Contingency Plan Quarterly Report on Ambient Monitoring Results

Second Quarter 2025

MWRA gathers data on various Contingency Plan thresholds near the outfall in Massachusetts Bay. These thresholds are part of the Deer Island Treatment Plant (DITP) NPDES discharge permit. This report presents ambient monitoring results for Contingency Plan thresholds that became available in April through June 2025.

This report includes the results of February through June 2025 nuisance algae abundances, and 2025 winter/spring water column chlorophyll. There is one exceedance of Contingency Plan thresholds in this report, for nearfield *Alexandrium* cell counts.

NUISANCE ALGAE

PSEUDO-NITZSCHIA – winter/spring (February – April) 2025

There were no *Pseudo-nitzschia* threshold exceedances for winter/spring 2025. For *Pseudo-nitzschia* nuisance algae species, the caution level threshold values were derived from the 95th percentile of seasonal baseline means, and seasonal mean abundances at nearfield stations are compared against the threshold value.

During winter/spring 2025, *Pseudo-nitzschia* was not observed at any station, therefore the counts were below the caution level threshold of 17,900 cells per liter.

Figure 1 shows the *Pseudo-nitzschia* caution level threshold for the autumn and the mean abundance data for that season since the start of the monitoring program in 1992.

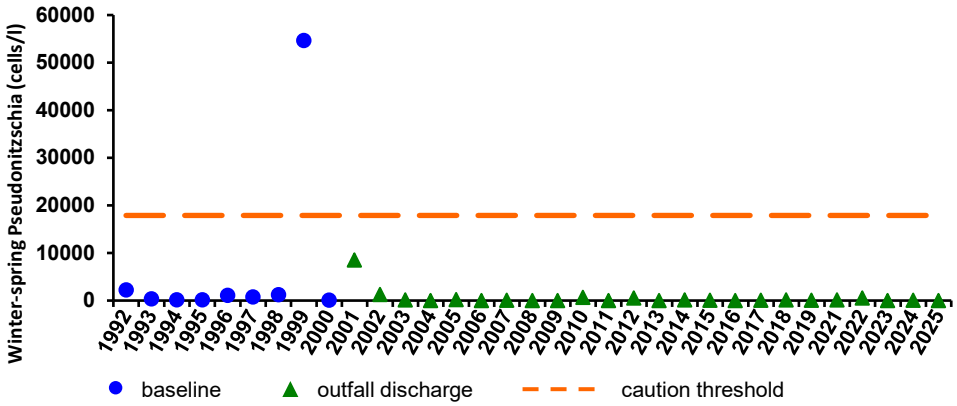

Figure 1. Nearfield *Pseudo-nitzschia* cell concentrations (winter/spring 1992-2025)

PHAEOCYSTIS – February – April 2025

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 *P. pouchetii* compared to its historical results.

Figure 2 shows the 2025 survey mean results against the results from all prior years since 1992. Due to reductions in the number of surveys conducted each year, the historical results encompass more time-points than shown for the current year[2].

There were no *P. pouchetii* cells detected thus far in 2025 (Figure 2).

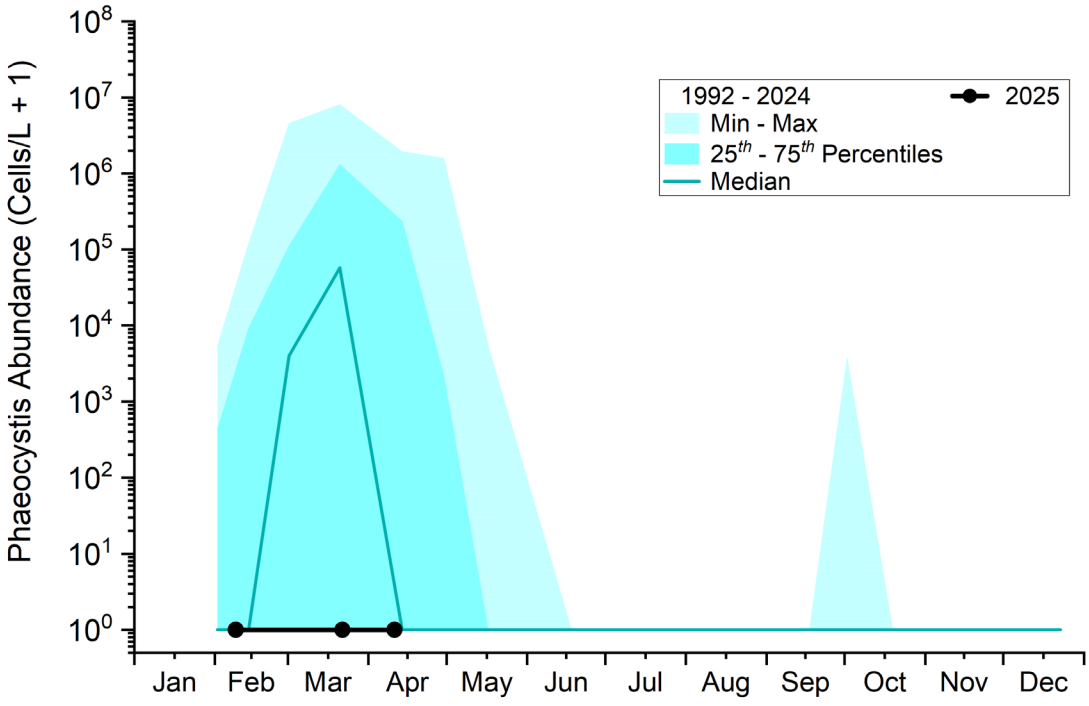

Figure 2. Nearfield Survey Mean abundance of Phaeocystis (1992 – 2025)

ALEXANDRIUM – March - June 2025

The nuisance algae *Alexandrium catenella* ("*Alexandrium*") can cause paralytic shellfish poisoning (PSP, or "red tide") in Massachusetts Bay. MWRA measures *Alexandrium* abundance using a molecular probe (NA1) thought to be specific to the *Alexandrium* red tide species *tamarense*, *catenella*, and *fundyense*[1]. MWRA also checks observations of shellfish PSP toxicity from state fisheries agencies and other regional monitoring programs to track *Alexandrium* blooms in Massachusetts Bay and the Gulf of Maine region.

The results available so far indicate that in mid-May, coastal populations of *Alexandrium* north of Cape Ann were transported into Massachusetts Bay by winds and currents. On May 27, elevated PSP toxicity levels were observed in north of Boston in Gloucester, and detectable PSP was observed in Scituate to the south. Detectable levels of PSP south of Massachusetts Bay triggered the *Alexandrium* Rapid Response surveys (ARRS).

The first ARRS survey was conducted June 3. On this survey, *Alexandrium* abundances greater than 100 cells/L were observed throughout Massachusetts Bay, including the nearfield. This triggered a Contingency Plan exceedance as reported on June 10th (https://www.mwra.com/media/file/20250610_amx.pdf). There is no indication that this exceedance is related to the DITP outfall discharge.

Subsequent ARRS sampling was conducted June 11, June 17, and June 25. Preliminary data show *Alexandrium* abundances peaked on the June 11 survey, and have steadily decreased since. PSP toxicity has remained low, but detectable south of Boston. Massachusetts Department of Marine Fisheries (DMF) issued precautionary shellfish closures both north and south of Boston on June 13, but reopened these beds on June 27.

In Figure 3 below, we compare the preliminary results of *Alexandrium* abundance in samples collected from nearfield stations through June 2025 against those from all prior years since 1992. Due to reductions in the number of surveys conducted each year, the historical results encompass more data than shown for the current year[2].

[1] https://doi.org/10.1016/j.dsr2.2005.06.015

[2] There were two major modifications to the ambient monitoring plan for the outfall in 2004 and 2010; the numbers of surveys and monitoring stations were reduced through these revisions. More information can be found at: https://www.mwra.com/harbor/enquad/pdf/2010-04.pdf and https://www.mwra.com/harbor/enquad/pdf/2004-ms-92.pdf

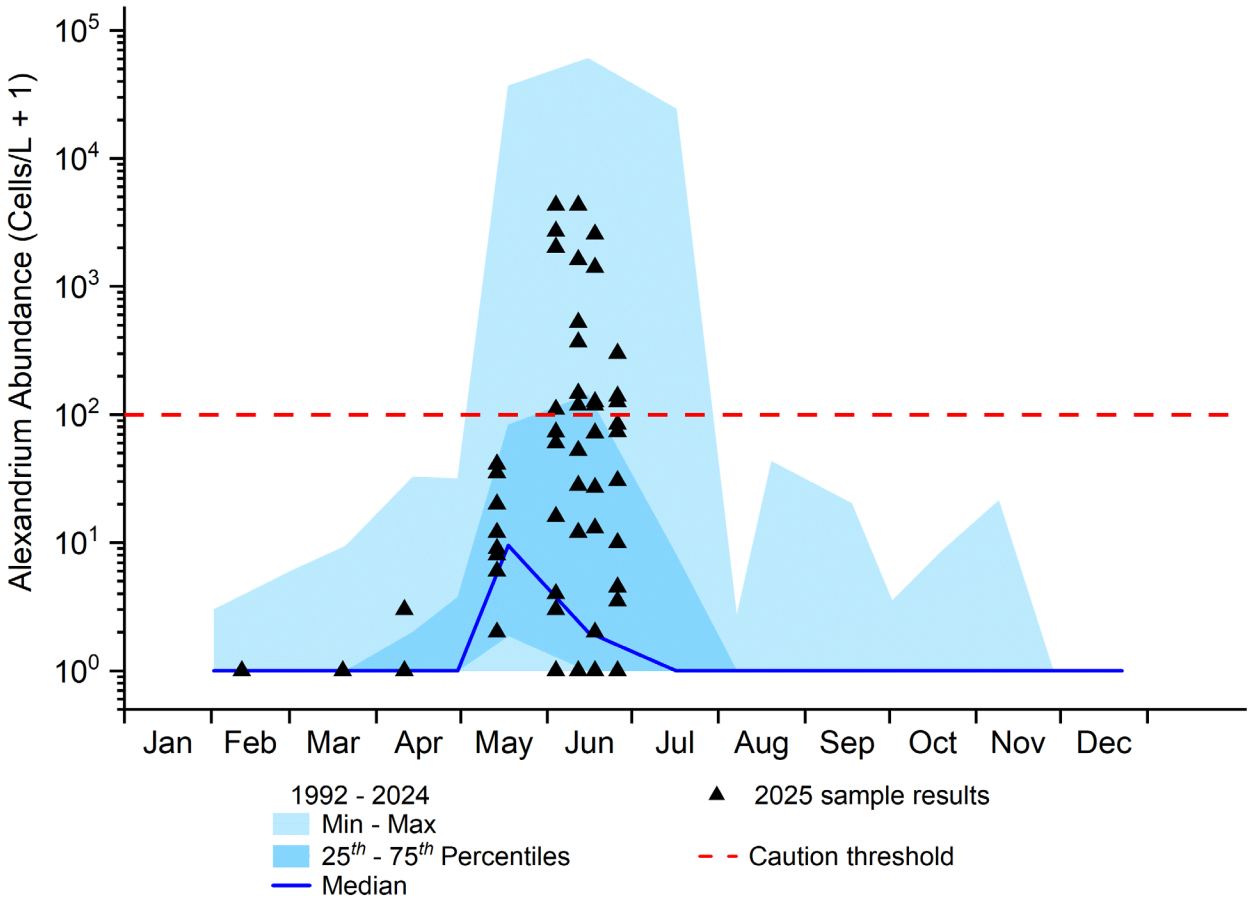

Figure 3. Nearfield *Alexandrium* cell concentrations (1992-2025)

CHLOROPHYLL – winter/spring (February - April) 2025

The chlorophyll seasonal caution level threshold value was derived from the 95th percentile of seasonal baseline means. Seasonal mean chlorophyll concentration at nearfield stations are compared against threshold values. The caution level threshold is 199 mg/m^2 for the winter/spring season.

There was no exceedance the 2025 winter/spring chlorophyll caution level threshold. The 2025 winter/spring nearfield mean areal chlorophyll was 186 mg/m^2, below the caution level threshold of 199 mg/m^2 (Figure 4).

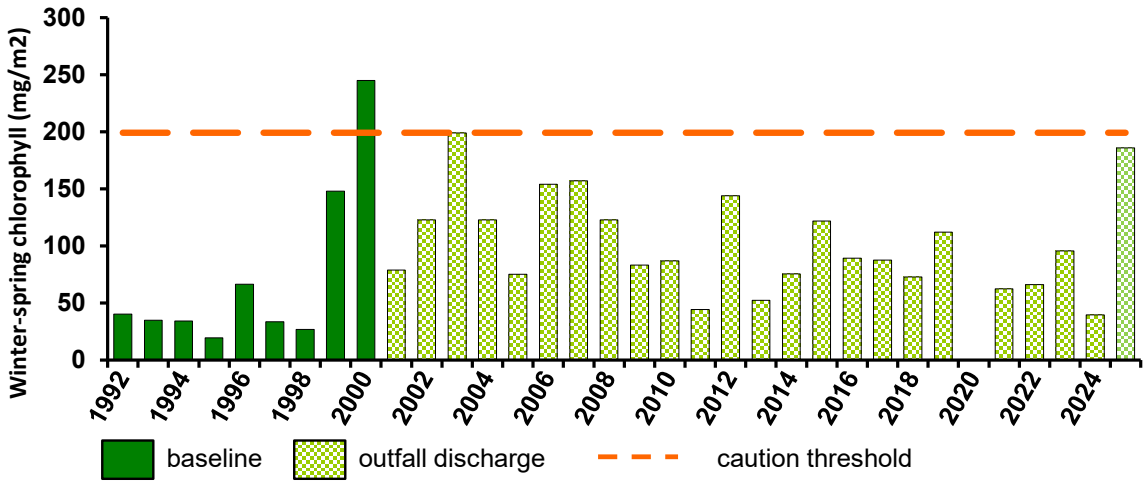

Figure 4. Nearfield winter/spring mean areal chlorophyll-a concentrations (1992-2025)
Note that no result is available for 2020 because winter/spring surveys in March and April were dropped due to Coronavirus pandemic related restrictions.