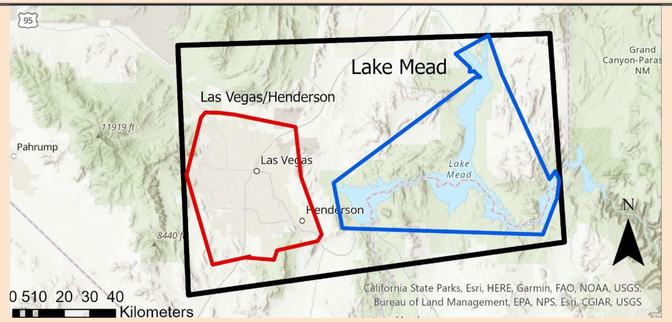
Water Loss in Lake Mead National Recreational Area

Lake Mead, Clark County, NV

Will Munson, Department of Data Analytics and Computational Social Sciences

University of Massachusetts Amherst

Introduction



Over the past 20 years, various places around the world have been struggling to maintain their water supply. 2022 in particular has been a grueling year - due to worldwide drought conditions, rivers and lakes around the world have experienced significant loss of water. For this project, we'll be focusing on one reservoir in particular - Lake Mead. Lake Mead has always run into problems with water supply, but in recent years, the reservoir was nearly declared "dead pool" status after it dropped to levels as low as 1040 feet.

What we are looking at in particular is how the landscape has changed over the past few decades, and what this means in terms of water loss.

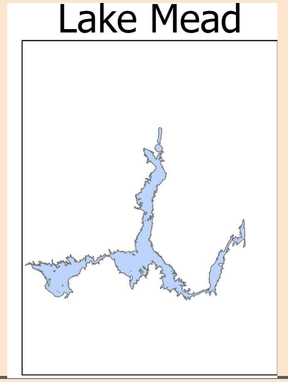


Figure 1 (At the top): The study area of focus, and the nearby Las Vegas.

Figure 2 (To the left): Lake Mead outline (if it were at full capacity)

"Storage Capacity of Lake Mead - Lake Mead National Recreation Area (U.S. National Park Service)." *National Park Service*, 17 Nov. 2022, https://www.nps.gov/lake/learn/nature/storage-capacity-of-lake-mead.htm.

Price, Jessica Taylor. "Why Experts Say Lawns Should Become a Thing of the Past." *News @ Northeastern*, 8 Sept. 2022, https://news.northeastern.edu/2022/09/08/las-vegas-lawn-ban/.

Methods

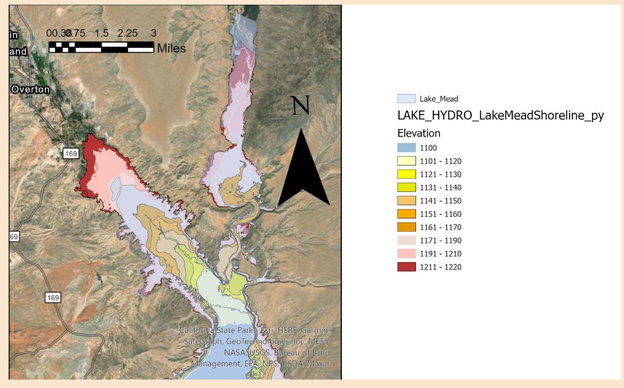


Figure 3: Overton Arm, the northern portion of Lake Mead. This area appears to have dried up almost completely. Satellite maps now show what appear to be shrubs growing in area that was once underwater.

- Initial layout was used as an outline for where the original water level was
- Used a more refined layer that showed the topography of the surrounding area
- Edited the symbology to show where the water is versus where it would be if it were at full capacity

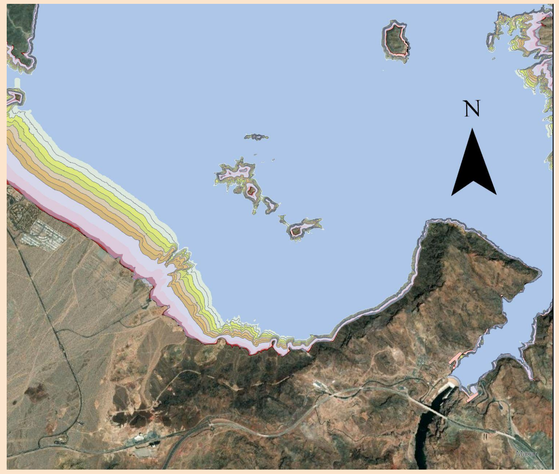


Figure 4: Boulder Beach area, near Hoover Dam, which is also pictured here on the bottom right corner. The rock formations are white on the edges that are supposed to be underwater at full capacity

Results & Discussion

Between the years of 2000 and 2015, the water levels in Lake Mead have been on a downward trend - from around 1200 ft in 2000 to just below 1100 ft in 2015.

Limitations:
Due to the lack of available shapefiles, I was only able to obtain data from as late as 2015. However, Lake Mead has been losing water rapidly, even before 2022. Also, since the Colorado River inlet to Lake Mead appears to be at least 20 ft higher than where the water line was then, there probably isn't enough accuracy in the information to determine if the river is actually dry or not.

Next steps:
Next, we will look into how much the Las Vegas metro area has grown as Lake Mead's water levels started dropping.

Actions taken:
As mentioned in the introduction, the water levels went from 1100 ft in 2015 to 1040 ft in 2022. Since Las Vegas depends on the Colorado River/Lake Mead for electricity generation from Hoover Dam, city authorities banned growing grass in yards, recommending that citizens replace their lawn with more drought-friendly plants.

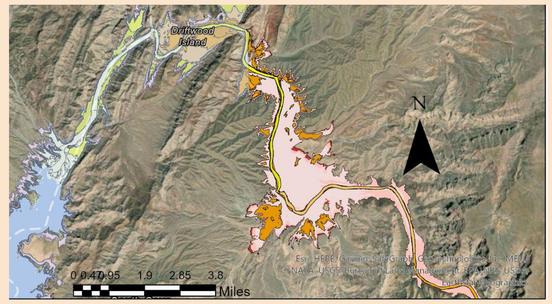


Figure 5: The Colorado River Inlet to Lake Mead. The river appears to be dry in the picture, as the inlet is between 20 and 30 ft above the water line.