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## NSEA - GIS Intern

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*Western Washington University*

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# COLLEGE OF THE ENVIRONMENT



**Internship Title:** GIS Intern

**Organization Worked For:** NSEA

**Student Name:** Maximilian Yost

**Internship Dates:** 3/28/23 6/9/23

**Faculty Advisor Name:** Leo Bodensteiner

**Department:** ESCI

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**STUDENT SIGNATURE** Maximilian Yost

**DATE:** 5/24/23

James van der Voort  
Nooksack Salmon Enhancement Association (NSEA)  
3057 E. Bakerview Rd.  
Bellingham, WA 98226  
05/29/2023

Leo Bodensteiner  
Professor  
WWU – College of the Environment  
516 High Street  
Bellingham, WA 98225

Dear Leo Bodensteiner:

Nooksack Salmon Enhancement Association (NSEA) hosted Max Yost in a GIS internship role. He created and edited multiple maps for us using GIS software, has performed site maintenance tasks, and aided in restoration monitoring activities.

He created and edited multiple maps for us using GIS software, has performed site maintenance tasks, and aided in restoration monitoring activities. is an intelligent and motivated individual. He created and edited multiple maps for us using GIS software, has performed site maintenance tasks, and aided in restoration monitoring activities.

Max did a great job navigating the duties of this position. At NSEA we did not have a well laid out GIS program and are just starting to utilize the software as a tool. NSEA had many ideas from different departments with different goals, Max was able to meet with department leads across the organization and create maps for each of them. My position requires me to be in the field 80% of my time, as Max's direct supervisor we had very little time to meet and discuss project work. He was able to take instruction from our short meetings and successfully work through projects. His independence and ability to self-direct allowed him to efficiently navigate the projects with minimal supervision. His ability to communicate clearly with me and other department leads proved invaluable to the demands of this internship position.

If you would like additional information about Max and his internship at NSEA, you can telephone me at (425) 367-1097.

Sincerely,  
James van der Voort

For my College of the Environment Senior Internship, I interned for the non-profit Nooksack Salmon Enhancement Association as a GIS intern. NSEA's main mission is restoring sustainable wild salmon runs in Whatcom County. NSEA's main focuses are restoration and stewardship as well as education.

I first learned of NSEA last summer, getting a seasonal job as a WCC field crew member. The crew I worked with is based at NSEA, sharing a warehouse with them and working hand in hand in collaboration on various NSEA projects. Coming back for my internship, I got to work under Eli DeWitt, NSEA's project coordinator, and James van der Voort, my old WCC crew supervisor who is switching over to an official NSEA project coordinator position. Most of my work included updating, editing, and creating GIS feature layers and maps used by the NSEA restoration crews, and creating maps and story maps that could be viewed and easily digested by the public. With my role, I got to work on projects with both the educational and the field side of NSEA.

Their organization is extremely driven to the community of Whatcom County. NSEA works alongside the Coastal Salish Peoples, host community work parties giving people the opportunity to participate in restoration and see their positive impact on local riparian ecosystems and run summer camps for kids on the importance of salmon in our watersheds. Publicly accessible maps as well as story maps are important for the public to see NSEA's progress over the years, and to gain insight in how streams should be restored and maintained.

My main work revolved around a 2023 riparian project list, a conifer test species feature layer, and research in other GIS applications – most notably Field Maps. NSEA has a lot of data stored through spreadsheets and old records. Through ArcGIS Pro and Online, I moved over all projects with complete site addresses into a point feature class so the organization could view all their current sites on a shareable Web Map. This not only serves the project coordinators, but field members too, who can now see from their phones where sites are in information pertaining to them such as a description of project details, the landowner and contact information, and when the site was last planted/maintained. The map was also made into a layout, with a legend,

informational paragraph, and title which will be available to the public shortly so they can also see the range of NSEA sites across the county.

I also created a conifer test species feature layer. NSEA has been planting conifer species since 2019 to see how well they hold and adapt to riparian environments. A basic layer was already created on ArcGIS Online. I took it a step further by organizing the point colors by species and creating a legend, as well as changing how the height field is used. Previously, whenever tree height was measured (usually 2-3 times a year since the planting), the old height would be overwritten by the new height, so you couldn't view the height progression. Height records were stored on paper documents, so I converted these into excel spreadsheets and then fields for the corresponding measuring dates in GIS so now clicking a point on the ArcGIS Online maps shows the height progress of the tree instead of the latest entry. A story map was also created covering the project details, showing sites through maps and planting pictures, to be used by NSEA as well as viewed by the public in another example of the work that they provide.

My other main task was learning about ArcGIS Field Maps. Field Maps is a desktop and smartphone application, that allows you to view your maps on your phone and update them in real time whether online or offline. This feature has a bit of a learning curve depending on what you want to accomplish with the app in the field. So, I created a document with instructions on how to complete various things that seemed to be what the field crew would most commonly be utilizing it for. I also went out in the field and tested the app out, making changes to points and creating new planting polygons through the GPS feature in the app and then syncing that with the original maps on ArcGIS Online.

Field Maps is looking like the future for the NSEA crew, as it allows them to update and change layers out in the field, ditching the need for the current method which is paper recording and then data entry once they get back to the office. During my time at WCC, printed out parcel layers with directions and illustrations were quite common on days when our supervisor wasn't there. With the integration of field maps, crew members can now pull out their phones and view the project site maps and details without needing much clarification. Since the maps can update

automatically, it also allows the project coordinators to see at the office in real time what changes are being made to the maps, and how progression is going.

Through my years as an Environmental Science major and GIS minor, I didn't really know what my work would look like after school, or if I would know how to apply what I'd learned to an acceptable degree. This internship has taught me valuable information on how ArcGIS Online and Field Maps work, two GIS applications that weren't covered extensively like ArcGIS Pro over the course of my minor. I've also gotten a better understanding of how GIS is used in conjunction with restoration work, and how it is often paramount for data modeling and management, as well as aiding the field work side.

It has taught me how important data management is, and how important it is to fully utilize your data, even if it means taking a longer road to get to the finished product. It has strengthened my understanding of the ArcGIS library, how many individual components of environmental stewardship come together, and how to explain tasks to people who may have little to no experience in that field in a way that doesn't seem overwhelming or confusing. Since most of the data types I worked with included simple polygons, points, or lines, it was a little disappointing that I could not fully test my GIS capabilities. I think a great way to do this could be by making an interactive map explaining how restoration helps salmon populations and streams overall, this could include buffers of riparian zones changing based on factors like planting points and invasive species removal, and even show impacts of events like floods which did happen a couple years ago. It could be a really interesting map that the public could play around with and learn how different things affect the ecology of streams.

For ESCI or ENVIS majors with a GIS emphasis, this position would be great to learn how those two different interests intersect and complement each other, and how they would be used in an office/field setting. It would also be good for those looking to expand their experience in different GIS Apps, and how they integrate with each other.