CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0921

Project Title

Impact of Rainfall on the Salinity and Water Level of Groundwater Wells

Abstract

Objectives

The objective of this study is to determine if rainfall has an impact on the salinity and water level of five groundwater wells located in a wetland restoration area in Goleta, CA. My data will help determine what species of native plants can be reintroduced in the restoration site.

Methods

I tested the salinity and water level of five groundwater wells. The salinity was measured in parts per thousand (ppt) using a sample of groundwater collected in a test tube and a handheld refractometer. The water level was measured using a commercial measuring tape and a wet erase vis-a-vis marker.

Results

Having tested the five groundwater wells 24 times each between July 2018 and March 2019, my data indicates that rainfall does not have a long term impact on the salinity of the groundwater wells. Specifically, rainfall has no impact on wells with a salinity <15 ppt and it only temporarily decreases the salinity of wells with a salinity >15 ppt. Regarding water level, four out of the five groundwater wells I tested show that rainfall increases their water level.

Conclusions

My conclusion is that rainfall does not have a long term impact on the salinity of the groundwater wells I tested and consequently, their salinity is affected by factors other than rainfall such as salts in soil and/or underground saltwater intrusion.

On the other hand, for the majority of the wells I tested, rainfall increases their water level.

Since the objective of the restoration area where the wells are located is to restore the original wetlands, my results will help determine which and where native plant species can be planted as all plant species have different salt tolerance and water needs.

Summary Statement

I found that rainfall increases the water level of the groundwater wells I tested but it does not have a long term impact on their salinity.

Help Received

I borrowed a handheld refractometer from UCSB's CCBER and was taught by them how to use it. Rainfall data was acquired from the Santa Barbara Hydrology Department. I went water quality monitoring weekly, created my graphs, and analyzed the data on my own.