

Effect of Drought on Sonoma County's Hydroclimate

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DATA 101: Introduction to Data Science

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Abstract

We used US Drought Monitor and NOAA data to analyze how drought severity can be predicted from precipitation and temperature data. We have looked specifically at Sonoma County, California. Our project uses the R package ggplot2 to illustrate the connection between temperature, precipitation and drought severity through the years 2014-2024. We also used our models to look at how droughts are connected to the larger issue of climate change and its influence on Sonoma County's water supply in reservoirs such as Lake Sonoma.

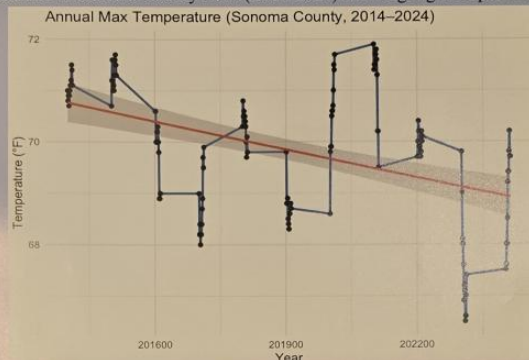
Introduction

The most recent major drought in California has affected the environment and living conditions within Sonoma County. Based on the NOAA climate reports the 2012 - 2016 California drought often referred to as part of a larger "Megadrought" was one of the most severe dry periods in California's recorded history. In our project we wanted to look at the effects on Sonoma County; pre-drought, post-drought, and during the driest part of the drought being 2014-2015.

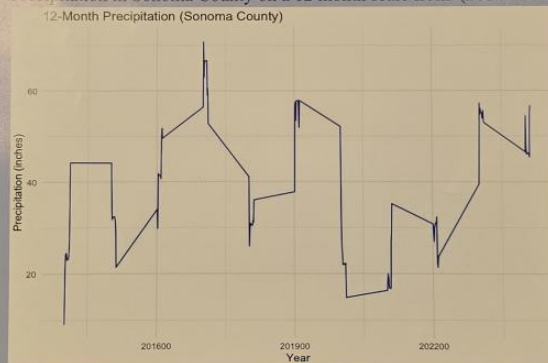


Results

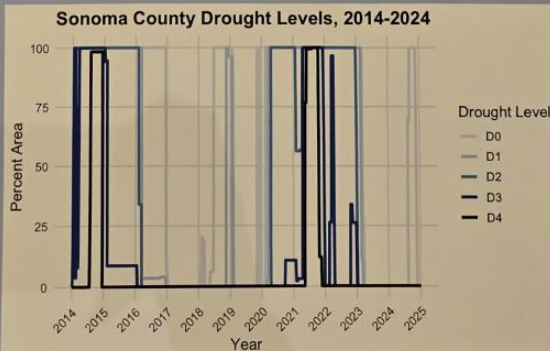
Temperature in Sonoma County from (2014-2024) showing high temperature spikes



Precipitation in Sonoma County on a 12 month scale from (2014-2024)



Drought severity in Sonoma County (2014-2024) showing spikes during the megadroughts.



Discussion

The graphs provided are important because they show the weather patterns demonstrating the drought periods within Sonoma County as well as its impact on our waterways. We were able to learn from our data that the drought within California was driven by a combination of extremely low precipitation and record breaking temperatures.

Sadly, droughts are expected to worsen due to climate change. Increasing temperatures have an effect on water levels and streamflow. Personal impact of droughts within Sonoma County also include crop losses and dryness leading to wildfires. Through our project we conclude that future drought severity can be anticipated through temperature and precipitation trends.

Drought Levels

Drought levels are quantified by measuring dryness intensity across the percentage of a county's total area.

D0	D1	D2	D3	D4
No Drought	Moderate Drought	Severe Drought	Extreme Drought	Exceptional Drought

