**White Pond Water Quality Monitoring Program Update August 25, 2022**

**CURRENT WATER USE STATUS: NO WATER USE ADVISORIES ARE IN EFFECT AT THIS TIME**

**SUMMARY:**

Water sampling conducted August 23 shows cyanobacteria and microcystin toxin results below state beach closure limits. Cyanobacteria populations have decreased overall this week., making bloom conditions much less likely. The cyanobacteria in the pond are now dominated by *Dolichospermum,* which is much less likely to produce toxins. For these reasons, the Swim at Your Own Risk and Pet Advisories were rescinded last week.

Water sampling will continue bi- weekly to monitor cyanobacterial populations in the pond.

If future water use advisories are issued, the town will notify the public via the White Pond Bloom Notifications (sign up at https://concordma.gov/3039/White-Pond-Watershed), as well as posting signage at public access points to the pond.

**Cyanobacteria Sampling and Bloom Status**

In the past few weeks, a shift was seen in the composition of the cyanobacterial population in the bloom forming cyanobacteria (BFC) from *Microcystis* to *Dolichospermum.* This week's samples continue to show that *Dolichospermum* comprises approximately 95-100% of the bloom forming cyanobacteria.

Phycocyanin (a measure of cyanobacterial biomass) measured at the Town Beach, Deep 2 and Thoreau Cove sites was similar to, or slightly less than, what was observed last week. Overall the cyanobacterial biomass is decreasing in the lake. Lim-Tex has explained that *Dolichospermum* has a higher concentration of phycocyanin per cell that *Microcystis.* For this reason, although phycocyanin levels have not dropped significantly I the past two weeks, it is very likely that the density of *Dolichospermum* cells has decreased compared to earlier weeks in the summer and it is unlikely that bloom conditions will emerge at this time.

*Dolichospermum* is much less likely to produce microcystin toxin compared to *Microcystis*. Although *Dolichospermum* can also produce anatoxin, it is unlikely that significant amounts of either toxin are being produced at the cell densities seen in this week's and last week's samples. For the above reasons, the Swim at Your Own Risk and Pet Advisories were rescinded last week.

This week's data indicates that the Town Beach remains the concentration point for wind/wave driven accumulations of cyanobacteria. Although visible accumulations of cyanobacteria in the water column or along the shore are less likely to be seen than earlier in the summer, these accumulations should be avoided if encountered.

Water sampling will change to bi-weekly going forward, depending on the results of each sampling round.

Pond users who are interested in learning more about the sampling program can visit the White Pond Reports webpage https://concordma.gov/3126/Bloom-Reports. Two documents on this page provide more information about the sampling protocol and rationale being used in the White Pond water sampling program.

White Pond Monitoring Addendum Oct 29 2021
https://concordma.gov/DocumentCenter/View/37187/White-Pond-Monitoring-Addendum-Oct-29-2021

Evaluation of Size Structure in Freshwater Cyanobacteria
https://concordma.gov/DocumentCenter/View/37186/Evaluation-of-Size-Structure-in-Freshwater-Cyanobacteria

**A-Pod HAB Trap update**

Slight (HAB?) scums/films are still being observed on calm water mornings with push-up against and into A-Pod Traps as wind develops, but the rate of accumulation has apparently slowed compared to May/June and July.

On August 20th, typical early and slight HAB scums were observed before A-Pod "A" and "B" traps at 10:32AM. However, and notably, by 12:57 PM, deep HAB layers were noted to be accumulating and entering A-Pod "A" trap, as shown in the photos below. This corresponded to slight and more sustained winds primarily to the northwest - which at first seemed odd as A-Pod "A" is set up to catch water flows from the south, south west and west. Based on water current assessments on August 20th, deeper water currents entering A-Pod "A" were moving easterly or clockwise around the pond - opposite shallow water, wind driven currents to the northwest. Thin and narrow HAB scums were observed along the downwind, western and northwestern-most coves in White Pond. These accumulations were consistent with gentle winds to the northwest at this time. So shallow water currents were moving opposite, or westerly, of deeper water currents flowing easterly and entering A-Pod "A". Westerly winds, like easterly winds, also serve to develop deeper clockwise water current flow around the pond, given shoreline pond morphology and Ekman flow principles. It was significant to document this water flow pattern change with depth given related HAB accumulation in A-Pod "A".

Also on August 20, at 12:20 PM, 300 feet off the main A-Pod "A" water clarity was estimated at 15.1 feet, versus 19.6 feet in the deep hole off the beach. This decrease in water clarity likely correlates with increasing HAB accumulations (and decreasing water clarity) building up in the A-Pod Trap "A" collection area at this time frame.

Seven pounds of dried out HABs, benthic algae, etc. were removed from A-Pods "A" and "B" this week - and added these to our first rotary compost bin. There were no substantial accumulations of HABs in A-Pods "C" or "D".

**White Pond August 20, 2022 Thoreau's Cove A-Pods "A" and "B"**

**10:32 AM Looking Southeast**. HAB PC in Trap "A" 0.55 RFUs
Note: Thin scums before both A-Pod Traps

**10:33 AM Looking Southeast.** HAB PC in Trap "A" 0.55 RFUs
Note: Lack of heavy HAB accumulation at this time

**12:57 AM Looking South at A-Pod "A" main A-Pod capturing deeper (8ft water column) flows.** HAB PC in Trap "A" 19 RFUs Note: HAB accumulation since 10:33 AM. Slight wind to Northwest and North with clockwise deeper water current developing around pond.

**12:57 AM Looking South at A-Pod "A" main A-Pod capturing deeper (8ft water column) flows.** HAB PC in Trap "A" 18 RFUs