



THE CURRENT STATE OF NEW JERSEYS COASTAL LAKES

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INTRODUCTION

The coastal lakes are a vital part of New Jersey's aquatic ecosystems, yet they confront persistent challenges stemming from various forms of pollution. This study delves into an examination of historical and current data to evaluate the ongoing state of these lakes. By evaluating and comparing current water quality data to previous data from the last 5 years we can make assumptions about the current state of the lakes.

METHODS

1. Water was collected at each of Monmouth County's coastal lakes starting at the northernmost lake, Lake Takanassee down to the southernmost lake, Wreck Pond.
2. Water samples were tested using a YSI, turbidity meter, Cyanofluor, pH meter and a Fluorometer. Water samples were also sent to the NJDEP for further analysis.
3. R-studio was used to see how the water quality parameters of each lake changed over time. Spring collection data was compared over the last 5 years (2019-2024).
4. To generate figures, line graphs were made using r-studio to show the change over time in several parameters (salinity and pc:chl) (Fig. 1 and 2), a box and whisker plot was created to show change in fluorescence (Fig. 3).

It's Not Easy Being Green: Algal Blooms Arriving Ahead of Schedule in Monmouth Countys Coastal Lakes

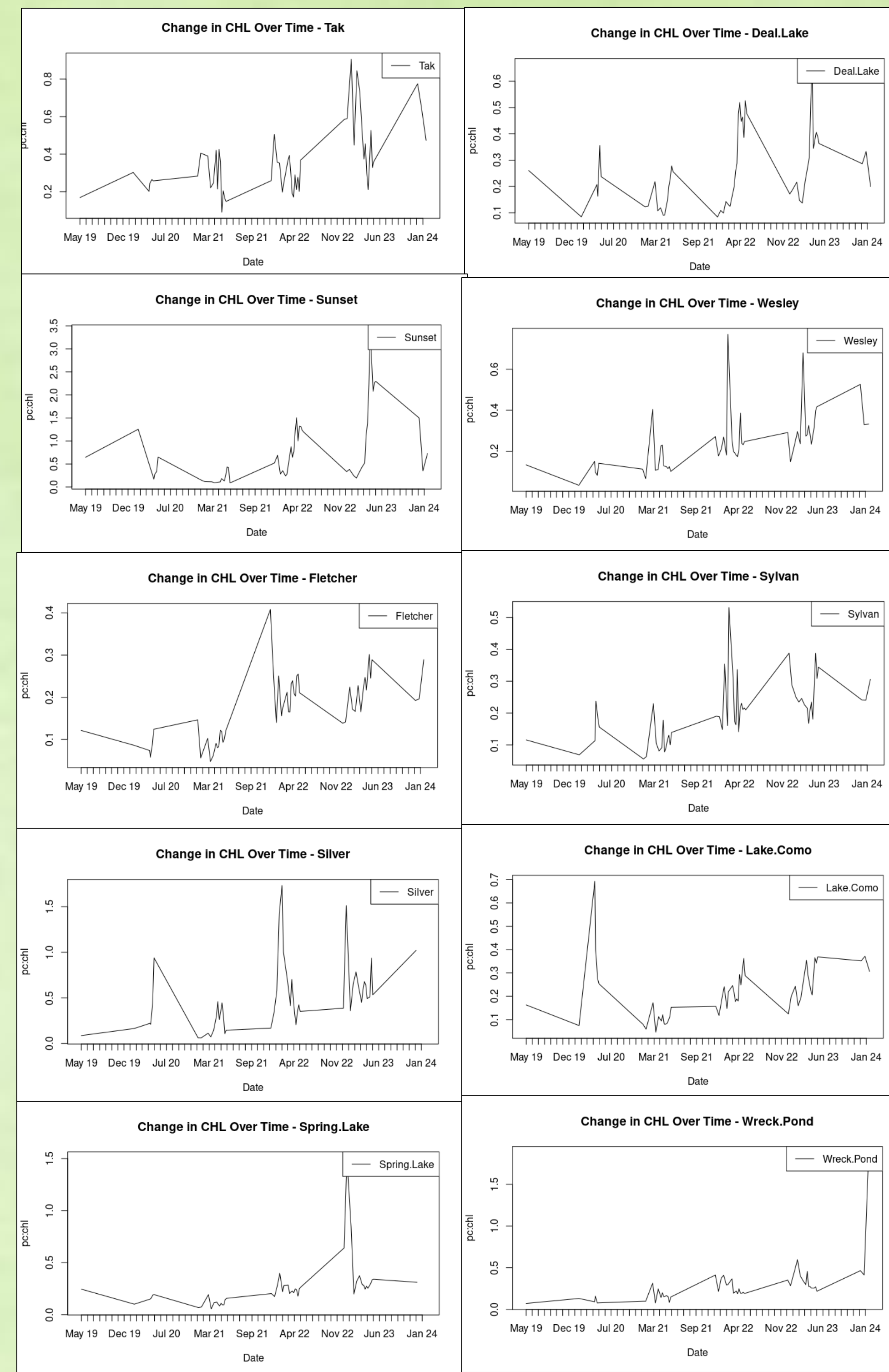


Figure 1. Change in pc:chl from 2019-2024 in all ten of Monmouth County, New Jersey's coastal lakes.

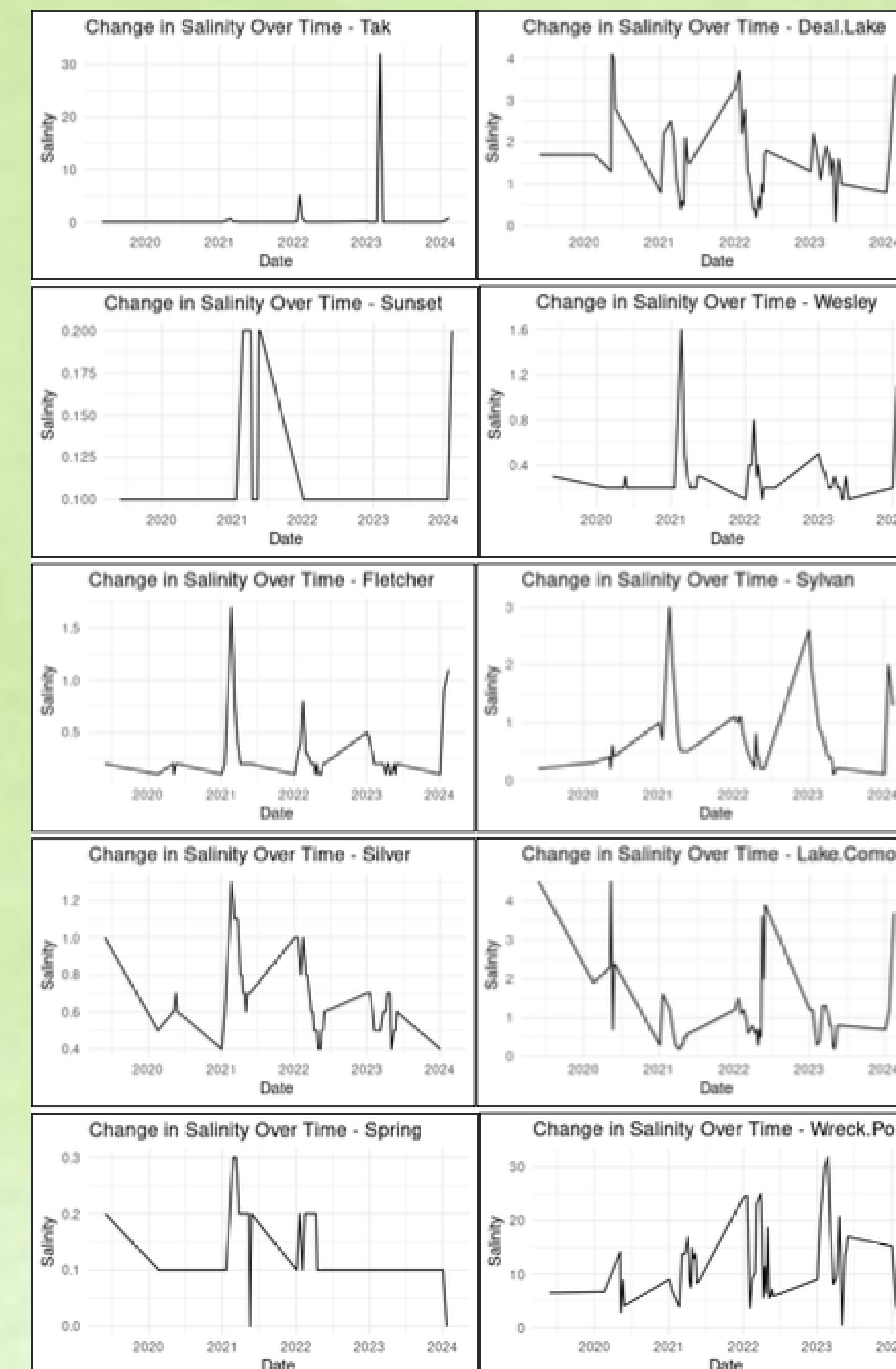


Figure 2. Change in salinity from 2019-2024 in the coastal lakes of Monmouth County, New Jersey

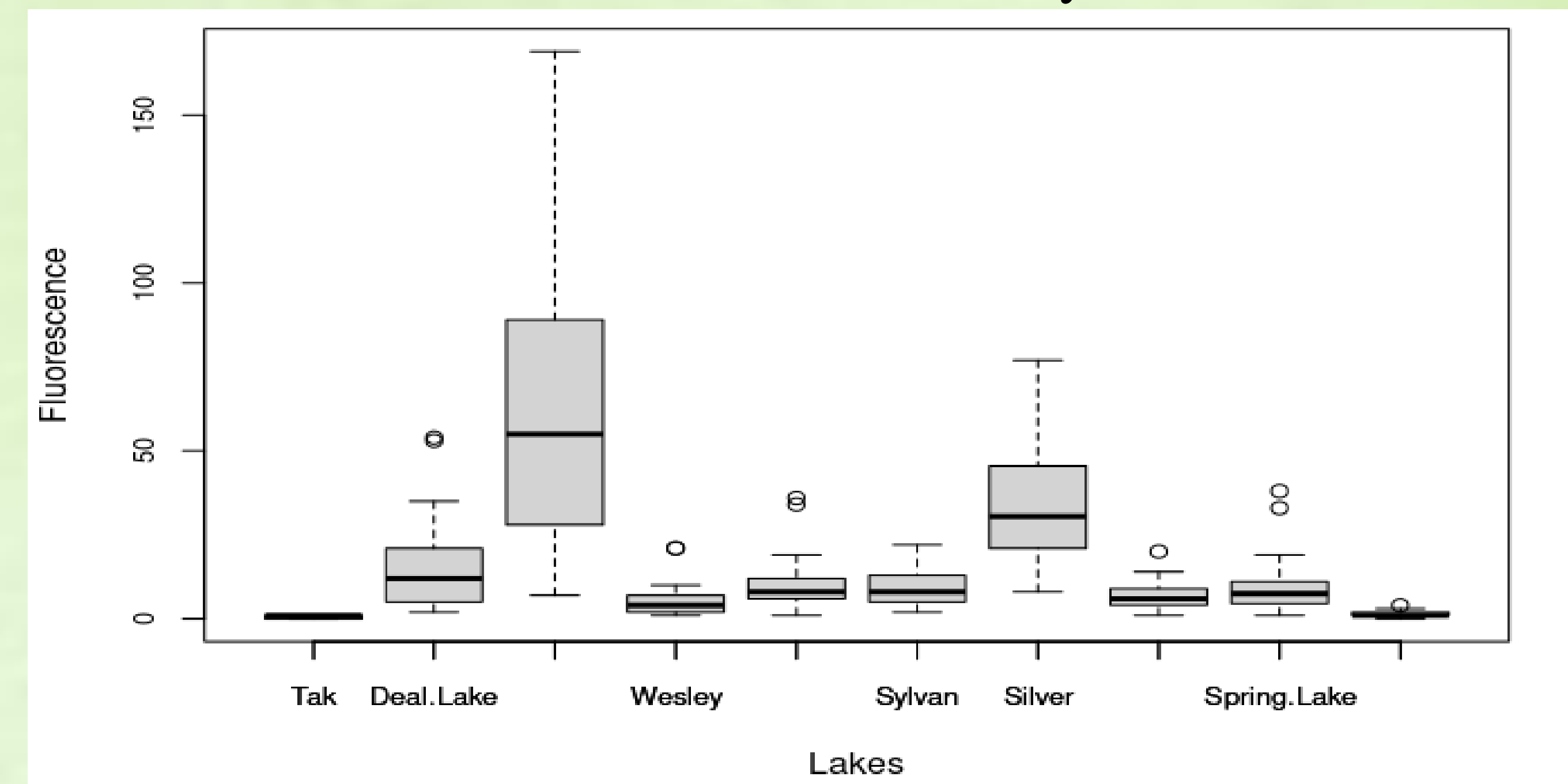


Figure 3. Comparison of the mean, upper and lower quartiles of fluorescence at all ten of the artificial coastal lakes in Monmouth County, New Jersey

RESULTS

- 0.3-1.0 pc:chl levels were observed in February 2024 , in previous years these levels were observed in summer months (Fig. 1).
- Increased salinity was observed in 6 of the 10 lakes (Deal, Sunset, Wesley, Fletcher, Como, Sylvan) with levels ranging between 1.5-3.5 ppt in some lakes in February 2024(Fig 2).
- Heightened algal blooms were seen in Deal, Sunset, and Silver lakes (Fig. 3).

CONCLUSION

- In conclusion the coastal lakes are being affected by increased pc:chl and fluorescence earlier in the season than previous years.
- The increase in pc:chl indicates that the optimal environment for algal growth is occurring earlier thus resulting in algal blooms occurring earlier in the year when compared to previous years(Figure 1., Figure 3.).
- The same can be said for the increase in salinity. While it changes seasonally it is happening more dramatically than previous years (Figure 2.).
- Silver Lake needs the most attention due to the elevated pc:chl, fluorescence , and salinity.
- These findings are imperative for devising effective long-term restoration and monitoring strategies. By comparing past and present data, we aim to discern trends and identify potential stressors.

Literature cited: Adolf, J. E., Saldutti, K., Conlon, E., Ernst, E., Heddendorf, B., Shifren, S., & Schuster, R. (2022). Nitrogen-limited Cyanobacterial Harmful Algal Blooms in Deal Lake, New Jersey.