

Chemical, Biological and Physical Drivers of Harmful Blue-Green Algae Blooms in Kansas Reservoirs

INTRODUCTION

- Cyanobacteria, also known as blue-green algae, blooms have been a threat to Kansas lakes and reservoirs for many decades.
- When the cyanobacteria bloom, they release harmful toxins into the surrounding environment.
- These toxins can harm fish, other animals, and humans that come into contact with them.
- There are many known drivers that lead to an increase in blooms, but many drivers are still unknown.
- This study analyzes long-term data from Kansas reservoirs to characterize water quality conditions - including cyanobacteria - vary by region and environmental conditions.

OBJECTIVES

- To study the chemical, biological and physical parameters that lead to cyanobacterial blooms.
- To evaluate how those parameters correlate, or if there is any correlation.

METHODOLOGY

- Literature review
 - Previously produced literature and studies were evaluated to establish a basis for this research.
- Data analysis
 - Water quality data was obtained from the Kansas Department of Health and Environment (KDHE).
 - Correlation analysis were run on the trophic status index (TSI), TN/TP, total algae cell count, total algae biovolume, blue-green algae cell count, blue-green algae biovolume, green algae cell count, green algae biovolume, diatom algae cell count, diatom algae biovolume, other algae cell count, other algae biovolume, and the age of the lake at sampling time.
 - The distribution of the age of lake at sampling time and the distribution of the TSI by region were analyzed.

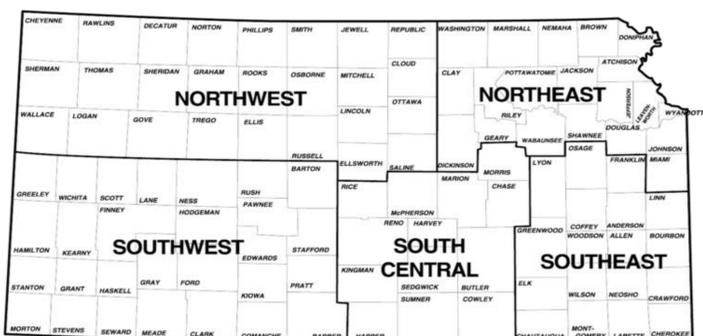


Figure 1. Kansas Department of Wildlife and Parks. (n.d.). *Regions Map*. <https://ksoutdoors.com/KDWP-Info/Locations/Hunting-Fishing-Atlas/Regional/Regions-Map>

RESULTS

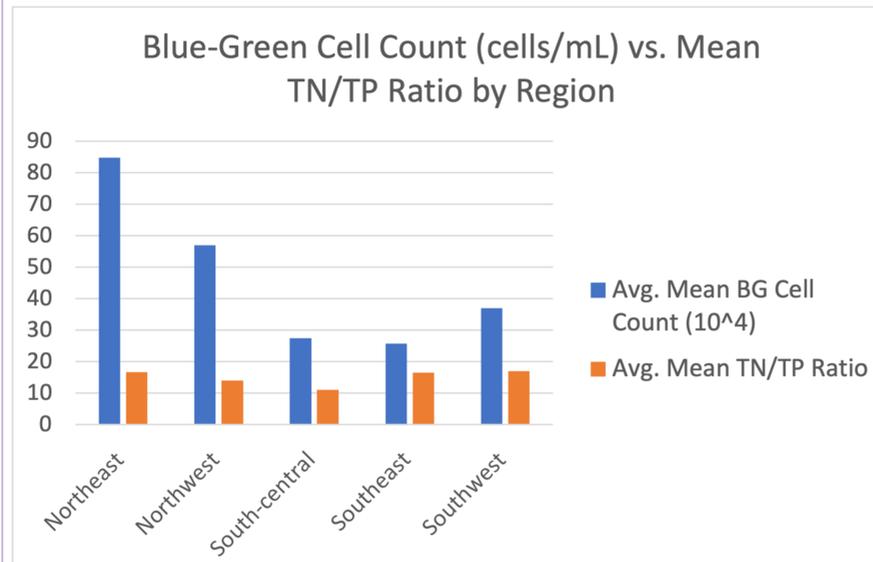


Figure 2. Cell Count vs. TN/TP Ratio

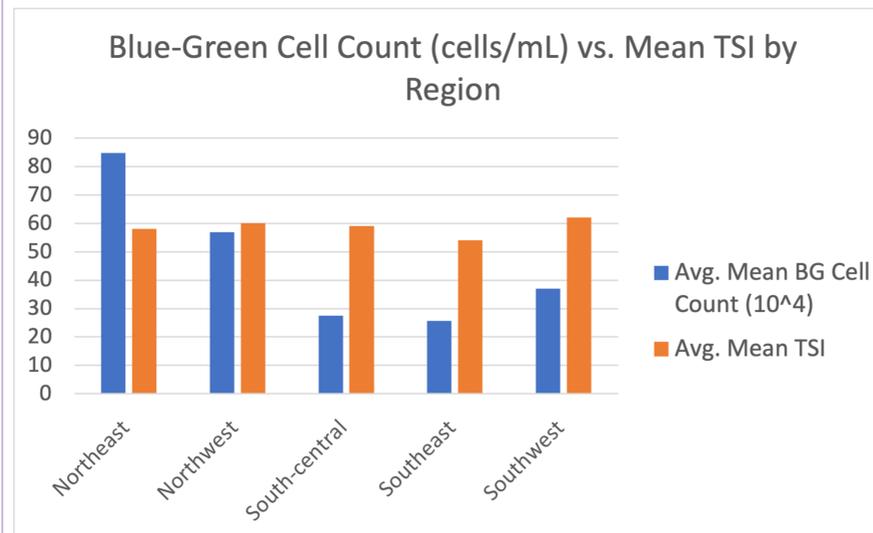


Figure 3. Cell Count vs. TSI

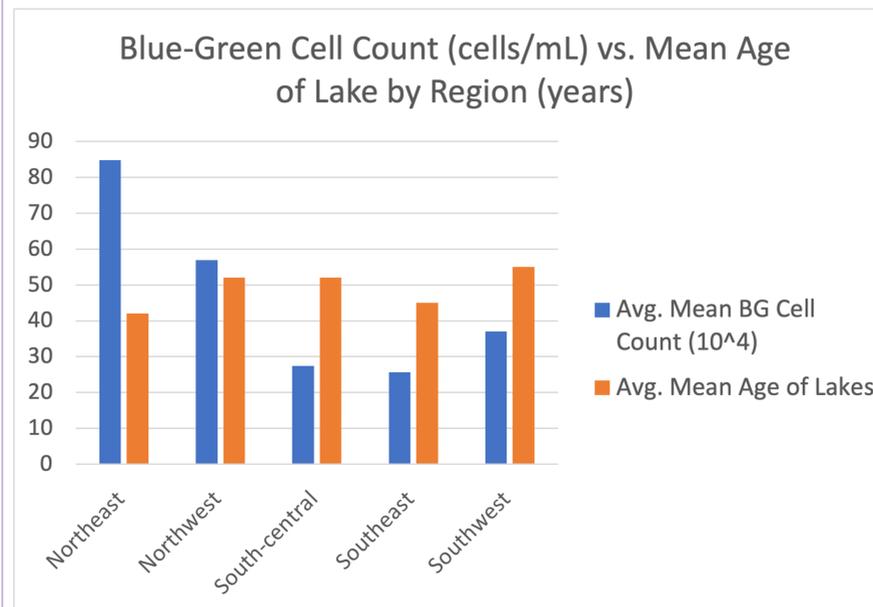


Figure 4. Cell Count vs. Age of Lake



Figure 5. Cyanobacteria bloom in Marion Reservoir, Kansas in June 2022.



Figure 6. Cyanobacteria bloom in Marion Reservoir, Kansas in June 2022.

CONCLUSIONS

- There are many drivers that correlate to an increase in cyanobacteria blooms, including increase in temperature, the trophic status index of the lake/reservoir, and many other factors.
- Many of the drivers that lead to an increase in cyanobacteria blooms are still unknown.

FUTURE WORK

- Continue analyses of Kansas reservoir dataset to examine water quality trends over time and in relation to other land use and environmental drivers.