

News From and For the Washington GIS Community

THE
 SUMMIT

Issue 47
 Late Fall 2018

WAURISA President’s Message

By: Ian Von Essen, WAURISA President

Spokane has only had a few inches of snow so far this year, yet the ski season has started at Mt. Spokane, along with my ski patrol responsibilities. We sure could use some more snow as my “rock skis” are getting pretty abused. Prior to every ski season as a patroller I am required to go thru an annual First Aid Refresher Training. What made this year unique was the fact that our mountain, Mt. Spokane, is going through a fairly dramatic expansion this year, adding an entire new backside of ski runs that will be some of the best runs on the mountain. In preparation for that expansion I was asked by the Patrol to spend an entire day teaching a series of classes on the search and rescue protocols of our mountain, especially as it relates to our recent expansion. This whole effort wouldn’t have been possible without the use of GIS, GPS, and aerial photography all of which are

viewable through our Spokane County ArcGIS Online Search and Rescue application that was specifically made for Mt. Spokane Search and Rescue efforts. Having worked in this field for over 35 years, I am continually amazed by how the technology of GIS has infiltrated so many aspects of our daily lives.



Three weeks prior to the refresher in early October I was with our immediate past president, Josh Greenberg, attending an excellent soup-to-nuts all day workshop at the recent URISA Pro Conference in Southern California. During the afternoon of that workshop we flew a drone near the convention center and shot and processed a five acres high accuracy aerial imagery which was

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Geospatial Data Act Signed Into Law

By: Cy Smith, Oregon Geospatial Information Officer

The Geospatial Data Act of 2018 was signed into law by the President on Oct 5. We asked Cy Smith to tell our readers about the law and the benefits it will bring to the geospatial community.

I was involved with Utah Senator Orrin Hatch’s staff in writing and re-writing portions of the Geospatial Data Act (GDA) over the last couple years to accommodate various sectors of the geospatial community, including surveyors, other private sector interests, and the open data community. Senators Ron Wyden and Jeff Merkley of Oregon co-sponsored the bill, along with Senator Hatch and eleven others. The bill was, at various times, very controversial. Nevertheless, we got a bill enacted

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that will be a game-changer for the geospatial community. The statute is part of H.R. 302 and can be found in Title VII, Subtitle F, Sections 751-759.

The bill codifies in statute the existence of the Federal Geographic Data Committee (FGDC) and its advisory committee, the National Geospatial Advisory Committee (NGAC). Both of these bodies only existed by Presidential Executive Order in the past; the FGDC since 1993 and the NGAC since 2009. Executive Orders are a tenuous form of authorization and only provide authority over the executive branch of government, in this case at the federal level. The bill also provides for Congressional oversight of geospatial spending by federal agencies. There is currently no such oversight and, as a result, no way of knowing how much money is being spent by federal agencies on geospatial data and technology. As Peter Drucker famously said, if you aren't measuring it, you aren't managing it.

One of the most important aspects of the statute is that it directs federal agencies to partner with state and local governments, as well as the private sector and universities, to build the National

Spatial Data Infrastructure (NSDI). This should result in significantly more such partnerships and cause more money to flow to state and local governments for the development and maintenance of geospatial framework data. In the past, this has been done irregularly through competitive grant programs for some data themes. One of the things that NGAC can advocate for is the elimination of the competitive approach in favor of a method that results in more evenly funded projects and the development of NSDI themes everywhere.

As mentioned earlier, NGAC was codified in this statute. Many of the existing rules and regulations that govern federal advisory committees under the Federal Advisory Committee Act have been suspended for NGAC. As a result, the NGAC has more authority and can do more to set its own agenda. The NGAC agenda has been entirely controlled up to this point by FGDC. There will now be more of a partnership approach with FGDC to the work that NGAC accomplishes.

There were quite a few changes made over time to satisfy various federal constituencies, like defense and environmental protection. Two changes were made to the statute near the end of the process that helped eliminate or decrease opposition. The surveying portion of the geospatial community wanted language that would ensure that the procurement of geospatial data and services would be done in a manner that protected public safety, health and welfare. That is the purpose of survey licensure. The Brooks Act, which has been in place for decades, already serves this purpose to some extent, and the other sectors of the geospatial community were strongly opposed to using the GDA to modify the Brooks Act. Sec. 759B, the Savings Provision, was added to the GDA to indicate that it is subject to all existing laws, which would include the Brooks Act.

The private business portion of the geospatial community wanted some assurance that federal agencies would not use other government agencies to compete with private businesses to develop geospatial data or provide geospatial services. The language in Sec. 759C was included in earlier versions of the bill, but the word "shall" was replaced with the word "may" in the final version, to indicate that the private sector may be used to the maximum extent practical to provide geospatial data and services to federal agencies.

The open data community was concerned that the bill did not have enough language to ensure that geospatial data developed as part of the NSDI would be free and open to the pub-

(Continued on page 4)

A black rectangular graphic for Solv3D. At the top center, a red wireframe figure of a person stands with arms raised, holding a large red wireframe sphere. The text "WELCOME TO THE POINT CLOUD REVOLUTION" is written in white, bold, sans-serif font across the sphere. Below the figure, there are two columns of white text. The left column reads: "Solv3D is changing the way that spatial data is leveraged by putting the power and productivity of 3D point cloud processing & visualization within reach". The right column reads: "Our advanced solutions are focused on enabling users to easily process and share massive data sets over the web, transforming them so they can be used as part of regular work flows". At the bottom of the graphic, the Solv3D logo (a red wireframe sphere) is on the left, followed by the text "Solv3D" in white and "solv3D.com" in red. Below that, the phone number "1.888.325.1285" and email "info@solv3D.com" are listed. At the very bottom, the slogan "We Put the Power & Productivity of 3D Point Cloud Processing & Visualization Within Reach" is written in white.

amazing to view and review only an hour later that afternoon via our laptops. When I think about how long it used to take for large scale (small area) imagery products to be shot historically for a public works road intersection improvement project, it truly is amazing to have almost instantaneous turnaround on the development of such high accuracy terrain and imagery data.

Other activities that occurred during the URISA Pro Conference included Josh Greenberg's and my participation in the URISA CAB (Chapter Advisory Committee) meeting which briefly discussed the decoupling of One URISA from the CAB

Committee and returning the committee's primary focus to its original mission of sharing "best practices" between URISA state chapters. And my participation in a panel discussion regarding "NextGen 911 Advocacy and Funding" an issue of importance to all 59 PSAP's across the State of Washington. Panel members also included Ty Wooten, NENA's Director of Education, and Budge Currier, the Director of the California 911 Emergency Communications System. Even though the panel discussion was held late in the day over 40 individuals were in attendance and continued to question the panel members 20 minutes beyond our end of the day hour timeslot.

In early November I was asked by our ski patrol to attend a 3-day Ski and Mountain Rescue Conference in Sun Valley, ID. Participants in this conference included Ski Patrollers, Firemen, EMS (Emergency Medical Services) providers, i.e., Ambulance Services, Sheriff personnel, doctors, nurses, life flight EMS staff (helicopter services), and the air national guard, basically anyone involved in mountain rescues across the Pacific Northwest. One of many highlights for me was the discussion around the expedited delivery of AED's (Heart defibrillator) and other critical first aid supplies via drones to remote mountains locations in the not too distant future. And again none of this occurs without the use of GIS, GPS, drone technologies and all the digital mapping that has occurred over the last couple of decades by all of you. All conference participants received a long sleeve T-Shirt which on

"When I think about how long it used to take for large scale imagery products to be shot historically... it truly is amazing to have almost instantaneously turnaround on the development of such high accuracy terrain and imagery data (from drones)."

the back had crossed skis and a bit of dark humor with the wording underneath, "Got Trauma?"

WAURISA just recently finished hosting another successful WAURISA Fall Mini Conference at the EWU-WSU Riverpoint Campus in Spokane WA on November 5-6, 2018. Special thanks

to all who came and to our workshop presenters, John Sharrard, TJ Abbenhaus, & Scott Wolter of ESRI and Jackson Beighle, Frontier Precision, to Ascent GIS for coffee and refreshments, and to Dr. Kerry Brooks who sponsored the workshop so that it could be held at the EWU-WSU Riverpoint campus. For more detail on that event please see the companion article within this Summit Newsletter. Another annual event that happened was GIS Day. In addition to the various activities that occurred

at local schools all across Washington State,

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lic. Language was added in Sec. 755(C) referencing OMB Circular A-130 to accommodate that concern, but Sec. 755(D) was left in the statute to ensure that proprietary data purchased by a federal agency to support a particular business process did not have to be placed in the public domain as a result of the GDA.

The game-changing aspects of this bill, in my opinion, are the codification of the existing governance structure for the NSDI, Congressional oversight of federal agency geospatial expenditures, and direction to federal agencies to partner with state and local governments to build the NSDI. At some point in the not-too-distant future, I hope there will be an opportunity to amend this statute to create a governance structure where all NSDI stakeholders have an equitable seat at the table. The NSDI is being constructed, bit by bit at every level, but the federal agencies have an outsized role in directing the activities. As a result, the coordination and collaboration that's needed is not actually happening.

The complete text of the Geospatial Data Act of 2018 can be found at <https://www.fgdc.gov/gda>.

Upcoming Summit Newsletter Deadlines

Submit articles to *The Summit* for publication by:

Winter Issue

First Draft (Optional)	2/5/2019
Final Draft	2/15/2019

Spring Pre-Conference Issue

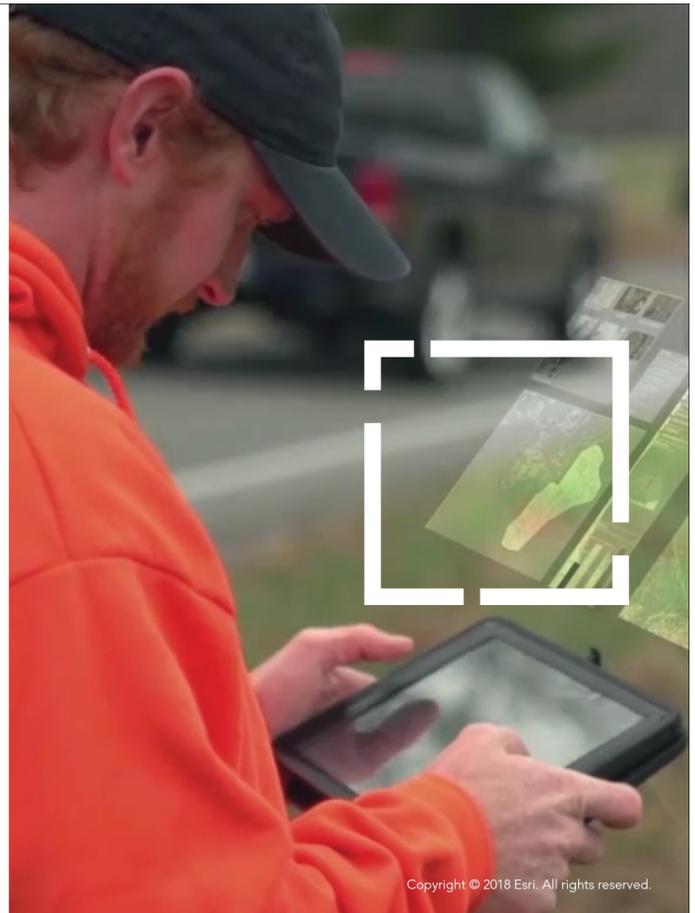
First Draft (Optional)	4/16/2019
Final Draft	4/26/2019

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(President's Column, Continued from page 3)

WAURISA and the Washington State's OCIO office jointly sponsored our 8th annual Joint Agency GIS Day event in Olympia, Washington on Wednesday, November 13th, 2018 and our immediate past president, Josh Greenberg, gave the Keynote speech which was very well received.

It's that time again where we start our planning for our seminal annual WAURISA Conference. We normally switch locations each year, and this year is no exception as we will be moving the conference back to Tacoma, WA the week of May 20-23, 2019. For the majority of us, WAURISA exists because of what WAURISA brings to us (GIS Training, Networking, etc.) at the conference. It takes a large number of volunteers to put on a conference of this size. Maria Sevier, a long time WAURISA member and conference committee member will continue in her role as conference coordinator this year with WAURISA Board support from Heather Glock who has agreed to the Board's conference liaison. We recently had our first conference committee meeting and we are actively looking for volunteers to help with several of the conference subcommittees. If interested please contact either Maria Sevier, mariasevier@gmail.com or Heather Glock, Hglock@esri.com.

Again, I would like to thank all of you for the opportunity to serve as your WAURISA President. As the December holidays and New Year draw near I wish you and your families a happy and fun-filled set of winter festivities.

Sincerely,

Ian Von Essen

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2018 Dick Thomas Student Award Winners

By: Trevelyn Lough, GIS Lead, Pace Engineers

WAURISA's 2018 annual GIS conference received 12 submissions, a record number, for the eleventh annual Richard 'Dick' Thomas (DTA) Memorial Student Presentation Competition and Award. WAURISA established this award in 2007 to honor Washington State GIS pioneer and mentor, Richard 'Dick' Thomas, 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.

Graduate and undergraduate students compete in separate tracks. Of the 10 undergraduate abstract submissions, four were selected to be presented as 15-minute talks in the DTA Competition. The remaining six undergraduate students and groups were invited to present their work as lightning talks in a separate session. Both graduate abstracts were accepted as 15-minute talks for the DTA Competition. All students who were accepted to participate in the judged competition received a free 1-day registration to the conference. All sessions were held on Thursday, May 24th, 2018 at this year's Washington GIS Conference (May 21-24) at the Red Lion Hotel in Olympia, WA.

The prize for first place in both tracks:

- Dick Thomas Award Certificate and Plaque
- \$500 plus a one year membership to WAURISA
- 2-day registration to the 2019 WA GIS Conference
- Option to publish paper in *The Summit*

Graduate Winners: Stuart Heath, Anna McDermott, Daman King

Undergraduate Winner: Mingyou Yang

The prize for second place in both tracks was:

- Dick Thomas Award Certificate
- \$250 plus a one year membership to WAURISA
- Option to publish paper in *The Summit*

Graduate Winners: Azad Mohammed, Matthew Seto, Brandee Knight

Undergraduate Winner: Brandon Voelker

The prize for third place was:

- Dick Thomas Award Certificate
- \$250, plus a one year membership to WAURISA
- Option to publish paper in *The Summit*

Undergraduate Winner: Leslie Kirk

The prize for Honorable mention was:

- Dick Thomas Honorable Mention Certificate
- Option to publish paper in *The Summit*

Undergraduate Winner: Sarah Pyle

First Place (Graduate Track): Stuart Heath, Anna McDermott, Daman King

The three presenters are students at University of Washington (UW) Tacoma. They presented a project completed as part of a



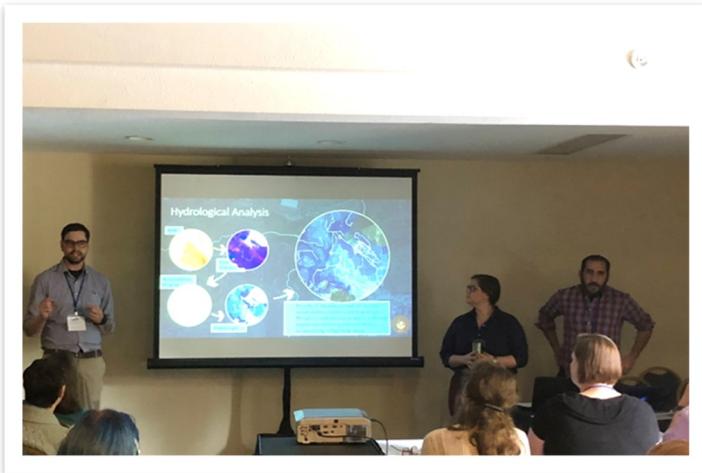
graduate-level environmental planning course taught by Christina Chelf, a lecturer in the UW Tacoma Geospatial Technologies program. Their project was titled "Exploring the effects of terrain on the spread of arsenic and lead using LiDAR."

Here is their abstract: Boasting the world's tallest smokestack, at 451 feet tall, the Asarco smelter facility operated in northern Tacoma, WA from 1890 until it was closed and demolished in 1993. Its smelter plume dispersed in the wind, allowing toxic particles of lead and arsenic to settle in the soils within 1,000 square-miles of Tacoma. Even small amounts of lead and arsenic in soils can potentially lead to long-term health effects, causing several types of cancers and affecting the development of the brain and nervous system in children, who are most at-risk of exposure to toxins in soils. Little is known about the effect terrain has on the dispersion of chemicals. In this investigation we aim to highlight terrain features such as valleys or ridges that have higher concentrations than the Washington State Department of Ecology's contamination model predicts. We used ArcMap and ArcScene to interpolate levels of arsenic and lead across Pierce County, combined with LiDAR to highlight valleys and ridges in the area connected to bodies of water that disperse arsenic and lead. In order to com-

municate our results, we have a 2-pronged approach. First a Tableau dashboard to demonstrate how the data supports our conclusion. Tableau allows us to display our findings and map outputs, as well as the corresponding statistics in a user friendly format. Then with an ESRI Story map that clearly communicates the findings in a easy to understand way that can be given to people in the community that might not have had their homes cleaned up by Ecology as well as further educating the residents of Tacoma. By identifying the effect terrain has on the dispersion of pollutants we can inform other communities in similar situations and help to find more efficient containment and cleanup solutions in the future.

Second Place (Graduate Track): Azad Mohamed, Matthew Seto, Brandee Knight

The three presenters are also students at UW Tacoma, and they



presented project work completed for the same graduate-level environmental planning course taught by Christina Chelf. Their project was titled "Stormwater Analysis in Arsenic/Lead Contamination in Pierce County."

Here is their abstract: The ASARCO smelter furnace, then the highest smokestack in the world, opened in 1889 and was in operation for 100 years in the city of Tacoma, Washington. The furnace melted metal cores to extract copper, lead, and arsenic which produced contamination of the surrounding areas. The reason the smokestack was built so high was a strategy by the company to disperse the contaminants more widely. Many models have been built to more accurately determine areas which require future restorative action, however, some of these models fail to account for rain and stormwater runoff. This project will explore the interaction between stormwater and surface pollutants to determine if the lead/arsenic surface pollution model is impacted by the inclu-

sion of a stormwater and rainfall variable in the city of Tacoma and Pierce County. LiDAR and terrain modeling along with data regarding average yearly rainfall, stormwater flow, and impervious surfaces of the area will be utilized to create the model. We will create the model for Tacoma/Pierce County and overlay that with arsenic and lead pollution models. The model will indicate areas of possible contamination through transport of pollutants due to water runoff and can suggest remediated sites that need further analysis due to the possibility of pollutants collecting. Furthermore, this model will provide evidence for cleanup crews to prioritize higher elevation remediation sites so that downstream lots are not polluted over time due to rainfall and runoff.

First Place (Undergraduate Track): Mingyou Yang

Mingyou is a student at UW Bothell and his presentation was



presented "Finding King County Population's Cardiovascular Mortality Risk Factors: A GIS-based approach." His project was completed under the guidance and support of his advisor, Santiago Lopez.

Here is his abstract: Social-economic disparity has been shown to be one of the most significant risk factors in influencing population's health. Some factors that project this disparity include accessibility to fresh food options, green spaces, and healthcare; these amenities are unevenly distributed geographically similar to disease occurrence patterns. This study aims to use geographic information system (GIS) tools to depict the relationship between cardiovascular diseases induced mortality rate and accessibility to amenities such as farmer's markets, food facilities, parks, and health insurances. We also used the target population's demographic information such as age distribution, sex ratio, ethnicity, and population density in each census tract as our controlled vari-

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Building the Data Pillager

By: Grant Herbert, Senior GIS Analyst/Developer, FLO Analytics

Geographic Information Systems (GIS) are an insatiable consumer of data that constantly need to be kept updated, managed and organized. The availability of data as a REST endpoint allows users to consume data from an authoritative source without having to store that data locally. That's a huge boon to map makers everywhere. But sometimes, you need a local copy for archiving the state, making local edits, or adding your own data for analysis purposes. Looking for a suitable dataset to download can be an exercise in frustration, and although I have found that many GIS practitioners are happy to share their data, there are times when it can be hard to even get through to the right person to ask!

Back in 2014 I started building a tool to download data from a REST service. The purpose was to sync a REST service to a local dataset that had to be available offline and that I could modify if necessary. The data was publicly available, but only as an Esri REST service and not as a shapefile or geodatabase format for download. The first iteration was a simple script, specifically for that dataset, but it proved so useful I started using it for other datasets.

The script —now nicknamed the Data Pillager— was tweaked and modified, converted from a command line script to a toolbox tool, and got some appropriate pillaging help text and messages

added to it. I then shared it with some fellow GIS people in an online group and it started to get used by others outside my organization. The Esri toolbox containing the tool is available for download from GitHub (along with all the source code). It uses only libraries available in the standard Esri install at 10.3 so it should work on most machines.

The Data Pillager downloads vector data from an Esri ArcGIS REST endpoint and writes the output to a folder (creating a shapefile) or a filegeodatabase. If you have a username and password you can also access secured services (unlike a real pirate it doesn't access services without authorization!). It works around the feature number limitations of accessing a REST service (typically only returning 1000 features at a time for the default setting) by repeatedly requesting the data in chunks allowed by the service, working its way through the list of features by unique ID. Once finished it will combine the data into a single dataset and clean up the individual downloads.

Putting too much pressure on a hosting server may cause it to refuse to respond. To mitigate that you can set the maximum number of times that the program will re-attempt the download if it encounters an error until it gives up, as well as the wait period in seconds between tries. Finally, you can enter a SQL data query that can limit the dataset request. The SQL query is not validated

so it is up to the user to get it right! Development is currently slow, but recent enhancements include the ability to download all the sub-services from an endpoint or a folder, handling very long service names, and dealing with duplicate names in the same set of services.

The Data Pillager outputs not only a dataset (or datasets) but also a layer file for each with the symbology of the service. It also generates text files containing the endpoint JSON representation and the symbology in case you need further information or metadata. As it runs, it will report on progress with vaguely piratical themed messages.

Running the Data Pillager is straightforward. Download it from <https://github.com/>

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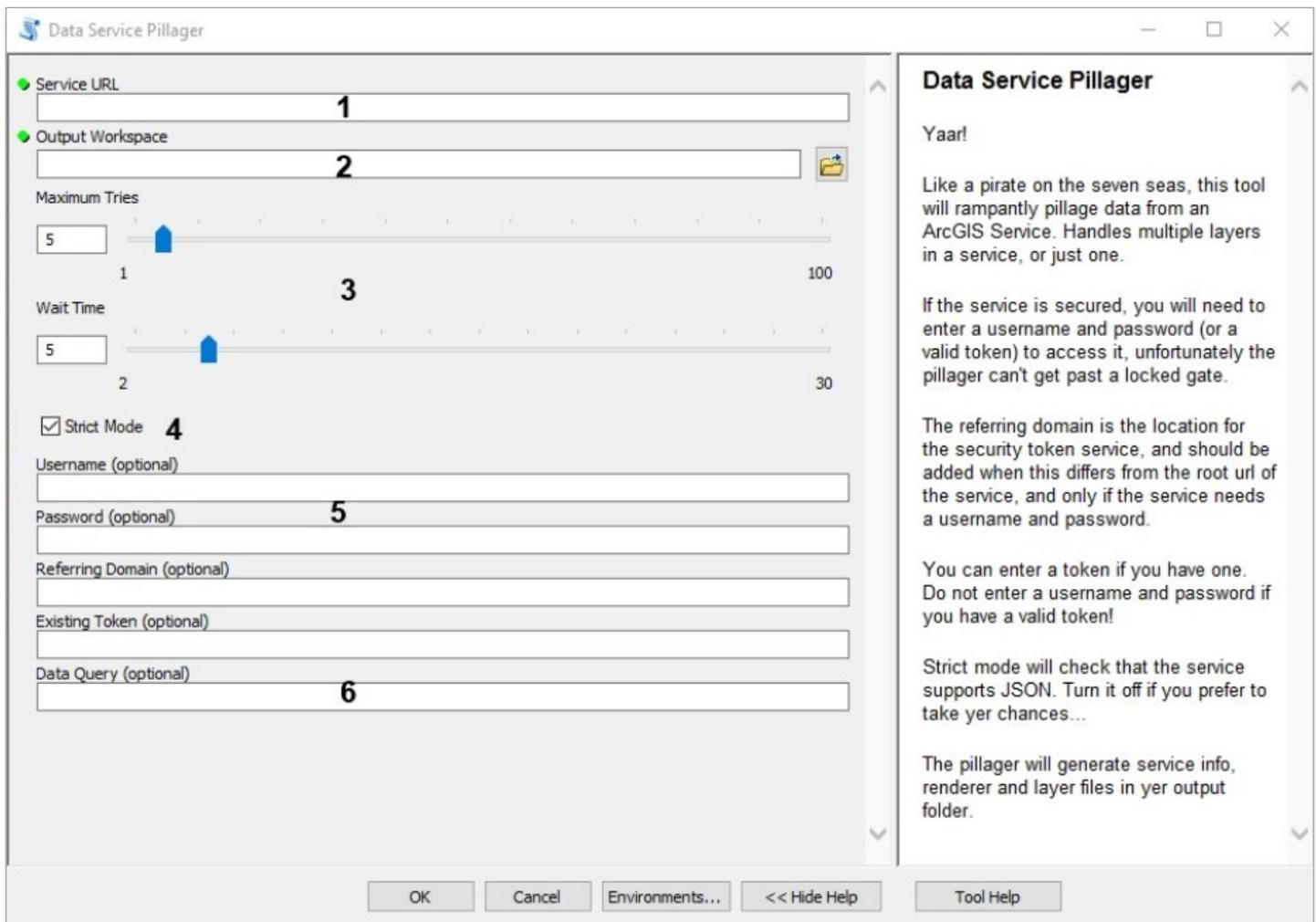
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[gdherbert/DataPillager](#) (Make sure that the source is pointing to the correct python script. It is not imported into the tool for easier modification). If you need a version for 10.1, check the releases and download the first version. When you open the tool, there are a number of input fields. Only 2 are required: the URL and the output workspace.

1. Required: Enter the rest endpoint URL that has the data. If the URL has sub-services, these will also be downloaded.
2. Required: Enter the output workspace path. It is highly recommended that you use a filegeodatabase over a folder. Not only does this give better performance, it supports longer field names than the shapefile format and is less likely to mangle data. You need to have write access to the folder so the tool can write temp files and the layer output.
3. This section determines the number of times the tool will retry a download in event of error, and the wait between tries. Only modify this if the server reports too many timeouts.
4. When Strict mode is on, the tool will check if the service supports JSON format and only proceed if it does. If off, it will try anyway (but may fail).
5. For secured services, you can enter a username and password, and optionally a referring domain (useful if the referring domain is not the same as the service URL). You can also try entering a token if you have already generated one (useful for Portal services).
6. Enter a valid SQL query. This will be passed to the service and not validated. An example of a valid query might be `ST_ABBREV IN ('WA', 'OR')`.

The author can be contacted via his GitHub page or gdherbert@flo-analytics.com.

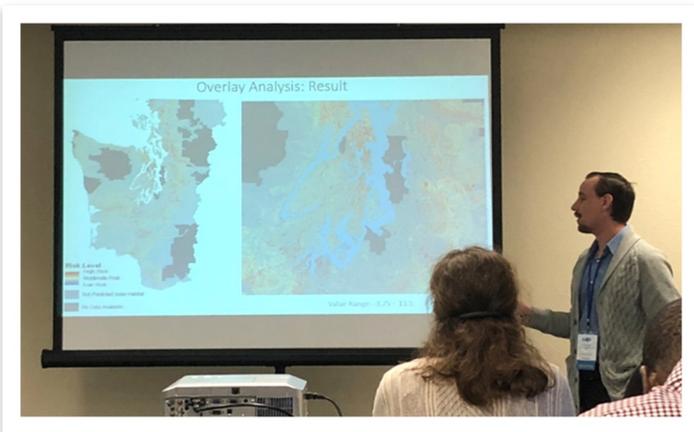


ables. For all census tract in King County (n=396), we determined each census tract's accessibility to facilities by considering the count of facilities in each tract and the Euclidean distance from each centroid to the nearest facility as indicators of accessibility.

We considered that neighboring census tracts will likely to influence each other, so we used Moran's I to test spatial autocorrelation. We used spatial lag, spatial error which found $R^2=0.37, 0.38$ and variables such as the number of people with insurance and ethnicity groups such as Asian population and White population appear to be statistically significant with $P<0.05$. The results of this study show the possibility of predicting risk factors of population's cardiovascular health through the integration of public health and GIS models.

Second Place (Undergraduate Track): Brandon Voelker

Brandon is a student at UW Tacoma and his presentation was titled "Mapping the Susceptibility of Alders to *Phytophthora alni*



in Western Washington" and included a web map demo. His project was completed under the guidance and support of his advisor, Matt Kelly.

Here is his abstract: Various microorganisms are known to cause diseases in plants. One such group of organisms are water molds known by the genus name of *Phytophthora* (meaning plant destroyer in Greek). They are fungus-like in structure, have a complex life cycle, and can cause considerable damage "most famously causing the potato blight that resulted in the Irish Potato Famine. *Phytophthora alni* is a species that causes lethal disease in alder trees. Affected trees exhibit symptoms of abnormally small, sparse, or yellowish foliage, crown dieback, necrosis in the inner

bark, and rusty spots on the outer bark. One variant, *P. alni* subspecies *alni*, is widespread across Europe, devastating stands of alder since the 1990s. In the United States, *P. alni* subspecies *uniformis* has already been found in the wild in Alaska and Oregon. Recently, it has been detected in potted alders in nurseries in Pierce County. It is currently unknown whether any member of the *P. alni* species complex is in the wild in Washington, either naturally or through introduction from nursery plants. To begin efforts to detect *Phytophthora alni* in Western Washington, a risk assessment map will be created. The spatial analysis involves examining environmental factors that increase infection susceptibility and correlating with the distribution of alders. These include slope, curvature, soil type, and soil moisture. Road networks near plant nurseries are also considered. The risk assessment will provide a starting point for choosing sampling sites, and if found, provides an opportunity for further research on the organisms biology and ecology. The analysis will inform forest management practices, as the highest risk areas could be inspected for symptomatic alders and mitigation measures could be enacted if needed. The assessment will also have implications for restoration sites, a possible vector for introduction, where native trees such as alder are planted from nursery stock.

Third Place (Undergraduate Track): Leslie Kirk



Leslie is a student at UW Tacoma and her presentation was titled "Am I Safe: Youth Pedestrians in Lincoln High School Catchment Area." Her project was completed under the guidance and support of her advisor, Matt Kelly.

Here is her abstract: In urban neighborhoods, it is common for children to walk to school as well as to visit parks and friends. In

such neighborhoods pedestrian safety is vital. Led by UW Tacoma, several agencies (such as Tacoma Public Schools, Metro Parks Tacoma) have initiated a cooperative effort (the Action Mapping Project) to introduce GIS to younger students. As a Community Mapping Mentor on this project, I became interested in examining how students in the Lincoln High School catchment area view their personal safety, particularly when they walk to and from school. In a pilot participatory mapping exercise, students were asked identify areas they frequented as well as what parts of their neighborhood they avoided. This study examines these pedestrian routes to determine the factors that could improve or sustain youth safety. Such factors include but are not limited to sidewalk conditions, adequate street illumination, designated crosswalk density and frequency of vehicle/pedestrian crashes. The goal is to identify sites where improvements could decrease pedestrian risk and facilitate safer passage for teens. By using multi-criteria analysis (via raster overlay), I expect to find places where adjustments to vehicle traffic or crosswalk improvements could reduce risk to students. The information gleaned is useful to school administrators, city planners, and the park board who have the responsibility for ensuring public safety. However, the ultimate beneficiaries are the students themselves who walk to school or around their neighborhoods.

Honorable Mention (Undergraduate Track): Sarah Pyle

Sarah is a student at UW Tacoma and her presentation was titled



“Before Internment: Tacoma’s Japanese Community.” Her project was completed under the guidance and support of her advisor, Matt Kelly.

Here is her abstract: Tacoma’s Japanese Language School was a center for family activity and education, as it was founded by parents. At the time, most language schools were founded by a church and restricted membership based on religion. The unique situation of the school brought Japanese families of all sects together. Shortly after Pearl

Harbor, almost all of Tacoma’s Japanese residents were forcibly removed and sent to internment camps. The Japanese Language School was shut down soon after. Previous research on Tacoma’s Japanese community has created maps based on interviews with historians, and books about the community. This project is based on individual interviews with 35 people who attended the Japanese Language School. Each interviewee identified locations that were important to the community.

The important places remembered by the former students has been digitized to create a heat map of the community’s activity. These important places include schools, homes, businesses, and churches. In addition to the historical polygons, historical roads and railroads have been collected and digitized. Historical data has been compared to current Tacoma data to show change in the city’s community since the Japanese Community left. The analysis of interviews identified several nodes of social celebration: the Japanese Language School, and churches of all creeds. The schools and churches that the Japanese Community engaged with are as active as ever. However, homes and businesses of importance have been demolished or are being reused without knowledge of the building’s past. These maps show change in the city since the 1930s. With this information, UWT may recognize these sites as historical and memorialize them. The memorialization of these important sites will educate current Tacoma residents about the historical value of the places around them.

Lightning Talks

Two student lightning talks were also quite diverse. Augustine Canales, a UW Tacoma student, discussed his work as a Community Mapping Mentor with the Action Mapping Project where he explored the impacts of crime, vacant land, parks, and streetlights on how youth travel. Brad Srebnik, a UW Seattle student, presented his work using Python scripts and ArcGIS Network Analyst tools to assess bike routing costs.

Thanks!

Thank you to everyone who made the competition a resounding success. A big thank you to the judges for generously donating their time to review the abstracts and judge the presentations: Shane Clarke (Esri), Katie Heim (City of Arlington), Dan Miller (Department of the Military), and Jennifer Radcliff (City of Tumwater). Thank you to all the students who submitted their abstracts and shared their projects with the GIS community in Washington State.

Sound to Summit Regional GIS Study Launched

By: Greg Babinski, MA, GISP, King County IT Regional Services

A total of 36 people attended a session of the *Sound to Summit Regional GIS Study Kick-off meeting*, held on October 22, 23 & 24, 2018 in Seattle, Kirkland, and Kent.

The strategic objective of the *Sound to Summit Regional GIS Study* is to determine the best feasible way to organize and operate geographic information system (GIS) services within the region to enable enhanced use and business effectiveness from GIS, increase ROI, and decrease cost.

Without exception, every public agency shares geography with other agencies. Shouldn't we share geographic information? A GIS (geographic information system) is valuable for local government agency operations, but it is expensive to maintain and operate.

The *Sound to Summit Regional GIS Study* is exploring the best feasible way to organize and operate GIS data and services within the region that we share.

We will work with technical staff and leadership within each individual agency to analyze the potential for future GIS organization and operations.

To facilitate regional collaboration, we aspire to develop uniform external GIS policies and procedures to minimize technical differences. Collaborative GIS policies and procedures will help us to share technical expertise, to enable smart communities across

jurisdictional boundaries, to standardize, store, and share high-quality data, to enable GIS mutual aid and 24x7 support, to build capacity through economies of scale, and to facilitate buy-in for large collaborative priority initiatives that support the entire region.

We will develop a recommended future collaborative *Sound to Summit* regional GIS environment. The recommended option will be selected from a range of alternatives, including status-quo. For each alternative

we will clearly define pros and cons, opportunity costs, potential savings, and other benefits from increased capability. We will analyze the potential ROI of each option. We will also develop clear performance milestones and metrics to help validate progress with each option.

No agency will be excluded. Once implemented every agency will be able to enhance their use and business effectiveness from GIS, increase GIS ROI, and decrease cost. Value will extend beyond jurisdictional boundaries. Citizens, businesses, academia, and non-profits will benefit from an enhanced, sustainable GIS platform for our shared *Sound to Summit* region.

Origins

Regional collaborative GIS is not a new concept. Recently, Pete Crosswell published a report titled *Report on National Survey of Multi-Organizational GIS Programs* (available for download on the URISA GIS Management Institute website at: <https://www.urisa.org/gmi>). This report documents about 40 regional, collaborative GIS entities in the United States and Canada. Some (Lane County, Oregon) are more than 40 years old. Others have been started within the recent past, validating that this is a concept that should be investigated by every region with many GIS operations with overlapping geographies.

King County attempted to initiate regional GIS twice in the past (1993 & 1999) but failed. In 2012 at the Esri UC, I had lunch with the CIOs of Kirkland and Bellevue, where we discussed and

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Lane Council of Governments Regional GIS – In operation since 1975

agreed on the benefits of restarting an initiative to pursue some of the benefits of regional GIS. In 2015 both Karl Johansen and I began to discuss this topic. We both drafted white papers that each came to the conclusion that a collaborative approach to GIS for our region should be again pursued.

My research showed that in 2015, there were approximately 150 GIS professionals who worked for public agencies in King County. The assumption is that among this community, there are likely redundant efforts that might be eliminated and parallel projects that might be candidates for a collaborative approach. In 2016 King County approved an initiative to start work on a regional GIS study. A Regional GIS Steering Committee was mobilized, comprised of:

- City of Bellevue: Scott Gebhardt
- City of Covington: Shawn Buck
- City of Enumclaw: Darci Hanson
- City of Kent: Catherine Crook (Secretary)
- City of Kirkland: Brenda Cooper
- City of Mercer Island: Leah Llamas
- City of Renton: Tim Moore (Vice-Chair)
- City of Seattle: Steve Beimborn
- Muckleshoot Tribe: Grant Timentwa
- Snoqualmie Tribe: Heather Minella
- King County: Greg Babinski (Chair)

The membership of the Steering Committee is intended to represent large, medium, and small cities, rural cities, contract cities, and the tribes.

The project has also mobilized an Advisory Committee comprised of people knowledgeable about GIS management but who are not stakeholders in the *Sound to Summit* region. The Advisory Committee is made up of:

- Geoff Almvig: Skagit County
- Matt Freid: City of Portland
- Tim Nyerges: University of Washington
- Chris Owen: City of Walla Walla
- Cy Smith: State of Oregon
- Ian Von Essen: Spokane County (retired)
- Joanne Markert: State of Washington

Scope of work

The specific goals of the *Sound to Summit Regional GIS Study* include:

- Research and report on the baseline GIS resources and capability for public jurisdictions within the geographic focus area.
- Provide an option for public jurisdictions to research and report on the baseline return on investment currently achieved by their agency within the geographic focus area.
- Research and report on state of the art regional collaborative GIS operations in other geographic areas.
- Facilitate ongoing research and information sharing about

the future of GIS related to technology, commercial conditions, and political environment. Study feasible options within the local environment for a future collaborative regional GIS approach that: a) maximizes overall effectiveness, b) maximizes ROI, c) enables broader GIS use, and d) controls costs in a way that is sustainable into the future.

Present a range of options for implementation: a) status quo, b) recommended option, and c) alternate recommendations. For each option, report on the level of effort, including financial requirements, to achieve the end state.

(Continued on page 16)

San Diego GIS—A joint powers authority of the City and the County

An Interview with Heather Glock, 2018 Summit Award Winner

By: Jacob Tully, Swinomish Tribe

In the course of our careers as GIS professionals, we come across many types of people, GIS wunderkinds, computer programmers who discovered mapping, mappers who discovered computers, sales people, scientists, and government bureaucrats. We work with those who understand GIS and those who don't want or need to. Our audience is by the nature of our work diverse, and touches on many disciplines. I believe that one of the roles of the GIS professional is to evangelize the spatial, to use place to answer problems that range from the universal to the specific. In this work, we are lucky to have a broad community of collaborators and colleagues, but none of this is exactly organic. In the background, there are those who seek to serve the larger, collective good of the profession, and one of those people is Heather Glock, nearly a 20 year veteran of ESRI, past WAURISA President, and all around good human. We caught up with Heather to learn a bit about her interests, what GIS means to her, and some lessons learned from over the years.

Heather Glock, originally from Minnesota but has called Wash-

ington her home since moving here in 1999. In addition to being an ESRI employee for 18 years, Heather is a mother of "a wonderful 14 year old daughter" and spends a lot of her time supporting her extracurricular activities and doing fun things around the region. Heather recently completed her Master's in Public Administration with a concentration in public policy, which she says has helped her to better understand the workings of local governments. When not at work or doing work on behalf of her family, Heather enjoys vegetable gardening, hiking, and reading, mostly about politics, economics, and capitalism.

The Summit: What's the last thing you read?

Glock: Two things, a series of books and videos on deck building, and also a book on how to make sushi at home. I might leave the deck building to the professionals but expect to make more sushi at home after my first attempt was a success. I also recently read a book on investing to help update my retirement investments. One book I'd like to read is, I know it's funny, is one that explains the game of football. I just don't understand the game.

The Summit: I suspect there's no shortage of people in the upper Midwest who would be happy to help you out with that last part! What was it like going to school, working full time, and being a full-time mom?

Glock: A lot of it was a blur! I did pretty well in school and think I did a good job keeping up with work, but I am now quite averse to overscheduling myself. I have a low tolerance for being busy *all the time*. I like to take time to sit on the couch, read a book for fun and not feel in a rush to go somewhere or get something done. I expect I'll bounce back and get busy again, but for now my idea of a perfect day is when I don't have to do anything."

The Summit: I've always found it a little difficult to explain GIS to the non-GIS person. What does GIS mean to you?

Glock: The way I describe it to friends and family is that you can think of it like a tool or a system that supports informed decision making. An information system, just like other information systems but one that deals with geography or location. One thing I say, that I picked up from an ESRI publication called *The Language of Spatial Analysis* is that through maps, GIS shows us where things are, how they relate, what it means, and what actions to take.

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Jack Dangermond, Esri President and strong supporter of URISA, congratulates Heather on her award

The Summit: How did you get your start in the GIS field?

Glock: It was a bit of a fluke, I have a background in the printing industry, prepress, graphic design, typesetting, so when I moved to Washington I was working in a different industry altogether but met a gal who was working for ESRI who told me about an opening, so I applied and got the job. When I started in 2001 my position was heavily tied to running regional events programs, seminars and tradeshow, events and meetups. It didn't necessarily require a GIS skillset, but I eventually started moving into inside sales which gave me a start on using the GIS technology and exposure to how customers were using it. As ESRI grew I transitioned away from that position into being a full-time account manager in the Olympia ESRI office, and now I manage a set of accounts in the local government space, working with smaller cities and regional governments in the Pacific Northwest.

The Summit: How important do you feel a GISP certification is to having a successful career in GIS?

Glock: I think that the GISP question is a good one. I like that it's been around awhile and continues to gain recognition and the qualifications [further] refined. I would like to see more employers recognize that and to see it in job descriptions. Funny that I've been in the industry for 18 years and haven't taken steps to earn a GISP. I admire those who have one because I've spent a lot of

time in other educational environments, and it takes work to pass the GISP exam. I hope it continues to gain recognition and define itself like how other industries have licensure requirements and qualifications.

The Summit: What's an average work day like for you? How do you keep up with it all, any tips for success at the day to day level?

Glock: Most of my day is spent communicating with customers, often on the phone and by email. As often as possible I try to meet with my accounts in person because it is a great way to understand what a customer wants to do, and it is always helpful to see the dynamics and body language taking place when people are gathered around a table discussing plans. In terms of keeping it all together and tips for success, there's one thing I *have* to do or else I'm lost – I need to finish tasks right way after account meetings. Things like sending out a follow-up email after a meeting - I have to take action because if I wait a day or two, it's a faded memory and I don't get back around to making the most from the meeting.

(Continued on page 21)

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- For each option, report on the level of associated risk.
- For each option, propose quantifiable performance metrics to help verify achievement of future enhanced GIS capability and ROI.
- Provide a road map for next steps, including opt-in/opt-out alternatives for public jurisdictions.

To achieve these goals, the Steering Committee has approved a scope of work and schedule that should allow the project to be completed by early in the fourth quarter of 2019.

I have been reporting on this initiative during the past two years at the Esri UC, GIS in Action in Portland, the Washington GIS Conference, GIS-Pro in Palm Springs, and most recently with Catherine Crook from Kent and Heather Minnella from the

Snoqualmie Tribe at the 2018 NWGIS User Conference in Bremer-ton (see <https://tinyurl.com/S2SRRegionalGIS>).

A note about the name

Why *Sound to Summit Regional GIS*? The agencies participating in the study all are primarily located in King County. But many jurisdictions straddle county lines. King County provides services into other counties. PSRC and Sound Transit are by definition multi-county public agencies. The Muckleshoot and Snoqualmie tribes have interests outside King County and some municipalities straddle county lines as well. The Steering Committee agreed that the name ‘Sound to Summit’ reflects the fact that many of our agency interests are bound to the east and west by natural features, but in many cases extend beyond any political boundaries to the north and south.

About the author

Greg Babinski is GIS Marketing and Business Development Manager for King County 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. Greg is a GISP – Certified GIS Professional. Babinski is Past-President of URISA and founder and Past-Chair of URISA’s GIS Management Institute. In 2005 he founded The Summit – the Washington State GIS Newsletter. In addition to GIS consulting, he is a GIS researcher, author, and instructor. He has spoken about GIS management across North America, Europe, Asia and Australia. In his spare time Greg likes hiking steep, narrow and dangerous trails that lead high above the clouds to awesome views.



2016 Public Agency GIS Staff

Statewide LiDAR Plan

By: Joanne Markert, Washington State GIS Coordinator

Toe Jam Hill on Bainbridge Island rises as a paramount challenge for cyclists touring the scenic island's south end, with a grade so steep that a popular club-sponsored ride each February no longer includes it on the route. Any riders who still take on Toe Jam are likely to have no idea that, right under their wheels, a violent earthquake lifted the ground 23 feet when it struck a millennial ago.

Geologists did not know of the Toe Jam Hill fault either until the late 1990s, when advanced light pulse technology unveiled the huge subterranean crack, one of the largest of many underlying the Puget Sound region. The fault was detected using technology called LiDAR, for Light Detection and Ranging, a sophisticated form of aerial photography. LiDAR sends piercing laser beams to the ground to collect data used to drawing high resolution, three-dimensional geographic representations of the earth below.

LiDAR is just one of the many tools that are increasingly being harnessed by Geographic Information System (GIS) professionals working in state, local and tribal governments in Washington.

The technology is used not only in planning for the potential of future earthquakes along known fault lines, but also to identify geological hazards, map forests and aquatic lands, determine where tsunamis have hit coastlines to aid in finding the best evacuation routes. It even guide future responses to climate change. A coordinated, statewide LiDAR strategy was on of the many topics to be discussed during the [7th annual Joint Agency GIS Day event](#) on Nov. 14 in Olympia. Look for a recap in the issue of The Summit Newsletter.

The annual event was held at the 1500 Jefferson Building. GIS professionals and policy makers from across the state gathered for the event. They learned about the latest in geographic data management, especially as it applies to sharing mapping technologies to make critical decisions about land use and assessing risks when locating infrastructure like airports, sewer lines, highways and housing developments.

(Continued on page 18)

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Data sharing is especially important when it comes to LiDAR, says State GIS Coordinator Joanne Markert in the Office of the Chief Information Officer, who is helping with the coordination of a statewide plan for LiDAR technology as well as serving as co-coordinator of GIS Day. LiDAR relies on aircraft loaded with highly specialized equipment to make repeated passes over land and water. The data then must be meticulously compiled and plotted in any number of ways depending on how it will be used.

“One local government might use it for determining building heights. The U.S. Forest Service uses it for fire management and forest health, while F.E.M.A. uses it for emergency management planning. Tribes may use it for locating historical stream channels that could be used for salmon recovery,” Markert said.

Washington is one of eight states to be developing a statewide LiDAR plan under the assistance of the National States Geographic Information Council. Once in place, the plan will be available to other states and will help with the establishment of best practices nationally. Well over 30 state, federal, local and tribal governments are currently involved in the process.

The statewide strategy, expected to be complete in February, is aimed to guarantee a broad spectrum of participation among government and a common means of sharing both the high-resolution data LiDAR produces and the costs of gathering it.

“Any data collected by the State of Washington is public, and has to be available for public distribution,” she said. “But it costs money for the data – and where do you host it?”

LiDAR achieved global attention in recent years when the technology was deployed by the National Geographic Society to discover a long-lost civilization in a rain forest in the Honduras and a vast Mayan “megalopolis” hidden for centuries deep below a vast jungle in Guatemala.

Washington’s Department of Natural Resources (DNR) is the biggest user of LiDAR technology in the state. In 2015 DNR received a \$4.5 million appropriation to collect LiDAR data across western Washington to identify geological hazards such as landslides and better identify flood risks.

Joe Smillie with DNR said the technology is especially useful in areas of the state’s west side that are covered with heavy vegetation and big timber as the LiDAR lasers can peer right through it. “We can see where the old landslides are, where land has moved and how glaciers have carved through valleys,” he said.

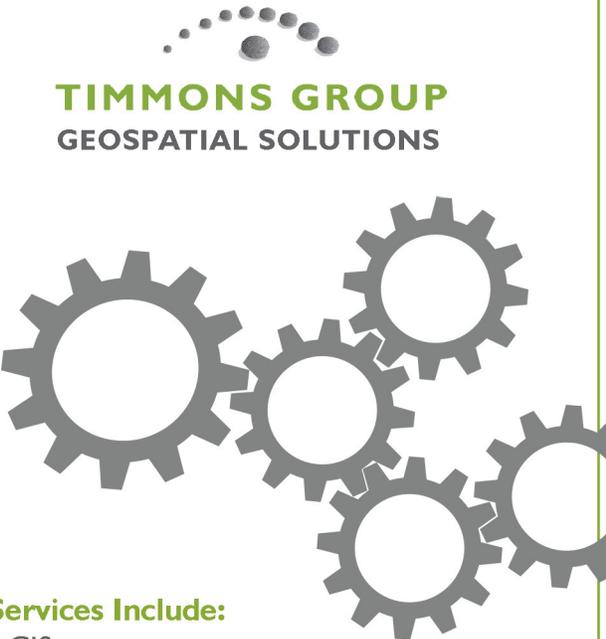
DNR is leading a county-by-county inventory using LIDAR to locate critical landslide hazard areas. Pierce County was completed last year. The agency will move on to Skamania County along the Columbia Gorge and King County later this year. After reviewing the LIDAR data, DNR sends geologists to the suspected landslide areas for additional verification and mapping work.

Washington tribes have been at the forefront of using LiDAR technology for years, according to the Northwest Indian Fisheries Commission.

For instance, the Puyallup and Muckleshoot tribes are using LiDAR-based maps to track the effectiveness of a salmon habitat restoration project along the Greenwater River earlier this decade. The Stillaguamish and Tulalip Tribes have partnered with DNR and three private timber companies to map forestlands in the Stillaguamish and Skykomish basins.

The Squaxin Island tribe is using LiDAR mapping models of Squaxin Island and Oakland Bay to help predict how sea level

(Continued on page 20)



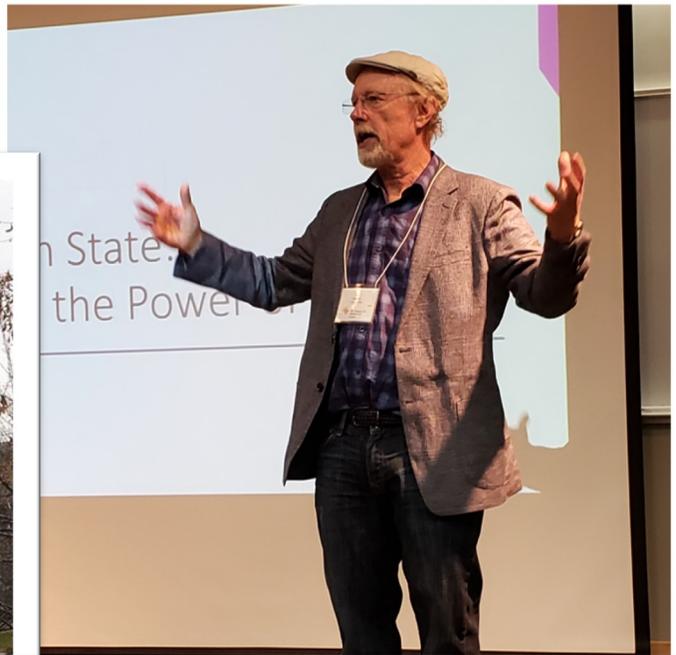
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2018 WAURISA Fall Seminar Held in Spokane

By: Stephen Beimborm, City of Seattle GIS Coordinator



Over forty GIS professionals and students gathered in Spokane for WAURISA's third annual Fall Seminar, held on November 5th and 6th on the satellite campus of Eastern Washington University.

The first day of this year's program included a series of technical workshops on migration to ArcGIS Pro, extracting value from LiDAR data, preparing for and managing disaster events using ArcGIS Online, and use of unmanned aircraft systems to acquire highly-accurate aerial data.

On the second day, Washington State's GIS Coordinator, Joanne Markert, provided an update on initiatives sponsored by the state's Geospatial Program Office, after which Esri's Scott Wolter discussed the future direction of the ArcGIS platform.

The annual Fall Seminars were introduced in 2016 as a way to

bring educational and networking opportunities to people in the GIS field who live east of the Cascade Range in Washington. The annual WAURISA Conference, typically held in May in a city along the Interstate 5 corridor, can draw three hundred or more people, but few of them travel from east of the mountains. For the past three years, the Fall Seminars have helped to fill that void by porting similar content to the lively and expanding University District in downtown Spokane. As an added bonus, attendees are able to share trade secrets with those who travel from North Idaho.

Pictured: Josh Greenberg (on scooter), Ian von Essen, and students in a workshop taught by TJ Abbenhaus.

rise will impact their fishing rights and other natural and cultural resources. The Sauk-Suiattle Tribe is monitoring the amount of sediment moving through the watershed as glaciers recede with the aid of LiDAR.

Another potential use is in agriculture, where LiDAR-based calculations for slope and direction of croplands can help determine crop yield, drainage efficiency and fertilizer placement. It could also be used for orchard management.

The potential for LiDAR technology is just beginning to be realized, especially in Washington, Markert said.

“We are unique in the country. For one we’re on the west coast. We are large, we have a lot of coastline and shoreline areas, and we had already been collecting LiDAR already,” she said. “We want to do it more and do it better.”

As for cyclists attacking Toe Jam Hill, they may have more pressing things on their mind than an earthquake, like reaching the top. But they may also wish to be aware of the [LiDAR-discovered fault lines](#) while riding at nearby Waterman Point north of Manchester and along Salmon Beach south of Belfair.

Additional LiDAR resources:

[Washington Department of Natural Resources](#)

[DNR LIDAR Portal](#)

[The Bare Earth Story Map](#)

[U.S.G.S. LiDAR Point Cloud](#)

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The Summit: In your view, is GIS a tool or a field unto its own?

Glock: I think of it as a tool. I don't think that it's a field unto its own, but an information system that connects to other, different information systems to bring geography to bear in decision-making. That said, there is an entire industry sector dedicated to GIS, mapping, and location intelligence. But to me, the only unique thing about GIS is that it addresses the spatial or geographic component of data. Like other information systems GIS supports analysis and [it's] designed to improve decision making. Anyone with some talent, natural knack with science or is persistent in understanding in how something works can make it in GIS. It leverages the same set of skills that help people make it in tech in general – being nimble, understanding trends, having persistence when troubleshooting, and networking to solve problems. In that sense it's not a field unto its own. Most technical fields have that same skillset needed for success. What I like about GIS when you think of it as an industry is there is a place for everyone – whether you are into web design, IT infrastructure, data management and analysis, there is a place for you in job sections ranging from health, to military, to natural resources to policy and decision making.

The Summit: What is one thing, be it a map, app, book or other GIS related piece of information that you wish more people knew about?

Glock: I wish more people were actively practicing the analysis piece of GIS. I've noticed that, which is not to say it's good or bad, but a lot of conversations I've had have to do with data maintenance, normalizing, updating data. I don't have many conversations about analysis [of data] and the new and unique ways of doing analysis.

The Summit: Oh, how I long to buffer and clip! Speaking from my own experience, I wonder do friends or family expect you to always navigate, to know the state capitals, things of that nature?

Glock: No, I don't feel that expectation very often. Perhaps that is an area for me to improve on – being more vocal with friends and family about geography and its role in affect-

ing our lives. I should brag more about my career – we are lucky we have such a wonderful visual component to what we do with maps. Done well, a single map will tell a story – no explanation needed. People just get it.

The Summit: Last question, you find yourself lost in an unfamiliar town/city/place but don't have much of an agenda. You think you're on the right track but you're not 100% sure. Do you get out the map or make your way as best you can without it? Do you think there is anything getting lost in a world where you always know where you are and have directions in your pocket?

Glock: I would prefer to use intuition to find the hotel I'm staying at or say, a place for lunch and not whip out a map. I'm very left handed and find that I often have a hard time keeping left and right straight – just ask any one of my co-workers who travel with me. The same thing tends to happen when I attempt to orient myself with a map in unfamiliar territory. The wires get crossed and I interpret the directions exactly opposite of what they are. Because of this, as a kid I developed a trust in whatever internal directional guides are lodged in my brain to “sense” where I need to go. Navigational technology is wonderful and necessary, but so too is maintaining an internal sense of orientation you can depend on.

The Summit: Thank you for your time, Heather.

Glock: You're welcome!





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Esri, the global market leader in geographic information systems (GIS), offers the most powerful mapping and spatial analytics technology available. Since 1969, Esri has helped customers use The Science of Where to unlock the full potential of data to improve operational and business results. Today, Esri software is deployed in more than 350,000 organizations including the world's largest cities, most national governments, 75% of the Fortune 500, and more than 7,000 colleges and universities. Esri engineers the most advanced solutions for digital transformation, IoT, and location analytics to create the maps that run the world. Visit us at esri.com/news



FLO is an employee-owned consulting company with offices in Portland and Seattle. We use GIS and data analytics to do the number crunching, analysis, and problem solving to bring our clients the best possible data-driven tools and information. Intrinsically grounded in "place," and its relationship to people, the land, and the built environment, we are committed to helping you use GIS and data analytics to make informed decisions.



Frontier Precision is a reseller of Trimble Survey and Mapping products, including scanners, lasers, software development and GIS Services.



Latitude Geographics Group Ltd. is a Geographic Information Systems (GIS) software development and services company.

For 20 years, the King County GIS Center has been providing quality services and exceptional value with the most capable GIS organization in the Pacific Northwest. Unlike most consultants, our professional staff members are practicing users of the GIS solutions that cities, counties, utilities, tribes, and regional agencies require. Why do we offer our services to outside customers? We have a long-term interest in the success of GIS throughout the region. Our success depends on satisfied clients. We are committed to delivering quality GIS business solutions that provide value for our customers. Whenever you need GIS consulting, programming, data, mapping, or training let KCGIS help you put GIS to work!



King's Books is Tacoma's new and used, community-centered bookstore. We have books in all fields, from quirky map books to poignant children's books, a range of events weekly, and two bookstore cats. Our events include author talks, art festivals, poetry, community events, and fourteen very-specific book clubs. We supply books to organizations and businesses and sell book off-site at various events. Visit us at 218 St Helens Ave or online at kingsbookstore.com. Follow us as kingsbooks across social media.



Marshall GIS is a woman-owned Telematics company with over 24 yrs experience, that implements cost-saving resource management solutions using the visually intuitive power of GIS.



Michael Baker International, a leading provider of engineering and consulting services, has been partnering with communities since 1940 to solve their most complex infrastructure challenges with a legacy of expertise, experience, innovation and integrity. Supported by more than 3,000 employees in nearly 100 locations across the United States, we provide a full continuum of engineering and consulting services, including design, planning, architectural, environmental, construction and program management. Our clients include U.S. federal, state and municipal governments, foreign allied governments, and a wide range of commercial clients. Michael Baker is committed to delivering a standard of excellence that fosters a culture of innovation, collaboration and technological advancement to help solve our clients' complex challenges.



PACE is an employee-owned company providing professional civil and structural engineering, planning, surveying, geographic information system (GIS) services from offices located in Kirkland and Wenatchee, Washington and Lake Oswego, Oregon. Founded in 1992, we have expanded our expertise over the years to build a multi-disciplinary team capable of offering our clients a complete package of engineering services. With a staff of professional structural and civil engineers, licensed surveyors, and a full array of professional and support staff, PACE provides maximum efficiency to meet our clients' goals.



Solv3D provides tools that enable people to effectively use large 3D point clouds and imagery within their existing workflows. Using 3DPointLogice™, individuals can easily turn massive point clouds into manageable data sets. With the SiteVisit360™ collaborative platform, companies can leverage the value and insight of 3D for estimation, planning, design, and decision-making purposes.



From small-town infrastructure to federal design-build projects, and from large mixed-use communities to urban in-fill projects, Timmons Group has proudly built a reputation of excellence since we first opened our doors in 1953. Our deep experience positions us as an industry leader with an unwavering commitment to forward-thinking, innovative design and complete solutions for client success. Recognized for nearly 20 years as one of Engineering News Record's Top 500 Design Firms, Timmons Group provides civil engineering, environmental, geotechnical, GIS/geospatial technology, landscape architecture and surveying services to a diverse client base. Our market-focused organization is structured to help fulfill our mission "to achieve unparalleled understanding of our clients, their businesses and their visions, resulting in unrivaled customer service and shared success."



The Urban Studies Program at the University of Washington Tacoma offers an Undergraduate GIS Certificate (25 Credits/5 courses) and a BA in Urban Studies degree with a concentration in GIS & Spatial Planning. In the BA, Graduates are well prepared to either compete for a variety of employment opportunities in technical, planning and policy-making domains or to pursue graduate study. The program also offers an 11-month MS in Geospatial Technologies (40 Credits/8 Courses). The MS degree provides advanced training in GIS, including the use and application of geospatial hardware, software, and data in urban and environmental planning scenarios as well as the development and deployment of location-based mobile and web applications. <https://www.tacoma.uw.edu/urban-studies/urban-studies-home>



GIS User Groups in Washington

Cascadia Users of Geospatial Open Source

www.cugos.org

Contact [Karsten Vennemann](#)

Central Puget Sound GIS User Group

Join Listserve [here](#)

Central Washington GIS User Group

<https://www.linkedin.com/groups?home=&gid=8252704>

Meets the 2nd Wednesday of each month.

Contact [Amanda Taub](#)

Cowlitz-Wahkiakum GIS User Group

Meets the first Wednesday of each month at 3:00 pm at the Cowlitz County Administration Annex Building, CWCOG meeting room, 207 North 4th Ave, Kelso WA (unless other location is announced).

Contact [Ken Pearrow](#)

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.wvu.edu/huxley/spatial/nwwgis/nwwgis_mtgs.htm

Snohomish County GIS User Group

<http://www.arlingtonwa.gov/350/Snohomish-County-GIS-Users-Group>

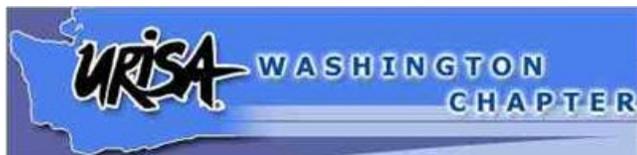
Southeast Washington/Northwest Oregon GIS User Group

<http://gisgroup.wordpress.com>

Washington Geographic Information Council (WAGIC)

<http://ocio.wa.gov/boards-and-committees/washington-state-geographic-information-council-wagic-0>

Join Listserve [here](#)



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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 250 words and essays should be limited to 500 words.