegates to the GIS-Pro conference is to maintain and enhance ties with URISA. To achieve this goal the Chapter Advisory Board (CAB) hosts a half-day meeting the day before the start of the conference. The CAB is comprised of at least one member of each active URISA chapter. They meet monthly via conference call, and convene annually in-person at the conference for a half-day meeting. This year, the meeting served as a recap for discussions and decisions that were made over the previous 11 months. One of the main take-away's from the CAB meeting is that starting in 2014 all chapters will be required to pay URISA a chapter affiliation fee of $500. This fee helps pay for services and benefits that URISA offers its chapters, such as liability insurance. Until now, URISA has paid for these services without asking for contributions from its chapters; however, this model is no longer sustainable for URISA. Another key piece of news from this meeting is URISA's goal to align chapter and national membership – by 2019 URISA and its chapters will adopt a membership model where all chapter members are also members of URISA, and vice versa.

Another highlight of our time at GIS-Pro was our attendance at the URISA Finance and Marketing committee meeting. There, we learned about URISA's annual budget and took notes on discussions about new membership options and ideas for new workshops and partnerships. In addition, the Education Division meeting revealed the direction URISA wants to take their learning opportunities, and their hopes that the chapter affiliation fee can offer more training, not only in person, but also online.

The GIS-Pro conference offered a truly impressive selection of quality presentations and panel discussions. Between the two of us, we covered a dozen different tracks. One highlight was the GIS Ethics panel track. If you have a GISP credential, you know that it includes a code of ethics that you agree to abide by. What might be less evident is realizing the myriad ways you may need to invoke the ethics code in your work. The session focused on raising the awareness of ethical decisions and the scope of issues that require ethical considerations. WAURISA is looking to offer a GIS Ethics session at our conference this year. Another impressive session was "Building an Address Repository Using the FGDC Standard: Implementing Quality and Data Sharing." This session is actually one of several packaged workshops that URISA makes available to chapters – and certainly a workshop WAURISA can bring to its membership if there is interest. It was an all-day session that showed the participants how to go about developing a Master Address Repository. It reviewed the Federal standard and impressed on us how important quality address data can become.

Depending on finances, WAURISA endeavors to send at least one board member to URISA's GIS-Pro conference each year.

City of Auburn Wins Digital Cities Award



Example of the Asset Management System.

Ashley Riggs, IT Operations Manager (left) and Ron Tiedeman, IT Director (center), accept the award on behalf of City of Auburn during the National League of Cities' annual conference in Seattle on November 15th.

(Continued from page 5)

gration allows for better decision making and an efficient use of tax payer's money.

Mobile Data Collection

The City is in process of collecting pavement data in an automated fashion so strategic pavement crack and pothole analysis can be done. This collection is done with six sophisticated cameras that are attached to a vehicle which drives both directions of every street in the City.

Not only is pavement data collected, but 360 degree aerial imagery is collected and geo-referenced so any above-ground asset can be collected, at any time, i.e. signs.

This collection allows the City to stay current with federal regulations and also allows the City to strategically manage the budget dedicated for street maintenance based on need and priority.

About The Center for Digital Government

The Center for Digital Government is a national research and advisory institute on information technology policies and best practices in state and local government.

The Center is a division of e.Republic, the nation's only media and research company focused exclusively on the state and local government market and education.

King County Cedar Grove Road Area: Odor Identification & Sourcing

(Continued from page 4)

owned by CGC and the King County Regional Sanitary Landfill. King County land parcel data was obtained from the King County GIS Portal online. A feature class of all county parcels was downloaded and imported into ArcMap. A separate feature class was created from the parcels feature class to only include the two land parcels occupied by the landfill and composting facilities. The gas reclamation facility shares a land parcel with the landfill. The new feature class is used to identify their location in regards to the FCUAC boundary (Figure 1).

Odor complaint data was recorded and logged by the Puget Sound Clean Air Agency (PSCAA) from January 2005 through March 2013 into PDF form and transformed into Excel format. The INND obtained a copy of the spreadsheet for their research and passed the complaint data along to Atlas and GRCC. The complaint data includes the complainants name, address, date of complaint, any comments given by the complainant, and starting in 2012 the time of the odor complaint. The odor complaints spreadsheet was imported into ArcMap as a table. Geocoding of the complaint addresses could now begin.

The first step in the geocoding process was to create an address locator. The King County Metro Transportation Network feature class was downloaded from the KC GIS Center online and used to create the address locator that would be used to geocode the complainant addresses. Over 4,000 addresses were geocoded into ArcMap (Figure 2). Some were duplicate addresses due to the same complainant calling more than once. The geocoded addresses were displayed in ArcMap and several other feature classes were created from the geocoded addresses that filtered complaints by season and by year.

The first analysis explored was the Hot Spot (Getis-Ord Gi*) Analysis tool. Before the tool was run the Frequency tool was used to create a table of the frequency of complaints from a given location. The new frequency table was used as the input table to run the Hot Spot Analysis tool. The Hot Spot Analysis was used to determine where the high and low frequency of complaints occurred. The resultant Gi* statistic is a z-score. The larger positive z-scores indicate a higher frequency clustering of odor complaints; whereas, the smaller negative z-scores indicate a low frequency clustering of odor complaints. The results were displayed in ArcMap showing a higher frequency clustering of complaints closer to the facilities (Figure 3).

For initial analysis purposes and feasibility a small number of complaint and non-complaint days needed to be selected to investigate the weather conditions at the time and used for comparison. Dates were selected from 2012 in order to obtain as much archived weather data as available. A complaint day was considered a significant case day if five or more complaints were received on that day. Two significant case days, August 14th and December 12th of 2012, were chosen at random to investigate further. Two null days, August 8th and December 6th of 2012, in which no complaints were received were also chosen at random within a week from the two case

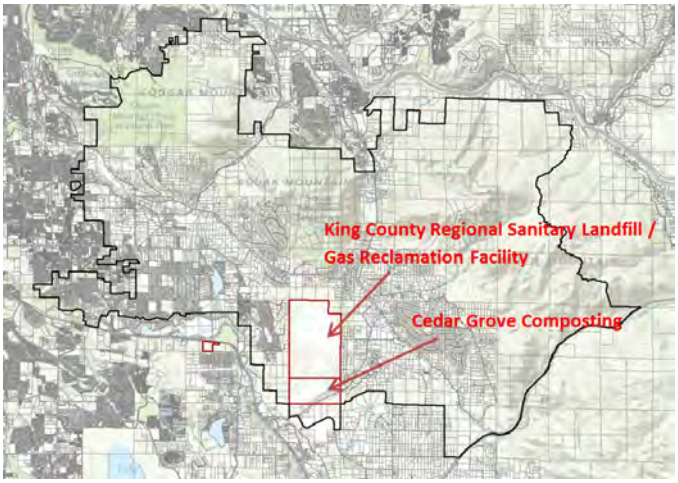


Figure 1. Parcels that are potential sources of odors, and boundary of Four Creeks Unincorporated Area Council.

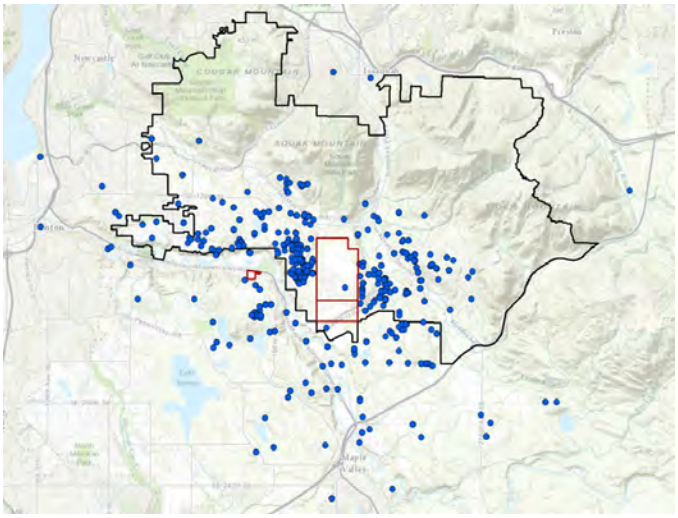


Figure 2. Complaints from 2005 to 2013 were geocoded, resulting in over 4000 points.

dates for best comparison.

The next phase of the project was to identify weather stations in and around the FCUAC area to gather available archived weather data. The Weather Underground has the largest network of personal weather stations in the world. Personal weather stations are owned by both amateur weather enthusiasts and employees of the National Weather Service. Some are basic weather stations that record elements such as temperature and wind speed while others are full weather stations that record all elements of weather data throughout the day. The Weather Underground website offers archived data from each of their registered weather stations in their network if available. A total of 11 weather stations were identified in proximity to the FCUAC that recorded data in 2012 (Figure 4).

An Excel spreadsheet was created for each of the four selected dates. The available weather data from each of the 11 weather stations included the high and low daily temperature, average and high daily wind speed, average daily wind direction and average daily humidity. The weather data obtained from the weather stations were input into each of the spreadsheets for the respected date. Each spreadsheet was imported into ArcMap as a separate table. The tables included the latitude and longitude of each weather stationed to display the point in ArcMap.

The location of the weather stations was used as sample points for further analysis. It is important to know what the weather was doing in between sample points. This was accomplished by using the Inverse Distance Weighted (IDW) tool, a part of the Geostatistical Analyst toolset, to create an interpolated continuous surface. IDW uses the measured values surrounding the prediction location to predict a value for any unsampled location, based on the assumption that things that are close to one another are more alike than those that are farther apart. Using the high temperature attributes the IDW was calculated. The outcome was a continuous raster surface of predicted high temperatures for each of the selected dates. In order to accurately compare the four surfaces a reclassify was necessary to represent the same values with the same symbology for each surface (Figure 5).

The IDW was calculated for each of the four dates using the high wind speed and average wind direction attributes. The outcome was 8 continuous surface rasters. Ideally, the wind

(Continued on page 20)

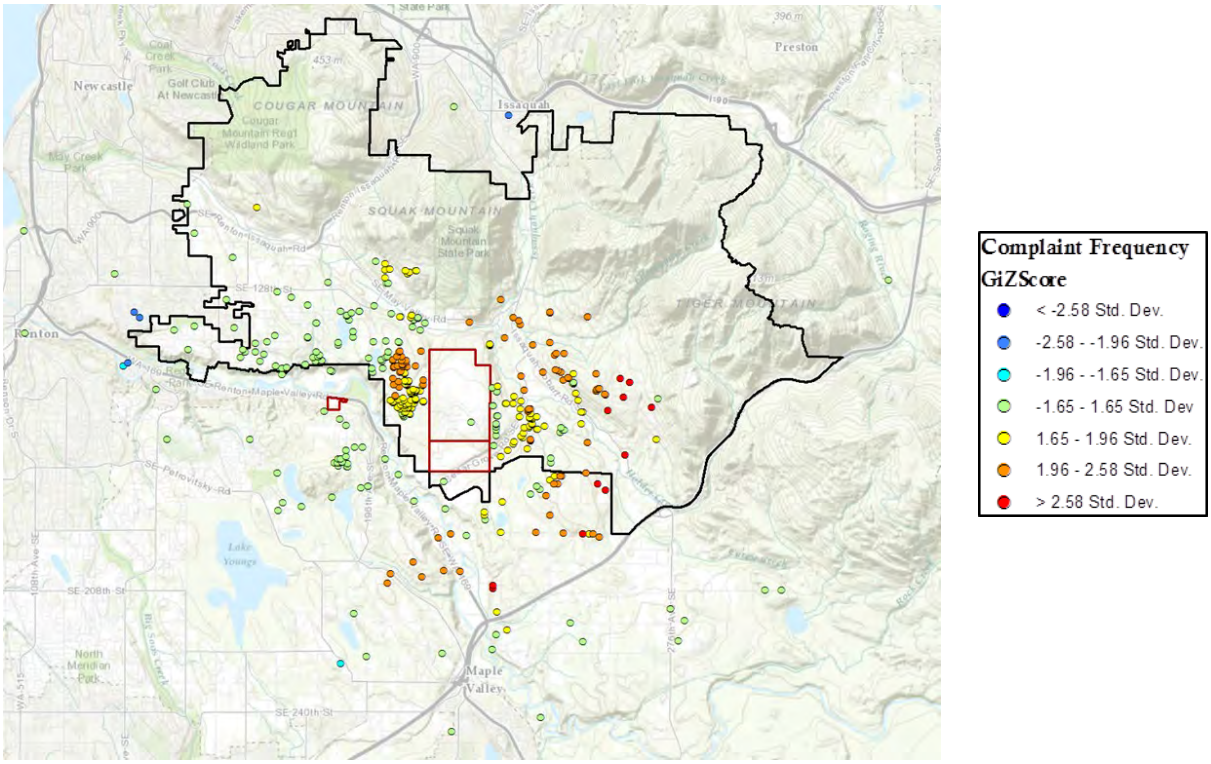


Figure 3. The result of running the Hot Spot (Getis-Ord Gi*) Analysis tool. The output is a z-score. Larger positive z-scores indicate a higher frequency clustering of odor complaints.

King County Cedar Grove Road Area: Odor Identification & Sourcing

(Continued from page 19)

speed and wind direction components should be joined in such a way so that they can be represented as one symbol and then overlaid onto the temperature surface layers. The first step in this process was to convert the raster to a point feature class. This was done for each of the 8 wind surfaces using a cell size of 2,000 meters. The outcome was 8 point feature classes. The wind speed point feature class was joined to the wind direction point feature class for its corresponding date, which resulted in 4 final point feature classes representing the predicted wind values at each center point of a 2,000 meter grid. The point features were changed to arrows with graduated colors representing wind speed. The arrows were then rotated upon the wind direction field to indicate which direction the wind was blowing from using the geographic rotation style. The wind layers were then overlaid onto the temperature layers in ArcMap (Figure 6).

Results and Conclusion

The results of this analysis show no clear indication of a relationship between the location of the facilities in question, the origin of the odor complaints, and the predicted weather patterns for the FCUAC area. For example, on August 14th, a complaint day, the majority of the complaints were located just northwest of the landfill and compost site. However, the predicted wind direction within this same area showed a southwesterly wind (the direction in which the wind is blowing from). While temperatures show to be higher on the August complaint day than the August null day, both December dates indicated a close temperature range.

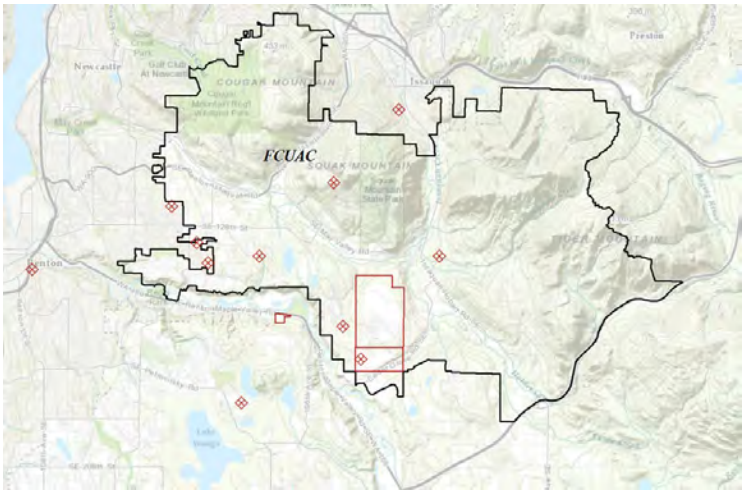


Figure 4. Weather stations around the FCUAC that recorded data in 2012.

One factor that may have influenced the inconclusive results is that the average wind direction, high wind speed, and high temperature data collected may not accurately depict what the weather patterns actually were at the time of the odor complaints. The archived weather data from the Weather Underground did not provide the necessary data needed at the specific time intervals. Also, a greater number of weather stations placed strategically around the project scope would be ideal for such analysis. It must be noted that the further away from a sample point of data one moves then the less accurate the prediction becomes.

Given the results of the analyses it is important to note that the steps followed in this project may be used as a model for identifying the source of odors, given the right data. GIS was an essential part of this odor sourcing and identification problem. The model may also be efficient in future planning for the location of large processing facilities. As this project has shown, it is possible to be able to predict odor dispersion behaviors using advanced GIS analysis tools and given the current and predicted weather conditions.

Melissa Kelly's paper won third place in the Dick Thomas Memorial Student Presentation Competition at the 2013 Washington GIS Conference. Melissa graduated from the GIS Department at Green River Community College and her advisor was Sabbah Jabbouri.

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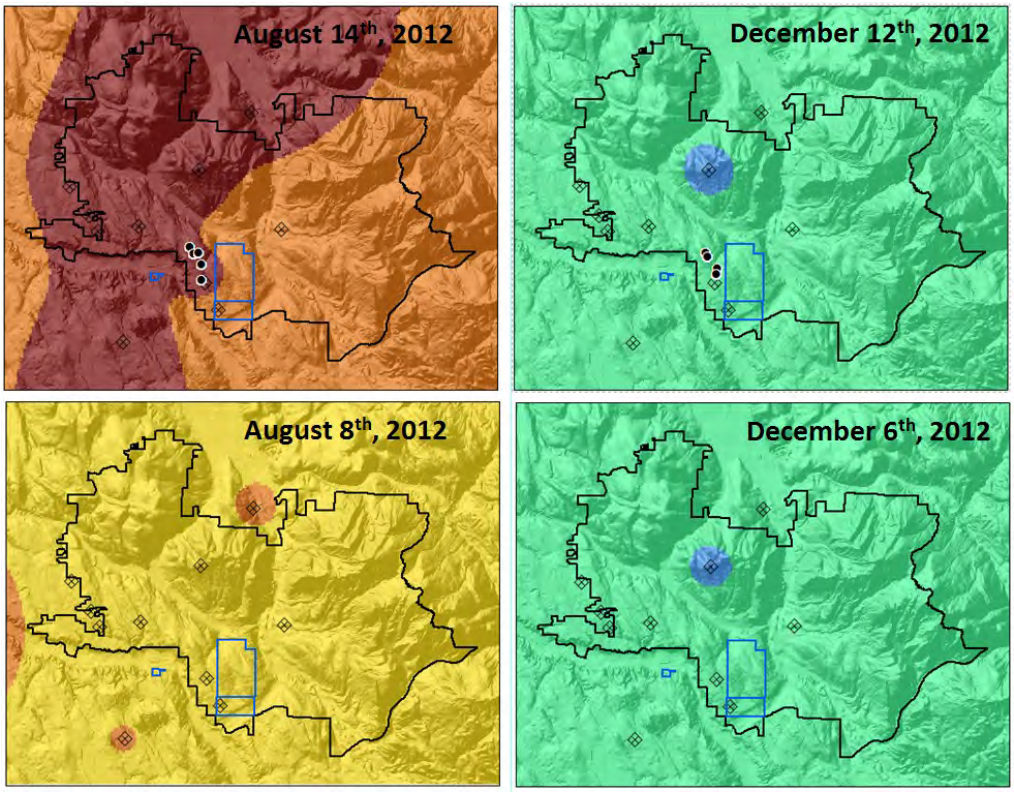


Figure 5. Interpolation of the predicted high temperatures between weather stations.

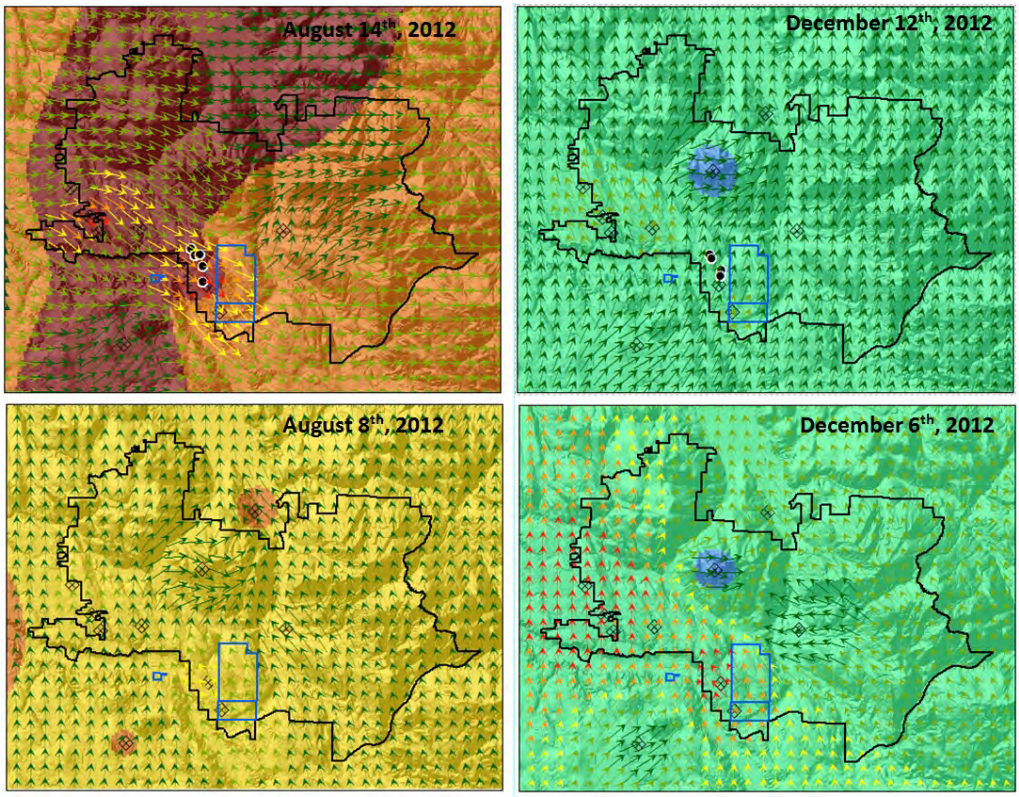


Figure 6. Wind speed and direction overlaid on temperature surface layers.

President's Column

(Continued from page 1)

The conference team is excited to introduce a new exhibitor option for small businesses, and they're working on engaging social events as well as the traditional conference activities including the Dick Thomas student GIS project competition and poster competition. Be sure to check out the conference website for the latest details – we're updating information every week:

http://waurisa.org/conferences/2014_Conference_Index.php

What we need now is your contribution to the conference – whether it's registering now to take advantage of early-bird discounts, submitting a presentation abstract, proposing a pre-conference workshop, offering to volunteer your time during the conference, or simply connecting with the conference planning team to ask a question or offer an idea. Each action you take serves to enhance our conference for the benefit of everyone who attends. It's time to make your plans for the conference. Don't hesitate to contact the conference committee with your questions or ideas:

2014WAGISConference@waurisa.org

We are sincerely looking forward to seeing you in Tacoma in May!

As always, you are invited to participate in WAURISA's monthly Board of Directors' call. It's open for everyone, and other than to announce your presence, you can listen without comment or join the conversation on as many topics as you wish. We welcome everyone and value diverse opinions on the projects and issues we're tackling. The meetings are held the second Tuesday of each month from Noon-1:00 p.m. The toll free number is: 1.800.944.8766 access code 20311.

Thank you, I look forward to hearing from you, and seeing you at our conference in May!

Heather

president@WAURISA.org

Washington Women in GIS and Technology

By: Tonya Kauhi

There is a new networking group in town. The Washington Women in GIS and Technology group was created for South Puget Sound women working in GIS and technology to meet, network, brainstorm and learn from one another. The group plans to meet quarterly.

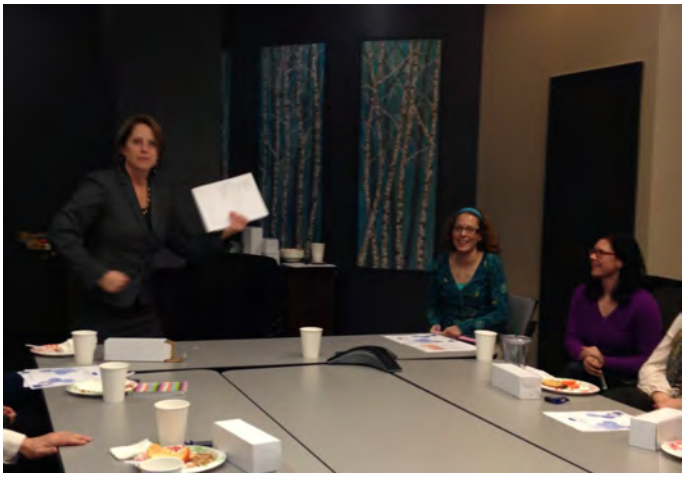
Julie Anderson, Pierce County Auditor, (http://www.julieanderson.org/) was our guest speaker and shared her insights about leadership and management with our group at our November 2013 meeting.

GeoEngineers hosted the event at their Tacoma office. Professionals from several public and private sectors attended, as well as students from UW Tacoma.

One of my favorite comments came when Julie was asked what leadership styles she uses. She stated "It's not about leadership - it's about self-management". I think this comment is powerful as it puts the responsibility on each of us. This was just one of many great lessons she shared with our group. We were very thankful for her time and insights.

Please join us for the next meeting scheduled for Wednesday, February 12th, 2014 at 6:00pm at the GeoEngineers Tacoma office; 1101 South Fawcett Ave, Suite 200, Tacoma, WA.

Follow us on LinkedIn: http://www.linkedin.com/groups/Washington-Women-in-GIS-Technology-6527088?



Left to right: Julie Anderson, and group organizers Tonya Kauhi and Renee Quenneville.

2014 WA GIS PERSON OF THE YEAR

Do you know of a special person:

Who has contributed to the GIS Community in the state? Who has shown a long-term commitment to the field?

Who excels in their work in the GIS/IT field and is known for innovative successful projects that add value to the GIS/IT industry?

Who is a leader and mentor in the field, sharing wisdom and volunteering time to the profession?

Nominate them for the GIS Person of the year and join us to honor their contributions and achievements.

For more information see our awards page at:

http://www.waurisa.org/awards.html

BECOME A BOARD MEMBER OR OFFICER

Positions up for election in 2014 (incumbents may be running)

- Treasurer
- Board Position #4
- Board Position #5
- Board Position #6

Some benefits of becoming involved in WAURISA:

- Gain new leadership skills and advance your career
- Interject your vision into the WAURISA mission
- Contribute to the awesome GIS Profession
- Earn GISP points for your service
- Connect with and bond with other GIS profession leaders throughout the region and the world
- Experience the opportunity of representing the region at a URISA international conference

Contact nominations@waurisa.org if you are interested or have questions.

People on the Move

Clallam County has moved ***Tom Shindler*** from DCD into a newly created position in the IT Department (GIS & Permit System Coordinator), where he can expand the use of GIS as an enterprise tool, beyond departmental limitations, and better coordinate the many related databases in the county.

Matt Stull left Mason County at the end of October. He moved to the City of Tumwater to be their GIS Coordinator and start their GIS program.

Public Maps in Washington

Spotted on a Washington State Ferry traveling from Southworth to Fauntleroy, this map indicates each ferry destination with a unique icon. Photo by Paul Andrews.

Editorial

By: Eadie Kaltenbacher, GISP

Maps are, by definition, a selective view of the world. It is not possible to show all the information for a particular place on a single map: even a single point on Earth contains huge amounts of data. It has physical components (temperature, elevation, soil composition), non-physical components (political boundaries, service areas) as well as overlapping layers (from underground up to the earth's surface, and higher), plus all the attributes of those layers. And that's just the present moment – each point also has a past and a future.

A good map picks a few aspects of these features and symbolizes them in a meaningful way. Similarly, a GIS professional must be able to choose a few meaningful aspects of their profession and communicate them to any listener. In his interview, Karl Johansen advocates for the ability to "provide sound-bite level feedback to influential people". I agree this ability is crucial for GIS professionals to communicate what they do and why it is important.

A GIS professional must be able to choose a few meaningful aspects of their profession and communicate them to any listener.

In answer to the inevitable question of "What do you do?", and its twin "What is GIS?", I have been challenging myself to formulate a concise and articulate response. So far it contains a description of GIS as a digital model of the Earth, and a brief overview of layers, analysis, and visualization. I keep a couple of examples in mind to illustrate my points. My description has been tested a few times, both by design and unexpectedly, and I continue to refine it. I recommend spending some time thinking about these questions and how you would answer them.

Karl also suggests that the written word is important for the GIS field to move ahead. I think he will be pleased to find two impressive student submissions in this issue of *The Summit* that clearly articulate the work they performed. *The Summit* always welcomes submissions relevant to GIS in Washington State, and contributing an article is an opportunity to enhance your own written communications.

Although it is only January, spring is just around the corner, and WAURISA's conference is coming up in May. This year's theme is "Communicating Our World". This will be an excellent opportunity to showcase how you communicate using GIS, and about GIS itself. Just as a good map distills large volumes of information into a concise message, we should strive for the same goal in our communications about GIS.

Literary Corner

"**Indeed, on a second glance, it seemed impossible to fancy that the body was in a natural position.** But for some disarray (the work, perhaps, of the birds that had fed upon him or of the slow-growing creeper that had gradually enveloped his remains) the man lay perfectly straight - his feet pointing in one direction, his hands, raised above his head like a diver's, pointing directly in the opposite.

"I've taken a notion into my old numbskull," observed Silver. "Here's the compass; there's the tip-top p'int o' Skeleton Island, stickin' out like a tooth. Just take a bearing, will you, along the line of them bones."

It was done. The body pointed straight in the direction of the island, and the compass read duly E.S.E. and by E."

-from Treasure Island, by Robert Louis Stevenson

UPCOMING DEADLINES

Submit articles to *The Summit* for publication by:
Spring Issue: April 18, 2014
Summer Issue: July 11, 2014

The Summit is the newsletter of WAURISA. To encourage the discussion of issues and ideas of importance to the Washington GIS community, we welcome letters to the editor or opinion essays. Letters should be a maximum of 100 words and essays should be limited to 500 words.

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GIS User Groups in Washington

ACSM – Washington State Section
www.wss-acsm.org

Cascadia Users of Geospatial Open Source
groups.google.com/group/cugos
Contact Karsten Venneman

Central Puget Sound GIS User Group
Join Listserve here

Central Washington GIS User Group
Meets the 2nd Wednesday of each month.
Contact Amanda Taub

Cowlitz-Wahkiakum GIS User Group
Meets the last Wednesday of each month at 3:00 pm at the Cowlitz-Wahkiakum Council of Governments meeting room, 207 North 4th Ave, Kelso WA.
Contact TJ Keiran

King County GIS User Group
www.kingcounty.gov/operations/GIS/UserGroups.aspx
Meets 1st Wednesday every other month at 11:00am at the KCGIS Center, 201 S. Jackson Street, Seattle WA, Conf Room 7044/7045.

Northwest Washington GIS User Group
www.wwu.edu/huxley/spatial/nwwgis/nwwgis_mtgs.htm

Southeast Washington/Northwest Oregon GIS User Group
web03.pocketinet.com/~sewa-neor-gis/sewa-neor-gis.org/index.html

Washington Geographic Information Council (WAGIC)
geography.wa.gov/wagic
Join Listserve here

Washington Hazus Users Group
http://www.usehazus.com/wahug
Contact Kelly Stone

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