

## Contingency Plan Quarterly Report on Ambient Monitoring Results

Second Quarter 2022

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MWRA gathers data near the outfall discharge location in Massachusetts Bay on various thresholds in the Contingency Plan related to its Deer Island Treatment Plant (DITP) NPDES discharge permit. This report shows ambient monitoring results for Contingency Plan thresholds that became available in April through June 2022. Previous Contingency Plan reports are available at <http://www.mwra.state.ma.us/harbor/html/contingency.htm>.

Included in the report are nuisance algae abundances and areal chlorophyll results collected during winter/spring (February – April) 2022, and preliminary *Alexandrium* results from May 2022. There are no Contingency Plan threshold exceedances in this report. The water column survey conducted in February was under restrictions related to COVID-19 health and safety protocols, which required reduced staffing, dropping collection of some particulate and dissolved nutrient samples, and not having a dedicated marine mammal observer on the survey. As of the March survey these restrictions were eased to allow all scheduled data to be collected.

### NUISANCE ALGAE

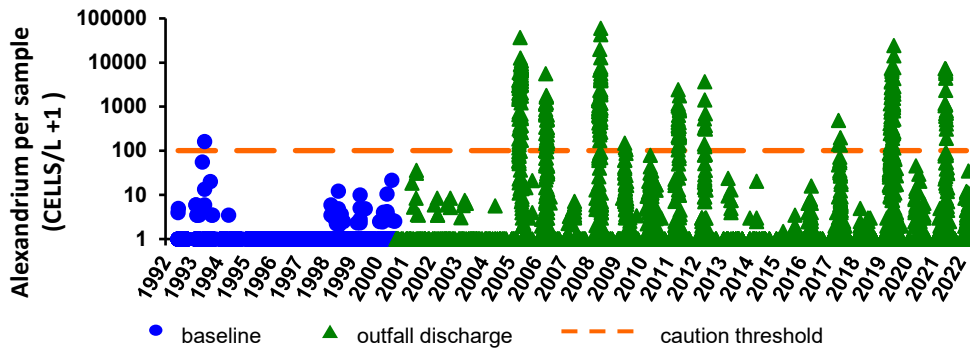
#### **ALEXANDRIUM – February through May 2022**

The [nuisance algae](#) *Alexandrium catenella* (“*Alexandrium*”) can cause Paralytic Shellfish Poisoning (PSP, “red tide”) in Massachusetts Bay. MWRA measures *Alexandrium* abundance in its monitoring program, and checks observations of shellfish PSP toxicity from state fisheries agencies and other regional monitoring programs to keep track of the course of Gulf of Maine *Alexandrium* blooms.

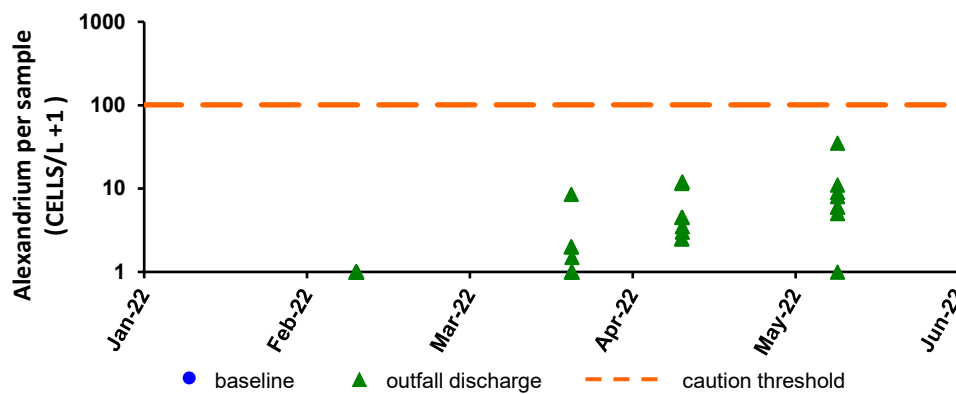
During winter through spring 2022, there were very low abundances of *Alexandrium* detected in the samples collected in either nearfield (stations near the outfall) or farfield (reference stations). The highest abundance of 69.5 cells per liter was seen at one farfield station in April, and 34 cells per liter at one nearfield station in May, which are below the caution threshold value of 100 cells per liter. Data from May are preliminary because they have not yet gone through the complete set of quality assurance checks.

On June 21, elevated PSP toxicity levels detected in blue mussels *Mytilus edulis* in Mass. Bay triggered *Alexandrium* Rapid Response surveys (ARRS); extra ARRS stations were included in the regular water column survey on June 28. Results from the survey are not available this quarter, and will be included in the next quarter’s report. <https://www.mass.gov/lists/psp-notices#2022-notices> and [http://www.massmarinesfisheries.net/shellfish/psp/psp\\_counts\\_portalized.html](http://www.massmarinesfisheries.net/shellfish/psp/psp_counts_portalized.html).

In the figure below, we compare nearfield *Alexandrium* data to the threshold for each sample collected through April 2022. Figure 1 includes data since the start of the monitoring program in 1992. Figure 2 shows data for 2022 only, which includes four regular water column surveys. Note logarithmic scale for each graph.



**Figure 1. *Alexandrium* cell concentrations in Nearfield (1992-2022)**



**Figure 2. *Alexandrium* cell concentrations in Nearfield (2022)**

***Alexandrium* per-sample abundance (cells/liter)**

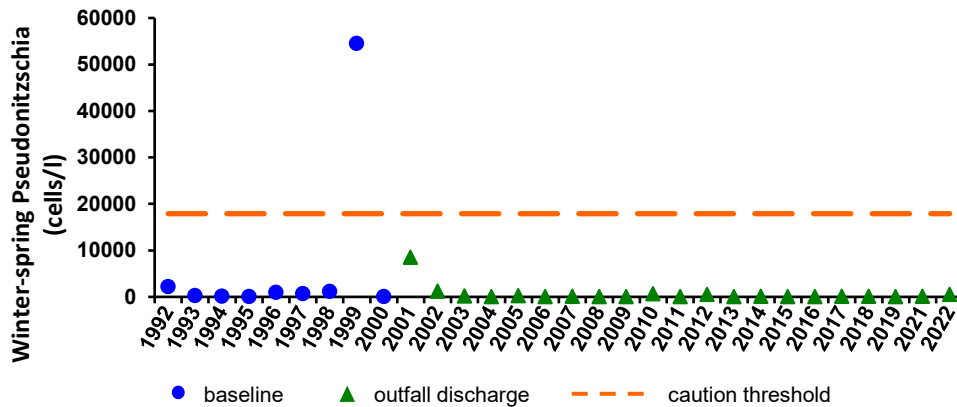
Caution threshold	100
February-May 2022	34*
* maximum of all nearfield samples collected February – May 2022	

**PSEUDO-NITZSCHIA – Winter/Spring (February – April) 2022**

There were no *Pseudo-nitzschia* threshold exceedances for winter/spring 2022. For nuisance algae *Pseudo-nitzschia* species, the seasonal Caution Level threshold values were derived from the 95th percentile of seasonal baseline means. Seasonal mean abundances at nearfield stations are compared against threshold values. The Caution Level threshold is 17,900 cells per liter for the winter/spring season.

During Winter/Spring 2022, *Pseudo-nitzschia* was observed with low abundances in multiple samples from nearfield stations, with the highest abundance of 4,263 cells per liter. The mean seasonal abundance was 502 cells per liter, well below the Caution Level threshold for the season.

In Figure 3, we display the *Pseudo-nitzschia* Caution Level threshold for Winter/Spring season and the mean abundance data for the season from since the start of the monitoring program in 1992 to present.



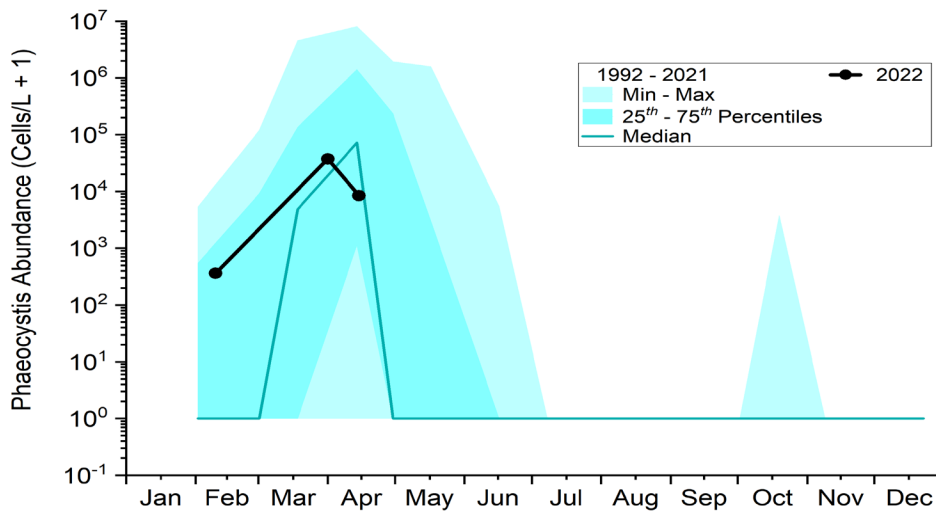
**Figure 3. *Pseudo-nitzschia* cell concentrations in Nearfield (Winter/Spring 2022)**

### ***PHAEOCYSTIS* – Winter/Spring (February - April) 2022**

In February 2017, EPA approved changes in the Contingency Plan to remove the threshold for the seasonal abundance of the nuisance alga *Phaeocystis pouchetii* in the nearfield water column. During bloom conditions, *Phaeocystis* can form large, gelatinous colonies, which may accumulate as foam as they disintegrate on beaches. Evaluations of prior threshold exceedances for this species have indicated that they resulted from natural fluctuations in Massachusetts Bay, do not represent degradation, were not a result of MWRA’s discharge, and have not occurred in concentrations that would pose problems for recreation. MWRA agreed to continue to report each quarter on nearfield survey mean abundances of *Phaeocystis pouchetii* compared to its historical seasonal pattern.

Figure 4 shows the 2022 winter/spring survey mean *Phaeocystis* results against the seasonal background for all prior years since 1992. Due to reductions in the number of surveys conducted each year, the historical seasonal pattern encompasses more time-points than shown for the current year.

Both the timing and magnitude of survey mean *Phaeocystis* abundance from February to April 2022 was within the range of the historical seasonal pattern.



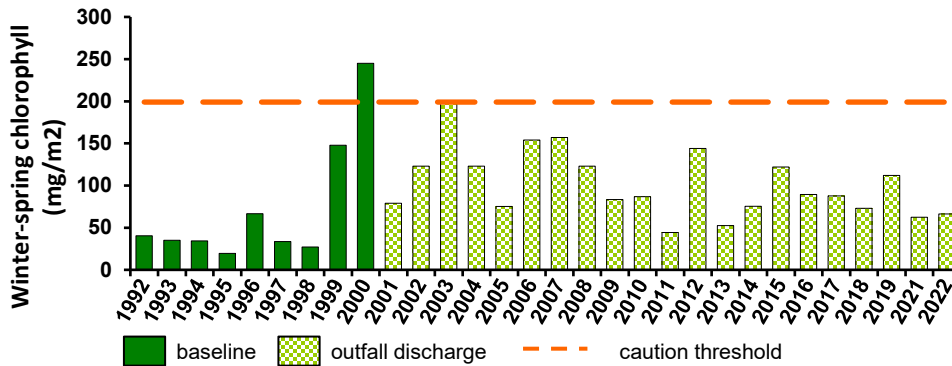
**Figure 4. Nearfield Survey Mean abundance of *Phaeocystis* (1992 – 2022)**

**CHLOROPHYLL - Winter/Spring (February – April) 2022**

The chlorophyll seasonal Caution Level threshold values were derived from the 95th percentile of seasonal baseline means. Seasonal mean abundances at nearfield stations are compared against threshold values. The Caution Level threshold is 199 mg/m<sup>2</sup> for the winter/spring season.

There were no [chlorophyll threshold](#) exceedances for winter/spring 2022. The nearfield mean areal average chlorophyll for winter/spring 2022 was 66.3 mg/m<sup>2</sup>, well below the Caution Level threshold of the season and in the range of other years in the baseline (pre-discharge) period.

Figure 5 shows chlorophyll mean area result for winter/spring 2022 (February through April), and data since the start of the monitoring program in 1992.



**Figure 5. Winter/Spring mean areal chlorophyll concentrations in Nearfield (1992-2022)**