Contingency Plan Quarterly Report on Ambient Monitoring Results

Third Quarter 2026

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 July through September 2026.

This report includes the results on flounder liver disease, nuisance algae abundances, summer and early fall bottom-water dissolved oxygen, and depth of oxygenation in sediment. There are no exceedances of Contingency Plan thresholds in this report.

FISH AND SHELLFISH

Flounder Liver Disease – 2026

The prevalence in winter flounder (*Pseudopleuronectes americanus*) of centrotubular hydropic vacuolation (CHV), a liver disease associated with contaminant exposure and considered a precursor to liver tumors, is a useful measure of the effects of pollution in the coastal waters. In Boston Harbor, rates of this disease were historically quite high but dropped considerably during the 1990s.

The Caution Level threshold for the prevalence of flounder CHV liver disease is 45%, which is based on measurements collected from Boston Harbor during the baseline period (1991-2000). Since Massachusetts Bay monitoring began in 1991, prevalence of CHV near the outfall site has been much lower than the threshold. A total of 34 winter flounder were collected at the outfall site during the survey on April 26 this year, short of the program goal of 50. An additional 4 flounder were provided from a MA DMF survey on May 7. For the first time in the program's history, none of the flounder (0%) collected at the outfall site were found to have CHV (Figure 1).

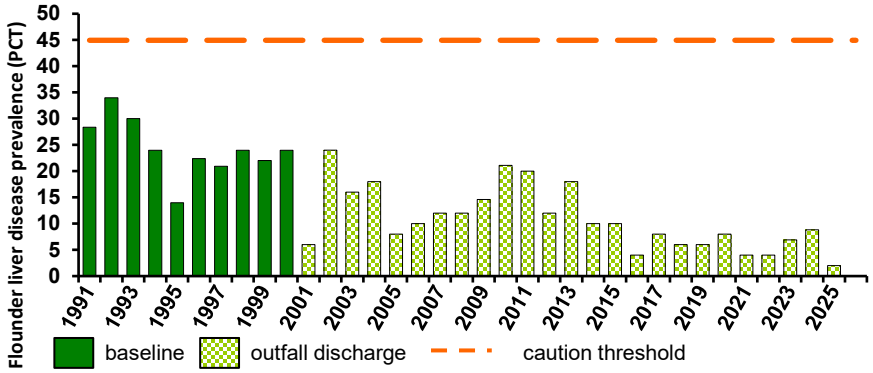


Figure 1. Flounder liver disease prevalence at the outfall site from 1991 through 2026. The horizontal dashed line shows the Caution Level threshold of 45%.

NUISANCE ALGAE

Phaeocystis – May through July 2026

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 the exceedances 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 2026 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].

So far in 2026*, P. pouchetii* cells were detected in moderately high abundances during the winter/spring surveys before greatly declining in the early summer surveys (Figure 2).

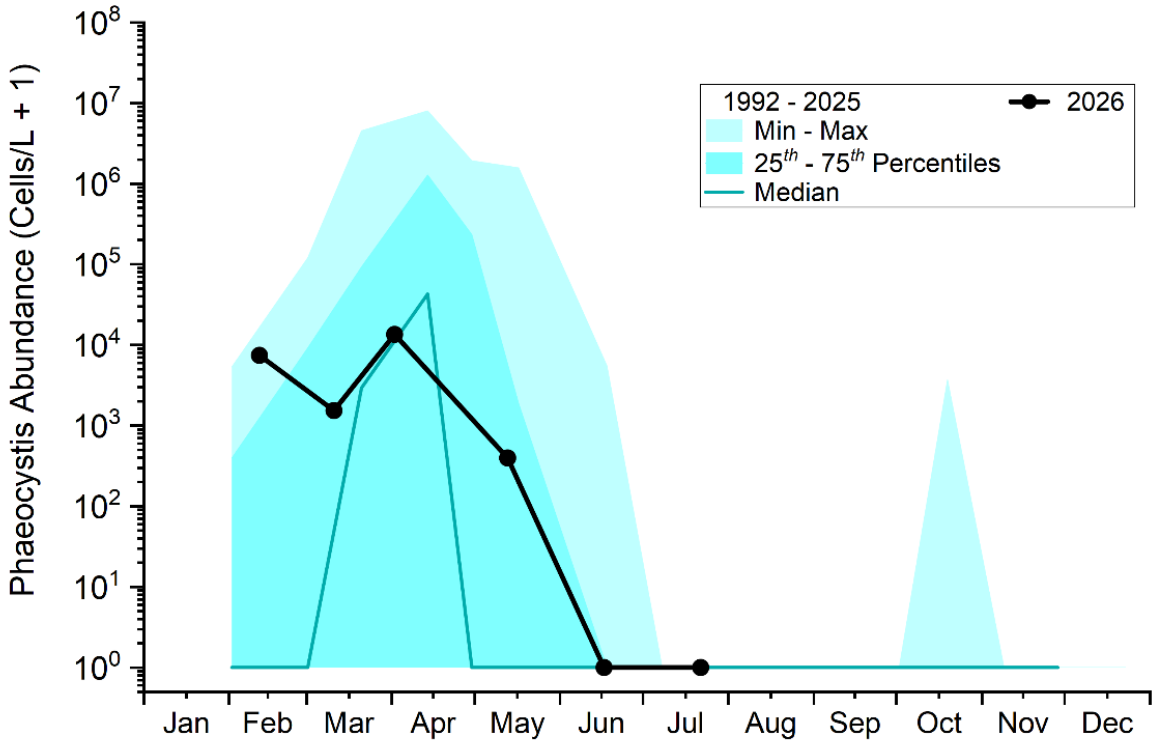


Figure 2. Nearfield survey mean abundance of *Phaeocystis* (1992 – 2026)

Alexandrium – July through September 2026

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 *A. tamarense*, *A. catenella*, and *A. 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.

During the survey conducted in July 2026, preliminary analysis shows that *Alexandrium* cells were observed with cell abundance ranging from 1 to 19 cells/L, in samples collected from nearfield stations (stations within 7.5 kilometers from the outfall) and farfield stations (reference stations). Only a sample with 100 or more cells of *Alexandrium* per liter from a nearfield station would constitute an exceedance under the Contingency Plan.

In Figure 3 below, we compare the preliminary results of *Alexandrium* abundance in samples collected from nearfield stations through July 2026 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].

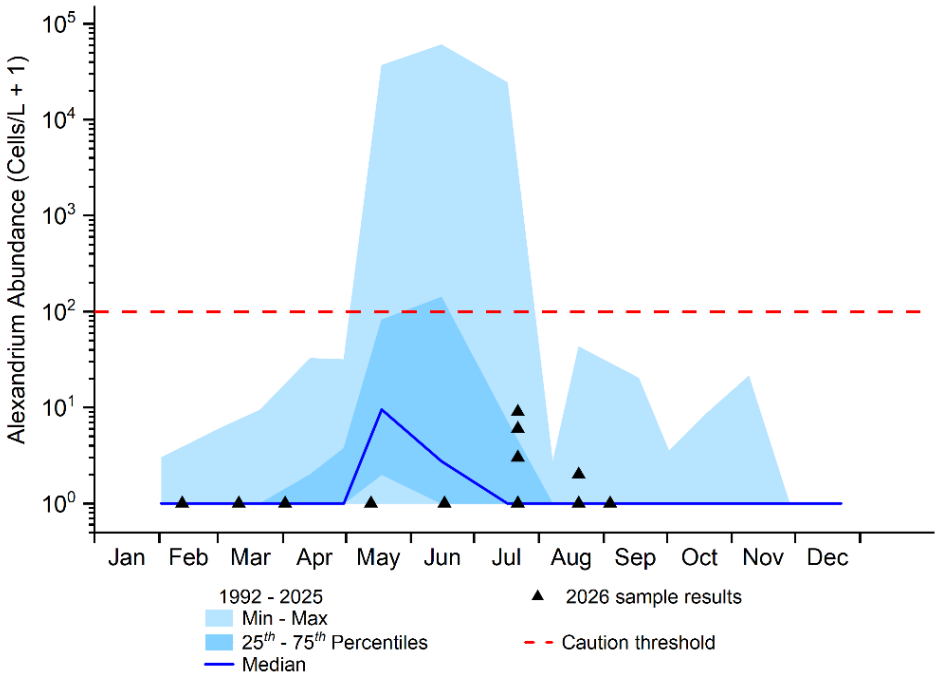


Figure 3. Nearfield *Alexandrium* cell concentrations (1992-2026)

[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

DISSOLVED OXYGEN

Bottom Dissolved Oxygen (DO) – February through September 2026

DO thresholds are tested on results collected in the bottom water from nearfield and Stellwagen Basin stations during June through October each year. During this period, warmer temperatures cause lower solubility, and water column stratification can further reduce dissolved oxygen concentration and saturation in bottom water.

The DO caution and warning level thresholds are based on state water quality standards that were in effect during the baseline monitoring period. To reflect the level of natural fluctuation, background level thresholds were established from measurements collected during the baseline sampling between 1992 and September 2000 from the two areas. DO results are not exceedances unless they are also below background level thresholds.

Through September 2026, there have been no Contingency Plan exceedances of dissolved oxygen in the nearfield or at Stellwagen Basin (Figure 4).

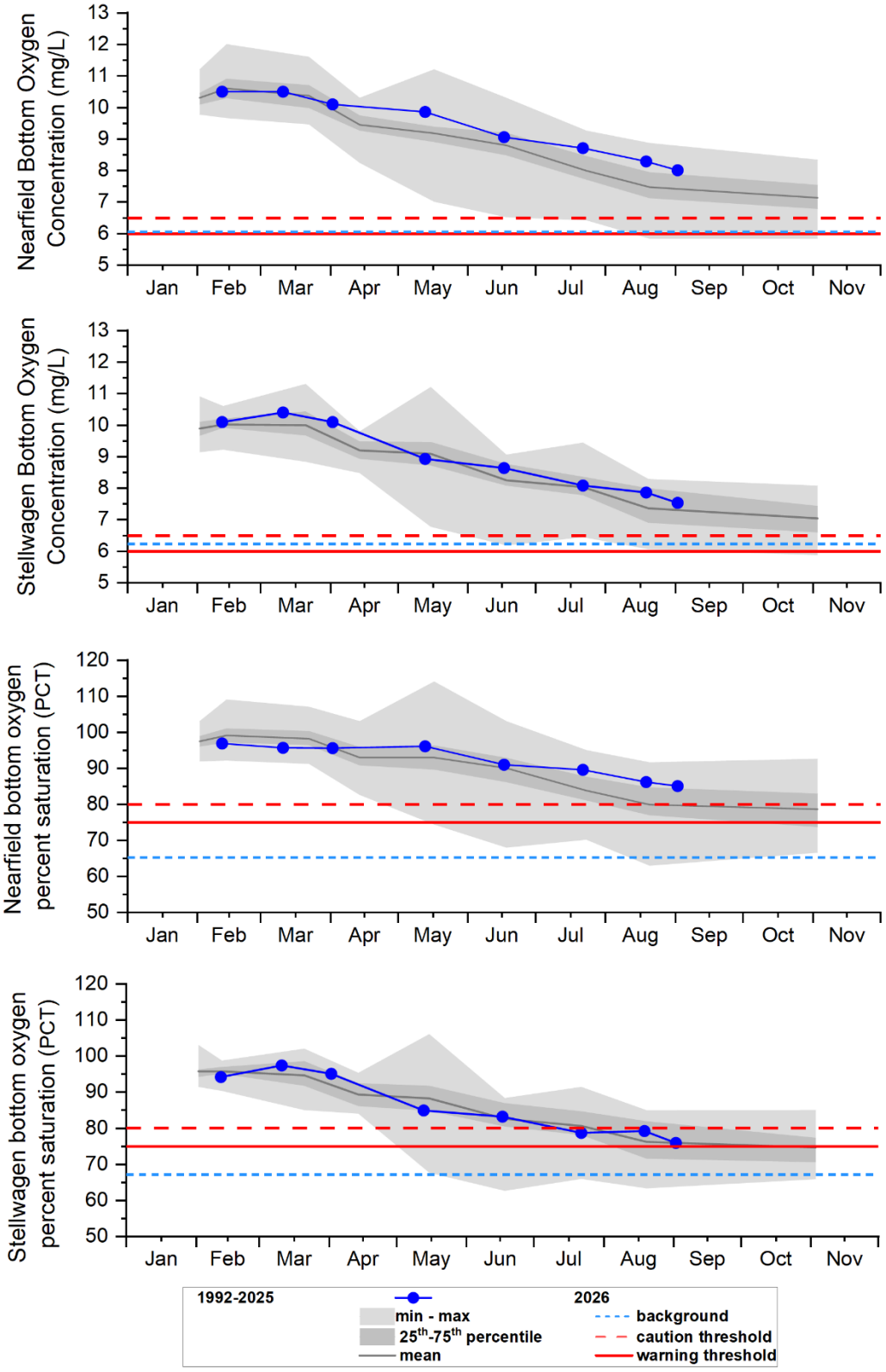


Figure 4. Bottom dissolved oxygen concentration and percent saturation in nearfield and Stellwagen Basin

Sediment redox potential discontinuity depth – August 2026

The thickness of the oxygenated layer in sediment is called the redox potential discontinuity (RPD) depth, which is an effective measure of benthic habitat quality. A diverse bottom-dwelling community includes organisms that mix water and oxygen down into the sediment. In an over-enriched environment, organic material deposited on the sediment surface can use up the available oxygen or smother the bottom-dwelling community. Such areas have a thin or nonexistent oxygenated layer.

Through 2019, MWRA monitored the RPD depth in sediments using sediment-profile images, cross-sections of the upper several centimeters of the sediment taken with a special mud-penetrating prism and camera. A caution level threshold was set at half the mean measured in the baseline period. Because sediments remained highly oxygenated, with annual RPDs usually deeper than the average measured during baseline monitoring, EPA approved MWRA's proposed modifications including ending monitoring of nearfield sediments using sediment-profile images[3].

While this change means RPD depth estimates from sediment-profile images are not available, MWRA continues to estimate the depth of sediment oxygenation from sediment samples collected for benthic invertebrate community analysis.

Observations from the benthic monitoring survey on August 3, 2026 confirmed that healthy levels of sediment oxygenation persist in nearfield sediments. The apparent redox potential discontinuity (aRPD, visually assessed RPD) was measurable at 9 of the 14 stations. The depth of the aRPD was detectable at nine stations: aRPD = 0.5 cm at FF04, FF12, NF14, NF20, and NF24; aRPD = 1.0 cm at NF10; aRPD = 1.5 cm at NF12; aRPD = 2.5 cm at NF22; and aRPD = 3.0 cm at NF21. No stations appeared to have anoxic surface sediments (i.e., black with an odor of hydrogen sulfide and few or no infaunal organisms); and presumably the oxic-to-suboxic sediment layer extended below the depth of grab penetration at stations where the aRPD was undetectable.

[3] https://www.mwra.com/sites/default/files/2023-11/20201113_amp.pdf