THE EFFECTS OF ALGAECIDES AND HERBICIDES ON A *MICROCYSTIS AERUGINOSA* BLOOM IN LAKE OKEECHOBEE, FLORIDA (USA)

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Microcystis-dominated cyanobacterial harmful algal blooms (cyanoHABs) are a widespread reoccurring problem in freshwater lakes, resulting in worldwide economic and health impacts. As public awareness on cyanoHABs health risks increases, there is an urgency for understanding the short and long-term management of cyanoHABs. In this study, we tested various concentrations and combinations of algaecides and herbicides in order to provide science-based best management practices and eradication/treatment options. For this, a bloom from Lake Okeechobee, dominated by *Microcystis aeruginosa*, with *Pseudanabaena* present, was collected in August 2019. Bloom material was exposed to four increasing concentrations of eleven different algaecides, herbicides, or combinations thereof. Cell counts, abundance and morphology, chlorophyll a/b, phycocyanin and microscopic analyses were evaluated at the time of collection, 24, and 72 hours post-treatment. Toxin concentrations were measured from crude bloom material at 491 ± 94 µg/L as total microcystins. Overall, effectiveness of the chemicals varied; the most efficacious treatment method for reducing bloom density included hydrogen peroxide with peroxyacetic acid, hydrogen peroxide with peroxyacetic and endothall, and copper sulfate pentahydrate. Few chemicals, including endothall, were unable to deplete cyanobacterial abundance and therefore considered ineffective treatment options for the treatment of *M. aeruginosa*-dominated blooms. While microcystin concentrations typically increased one day post algaecide exposure, copper ethanolamine complex and copper gluconate/citrate chelates showed significant decrease in total microcystin 4 days post treatment. Future work aims at monitoring and treating toxic blooms together with toxin production and release for effective treatments *in situ*.

PRESENTER BIO: Forrest Lefler is a master student studying cyanobacterial diversity in South Florida. His current projects involve monitoring community shifts within Lake Okeechobee along the outflow to the St. Lucie estuary, assessing water quality, and evaluating treatment methods for harmful algal bloom-forming species found within the lake.