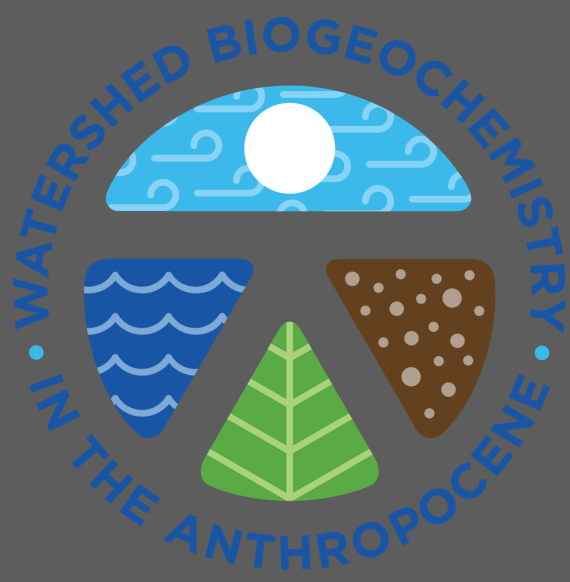




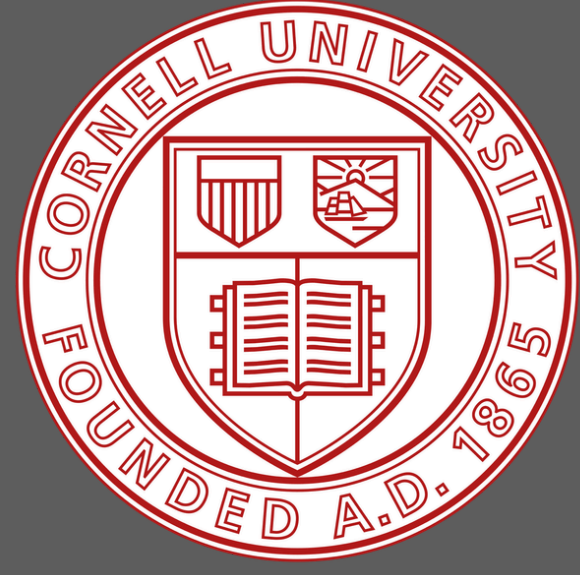
TRACKING ALGAL COMMUNITIES IN NEW YORK STATE LAKES USING MICROSCOPY AND PHYCOCYANIN

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BACKGROUND

We compared microscope images and phycocyanin (PC) measurements from New York State lakes to track changes in algae over the summer [1]. At Dryden Shore A, visible algae increased sharply in late July near a phycocyanin peak. Preliminary analysis of Dryden Shore A microscopic pictures suggest a type of cyanobacteria, *Spirulina* could be present [2], but this organism cannot be identified with full confidence using the field microscope.



Figure 3 Dryden Shore A 7/23/26

FINDINGS

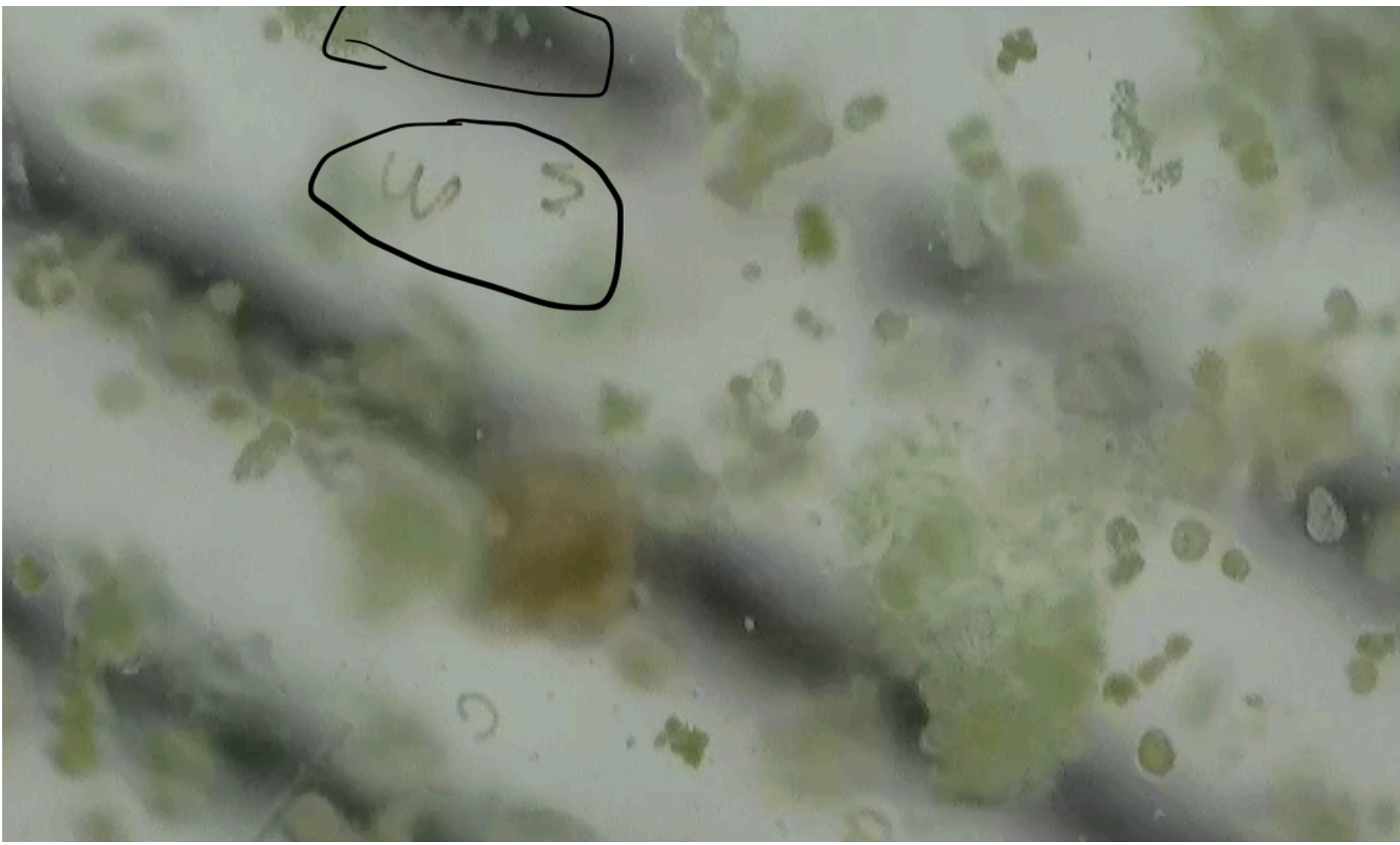


Figure 4: Dryden Shore A
7/23/26, after dilution



Figure 5: Digital Photo of Dryden
Shore A 7/23/26

RESEARCH QUESTION

How do algal communities in New York State lakes change with respect to time during the summer, and can microscopy and other measurements, such as phycocyanin, help to distinguish Harmful Algal Blooms (HABs) from normal algae?

METHODS

- Collected water samples from Dryden and Long lakes approximately twice a week beginning May 27, 2026.
- Used a Jiusion 4K WiFi field microscope to photograph the samples.
- Compared images from the same locations across dates to track changes in visible algae and other particles.
- Compared the images with phycocyanin measurements recorded by a YSI probe to look for evidence of possible cyanobacterial HABs.

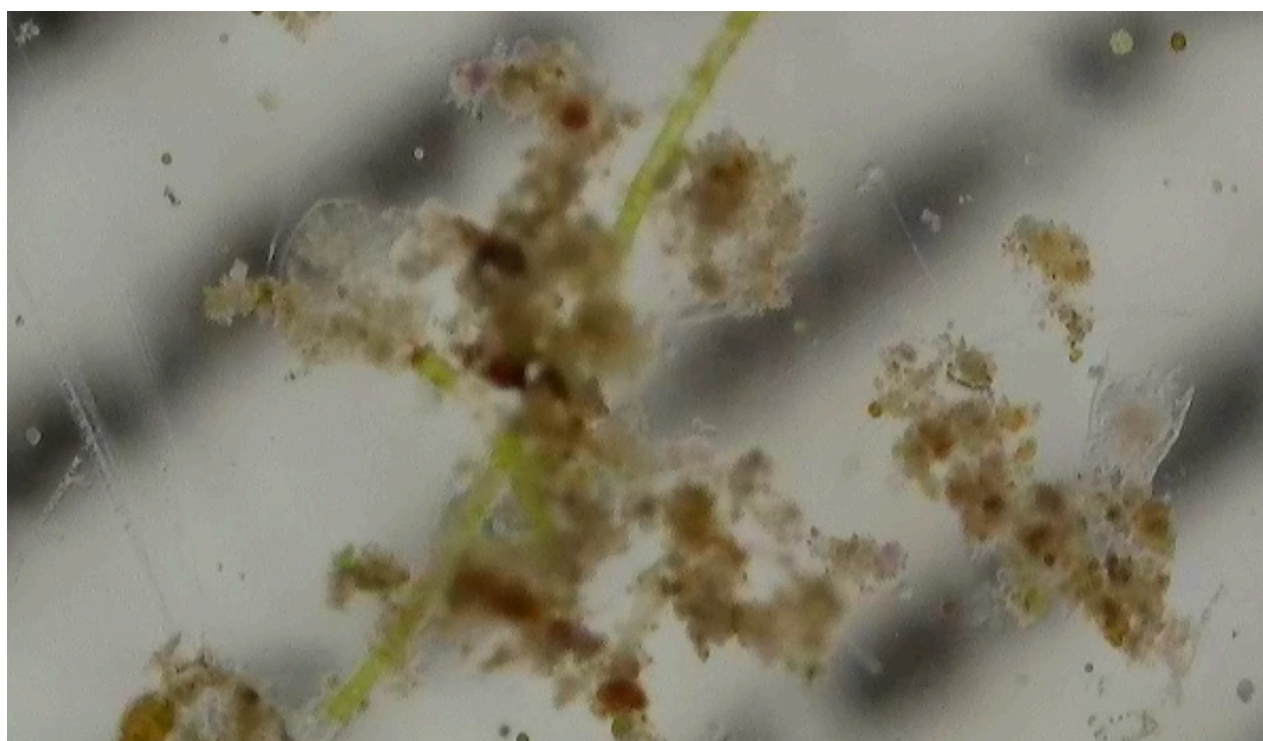


FIGURE 1: LONG SHORE B 7/14/26



FIGURE 2: DRYDEN A 7/8/26

- Microscopy images show there were noticeable changes in the amount of visible algae in certain locations, specifically Dryden shore A
- The most significant increase was on 7/23/26 in Dryden Shore A, where the sample was so concentrated it had to be diluted to see individual particles
- Phycocyanin at Dryden shore A reached its peak on 7/20/26 with 5.12 RFU, three days before the visual increase. On 7/23/26, phycocyanin was still elevated at 2.14 RFU
- Spiral structures were repeatedly observed at many different dates in a range of locations.
- Although the microscope used can't confirm with full confidence the identity of the structure, it's appearance was most consistent with *Spirulina*, a type of cyanobacteria
- Circled structures: Possible *Spirulina*
- Figures 3-5 show Dryden Shore A, the largest peak on darker blue line in Figure 6

FUTURE DIRECTIONS

- Using a compact microscope where cellular level magnification can be observed
- Further data analysis with both Dryden Shore A and Long Bottom
- Further research into different types of algae that form HABs

Time vs Dryden Phycocyanin (RFU)

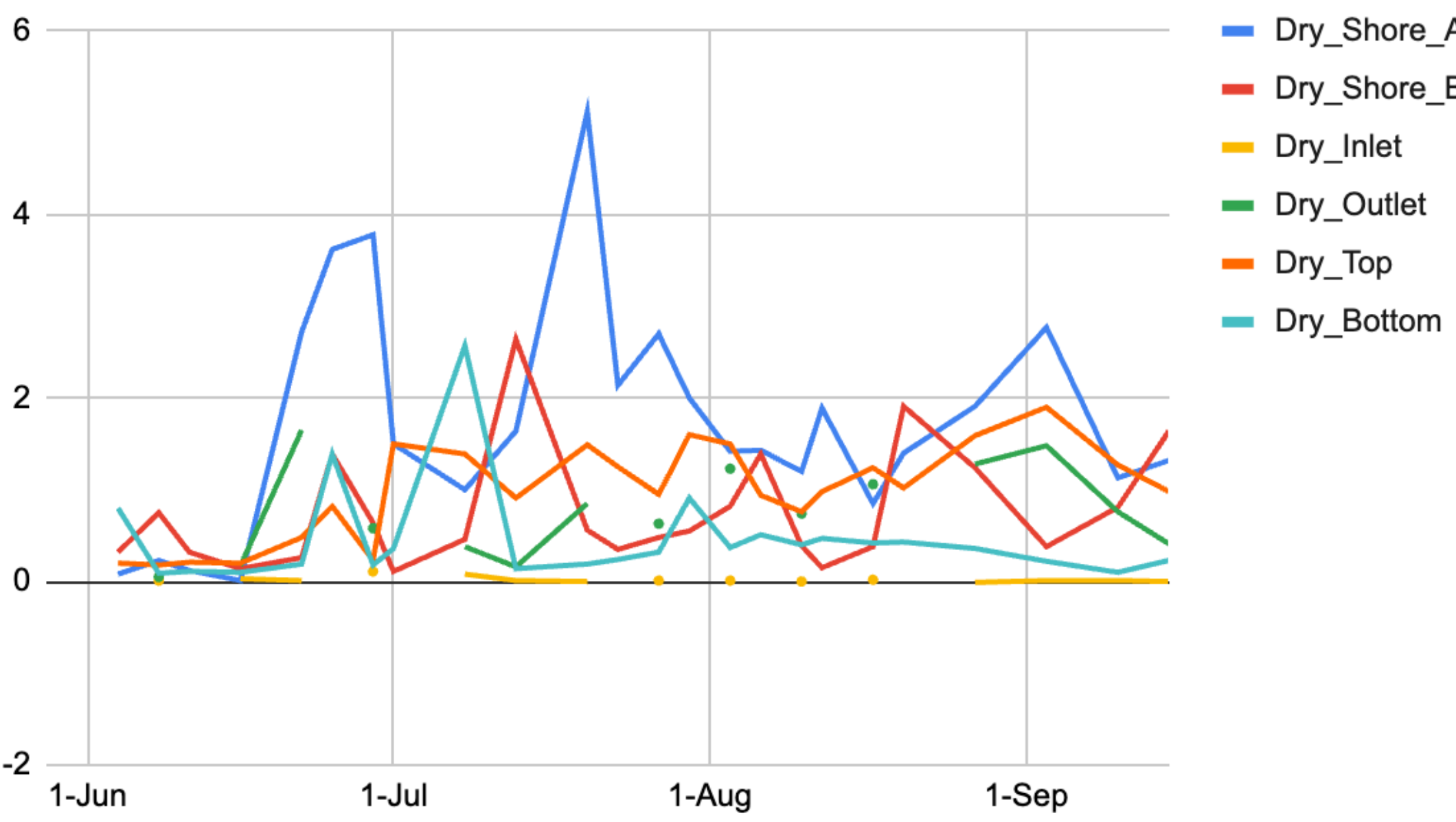


Figure 6 : Time vs Dryden PC (RFU) from 06/06/26-9/10/26

Time vs Long PC (RFU)

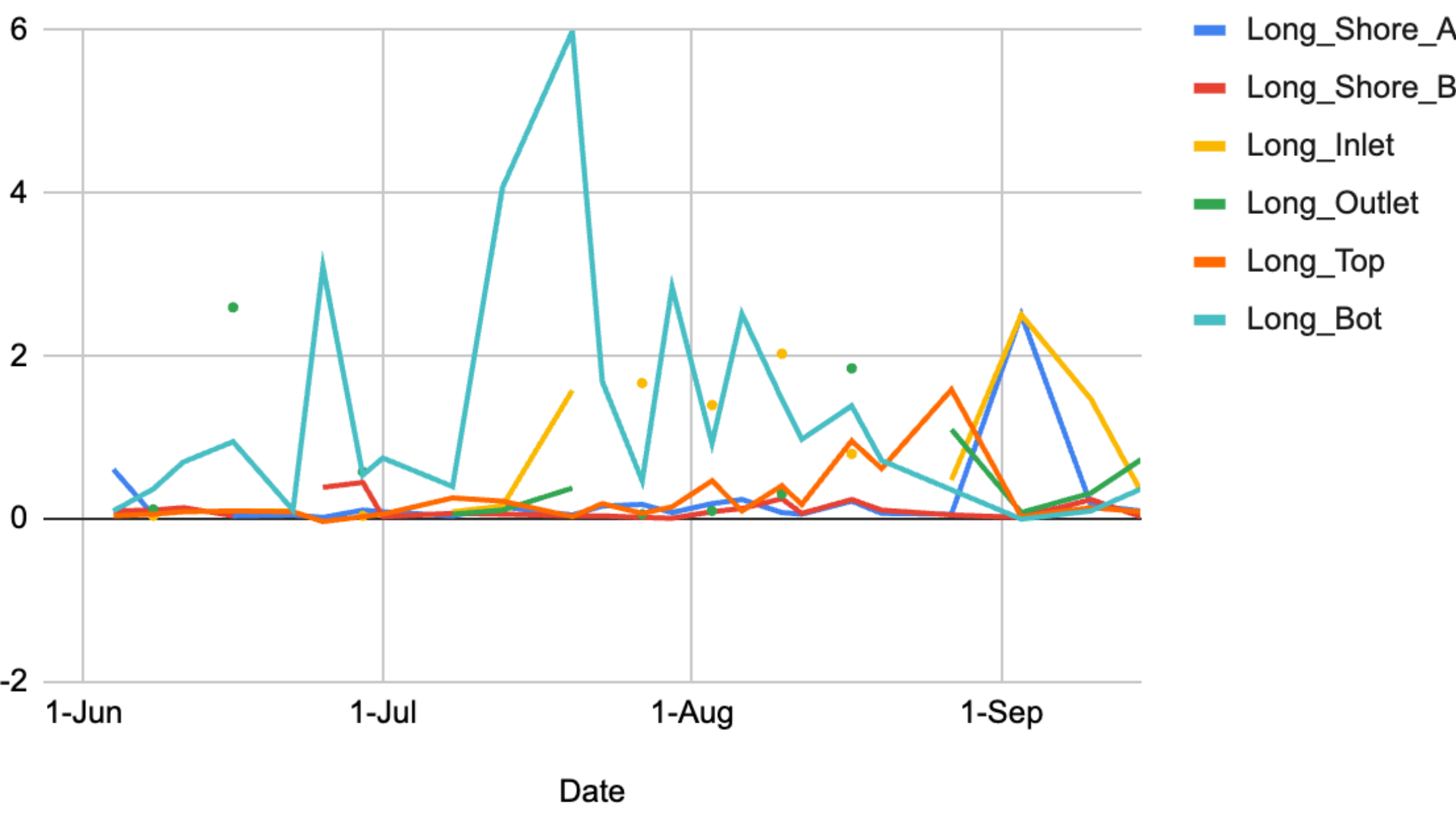


Figure 7: Time vs Long PC (RFU) from 06/06/26-9/10/26

REFERENCES

[1] Rosen, B. H., & St. Amand, A. (2015). Field and laboratory guide to freshwater cyanobacteria harmful algal blooms for Native American and Alaska Native communities (Open-File Report 2015-1164). U.S. Geological Survey. <https://doi.org/10.3133/ofr20151164>

[2] Wongsawad, P., & Peerapornpisal, Y. (2014). Molecular identification and phylogenetic relationship of green algae, *Spirogyra ellipsospora* (Chlorophyta) using ISSR and rbcL markers. Saudi Journal of Biological Sciences, 21(5), 505-510. <https://doi.org/10.1016/j.sjbs.2014.01.003>

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