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Proposal

Because of Grace's interest in and passion for the environment, we opted for Option 5 and decided to focus our final project on visualizing environmental data. The data in question was collected by Smucker et al. [1] across 20 different lakes from 1987 to 2018. In addition to analyzing the abiotic factors of the lakes, the authors also collected information about the areas around the reservoirs and about the presence of cyanobacteria—a phylum of photoautotrophic prokaryotes primarily responsible for the phenomenon known as "algal blooms" or cyanobacterial blooms that can occur in bodies of water. These blooms can have dire consequences on ecological and human health in the surrounding area.

In their research, Smucker et al. [1] were hoping to identify trends in cyanobacterial presence in relation to mounting anthropomorphic pressures such as climate change and pollution. Our goal is similar. We would like to visualize this data so that it is accessible to a broad audience. According to their paper [1], Smucker et al. found increasing levels of cyanobacterial presence starting in approximately 2003 to 2005, especially in agriculturally dominated areas. Our goal is to portray these conclusions such that viewers will grasp the severity of this issue.

For this project, we will be using the *cyanobacteria_data.xlsx* and the *reservoir_inforamation.xlsx* data from the United States Environmental Protection Agency [2]. The cyanobacteria data contains information about the levels of the cyanobacteria and the different types of bacteria present in the reservoirs. The cyanobacteria dataset only has the abbreviation for the different reservoirs so we need to join the reservoir information data to get the latitude and longitude for each reservoir. The goal is to create a visualization to see the amount of cyanobacteria that is present in each reservoir.

For the visualizations we will be using tableau. We will be using the map feature to show the locations and the amount of cyanobacteria present in the reservoirs. We will also be creating graphs and charts to show the different types of the bacteria and how much is present.

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References

[1] N. J. Smucker, J. J. Beaulieu, C. T. Nietch, and J. L. Young, "Increasingly severe cyanobacterial blooms and deep water hypoxia coincide with warming water temperatures in reservoirs," *Global Change Biology*, vol. 27, no. 11, pp. 2507–2519, 2021.

[2] N. Smucker, "1987-2018 cyanobacteria and water quality data for 20 reservoirs," *EPA*. [Online]. Available: https://edg.epa.gov/metadata/catalog/search/resource/details.page?uuid=https%3A%2F%2Fdoi.org%2F10.23719%2F1503175. [Accessed: 03-Apr-2023].