Responsibilities and Roles

As the high school intern within Dr. Zheng's research team, I was tasked with gathering useful information, communicating, and organizing data concerning the Main San Gabriel Basin. This included basin management, safe yield, percent groundwater use, and the water-bearing hydrogeology of the basin. I communicated the information gathered through meetings with Dr. Zheng where I presented my findings through presentations. As for organizing data, to properly showcase information about hydrogeology, I relied on visual diagrams to show data of basin depths and geological layers.

Methods

In order to gather official and useful information, I used San Gabriel's Watermaster website containing documents of future plans, safe yield data, and history of the purpose of the Watermaster. This official website contains accurate and well documented data of management and water use of the basin.

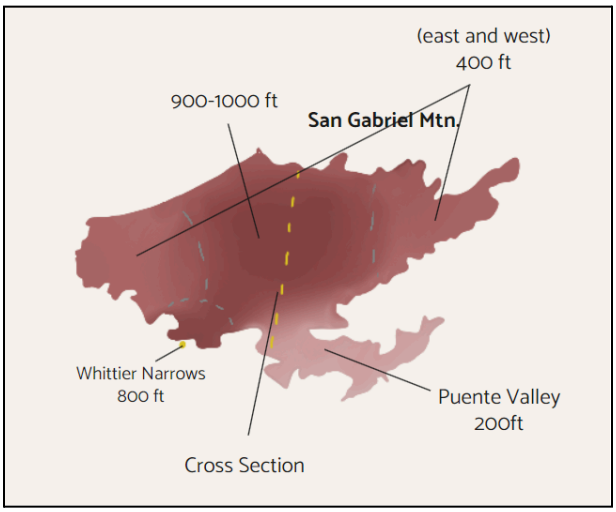
To create the diagrams, I relied on descriptions of the basin from the research (State of California The Resources Agency Department of Water Resources, 1966) as well as a painting program to handmake a depth-plot, and a cross-section diagram. This official document dates back to 1966 where an initial study on the basin had been conducted, however, I pulled data from the hydrogeology sections so the data is more reliable regardless of the date of the document's publication.

Results

The first characteristic of the basin I delved into was the purpose and types of management of the San Gabriel Basin. The Main San Gabriel Watermaster website contains their publicly available management documents that detail several different plans mostly focusing on water-conservation and water-quality. This is explained through the San Gabriel Valley's unpredictable and variable climate, causing water-reliability to become a concern especially concerning their growing population and how 90% of the water supply comes from groundwater. The main methods to make up the shortage of water rely on RDA (Resource Development Assessment) funded water importation projects, however, rising costs are slowly worsening the effectiveness of this method. While other plans such as cyclic storage, reverse cyclic storage, and a low safe yield of 150k acres/foot have been created to mitigate these problems, there is still struggle in properly managing the basin (*Main San Gabriel Basin Watermaster*, n.d.).

Another component to properly understanding the San Gabriel Basin is the hydrogeology to which the floor of the basin is made of. Especially with InSAR data, physical structure is important to understanding data. According to the research (State of California The Resources Agency Department of Water Resources 1966), I was able to create a depth plot, and a cross section of the San Gabriel Valley.

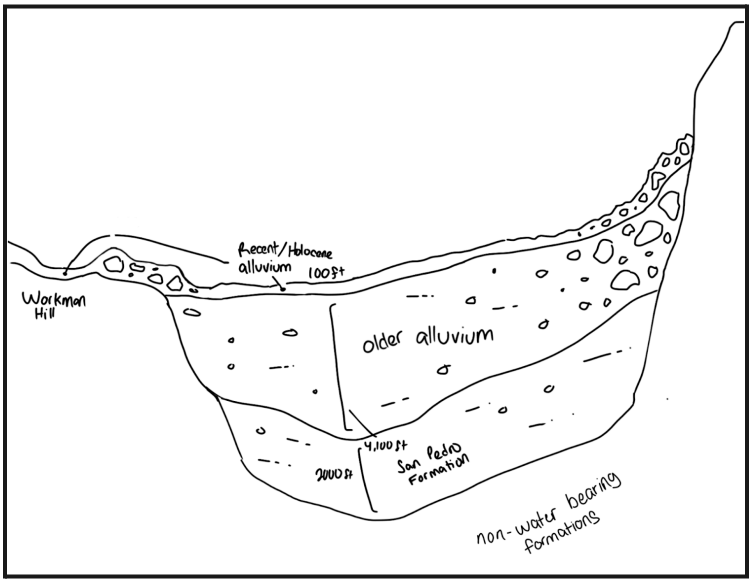
Depth Plot



San Gabriel Valley Depth Plot created by Shreya Narayan modeled after the research (State of California The Resources Agency Department of Water Resources, 1966) and (MHW, 6 C.E.).

The description in the research (State of California The Resources Agency Department of Water Resources, 1966) pointed out significant landmarks to describe the varying depth such as the Whittier Narrows and the San Gabriel Mtn. The gray dotted line marks a general separation of central San Gabriel Valley from the west, and east sections which were pointed out to be significantly shallower in depth. The yellow dotted line represents the area of which the cross section was based off of.

Cross Section



San Gabriel Valley cross section created by Shreya Narayan modeled after (State of California The Resources Agency Department of Water Resources, 1966)

The labeled layers included in this cross section make up the water-bearing formations only. These include recent alluvium, older alluvium, and the San Pedro Formation. Alluvium is a mixture of sand, silt, and clay, specifically dropped by a river or body of water. The San Pedro Formation and older alluvium layers specifically formed during the pleistocene era. The main water-bearing qualities of these layers come from their larger general particle sizes, making the space in between the particles able to store more groundwater. Generally, larger particle sizes are found closer to the San Gabriel mountains, shown in the plot by the larger particle masses towards the left side, as well as in the majority of the recent alluvium layer.

Skills Gained

Throughout this project I was able to develop and hone skills in efficiency and prioritization. In order to collect only the most needed and relevant information, I had to keep the purpose of the project in mind and prioritize only the related information to present to Dr. Zheng. I was also able to hone my skill to interpret and analyze texts so I could properly represent it as a diagram.

Conclusion

In conclusion, this project allowed me to delve deeper in a subject I was less familiar with and to gain useful skills I will use in the future. By learning the processes of research projects as well as more specific information about geodesy, I was also able to discover more of my interest within environmental science and to promote my future research into similar topics with similar skill requirements. As for the project itself, the information I collected and the plots I created will be useful in cross checking data collected using InSAR and to ultimately create the most successful method of InSAR use.

Works Cited

State of California The Resources Agency Department of Water Resources. (1966). Planned Utilization of Ground Water Basins (pp. 26–37).

MHW. (6 C.E.). *San Gabriel River Master Plan* (p. 247). https://pw.lacounty.gov/wmd/watershed/sg/mp/docs/sgrmp_eir.pdf

Main San Gabriel Basin Watermaster. (n.d.). Watermaster. https://www.watermaster.org/