WATERSHED MANAGEMENT INTERNSHIP REPORT

Homesteading the Expansion of the Western United States. Bureau of Reclamation Managing water in the West

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Acknowledgements

During this Internship I was extremely blessed to be part of the Southern California Area Office Bureau of Reclamation team. Everyone in this office and in the Yuma Arizona Area Office were extremely supportive and helpful. To begin I would like to give a special thank you to Jack Simes and Bill Steele and Julie Lapin. Thanks to them I was accepted to do my internship at the Bureau of Reclamation. Jack Simes in Particular was the one in charge of me during my whole internship. He made it his soul purpose to expose me to the water industry and to the world of the Bureau of Reclamation. Jack Simes helped me go on various important meetings, trips, and helped me network with many important people. Jack Simes has been a blessing in my life. I would like to thank Mr. Steele for educating me with the big scope on the Bureau of Reclamation. I would like to thank Doug McPherson for always having his office open and teaching me all he could in a works day. He taught me a lot and showed me important things I need to keep in mind during my career. I want to thank Nicole Barnhart for her outstanding service on keeping me informed and making sure all my paper work was finished. I would also like to thank Amy Witherall the Water Resource Planner, Art Buchanon the Office Automation assistant, Leslie Cleveland the Water Resource Manager, and Dennies Wolfe the Area Engineer, who all also always had their office open for me when I needed help. Last I would like to thank Ed Virden and Hong at the Yuma Area office for making my 2 week internship in Arizona possible and a huge success. I thank the Southern California Area Office and the Yuma Area office for their outstanding help and support and I promise them that I will work hard to hopefully work alongside them or in another sector in the water industry in the Future. Thank you!
Executive summary

During my internship that took me 8 month to complete I was fortunate enough to work with an important agency such as the Bureau of Reclamation. At the Bureau of Reclamation I was an intern and I was there to shadow them and help them out with any work I could. The Bureau of reclamation has a primary focus on making sure that they complete their water delivery on time, make sure their buyers get their water, and make sure that their water Programs are running well by holding meeting to talk about the progress on them. The Bureau focuses on finding new ways to save, use, and reduce water. As a shadow Intern I was able to take a look into Reclamation programs such as the Basin study, Pulse Flow Min 319, Title VXI and a few other water programs the Bureau if running. As an Intern I was able to help develop Executive summarize, help them organize their documents to make sure records are kept up with. As a shadow intern I was also able to present myself at important Event meetings such as the OC water summit that gave an update on the water situation in the Southern California. During the last portion of my internship I was able to go to Yuma Arizona to do a 2 week detail. In Yuma I was able to run a Dredge, do reading on water wells, take readings of water pumps, work in the water testing laboratory, and look at many dams, canals, and water reservoirs around the Yuma county. Coming into this internship I did not have the slightest idea on the efforts and work organizations like the Bureau of Reclamation do to save, use and reuse water. It really captivated my attention to consider making a career change. Thanks to this internship my career plans have changed and I am very enthusiastic to follow a career in the water industry.
Project Objective

During my internship I will be working as a shadow intern for the Bureau of Reclamation. The Bureau of Reclamation is a very important agency since they are the largest wholesaler of water in the country. The Bureau brings water to more than 31 million people and provided one out of five western farmers with water to irrigate 10 million acres of farm land. The USDA focuses on farming, agriculture, forestry and food; well thanks to the Bureau of Reclamation the farm land that they provide water to produces 60% of the nation’s Vegetables and 25% of its fruits and nuts. During this internship my primary focus was on networking since I still have one year left to graduate with a bachelors in Biology. Not knowing nothing about the Bureau of reclamation and about the USDA I was eager to learn what these organizations did. I made it my goal to observe everything around me and work to understand what they are doing in these organizations. I also paid close attention to people’s job that I encountered with to see and understand the overall scope of what the goal of these organizations is. Before the internship started I wanted to make sure to stay open to all opportunities and job I could learn more about to see if I would be interested in following that career. Once I found a few careers that interested me I wanted to make it my goal to learn as much as I could about it. During the internship I grew especially fond of being an Environmental Protection Specialist, or a hydrology technician. Since I was very interested in Hydrology, my plans changed during the last portion of my internship. I decided to go to the Yuma Area office were they had a hydrology and engineers team working. There I shadowed what they do and made sure to network and keep up with them so when I graduate I can apply for any open positions. As for an Environmental Specialist, I spent a lot of time in Doug McPherson’s office so I can listen on what jobs and things he does as an Environmental Specialist. I meet many important people and received some positive feedback to possible employment at the Yuma Area office. Adding on to that I now have a clear understanding on what the Bureau of Reclamation does and what the USDA focuses on to. I now feel confident to explore other options on my own pertaining to this field since I have networked with a good number of people and have proficient experience to start and succeed in this business. I feel like I reached my project objective and feel lucky to have been given this opportunity.
Internship Overview

During my Watershed Management Internship I was fortunate enough to work with a great organization such as the Bureau of Reclamation Southern California Area Office (SACO). The Bureau of Reclamation is a water management agency with programs and initiatives that help manage water in the Western states. The Bureau of Reclamation also works alongside other water agencies to give and manage water for Native Americans tribes and other surrounding communities to the people in the west. The Mission of the Bureau of Reclamation is to assist in meeting the increasing water demands of the west while protecting the environment and the public’s investment in structures they build to reach this goal. The Bureau of reclamation has been established since 1902. They are specially recognized for their dams, power plants, and canals that spread around the 17 western states. The Bureau is also the largest wholesaler of water in the country, they also providing water to farm land for agriculture. These water projects and initiatives that the BOR has done has led to the success and expansion of the West we now see today.

Throughout my stay at the office I was introduced to the many programs addressing desalination research, and conjunctive use of ground and surface water resources. Today California is facing a serious drought that is combating against our limited source of water so the Bureau of Reclamation has an important study called the Los Angeles Water Conservation Basin Study. Since the Los Angeles County account for a huge water demand, this Basin Study is a long-term flood control and water conservation study that looks at projected populations and climate conditions in the Los Angeles Basin. This Study will recommend potential changes to the operation of storm water capture systems, modifications to existing facilities, and development of new facilities that could help resolve future flood control and water supply issues. This report on its own sparked my interest in Hydrology. The Bureau is also always looking for other watershed modeling programs to improve both water quantity, water quality, and to find new ways to increase water resources. The Bureau of Reclamation also works alongside state and local water agencies to develop new ways to save and store water. The Bureau is also a major water sales company to a majority of southern California. Along with the basin study to develop new water augmentation strategies the bureau of Reclamation also is involved in water reclamation and reuse projects like Title XVI.

During my intern I was able to shadow the workers at the Southern California Area Office and I was able to shadow people at the Yuma Area office. Jack Simes the Area Planning Officer was my primary mentor during my time at the bureau. Jack Simes is a huge asset to the Bureau of reclamation. During my time at the Bureau Jack took me under his wing and helped me network with many people in the water industry. Jack Simes went above and beyond to help me network and see what is going on at the Bureau of reclamation. When I started going to the Office located in Temecula California I was informed about the programs and activities that were going on in the office. I began working with Jack and Amy Witherall the Water Resource Planner. I began working on the Los Angeles Basin study. This study was interesting and important because it will help give an idea and projection of how much water we have to save so that we can face the state’s water demands and combat this drought. The detail that I got to work on for Amy
and Jack is that I had to write an executive summary on each task that the study had finished. The study has 6 task and we are currently on task 4 and close to 5 with the report projected to be finished in December of 2015. The basin study is an important study because it is really helping us conserve water. I also got to shadow and spend a lot of time with Doug McPherson he is the Environmental Specialist in the office. Doug was great help and knowledge he would help me understand what environmental documents he has to revise and oversee. When the Bureau of Reclamation has a program or plan the Bureau of Reclamation has to make sure that they are not hurting the environment. Also they have to make sure that they are not damaging any historical monuments or land. If a program is not hurting anything they can do what’s called a categorical exclusion. A categorical exclusion is a document that states that they reviewed the plan and that there is nothing being hurt or affected. Dough McPherson has to follow EPA standards when an area or project of work is going to be on a plants or animal ecosystem. Doug has to file an ESA Endangered Species Act if there is a species that may be affected by the construction of a project such as building a dam, running water pipes, or building new facilities. Doug has to also oversee state regulations of California called CEQA California Environment Quality Act, NHPA National Historic Policy Act, or NEPA National Environmental Policy Act. The Bureau of reclamation are great Stuarts of the land because they try to not hurt the environment. During my internship I was also fortunate enough to go to important council and programs meetings with Amy, Doug, Jack, Leslie and Debby. My first meeting that I got to go to was at the municipal water district in LA. At the municipal water district I was able to see how the Bureau and other water agencies and districts work in conjunction. I was able to go to the municipal water district office twice to hear updates and suggestions on programs such as the Los Angeles Basin study and other water conservation programs. These meetings are especially important to make sure everyone is on track and everyone is updated so the work gets done.

One big event that I was able to be a part of was the 7th Annual OC water summit at the Disney land resort hotel. I was lucky enough to take our area managers place and participate in this luxurious event. The OC water district event was a great opportunity for me to network with hundreds of professional in the water industry. This event gathered 500 business professional, elected officials, water industry stake holders, and community leaders. The purpose of the OC water summit each year is to talk about what is going on with the water bonds, how our water reservations of water is doing, and for people in agriculture or water agencies to get heard. This year’s event really concentrated on the water bonds and on the drought going on in California. The discussion was on water supply challenges, policy issues, and other topics that impact our economy and the public health. It was a great event full of incite, public attention, and fun since everyone got to sit back and hear everyone else’s voice and concerns. It was also an event of to promote water conservation strategies and exposure to organization that what to help promote water conservation and knowledge.

During my internship I was extremely lucky to be part of one historical event at the Bureau of Reclamation which was the Minute 319 Pulse flow in Yuma Arizona. The Minute 319 Pulse flow was historical because in symbolize a historical agreement with both countries of Mexico and the United states. The Minute 319 provided water for
environmental flows for the Colorado River Delta and to gain important scientific information on the effectiveness of the flows down the river delta. Water has not been seen flow there for many years. Above it being a pulse flow this pulse flow was immense. The pulse flow had a volume of about 158,088 acre-feet (195 million cubic meters) of water for a 5-year term of the Minute. During my detail there I worked with Jack Simes and Doug Hendrix with Media and Relations. I helped them make sure that the event ran smooth, that people had seats, provide audio sound so the event can be heard, and supplied people with informational documents about the event. During the detail I was able to speak to a few newspaper editors and see how they do their part to help spread this in the media.

When I was at the Yuma office I knew I wanted to come back and do a detail there at the end of my internship and that's what I did. During the last part of my internship I went on a 2 week internship to the Yuma area office. I really wanted to go to Yuma to get introduced into their Hydrology team. I also wanted to go over there to see what other careers and jobs are offered at the Bureau of Reclamation. Since the Yuma area office is a field office and a desalination plant, and the Colorado River flows right down their city there is a lot going on in their office. My two week internship started on the 28 of July were I arrived to meet Hong Nguyen-DeCorse and ED Virden Ed Virden, Chief of YAO's Operations and Maintenance Office two very important people who operate the Operations and maintenance department at the Yuma area office. The first day was used as introduction and lecture day for me to understand the goals of their office. The Yuma office is a major office in the Bureau since they alone manage many dams and canals to transport water to Arizona, California and Mexico. Ed Virden and Hong work with the sales and distribution of the water flowing through the river. A lot of recognition goes to their jobs because if it is not for them, then no one get water their water. I was able to shadow and spend a whole day with Terri Phipps, she helps inspect the infrastructure and read underground water wells for the Bureau.

During the trip Mr. Ed Virden the president and coordinator of their maintenance and operation was kind enough to take me out and actually see the dams, canals and water structures around all off the Yuma Valley County. The field trip took all day were we got to see the imperial dam, Laguna Dam, Imperial Canal, the Great American Cannel, the newly built Brock Reservoir, and many other water structures that Yuma Arizona uses to deliver water to millions of people. While we were at the Historic Laguna Dam we were able to see their Modified 860-SL Ellicott Dragon Dredge from a distance. I was lucky enough to spend the next whole day on this dredge to see how they operate it and shadow the job of a dredger. The purpose of the dredge is to make the lake deeper so that they are able to store more water. The dredge Operates in swinging ladder and conventional mode to grind down the sediment below the lake floor. Jim Morehead and his crew were exceptional workers that showed me a lot about the dredge. I had a great time being on the dredge and helping out and shadowing them, dredging is a very important and hard job that the Bureau of Reclamation.

Next, for two days I was able to work with Fred Crockson who is part of the Hydrology team at the Yuma Area Office. He is also a professor at Arizona Western University. During my two days shadowing Mr. Crockson I learned how to read
underground water well and pumps. It took us two days to do our reading in the Yuma neighboring cities of San Luis and at the lithotroph area next to the board of Mexico and United states. I also learned that some farming land is higher than other land and that poses a problem to reading the wells since now you have higher elevated land. So what they do is that they have a field break well that help them account for this difference. I was able to work a whole day in the laboratory were they test the water as well . During my time in the laboratory I was able to shadow. Ron, Wayne, Dan and Gloria. What they do in the lab is that they go to their warehouse were they have pipes that run most of the water coming in to the plant. They also have a mode and potable water that they manage. With the guys at the lab we got various sample of water and took them back to the lab. In the lab we were sampling the water for heavy metals or hydrocarbon that show us in there are any bad pipes or pollution in the water. The laboratory portion was a bit more familiar than anything else in the field trip since I am a Biology major, I have spent a good amount of time in the laboratory at school. One of the best and most interesting talk I had in Yuma was with Nick Heatwole who is an Environmental Protection Specialist with the environmental team at the Yuma area office. Mr. Heatwole and their team work on protection the river and the structure from being damaged by invasive species. Their Job is to make sure that there is no pollution going into the river and contaminating water. Also they have to really focus on finding and exterminating invasive species. For example there is a very thick leafed plant called Giant Salvinia that was introduced into the river and it is native to Brazil. This invasive thick leaf plant is competing against lots of the other plants flowing into the river and that is bad for the environment. Also there is also a tiny clam that is a big head ache to the Bureau of Reclamation called Quagga and Zebra Muscles. This muscles are bad to pipes and dam since they stick on very tightly to them. This can cause pipes to clog or even ware out. This could cause lots of money in damages to their facilities. Gratefully the environmental specialist team are devising ways to compete against these creature. As a Biologist this type of work excites me and I have a great opportunity to work with environmentalist like them.

During my Yuma Arizona trip I was exposed to many other careers in the water industry. Gratefully I was able to network with many of the people out their and am staying in touch with them to for the future when I graduate. Thanks to this internship I am Positive that I am also going to be part of the water industry.
Conclusion

Back in January I was very unsecure about my future since I was entering my last year in school and I still did not know what I really wanted to do. When I got accepted to the internship I saw a light of hope and opportunity I knew I had to take advantage off. Now that the internship is over I feel like my life turned around for the good. I feel confident now of what I need to do and want to do for my future. Thanks to this Internship, Jack, and Julie I feel blessed and confident that I know I have the potential to form part of great organizations like the Bureau of Reclamation. Thanks to all the experience, knowledge, and networking I gained in this internship I can now go back and finish my last stretch of school calm, knowing when I graduate I have many opportunities out there to strive for. Thanks to this internship I grew a passion for this work and I know I will stay in the water industry. Internship like these that help unrepresented students are key programs that help students with potential like me find a way and a will.
Appendix

Me standing on top of Imperial dam. They were letting a 30 min pulse flow.
Modified 860-SL Ellicott Dragon Dredge

This is located on the Dredge operator. The red shading shows the area needed to be dredged and the yellow shows what has been dredged.
He we are testing water out of the mode to see any traces of carbon or anion. This will tell us if there is any pollution or metals in our water.

This is where the water runs through the pipes and get cleaned at the Yuma area office water plant.
This is the desalination plant at The Yuma Area Office.

This is the Imperial Dam Located in Yuma Arizona.
These numbers represent the Kilowatts per hour and readings on the Underground water pumps located throughout Yuma Arizona.