

Austin Watershed Protection Department Summer Internship

This summer I had the opportunity to work with the Watershed Protection Department for the City of Austin. Originally when I contacted the Watershed Protection Department they were not accepting summer interns due to a lack of funding for such positions, but thankfully I was able to apply for funding through Sewanee and receive a position helping the Department out in their Stormwater Monitoring team. The City of Austin Watershed Protection Department's mission statement is to protect lives, property, and the environment of the community by reducing the impact of flooding, erosion and water pollution. They seek to maintain and improve water quality by constructing water quality controls which reduce stormwater pollutants and by conducting business inspections and spill responses. To reduce and prevent flood impacts to life and property, they look to provide 10% of threatened structures with increased flood protection through drainage system improvements, maintain or improve Community Rating System/National Flood Insurance Program rating, and provide adequate maintenance of drainage infrastructure in addition to many other possibilities. They do an extensive amount of water quality testing throughout the large water system that runs through and is stored and used in the Austin area in the various lakes, creeks and underground aquifers. Among many other things, they also do biological surveys that gauge the quality of life for the ecosystems and organisms that rely on good water quality to survive.

While I was exposed and worked with many different sub-departments of the Watershed Protection Department I worked regularly and most closely with the Stormwater Monitoring Team. For the first couple days I worked in the office making various GIS context maps for projects and presentations which give a better visual representation for the data and areas of interest that my coworkers were writing or presenting reports on. The responsibilities for the

Stormwater Monitoring Team are generally to maintain sampling stations and to run samples taken from storm events at water sampling/monitoring stations located throughout the city. These samples are integral for keeping a historical record of water quality and most importantly to keep an eye on runoff contaminants that get drained into creeks from impermeable surfaces such as parking lots, buildings, and streets, and can give evidence of a pollution leak in the area. Unfortunately for the city of Austin, the 10 months from October 2010 through July 2011 have been the driest for that 10-month period in Texas since 1895, when the state began keeping rainfall records. This means that the Stormwater Monitoring Team couldn't do their normal duties of sampling because there was no water to sample. Consequently, besides the regular maintenance on the many stations that are located all across the Austin area, the team and I worked on other projects that the city needed help with. The maintenance/monitoring that we ran on the sites was to make sure that the gauges, phones, etc. were all running and online, and checked the rain gauge funnel for blockage/waste and all of the lines for leaks. Also due to the lack of rain we ran de-ionized water through the pump lines to clean them out so that when the next sample was taken it would be a legitimate representation of water quality. I also worked on a site installation for a few days where we dug a trench for a bubbler line and a pump line to run from the monitoring station which houses the sample containers, pumps, and cell phones to transmit the data to the office. After the station was set up and the lines were in place and buried, we drilled holes in the creekbed and attached clamps to secure the sampling intakes into the creekbed. For a majority of the days we worked in the field we were working on a project to map all of the BMP's and retention/detention ponds in the city (theres over 7,000). With GPS and a camera we photographed and documented the attributes/dimensions of the multiple input pipes/creeks that drained into the area along with the output pipes and their dimensions. Generally this task involved blindly bushwhacking in 100+ degree heat through overgrown areas where nobody had been since their construction, while trying to get a reading on the GPS so we could relay the information so the trip amounted to something. While this seemed like a

relatively unimportant project to me at first, considering that doing 3-4 sites a day, it will take a few years to complete the project, I came to realize that it is data collection like this that provides structure for future projects and further cements the information that the city has documented and available for use to whoever might use or benefit from them.

Without a doubt the most interesting project I helped out with was the S.W.A.T. (Soil Water Assessment Tool) programs I ran/helped out with. SWAT is a computer program and an add-on that runs through ArcGIS which was developed to quantify the impact of land management practices in large, complex watersheds. While the program is generally used for agricultural purposes, Roger Glick who was my internship advisor was able to reapply the program to assess urban stormwater. Austin is currently the first and only city or program to implement the program in such a way. Essentially the program allows the user to predict the residual effects that changes of land use in a given watershed will have on the surrounding creeks in respect to erosion, stormflow, stormwater runoff and the effects of land use changes on biohydrology. This was the most interesting to me because it gave me exposure to how current technology can be applied in ways that were not originally intended in the initial design and that nobody else in the world is currently using.

I had a very beneficial and motivating experience working for the Watershed Protection Department and would recommend it to anyone who is interested if they offer it in the future. It offered hands on experience that was on the same level to what I had experienced in my Natural Resource classes at Sewanee but in a different subject matter and setting. It furthered my knowledge of practical hydrology and the practices that are being used in the field along with practices that are still in their developmental stages as far as recognition. Also it gave me a very positive educational motivation as far as being able to see what kind of positive work and impact people can have on their community and environment once they leave school.