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News From and For the Washington GIS Community

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THE SUMMIT

President's Column

Tami Faulker, Thurston County, WA

I am excited to be leading and facilitating the Washington GIS Association and it is an interesting time to be doing this job! I hope we can take as many of you as possible on this journey with us as we transition from being a state chapter of a larger organization to being our own unique organization.

So, what is going to change? Well most of you will notice superficial things such as a new logo, a new website URL or e-mail addresses. We are changing the superficial so we can retain what this organization has always done well.

I have been on the WAGISA Board for five years and during that time the priorities have always been education, professional development, networking and developing relationships within our community and between various groups which intersect our community. We have tried to offer an exceptional conference each year, some smaller workshops as we are able, and to stay connected with what is happening in the GIS world in Washington State. That is not going to change. In order to have the autonomy to

have our board be elected by our active participants we had to become our own "new" organization, but you will notice that in terms of our mission to you, not much has changed.

That doesn't mean your board isn't busy. There is a lot involved in making this change and continuing to do our normal business. Things such as registering our new group with the IRS, getting insurance, and changing our by-laws and policies to fit our modified organization. Moving all the financial accounts and other supporting items to the new name also takes time.

Also there has been a lot dropped due to the pandemic and we



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2021 Washington GIS Conference Recap

By: 2021 WAGISA Conference Planning Committee

Another Washington GIS Conference is in the books. The May conference was the first virtual conference in WAGISA's (formerly WAURISA) history, and by all measures it was a success! The format of the virtual conference was similar to the typical in-person conference with workshops kicking off the first day of conference week, and a keynote followed by track presentations filling out the second and third conference days. The workshops included remote sensing with Free and Open Source Software (FOSS) and two workshops focused on ArcPro - migrating to ArcPro and editing in ArcPro.

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(President's Column; [continued](#) from page 1)

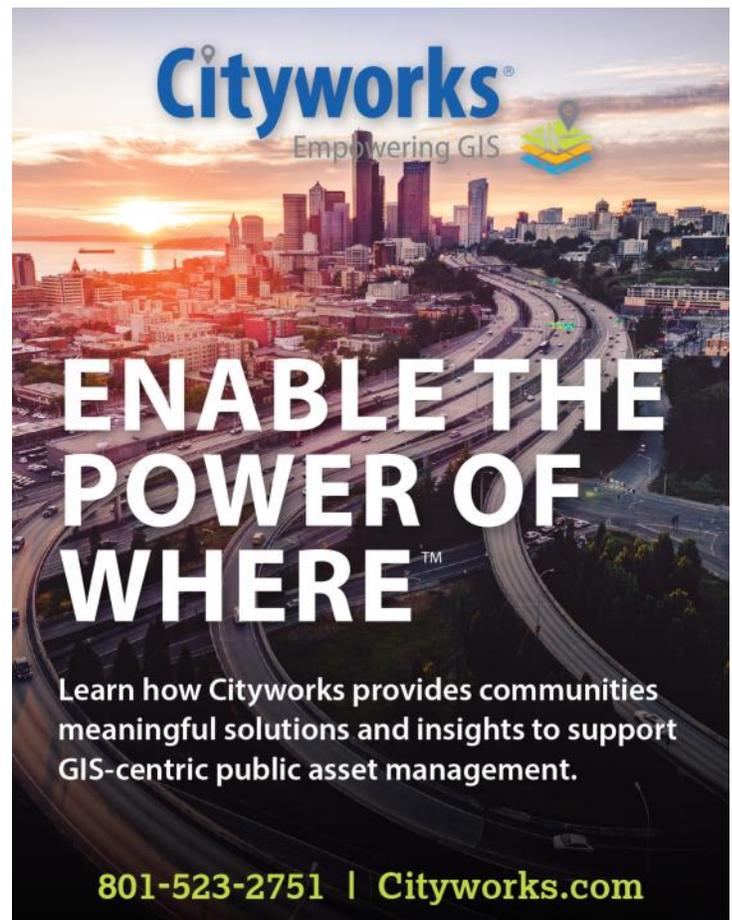
are beginning to plan again those things we had to drop. For example, our annual face-to-face board meeting has been online for the past two years to help protect against COVID-19 exposure. We hope to have to have this important planning meeting in person next September.

We are so happy with the results of our first online conference. A lot of that success is due to a wonderful group of volunteers, led by Katie Heim of the City of Arlington. They did a fantastic job putting together a completely new event for WAGISA. We are so thankful for all their hard work. We are also very grateful to all of you for attending our conference and actively participating in the events.

So, what are we doing next year? We are going to look at the whole range of options, including having a hybrid event. We will know more as time goes on.

If you would like to participate in a group that is committed to helping GIS professionals at all levels, I encourage you to visit our website and get involved. We are looking for committee members and some committee leads. For instance, we could use someone to lead the Professional Development committee. This committee organizes timely and affordable educational events (i.e., in-person workshops and online webinars) for our members and the broader Washington geospatial community. I have found the board and volunteers to be a good group of people to work with and helpful people to know in the GIS community! Welcome to WAGISA! Please help us as we move forward. [↪](#)

In the era of COVID-19, many of us have begun to work remotely, and some workers are planning to stay remote for the foreseeable future. Do you work in Washington State and live elsewhere, or vice versa? The Summit wants to share your story: tell us about the opportunities and challenges you have experienced with remote GIS work, and we will collect some highlights and publish them. Summit@wagisa.org

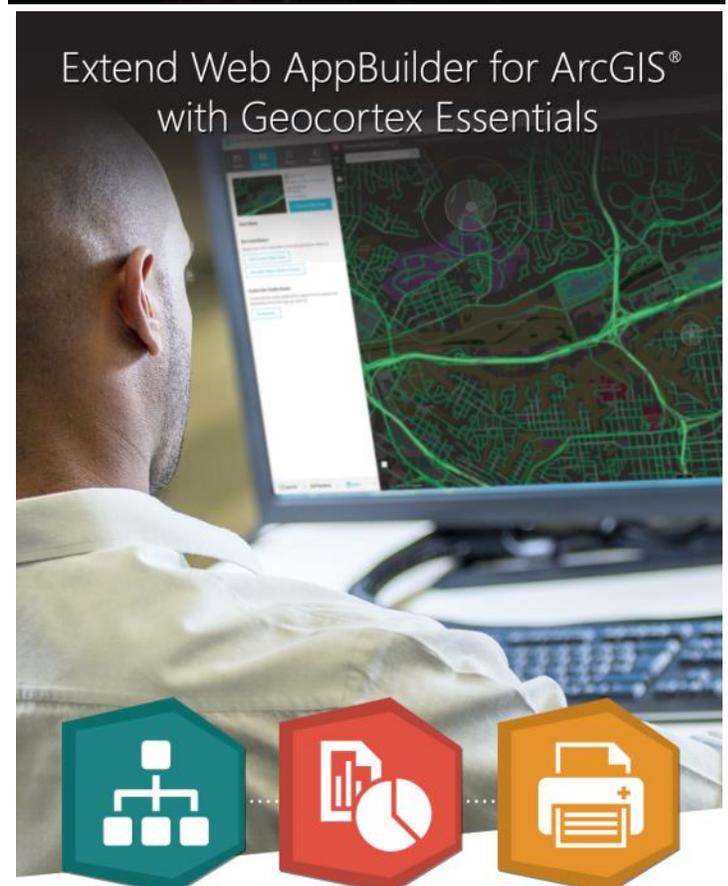


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Labeling in the New ArcGIS Map Viewer and JavaScript 4.x API-Based Apps

Article courtesy of
WAGISA Sponsor
[CivicLens](#)

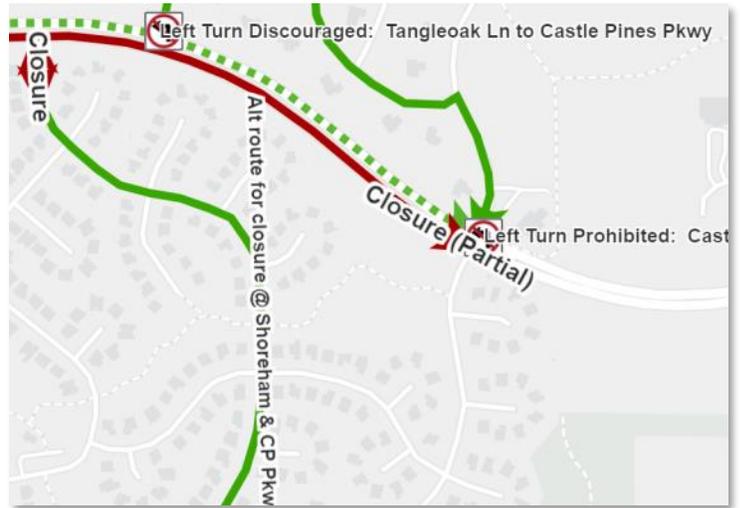
By: Joe Rhodes, CivicLens

Among the many advancements in the new ArcGIS Online Map Viewer, we at CivicLens are most excited about the vastly improved labeling capabilities, including multiline labels, curved placement along line features, dozens of fonts, user parameters for label offset, and the ability to create multiple label classes for a single layer. These capabilities greatly improve the ability to quickly convey primary attribute information from feature service data, which can produce a more engaging map, especially in maps intended for public consumption. Apps based on 4.x versions of the ArcGIS API for JavaScript API (including Experience Builder, Instant Apps, and custom applications) retain these label characteristics.

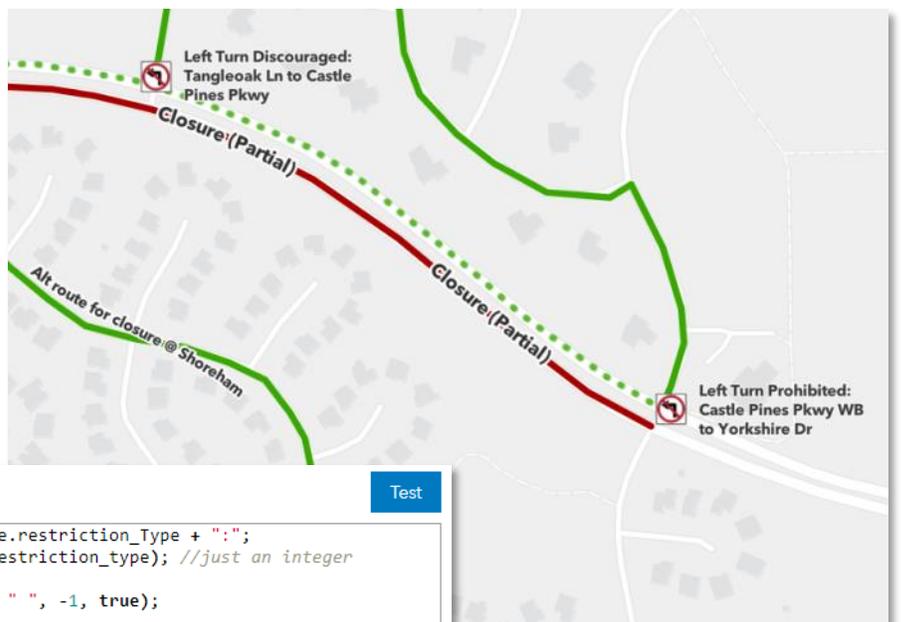
We've found multiline labels to be particularly useful. Although the Map Viewer applies some logic automatically to split labels onto multiple lines, a little bit of Arcade code really makes this feature shine. We had a customer request to display details on road closure features without requiring users to click on them, and there was way too much text for a single line. We wanted to put the restriction type on its own line ("discouraged" or "prohibited") to make it more prominent, so we needed a way to define the number of characters at which a new line would be created for the labels, and we needed to keep the words intact. The Arcade code shown below accomplished this, and the difference in the visual appeal of the map versus the same

map opened in Map Viewer Classic is remarkable. Give this code a try for your next mapping project! 🔄

```
Expression Test
1 var restriction_type = $feature.restriction_Type + ":";
2 var charCountPerLine = Count(restriction_type); //just an integer
3 var feature = $feature.street;
4 var wordArray = Split(feature, " ", -1, true);
5 var lbl = "";
6 var label = "";
7
8 for (var i = 0; i < Count(wordArray); i++) {
9   if (Count(label) + Count(wordArray[i]) <= charCountPerLine) {
10     label += (wordArray[i] + " ");
11   }
12   else {
13     label += TextFormatting.NewLine;
14     lbl += label;
15     label = "";
16     i -= 1;
17   }
18 }
19
20 lbl += label;
21
22 return restriction_type + TextFormatting.NewLine + lbl
```



Labeling in Map Viewer Classic



Above: Improved labeling in the new Map Viewer

Left: Arcade code used to create multi-line labels

Community Announcements

1. The Washington Geographic Information Council (WAGIC) invites you to the 10th Annual Joint Agency GIS Week Event! The event will be held virtually via Zoom. Tuesday, November 16-Thursday, November 18 It is free to attend, but you must register. [Register here!](#)
2. Want to review the 2021 WA GIS Virtual Conference presentations? Go to our YouTube Channel! https://www.youtube.com/playlist?list=PL9rEfbdHo29wtjvthzE6D96_vMaIaWsOb
3. The 2022 WA GIS Conference will again be a virtual event. We hope to organize in-person socials during the conference at several locations throughout the state.

(2021 WA GIS Conference Recap; [continued](#) from page 1)

We welcomed 55 presenters and over 200 attendees. Given the late start on conference planning due to the COVID-19 pandemic, the conference committee was thoroughly surprised to receive so many presentation abstracts. The committee worked hard to expand its webinar technology in order to support two concurrent tracks each day of the conference. This year's keynote speech from Dr. Dawn Wright from Esri, Why the World Needs Geospatial (i.e., YOU) Now More Than Ever emphasized how we as GIS professionals are critical to helping better understand and solve many global issues the world currently faces.

Conference sessions included technical software presentations and project summary presentations from agencies at the state and local level. The conference also included geography trivia contests and the annual Women In GIS breakfast social. And once again the conference sponsors provided some great prizes such as Amazon gift cards, wireless speakers and a variety of books and software licenses.

If you are feeling a bit nostalgic about the conference now that the days are short and often rainy - there is good news! The conference committee recorded the track presentations, and you can view them on the 2021 Washington GIS Conference YouTube channel! https://www.youtube.com/playlist?list=PL9rEfbdHo29wtjvthzE6D96_vMaIaWsOb

WAGISA is again planning for a virtual conference in 2022, to hopefully include in-person social events organized by locals in regions across the state. If you are interested in helping shape the conference or have suggestions for a keynote, speakers, or other conference activities, please email the conference committee at cc@wagisa.org. 🌀

Washington GIS Association: Here For You!

By: Tami Faulkner, WAGISA President

What can WAGISA do for you? A lot of different things, depending on your role in the GIS community. This section of the newsletter is going to concentrate on different benefits you can take advantage of with WAGISA. For this issue I am targeting GIS coordinators, GIS supervisors and GIS managers, particularly from cities, counties and tribal nations. There are so many ways to benefit from being actively involved in WAGISA if you have one of these roles in your job.

WAGISA has some special interest groups, which focus on specific areas of interest in GIS. The longest running of these is the WGGL – standing for Washington Local Government GIS Leaders. This group meets annually at the conference usually for a day filled with focused presentations and discussion involving subjects that help GIS leaders at all levels. WGGL members also periodically meet online to watch webinars related to leadership and program management. Recent excellent presentations in this forum include Managing Organizational Change and using the Slimjim Maturity Model to grow and manage your organization.

If this seems interesting to you I encourage you to go to <https://wagisa.wildapricot.org/Washington-Local-Government-GIS-Leaders> to find out more.

Additionally, our annual conference always features presentations on important topics for those in GIS leadership. And the networking opportunities and chances to learn from each other are limitless as a member of WAGISA. If you have a leadership role in your organization then WAGISA is here for you! 🌀

Not sure if you are a WAGISA member? Visit www.wagisa.org. If you are a current member, you'll be able to log in and see the additional "Member Resources" tab. If you have questions or troubles logging in, please [email](#) the membership committee for assistance.

A Conversation with Mike McGuire, WAGISA 2021 Summit

Person-of-the-Year Award Winner

By: Ian Von Essen, for the WAGISA Summit Newsletter

This year's GIS-Person-of-the-Year, our 2021 Summit Award winner, Mike McGuire, has a career story that exemplifies the amazing diversity of GIS professionals. While many of us in WAGISA do have backgrounds in geography and have specifically studied GIS, many of us discovered the GIS profession via other routes by starting out as engineers, cartographers, planners, sales analysts, appraisers, epidemiologists, archeologists, programmers, educators, and so on.

Mike McGuire's GIS career arc includes both the public and private sectors and he has spent the last 22 years as a successful GIS businessman as the sole proprietor of Ascent GIS. His company provides a range of GIS products and services for public, non-profit, and private sector customers. With the rapid technical advances of satellite imagery, drone and 3D Lidar technology, his company has specialized on providing his customers a range of airborne-based product solutions, including remote sensing and LIDAR based products, as well as digital orthoimagery and high resolution elevation data.

Mike was born in Medford, Oregon but has called Spokane his home most of his life, with stints in Montana and New York. Mike and I chatted for about fifty minutes about his interests, how he discovered GIS, what GIS means to him, lessons learned through the course of his varied career, and finally, his thoughts on being the 2021 Summit Award winner. This interview has been edited for content and clarity.

INTERVIEW:

Ian: First off, Mike, congratu-

lations on being this year's Summit Award winner. I know you were quite surprised when WAGISA announced that you were the 2021 GIS person of the year. Now that it has set in, how do you feel about the award today?

Mike: Ian, I am still in shock and honored at the same time. I work with numerous GIS professionals across the State of Washington, and there are many I would personally pick to receive this prestigious award. For the committee to choose me, recognize my work over 25+ years and the contributions to the GIS community in the State of Washington is absolutely flattering!

Ian: I have known you for well over twenty-five years; I knew you when you worked at Pacific CAD before you left and started Ascent GIS in the late 90's. We have worked together in many

different capacities over the years, specifically on GIS-related projects, but also in an educational capacity supporting GIS Day, professional workshops, and on several small and larger Spokane-based GIS Conferences. Can you tell the GIS community how you ended up working in the GIS profession?

Mike: By accident, by chance, being in the right place at the right time. In college, I was in the process of getting a Bachelor Association in Education Degree (BAE). The degree requires two courses in geography. I found the subject and the quality of instruction interesting enough. I made a deal with the history department chair, substituting three upper-level geography courses in place of three upper-level history classes. The "deal" was full credit for both courses if I read two books for each history course and produce a two-page paper on each book. Basically, I received six upper-level classes for the price of three.

During my second year as a public school teacher within Spokane's Mead School Dis-

(Continued on page 7)



The Summit Award tradition continues: Last year's 2020 GIS Person of the Year, Josh Greenberg (right), presenting to this year's 2021 GIS Person of the Year, Mike McGuire (Left),

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trict I started to have second thoughts if this was the career path meant for Mike McGuire. During this period, I was also bartending to offset low teacher wages. While bartending, the owner of an AutoCAD dealer sat at my bar and explained he had just terminated his GIS manager. Probably hinting of my true age, this was the first time I heard the acronym GIS. Long story short, he challenged me by registering me for an AutoCAD release 13 class. I passed with flying colors, and he offered me the GIS Manager's Position.

The company had reseller status with two GIS manufacturers, Autodesk/AutoCAD MAP and Esri/ArcView. By the end of my first year, my three-person department led sales over the Architecture/ Engineering /Construction (AEC) and Mechanical Design departments. When I found out the company was being forced to end its reseller status with Esri, I knew my department sales would suffer greatly. I also knew that there was opportunity staring me right in the face.

I approached Esri in 1998 inquiring about their business partner (BP) program. By September of the same year, I had met all Esri's BP requirements, signed with a satellite vendor, Space Imaging, ended my employment, and cofounded Ascent GIS Inc. In 1999 we added LizardTech LLC to our vendor list. Ascent GIS, 100% focused (our company tagline) was off and running, and here I am today almost 23 years later.

Ian: As you look back what are some of Ascent GIS's memorable accomplishments?

Mike: Well Ian, it's always nice to be recognized by your peers. During our early days, Ascent GIS was recognized by ESRI twice by selecting our company as business partner of the year. In addition, Jack Dangermond, at the closing ceremonies at the annual world business partner meeting, presented the Ascent GIS business plan as a recommended example of how to startup a new GIS company. This was a huge compliment and helped validate our company's mission.

As far as projects go, there are many; however, there are two I'm particularly proud of. We learned early in the business how important the imagery base layer was to GIS professionals. We acquired and processed terabytes of USGS grey scale imagery, especially for rural customers. Knowing the demand for quality orthos would continue, we began our research for additional nationwide imagery providers.

I will never forget sitting at my desk and discovering the National Agriculture Imagery Program (NAIP) pilot project. In 2003 the

Farm Service Agency (FSA) was spot-collecting aerial imagery across the agricultural lands in the United States. Fortunately, the map showed they had collected two-meter color imagery of several Eastern Washington counties. Without a single order, Ascent GIS purchased every pixel in Washington State. We reprojected, retilled, compressed and mosaiced all Eastern Washington State. It was the first time 90% of our customer base had seen color imagery of their service areas. I tell the story; Ascent GIS became rock stars overnight.

Most people by now know the NAIP story. Ascent GIS became "experts" on the NAIP over the years and continue to follow the USDA program today. Once our customers had a taste of color imagery, they wanted more, including higher resolution imagery. Here I will segue into my second favorite business venture: realizing Ascent GIS and the Washington State Department of Natural Resources (WADNR) were duplicating NAIP data acquisition and processing efforts, so we decided to form a public/private partnership.

Right before the move from analog to digital imagery, Ascent GIS and WADNR raised enough money through state and local government agencies to have the FSA rescan the film to a ½ meter resolution product. This was Washington State's highest resolution imagery data set to date, and it was captured in a single flying season. Ascent GIS shared image production and distribution responsibilities with the WADNR. In my mind, the successful collaborative efforts on this project would help pave the way for the current state imagery program, now in its fifth year.

Ian: Well it sounds like you have developed many relationships across the state through your work. In a few words can you expand on these relationships and how they benefited your professional career and business.

Mike: You know the old cliché, Ian: "it's all about the relationships." There is absolutely no way I can talk about the success of Ascent GIS, my success as a GIS professional, without bringing up past and current relationships. Washington State without a doubt is our strongest customer base. The GIS professionals across the state are some of the brightest, talented, committed, and friendliest people in the industry. I am so lucky Ascent GIS incorporated in the great State of Washington.

Ian: Can you provide any advice to young professionals just starting out in GIS?

Mike: Absolutely Ian. First, GET OUT OFF THE OFFICE and GET ENGAGED in whatever manner that works for you. There

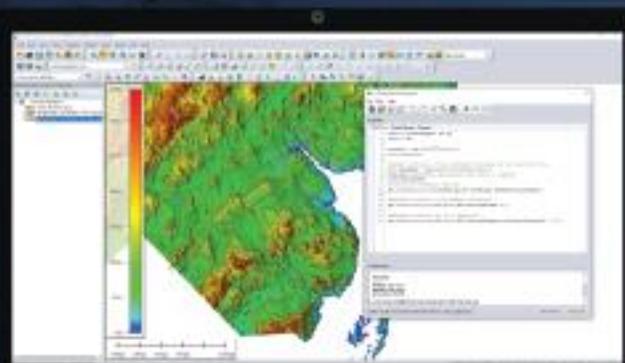
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Global Mapper Pro®, the newest addition to the Global Mapper family, is finally here! Global Mapper Pro incorporates all of the powerful point cloud processing tools previously available in the now-retired Global Mapper Lidar Module, and expands the functionality to include more terrain analysis and automated tools.



The new, advanced application incorporates all of the features and functions in the base version of Global Mapper v23 with a varied collection of professional-grade geospatial tools that will take your workflow to the next level.

Advanced GIS processing tools at your fingertips

Point Cloud Segmentation by Spectral Graph Partitioning



The Segmentation tool analyzes the characteristics of points in order to identify clusters and apply a Segment ID that can be visualized, searched, and selected.

Python Programming Language Integration



Based in Python v3.9, Global Mapper users are now able to automate workflows in the program using the Python programming language.

Automatic Breakline Creation



The new breakline extraction tool in Global Mapper Pro finds changes in elevation or slope and extracts these edges as 3D vector breaklines.

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A customizable undo manager allows the user to specify which actions to record in order to easily return to a previous data state.

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are innumerable ways to solve a given problem in GIS, whether it's through more efficient processing, generating better analysis, or improving your source data. In today's world, our first step obviously is to search the web, but as we've all discovered over time, we often come up empty. So to find new solutions you also need to connect up with your GIS peers, which means going to conferences, attending user group meetings and workshops, and of course joining WAGISA. But seriously the more you give of yourself by volunteering, whether it is to support one of WAGISA's many subcommittees, or perhaps hosting a local GIS user group meeting, or even during tough budget times just having a simple cup of coffee with local GIS professionals outside

your own organization, will help you create the connections that will help advance your career. I think this is critical for new GIS professionals to do, but it's also relevant to those of us who have been working in the GIS profession for quite some time. Like anything in life, the volunteer investments you make will help you and your GIS profession continue to advance and grow and will allow you to form the professional relationships and friendships that will support you throughout your entire professional career.

Ian: Any final thoughts, GIS Person-of-the-Year?

Mike: Yes, again it is an honor to receive this prestigious award. And I'm so grateful that I chose a career where I'm surrounded with such a diverse, talented, supportive, awesome group of people! 🌀

Global Mapper Pro: The all-in-one GIS software

Article courtesy of
WAGISA Sponsor
[Blue Raster](#)

With the release of Global Mapper® v23, Blue Marble Geographics retires the Lidar Module® and introduces Global Mapper Pro®. While Global Mapper v23 will still be available with many exciting updates, the Pro version provides access to Pixels to Points® and all the point cloud processing tools previously found in the Lidar Module, with impressive new and improved tools expanding the functionality to include more terrain analysis and workflow optimization.

With workflow efficiency in mind, Global Mapper Pro boasts a new user interface Vectorize Raster tool to create and smooth polygons derived from equal or similar values in a raster image or elevation layer. Further improving automation and workflow execution, Pro contains Python script integration and a new Script Editor interface. With Python installed alongside Global Mapper Pro, Python developers can execute Global Mapper processes via a Python script. Scripts involving Global Mapper operations, as well as desired functions from installed third-party libraries, can be created and run in the Script Editor or in any Python environment. Adding syntax coloring, bookmarking, and editing of scripts, the Script Editor can open and run multiple scripts with options to execute scripted processes in the context of the open workspace.

Expanding the diverse tools for terrain creation, editing, and analysis in Global Mapper, the Pro version improves Terrain Painting, the method for manually sculpting elevation models, providing options to edit surfaces based on existing vector features. Additionally, the new Automatic Breakline Creation derives vector line features from elevation, slope, and curvature changes in a terrain

model. With multiple analysis methods for breakline creation, this tool provides powerful extraction capabilities for roads, ridge-lines, curbs, and more.

Containing all the existing point cloud editing and classification capabilities from the Lidar Module, Global Mapper Pro continues to improve the tools available. With updates to building and vegetation classification methods, point clouds are divided into clusters, or segments, describing distinct features. Adding to the automatic tools available, a new Segmentation by Spectral Graph Partitioning tool provides the opportunity to customize how the analysis algorithm considers various characteristics of point returns in order to identify distinct features in the data. With applications ranging from ground identification to roof plane and car identification, the Segmentation tool applies a unique segment ID to each discovered feature. Point clouds can then be visualized by segment ID to clearly see the identified features. Pairing with the segmentation updates, a Select Segment mode provides the ability to select the identified features by automatically selecting all points with an equal segment ID value.

With the GIS industry, data, and analysis constantly changing, Blue Marble strives to provide a cutting-edge, all-in-one geospatial program. Broadening the focus of the Global Mapper advanced tools from lidar processing to more general analysis and automation opens the door for greater improvements and development freedom as the program continues to evolve. Global Mapper Pro takes workflows to the next level with a full suite of professional-grade tools for data creation, editing, and analysis.

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2021 Richard “Dick” Thomas Student Competition Results

By: WAGISA Community Engagement Committee

The 2021 Washington GIS Conference was held virtually this year, including the Richard “Dick” Thomas Student Competition (DTA) which took place on Sunday, May 23. There were six competitors and a panel of three judges. For those not familiar with the DTA, this award was established to honor a Washington State GIS pioneer and mentor, Richard ‘Dick’ Thomas, who passed away in 2006. The intent of this award is to honor Dick by continuing his work of encouraging students to excel in their studies and to transition successfully into careers in the field of GIS. WAGISA’s objective is to inspire students to present their original work related to GIS, geography, or geographic research at the annual Washington GIS Conference. For those of you who did not get to see the competition, you can visit our [WAGISA YouTube page to watch the full contest](#).

This year we had five solo competitors and one group compete, attending the University of Washington, the University of Washington Tacoma campus and Oregon State University (the latter presenter was allowed since he is a Washington state resident, which is one of the criteria for potential participants):

- Micah Gelber—University of Washington (UW) Tacoma
- Taylor Braden—University of Washington (UW) Tacoma
- Marco Bachini—University of Washington (UW) Tacoma
- Sam Payne—Oregon State University
- Conor Flannigan—University of Washington (UW) Tacoma
- Mai Aoki, Jason Sarura & Jonathan Simo—University of Washington

The winners of the 2021 DTA contest are:

First Place: Micah Gelber with a presentation titled *A Peripheral Glance: Tacoma Peri-Urban Analysis and Conceptual Overview*. Micah is also a student at UW Tacoma and will receive a check for \$500, free one year membership to WAGISA, free entry to the 2022 WAGISA GIS Conference and an opportunity to submit an article to The Summit Newsletter.

In 2nd Place, for a presentation titled *Coming Home: How GIS could Help a Species Rise from the Ashes*, Taylor Braden. Taylor is also a student at UW Tacoma and will receive a check for \$250, free one year membership to WAGISA and an opportunity to submit an article to The Summit Newsletter. In 3rd Place for a presentation titled *Invest in Waste: A Suitable Site Selection for Municipal Solid*

Waste Landfills in Pierce County, WA using Geographic Information Systems, Marco Bachini. Marco is a student at the University of Washington – Tacoma and will receive a check for \$125, free one year membership to WAGISA, and an opportunity to submit an article to The Summit Newsletter.

Please continue reading to learn about the experiences and insights gained from the contest’s first, second, third and fifth place finishers. 

First Place: Micah Gelber, UW Tacoma

A Peripheral Glance: Tacoma Peri-Urban Analysis and Conceptual Overview

Abstract: Peri-Urbanity relates to urban sprawl, uneven development, and urban-rural linkages. Peri-urban areas, also referred to as urban fringes among many other names, are roughly defined by land use designation and comprised of both formal and informal settlements. They tend to have larger tracts of land which are used for agricultural or industrial purposes. The present research focuses primarily on the effects of urban growth on Peri-urban agriculture and environments in western Pierce County, WA. The focus is informed by the fact that "present-day fringes/interfaces have become intimately bound up with notions of (more) sustainable urbanization and urban development" (Simon, 2008). Moreover, peri-urban areas provide urban spaces with sources of food production/cultivation, waste disposal or treatment sites, and recreation. However, the relationship is rarely symbiotic, and in many cases, urbanity is framed as having a parasitic effect on peri-urban areas. Peri-urban areas are often exploited for land, labor, and resources, and are used as accessory space for waste sites or industrial/residential development. This displaces populations and has deleterious environmental effects. Without adequate representation, peri-urban areas and inhabitants are at risk. GIS analysis for this research involved identifying Tacoma’s peri-urban areas using zoning and land use designations creating an environmental sensitivity index (raster overlay), and determining area of urban change within the generated environmentally sensitive areas. The results of the analysis show that roughly 21% of peripheral urban change from 2001-2016 occurred in environmentally sensitive area which raises concerns about peri-urban developmental trends.

This research focuses on peri-urbanity, a complex and critical spatial concept. My fascination began during my time as an

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undergraduate student. As a student who took a combination of urban studies and philosophy courses, I was always interested in combining the two in some way. I found this confluence



Micah Gelber enjoying a rare moment of free time while finishing his project. You can find Micah's project StoryMap here: <https://arcg.is/0W984>

in critical geography, most notably, the theories of Henri Lefebvre and Edward Soja. In *Thirdspace*, Soja expounds on the dichotomy (or dialectics) of centrality and peripherality. This discussion relates not only to urban development, but also governance, society, economy, environment, and, more abstractly, consciousness.

In the initial planning stages for the final project of the University of Washington - Tacoma's GIS certificate, I decided that I wanted to incorporate Lefebvre's and Soja's peripheral perspectives into the research. The main challenge was to take this abstract theory and 'bring it down to Earth' as my supervisor would say. I found this grounding point in peri-urban areas. As

I researched peri-urban contexts across the globe, I decided that this was the topic I wanted to focus on, and this set me on a path to thinking about urban-rural linkages in a whole new way. What interests me the most is that peri-urban areas, merely by existing, counter bicameral ways of thinking about urban/rural, center/periphery, and even closed/open systems. A particularly thought-provoking description of peri-urban areas is that they are like palimpsests: layered artifacts where the remnants of what was, what is, and what will be, are all present simultaneously.

During my time as a student of urban studies in the Pacific Northwest, I had grown to appreciate the experience of driving eastward from the metropolitan region to observe land uses, landscapes and lifestyles changing from what most consider 'urban' to 'rural.' This happens gradually and there exists an interface between the two, a 'transition space' that cannot strictly be defined as one or the other. The nature of these spaces as being 'caught in between' intrigued me. I also learned about the developmental challenges that such areas experience. In the phases of research development, I read about how peri-urban areas across the globe are often underrepresented and face a variety of unique challenges such as the erasure of agricultural practices, residential development, and governance relations.

I realized early on that I would need to narrow the scope of my project so that it could be completed with the time constraints, and this was a challenge for me. As someone interested in peripherality because of its wide applicability, I was reluctant, but eventually accepted the fact that I could not do it all. Ultimately, I settled on an environmental analysis of peri-urban areas in western Pierce County. The analysis involved determining the amount of urban change that has occurred in environmentally sensitive areas generated using raster overlay. The primary objective for this research was to use GIS to determine areas where development poses threats to the environment.

Second Place: Taylor Braden, UW Tacoma

*Coming Home: How GIS can Help Identify Potential Habitat for the Re-introduced Fisher (*Pekania pennanti*)*

Abstract: The Fisher (*Pekania pennanti*) is a member of the weasel family. About the size of a large house cat, the Fisher is an inhabitant of old-growth forests and is one of the only spe-

(Continued on page 13)

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cies able to effectively predate on Porcupines. In the 19th century, however, human impacts took their toll on the Fisher population and the Fisher went extinct in Washington State. Nearly a century later, the first reintroduction effort introduced Fishers from a healthy population in Canada back into Washington State. Several successful reintroduction efforts on the Olympic Peninsula and in the Cascade Range have been conducted since then, all in protected areas. So, the question arises: What happens when these Fishers start to venture outside of these protected areas? Using GIS, the habitability of locations within Clallam, Grays Harbor, Jefferson, and Mason counties for the Fisher were analyzed to determine where Fishers and people may come into conflict. This analysis took into consideration the ranges of the prey of the Fisher (Porcupine, Snowshoe Hare, Douglas Squirrel, and Mountain Beaver ranges), the ranges of the predators of the Fisher (Bobcat, Cougar, and Coyote ranges), the elevation, the presence of old-growth forest, and human impacts (the location of roads, trails, campsites, parcels that were uninhabitable for the Fisher, and timber harvest sites). These results were depicted on a map using a color ramp ranging from the least habitable locations for the Fisher to the most habitable locations for the Fisher. The most suitable habitat for the Fisher occurs in a ring around the Olympic mountains, with the greatest contrast in the habitability of a location occurring on the northeastern corner of the Olympic Peninsula. Future reintroduction efforts may want to focus on introducing more Fishers on the western side of the Olympic mountains to take advantage of unused habitat.

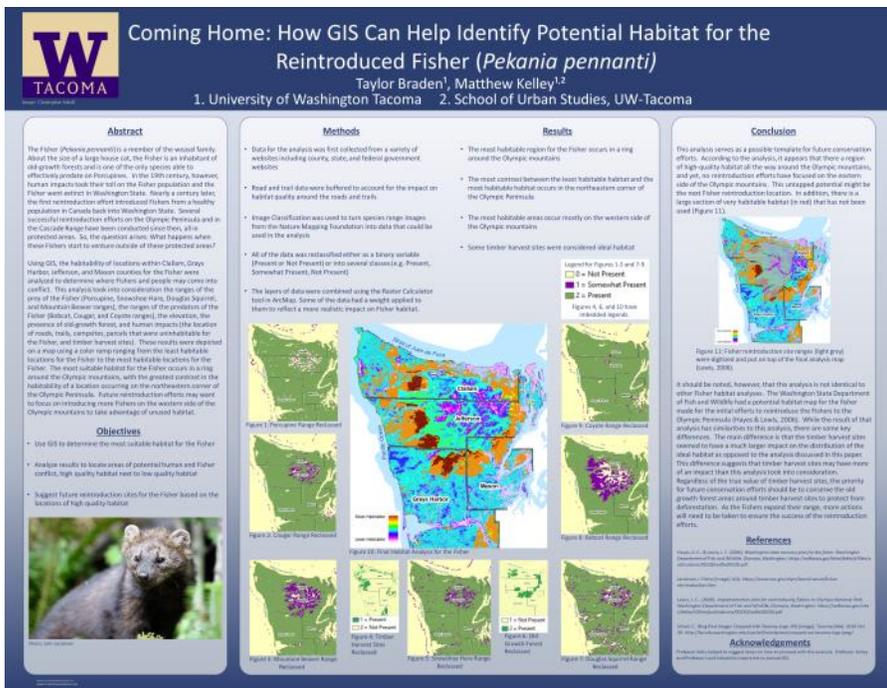
The Olympic Peninsula, specifically Clallam, Grays Harbor, Jefferson, and Mason counties seemed perfect for my analysis due to the successful re-introductions of

Fishers within Olympic National Park, which lies in all four counties.

I first became aware of Fisher re-introductions through the Mt. Rainier National Park newsletter. It is my goal to apply my education, a B.S. in Environmental Science, and a certificate in Geographic Information Systems, to map wildlife corridors or species habitat.

The lessons I learned from this experience involved having realistic expectations, problem solving, patience, and discovering limitations. For example, expecting ArcGIS Pro to put buffers around all of the roads in Grays Harbor was unrealistic. ArcGIS Pro crashed several times. This taught me to problem solve and to cut the roads layer into smaller pieces, buffer those pieces, and then put those pieces back together. This took hours and hours. Expecting that the data I wanted was available was also unrealistic. For the old-growth forest portion of the analysis, I used a proxy (the range of the Northern Spotted Owl) to determine where old-growth forests were since I could not find an old-growth forest layer. There were also no species range shapefiles for the prey and predators I was considering, so I used the image classification tool to create seven range layers from images of species ranges.

Overall, I enjoyed the learning process and the results of my efforts. It was a satisfying experience. I plan on pursuing a Masters in Geospatial Technologies to refine my analysis skills for future habitat analyses.



Left: Taylor Braden's Final Project Poster. Link to full-size poster: https://www.tacoma.uw.edu/d7/sites/default/files/sections/SAM/Braden%2C%20Taylor_0.pdf

Above: Old growth forest is ideal Fisher habitat.

(Continued on page 14)



Taylor Braden standing in front of a 14 foot diameter Western Red Cedar tree as he explores ideal habitat locations for Fishers.

Third Place: Marco Bachini, UW Tacoma

Invest in Waste: A Suitable Site Selection for Municipal Solid Waste Landfills in Pierce County, WA Using Geographic Information Systems

Abstract: Most people are unaware that solid waste management is a serious problem that needs full attention from our government leaders and people's cooperation. That is why governments are investing time, effort, and resources to introduce and implement several solutions for the increasing waste problem, such as prevention, recycling, and composting. However, there are solid wastes that are disposed in a landfill. Municipal solid wastes are those wastes generated and discharged from single- and multi-family dwellings and include wastes generated from within the dwelling, from the yard, and from activities outside the dwelling (McBead, Rovers, & Farquhar, 1995). However, according to the United States Environmental Protection Agency (EPA), MSW does not include everything that may be landfilled at the local level, such as construction and demolition (C&D) debris, municipal wastewater sludge, and other non-hazardous industrial wastes.

According to the study and data of Washington State of Ecology, in 17 years (2000-2017), Washington's population increased by 24 percent, and its waste generation increased by 64 percent. There were 10.5 million tons of waste generated for a population of 5.89 million in the year 2000. But in 2017, there were 17.2 million tons of waste generated for a population of 7.31 million. This data indicates the upward trend of both the population and the waste generated in Washington State. Unfortunately, the rate of increase in waste generation is higher than the population growth

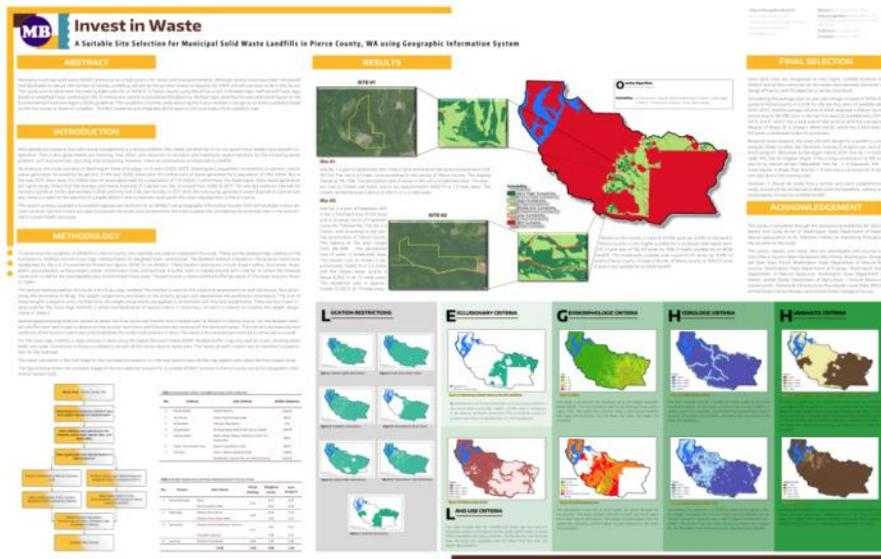
rate. The data shows the immense problem of solid waste in our society. The study's primary purpose is to establish appropriate locations for an MSWLF using Geographic Information System (GIS) with multiple-criteria decision analysis. It uses several criteria to evaluate and determine the most suitable site considering the potential risks in the environment, human health, and costs.

When we had to conceptualize our capstone project for our GIS Certificate Program, I thought of something relevant and something close to my heart and passionate about. One topic that I am concerned with is the environment. When I was still living in the Philippines, I joined several volunteering activities focused on environmental preservation and protection, such as tree planting and river clean-ups. Because of that, I became socially aware of the various environmental issues of society. One of the biggest environmental problems that the world is facing is the solid waste generation and disposal. Almost all countries around the world are dealing with the problem of proper and efficient solid waste disposal. In Washington State alone, the population has increased by 24 percent, and its waste generation has increased by 64 percent in 17 years (2000-2017, according to the Washington State of Ecology). This problem was the reason why I have chosen the topic and decided to focus on the Municipal Solid Waste (MSW) disposal in a Landfill. I wanted to understand the process of selecting a suitable MSWLF. I wanted to study and determine if there is a suitable site for Mu-



Marco Bachini at Ipo Dam in the Philippines, where he participated in a tree-planting activity to protect the watershed around the dam.

(Continued on page 15)



Marco's Project Poster. Link to full-size poster: <https://arcg.is/4rv800>

municipal Solid Waste Landfills (MSWLF) in Pierce County, WA using Geographical Information System.

I experienced various dilemmas in completing the project study. There were numerous ways and techniques available from different references and published articles on selecting a suitable site for a landfill using GIS. I have to choose the best possible methodology option to realistically and as much as possible accurately answer the suitable site for an MSWLF using GIS. Likewise, I had a dilemma on the project's scope in order to finish the study in the limited time we had. In the end, I have decided to adopt the Boolean Logic Method or Exclusionary Method and the Fuzzy Logic Method based on Weighted Linear Combination (WLC). I also narrowed the scope of the study and concentrated on the Pierce County area.

I also had to exert more time and effort on research to understand some of the references' terminologies since the topic was entirely new for me. I have no background in Environmental Science or Waste Management, as I graduated as an Electronics Engineer in the Philippines. But the process of gaining new knowledge and discovering new things was something that excites and motivates me.

There were many learnings on my part as I finished the project. I have encountered a lot of challenges and obstacles as I went

through the whole process. There were challenges in the hardware limitations and software capabilities. There were times when my computer crashed down and rebooted on its own. There were also times when the software stopped running, and I had to restart the application to continue. Data sourcing was also a big challenge. The unavailability of the data was an issue. Also, some of the data that I used was confidential, and I had to agree with the confidentiality clause from the data sources. Because of this project, I have learned to overcome and handle these frustrations and disappointments. I have learned to accept that these challenges are natural and part of the learning process to become a better student and person. Also, I realized that sometimes things happen unexpectedly and not according to our plans. I learned to adapt to these changes and deal with them gracefully.

In the end, I was so delighted with the outcome of my project. I am proud to say that my project was a fruit of intense hard work, perseverance, and dedication to learn something and complete the task in a limited time. Also, placing in the competition inspired me to continue learning and improve myself. Next year, I plan to take up a Master in Geospatial Technologies at the University of Washington Tacoma.

5th Place: Conor Flannigan, UW Tacoma

Geospatial Analysis of Racial and Socio-Economic Disparity in 911 Reporting in Pierce County, WA

Abstract: Recent events surrounding the Black Lives Matter movement and instances of police violence in the U.S. have (re-) highlighted the need for critical evaluation of law enforcement and emergency reporting systems. Existing literature predominantly focuses on racial bias in officer interactions. Research gaps exist regarding "upstream" infrastructure such as call-based 911 reporting and dispatch systems. **Methods:** For this study, over 50,000 Computer-Aided Dispatch (CAD) logs were obtained from 21 jurisdictions in Pierce County, WA for December 2020. Data were then filtered, spatialized, and aggregated according to geographic clusters based on indexes of socio-economic disadvantage and race generated from 2019 American Community Survey demographic estimates. CAD event type codes were re-

(Continued on page 17)

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classified into “violent”, “near-violent”, and “presence” categories; the latter representing cases where persons are being called to justify their presence. Results: Summary statistics show violent events reported 3.7 times as often in areas with high POC (non-white) representation compared to those with low representation. Additionally, reports with type codes suggesting an undesired presence (ex: “suspicious person”) are 3.5 times as frequent. Some of these events may reflect instances of “private racial profiling” in which the 911 system is being used to request or require that residents of color justify their presence in a particular space. These patterns reflect racial disparities in the use and impact of the local reporting system. Corresponding impacts are likely amplified by parallel distributions of socio-economic disadvantage. Conclusions: Findings confirm that there are disparities along racial and socio-economic lines in the regional distribution of 911-reported events. Further research should be undertaken to determine the prevalence of explicit racial bias in reporting. Geospatial analyses of 911 event distributions could provide invaluable metrics of local inequity. Additionally, these results may offer supportive evidence to those advocating for police divestment and/or reform.

As a Sustainable Urban Development major, there were a lot of different directions I could have gone with my GIS certificate project. However, throughout the course of my studies at the University of Washington Tacoma, I have been most strongly pulled towards issues and topics related to equity and social justice. Personally, I believe that understanding and applying these two concepts is essential to achieving sustainable outcomes for our collective futures. This perspective comes from looking critically at histories of capitalist extraction and exploitation, of both natural environments and of peoples and social groups. These practices have enabled the precipitous status quo we find ourselves saddled with today. It also comes from listening to the voices of marginalized leaders and organizers who have done amazing work in critical research, activism, and so much more. With the recent efforts of the Black



Conor Flannigan

Lives Matter movement, and a seemingly-more-widespread awareness of police killings, I felt compelled to use this research opportunity to contribute something to the movement.

My initial plans were a bit more ambitious. I wanted to collect audio files from actual 911 calls en masse, then do automated transcription and textual analysis to identify racial bias in the content of the calls. I would then, in theory, be able to spatialize those calls and construct a visual geography of racial bias as reflected by incoming calls to the 911 system. Unfortunately, due to Public Records Act requirements, this would have required a lot of people-hours and thus was infeasible (for now). The wonderful people at South Sound 911 helped me sort through these data collection issues to figure out what I was ultimately able to get. It turns out data collection is not easy! That being said, I learned that there are plenty of people out there who are willing to help if you ask nicely, and show a little bit of persistence. Networking also turned out to be an important asset.

In the end, this project turned out to be the single most satisfying part of my undergraduate experience at the University of Washington Tacoma. Putting all the pieces together was both fun and challenging. I am proud of the results I was able to produce, even as I am saddened by the racial disparities which they highlight. Despite the emotional ambivalence, I recognize that understanding these disparities is crucial work that we all must undertake, so that we may better dismantle systemic racism and create alternative systems which are equitable and sustainable for all. I hope to put the research skills and GIS tools practiced here to good use in the future, either through continued research into policing and 911, or by taking them into the world of public policy and law.

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Learning GIS Through Water Utility Lead Service Line Analysis: City of Wenatchee, WA GIS Internship Project

By: Sydney Iverson, Hannah Schurman, and Alex Leake, University of Washington GIS Certificate Program

The use of lead pipe fittings within water utility networks was common practice in the United States until the early 20th century. Lead pipe fittings are durable and flexible, ideal for the connection point between the main line of a water utility and the service line, especially when the two lines are at different depths. For these reasons lead has been the water utility network piping material of choice for hundreds of years. Unfortunately, today it is well understood that ingesting even small amounts of lead can have detrimental health effects, especially in children.

The Flint Water Crisis was a wake-up call for the country and brought public attention to a water crisis that is likely widespread. The Flint Water Crisis emphasized the importance of understanding where lead pipes and/or fittings exist in a water utility system. When the city of Flint switched water sources from the Detroit water system to the Flint river as a cost saving measure, the increased corrosivity of the river water in conjunction with the presence of lead in existing water pipes resulted in lead leaching into residents' drinking water.

There were many factors that lead to the crisis that is still unfolding in Flint, one of which is the presence of lead materials in water utility systems; to address the presence of lead in pipes and pipe fittings in utility systems the United States Environmental Protection Agency (EPA) recently revised its Lead and Copper Rule. The Revised Lead and Copper Rule mandates that water utilities across the US submit a Lead Service Line Replacement Plan by January 16th, 2024. This plan must include a strategy for determining the material composition of service lines and a procedure and timeline for replacing any lead pipes and fittings. Central to this is a Lead Service Line Inventory, a comprehensive database of potential lead material and its locations within a water utility.

Having just started a certificate in GIS at the University of Washington (UW), my capstone project group and I did not yet understand what a Lead Service Line Inventory encompassed, but we were intrigued when the City of Wenatchee, Washington reached out to our program with an opportunity to help them work towards compliance with the Revised Lead and Copper Rule. With the incredibly helpful support from sponsors from the City of Wenatchee, as well as the support from our instructors at UW, we dove headfirst into converting scans of handwritten utility reports dating from the early 1900's to the present into usable geospatial data. Our objective was to use the data we had collected to create a Lead Service Line Inventory that could be used in a GIS.

With a 6-month timeline for this capstone project, we were limited in the scope of what we could accomplish. We quickly discovered the data conversion was more nuanced than originally anticipated. Making a determination as to whether lead pipe or fittings exist

	KIND	SIZE	LENGTH	COST
Corporation Cock	1/2" Galvanized	5/8"		2 50
Lead Pipe	1 fitting	5/8"	18"	2 50
Pipes	1 Galv	3/4"	13'	1 65
Union				
L				
T				
Cross				
Service Cock	1 Galvanized	3/4"		2 00
Service Box	1 Iron	4"	3'	3 50
Trench				

An example utility report the intern team converted into GIS data

[\(Continued on page 21\)](#)

using the utility reports for a single property could take anywhere from 3 to 20 minutes. Historic data mining is not a glamorous job. We knew that this task could be handed off to people who did not understand the intricacies of a water utility, therefore we created a repeatable workflow for the data conversion that could be used by future teams.

We also wanted to contribute towards the city of Wenatchee’s strategy for prioritizing line replacements. Replacing service lines can be costly for both the water utility network as well as property owners, so we wanted to highlight areas that, based on the data we had seen, had a high likelihood of containing lead parts. To accomplish this we created a confidence scale to label the service lines. The scale was from 1-5 (1 being low confidence in data, 5 being high confidence in data) coupled with YES and NO (likelihood of lead parts within the service line). For example, if we found clear evidence of a lead pipe or fitting in a utility report, and in a later report found very clear evidence that the same pipe had been replaced with another material, that service line would get a designation of “NO” “5”. Once we got to the mapping phase, these designations allowed us to easily visualize locations we believed to have a high likelihood of containing lead. Knowing the impact this work could have on real people, quality control was of the utmost importance. As we learned more throughout this process we would go back to previously analyzed reports to confirm it was consistent.



Lead Analysis map and legend

At the end of the project, we produced reports containing notes and designations for approximately 500 service lines, a workflow document containing a step-by-step process for looking through utility reports, an online map of our findings, and a geoprocessing model for visualizing the analyzed service lines and their designations. Working with the City of Wenatchee on a real GIS project that has a high potential to impact the community was an incredibly rewarding experience. Complex systems, such as water utility networks that span back over a century, can provide unique management challenges. The City of Wenatchee’s response to these challenges in being proactive and engaging individuals from other organizations is commendable, and we wish them the best as they continue with this important work. 

Introducing WAGISA’s New Logo!

By: WAGISA Marketing Committee

Several months ago, a small group of creative people on the WAGISA marketing team got together to draw up and create a logo that will represent the newly formed WAGISA organization. Led by Mattie Wheeler, the team settled on a logo designed to represent the Geospatial professionals of Washington. The concept was to be inclusive as possible and use the familiar Washington state outline with bright, distinctive colors that represented the ocean, lakes/rivers, forests and plains of our geography. A silhouette of the Cascades was added as interest to the horizontal bands and while this does create a funny gold sky effect, the team liked the order of the bands as you see them. Several versions of the state, state plus text and just text were packaged together for board approval. At the August 2021 meeting the board unanimously approved the design. Several weeks later the WAGISA website was redesigned using the color pallet created by the new logo. Check out some of the approved designs below and the new website at WAGISA.org



Addressing Pandemic and Long-term Community Health: A UW PCE Project Team Provides GIS Support to Seattle Parks and Recreation Efforts

The Imperatives of Unforeseen Coincidence and Public Service in GIS Analyses

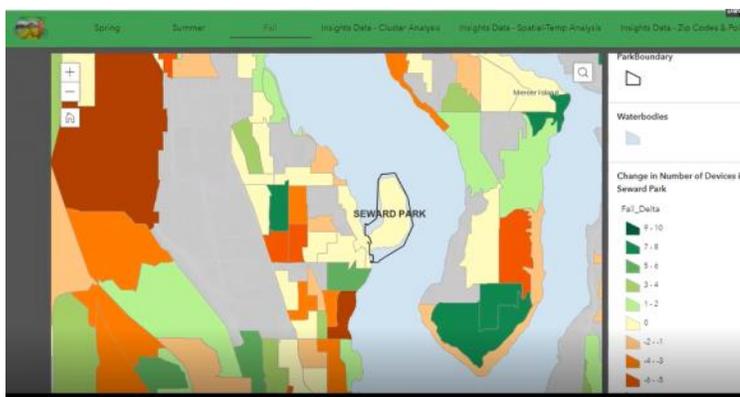
By: Shelley Grant, Addie Schlüssel, Dana Olsen, University of Washington GIS Certificate program

Access to parks and other outdoor recreational spaces have become crucial to sustaining the physical and mental health of urbanites, especially in densely-populated cities. Given a decade of skyrocketing Metropolitan Seattle area growth, estimated at nearly four times the US average, the need for access to parks is perhaps more critical than ever. The COVID-19 pandemic exacerbated this demand, with the closure of most indoor exercise and leisure spaces although we learned that recreation was not without risk. In the early days of the pandemic, we knew far less about the risk of COVID-19 transmission in open air spaces. As a result, parks departments allied with public health officials to balance residents' need for outdoor recreation with the safety of park staff and visitors. Run-off pandemic effects including budgetary cuts meant staffing shortages and reduced groundskeeping, which only increased the need for reliable information on parks usage patterns for the allocation of limited resources.

Our team of four post-graduate students, enrolled in the University of Washington's Professional and Continuing Education (PCE) GIS Certificate program (Grant, Cone, Olsen and Schlüssel), combined diverse professional experience and a personal curiosity in parks. We sought to tackle the challenge of contributing to timely global analyses on the impact of the novel coronavirus on our daily

lives. Backed by a senior team of Esri's Olympia office engineers and supported by Seattle Parks and Recreation (SPR) managers, we completed a comprehensive half-year project between January and June 2021.

We started by acquiring monthly, aggregated mobile device data from US and Canada third-party data provider [SafeGraph](#) to study evidence of visitation patterns at Seattle's Seward Park between 2018 and 2020. Our primary three maps plotted SafeGraph's census block group data, which shows the number of devices from each census block group visiting a given point of interest over the course of a month. By comparing 2020's seasonal visitation (post-pandemic) to an average of 2018 and 2019 visitation (pre-pandemic), we compared the levels of Seward Park visitors from specific census block



Map of single season estimate of pandemic-related change in pilot park (Seward Park) usage for devices originating in nearby census block groups

groups. We also displayed visitation trends based on time of day, day of week, driving distance from Seward Park, and local COVID-19 case numbers.

Applying agile work practices, we elected to complement static maps on change with dynamic supplementary maps, charts, and graphs using ArcGIS Insights Workbench and a signature symbology across our Experience Builder platform. Both platforms lend themselves to eye-catching data presentations that are easily understood and navigated by people with a range of GIS experience. Accessibility and accuracy were important to us, as we sought to make products useful for our decision-making audience of Seattle Parks and Recreation managers.

Making the Hard Task of Simple and Clear Mapping Even Harder

In reflection, an equally valuable project legacy was the underlying decisions and responsiveness we developed to address a once-in-a-century mix of public health, municipal service and scientific imperatives. As GIS professionals know well, ample behind-the-scenes effort is needed to produce clear and compelling visualizations of complex spatial information. To succeed with succinctness, the

(Continued on page 27)

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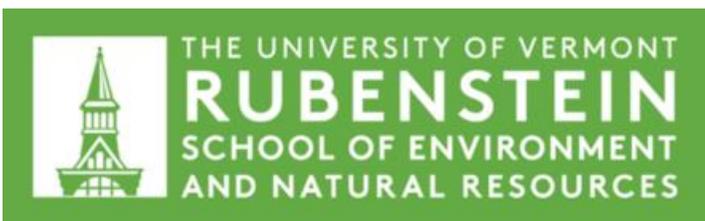
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We invite you to read more about [UVM's GIS and Data Communication Professional Certificate](#), and explore academics, research, and resources in [Geospatial Technologies at UVM](#).



Washington GIS Association Special Interest Group Updates Washington Local Government GIS Leaders (WGGL)

Are you in GIS leadership for a Washington city, county, or tribe? If so, the Washington Local Government GIS Leader (WGGL) special interest group is for you! The WGGL group was formed to provide a forum specifically for GIS leaders in local government. Membership of WGGL is comprised of GIS Supervisors (Managers, Coordinators, Directors, and Department Heads) working at City, County and Tribal organizations in Washington State. The WGGL group promotes: open collaboration to help solve uniquely government problems, active participation, sharing insights and resources, growing leadership skills, and improving overall communication among GIS leaders across the State of Washington. Recently, the WGGL group Leaders gathered virtually on July 29th at noon to listen to Greg Babin-ski from King County GIS Center talk about Equity and Social Justice in GIS. Greg's talk covered historic and current inequalities and our role as GIS leaders to help fight and stand up for equity and social justice in our every day mapping. For more information on the topic check out [King County's GIS for Equity and Social Justice](#) workshop. The WGGL group will continue to offer a series of focused virtual sessions designed to inspire GIS leaders as well as give time for discussion. These sessions will happen on a quarterly basis and are exclusive for WGGL members in order to promote small group discussion and networking. To learn more about the group and its upcoming meetings, visit the [WGGL page](#) and email wggl@waurisa.org to gain access to the WGGL resources and events.

Remotely Piloted Aircraft System (RPAS) Special Interest Group

Drone usage and program development are a significant area of growth for geospatial professionals. The Remotely Piloted Aircraft System (RPAS) special interest group's purpose is to increase and share technical knowledge for participating members, to create and understand strong workflow integration with RPAS data and to leverage geospatial analysis to solve problems. Meetings are held every third Thursday of the month via Zoom, and all are welcome. To learn more about RPAS and upcoming meetings, visit the [RPAS page](#) or email petter.keum@kingcounty.gov.

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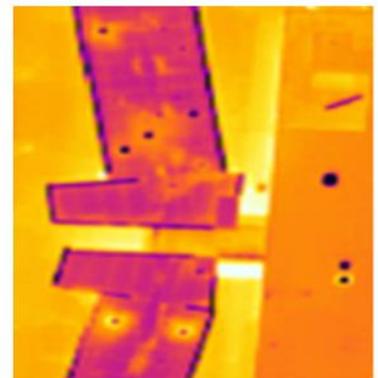
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tough decisions to prioritize content result in even tougher decisions to validate and support those aims. Luckily, good alignment among team members for the targets of utility, accuracy and aesthetics made decisions to focus on a reproducible and archivable “snapshot” of pandemic-related change relatively easy. Still, mid-pandemic circumstances such as remote-only collaboration, very limited work-time and multiple disease unknowns complicated team decision making.

Opting to centralize displays of pandemic-related change also forced us to critically think through the meaning of our foundational geoprocessing steps. We had the sub-optimal situation of estimating usage using “novel” datasets and nearly obsolete census block group level counts. Compromise was instrumental in achieving conceptual summarization through strategic park-specific seasonal and volume aggregations. We followed up this decision with steps to ensure reproducibility in study extensions using minimal systems capacities, including attentive documentation for online and desktop GIS versions.

Balancing Opportunity with Responsibility

Our early decision to prioritize summary plots of pandemic-related change also left many unanswered questions on the details of suggested pandemic-related change. We had yet to take advantage of our high volume datasets but realized our responsibilities both to develop actionable results for SPR as well as to make a valid scientific contribution to pandemic research. We heeded cautions on data use published by the data provider in supplementary analytics and kept in mind the justifications needed to support park usage research outside of heightened disease transmission periods.



Cluster analysis (k-means test) results displaying the similarity in estimated CBG level change in pilot park (Seward Park) usage (in std. dev.) for King County

We responded by creating an array of tailored sub-projects. To address SPR needs, we added spatio-temporal analyses of usage times, estimates on policy efficacy correlating to case load, and indications of SPR service reach to neighbouring King Co. communities. For scientific needs, we included confirmatory cluster analyses on the seasonal changes featured in central maps. These valuable steps showed us the inappropriateness of uncritical applying several big-data methodologies in this small-area study on leisure activity patterns. Tailoring and targeting our analyses was essential not only for responding to SPR’s needs but also for fulfilling our ethical responsibility to respect our public health and administrative priorities.

What We Took, and What We Leave

Sometimes it is just a single question that sparks something prodigious. This all started with, “What is the estimated pandemic-related change in urban park usage?” Through each of our unique backgrounds and talking with Seattle Parks and Recreation, we figured out there were far more questions to answer from just that one: what is peak park activity? Is there a pattern to usage? How far out do people travel to the park? Are there businesses nearby that may affect who is truly using the park, rather than just passing through?

It was the start of our learning, of pinning down what our focus should be in the short time we had, and with, at the time, unknown data. There were hopes, but there were also some let downs and scratching of heads when we finally got it. However, we all pushed forward and looked for another avenue to either find the answer we needed or figured it was not as important as we initially thought.

What is left behind of this project are maps, raw data sheets and documentation of our processes for Seattle Parks and Recreation. But that doesn’t mean we stop here. We hope to further our analyses within the local metropolitan area and beyond the pilot study locale. We developed data acquisition, geodatabase design and analytics processes that are widely applicable for supporting the GIS information needs of parks authorities at national and global scales. We invite you to visit our website at <https://parkusage.weebly.com/>.

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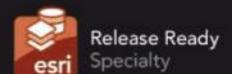
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Ascent GIS, Inc. is a professional GIS firm located in Spokane Washington specializing in GIS consulting, remote sensing, geospatial data acquisition and management, and implementing mappings systems at any level. For over 20 years Ascent GIS has provided professional GIS services to Federal, State and Local Government, Utility, Mining, Universities, Forestry, and Agriculture Organizations. Ascent GIS's technical staff is made up of Senior GIS analysts, Geophysicist, (PhD) and Remote Sensing Specialist. The Ascent GIS staff is dedicated to customer satisfaction.



Blue Marble Geographics is a GIS and geodetic software company that provides cutting-edge yet accessible products designed for both novice and experienced geospatial professionals. For nearly three decades, the company's products have been used and trusted by organizations around the globe. Blue Marble's expertise spans a broad spectrum of the geospatial technology sector with a particular focus on coordinate conversion, lidar and photogrammetric point cloud processing, geospatial software development, and user-driven product development. Our products include Geographic Calculator®, the industry standard for precise spatial data conversion and advanced coordinate system management; Global Mapper®, an all-in-one GIS application with a comprehensive array of data processing and analysis tools; and the Global Mapper Lidar Module®, a suite of powerful tools for editing and processing lidar and photogrammetric point clouds from drone-captured images.



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GeoComm, provider of Public Safety Location Intelligence®, has a national reputation as a leading provider of public safety GIS systems. These systems route emergency calls to the appropriate 9-1-1 call center, map the caller's location on a call taker or dispatcher map, and guide emergency responders to the scene of the accident on mobile displays within police, fire, and ambulance vehicles. Over the last 25 years, GeoComm has grown to serve local, regional, statewide, and military agencies in forty-nine states, helping keep more than 100 million people safe. In addition, in 2020 our statewide NG9-1-1 GIS project footprint has expanded to include fifteen statewide projects across the country. To learn more about GeoComm and our Public Safety Location Intelligence offerings visit www.geo-comm.com.

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Geocortex Since 1999, Geocortex products and services have addressed common GIS application development challenges. Geocortex offers pragmatic solutions to improve developer productivity, help solve complex business problems, and enable a better user experience when deploying Esri web GIS technology. The most popular capabilities of Geocortex can be used in Web AppBuilder, allowing you to accomplish even more.



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!



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The School of Urban Studies 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>



University of Vermont Continuing and Distance Education UVM's fully online program covers Geographical Information Systems (GIS), remote sensing, geospatial computation and data communication, and is focused on developing critical thinking and applied problem-solving skills including developing conceptual knowledge, technical skills, and applied uses of geospatial analysis. Learn more at: <https://learn.uvm.edu/program/geographic-information-systems-data-communication-professional-certificate/>



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: <https://mailman12.u.washington.edu/mailman/listinfo/cps-gis>

Central Washington GIS User Group

Meets the 2nd Wednesday of each month.

Contact the group: swgis.usersgroup@gmail.com or group organizer Amanda Taub: ataub.gis@gmail.com

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

<https://snoco-gis.maps.arcgis.com/apps/Shortlist/index.html?appid=d9ee08e6b1c648db8cd077fc8bb5f27c>

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>

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Washington Hazus Users Group

<http://www.usehazus.com/wahug>

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