

Contingency Plan Quarterly Report on Ambient Monitoring Results Third Quarter 2017

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 July through September 2017. Some of these new results, for the nuisance alga *Alexandrium*, exceeded a Contingency Plan threshold. These represent the continuation of a bloom that started in June, as reported last quarter.

Previous Contingency Plan reports are available at:

<http://www.mwra.state.ma.us/harbor/html/archive.htm#cpq>.

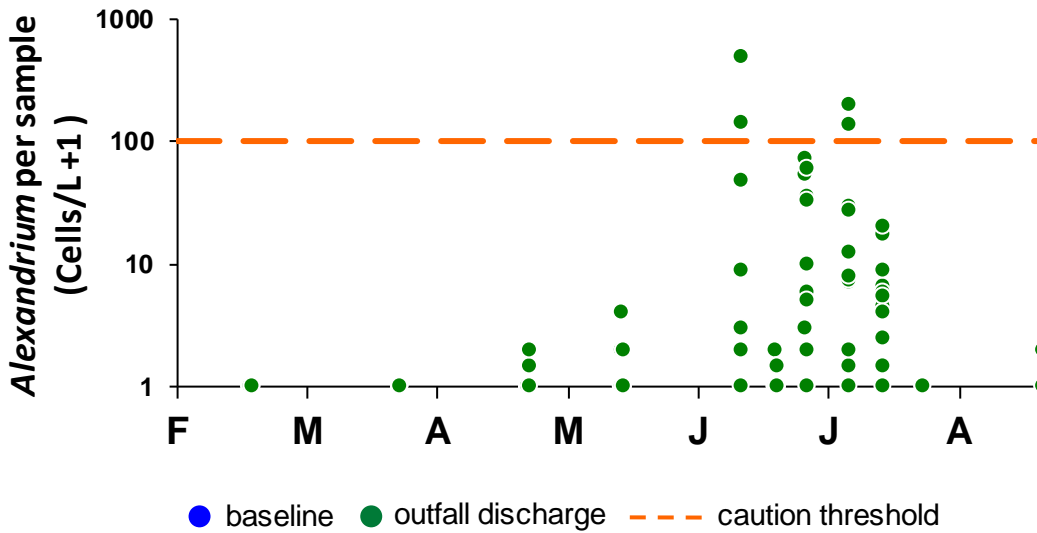
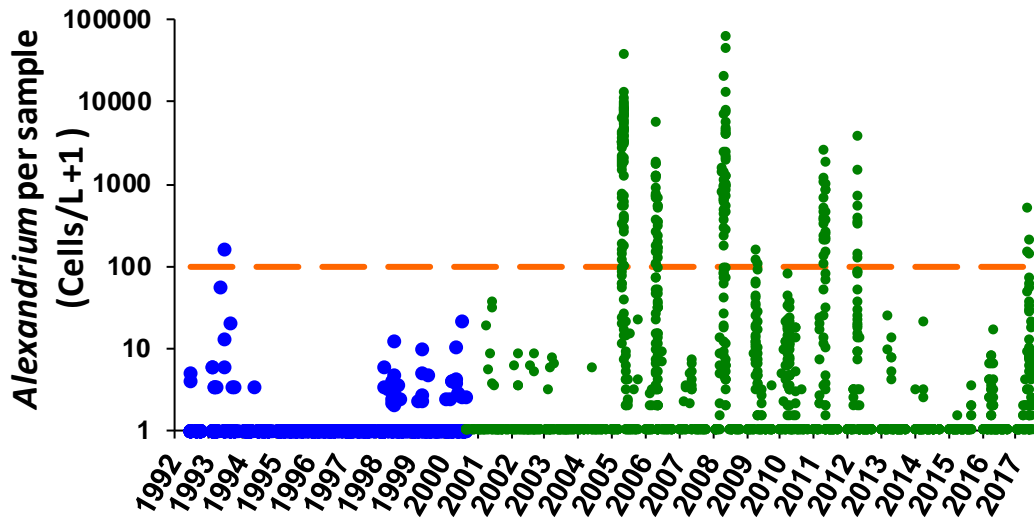
NUISANCE ALGAE

***ALEXANDRIUM* – July-August 2017 including two special, rapid-response surveys**

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

The contingency plan threshold exceedance for *Alexandrium*, reported last quarter, continued into the period covered by this report. The report for last quarter noted that preliminary results from June *Alexandrium* samples had triggered a caution level exceedance for this nuisance algae species, which activated a series of rapid-response *Alexandrium* surveys. This report includes the final, unchanged results from the previous quarter, results from two additional rapid-response surveys on July 8 and 16, and preliminary results from regular surveys on July 26 and August 23. By late July the *Alexandrium* bloom had subsided baywide. In preliminary results from subsequent, regular surveys on July 26 and August 23, *Alexandrium* was observed in a few of the samples at levels of 1 or 2 cells/L, but was absent from most of the samples. The very low cell counts from the end of July and August suggest that the *Alexandrium* bloom in Massachusetts Bay has ended for the year.

Consistent with the second quarter report, there continue to be no indications that the 2017 exceedance was related to the DITP outfall discharge. The additional results continue to support the conclusion that a portion of the coastal population of *Alexandrium* along the coast of Maine, New Hampshire and Massachusetts north of Cape Ann was transported by winds and currents into Massachusetts Bay. (See also notice http://www.mwra.com/harbor/pdf/20170620_amx.pdf.)



Alexandrium per-sample abundance (cells/liter). Data from last survey of July and the August survey are preliminary.

| | |
|---|------|
| Caution threshold | 100 |
| June – August 2017 | 199* |
| * Maximum of all samples collected July – August 2017 | |

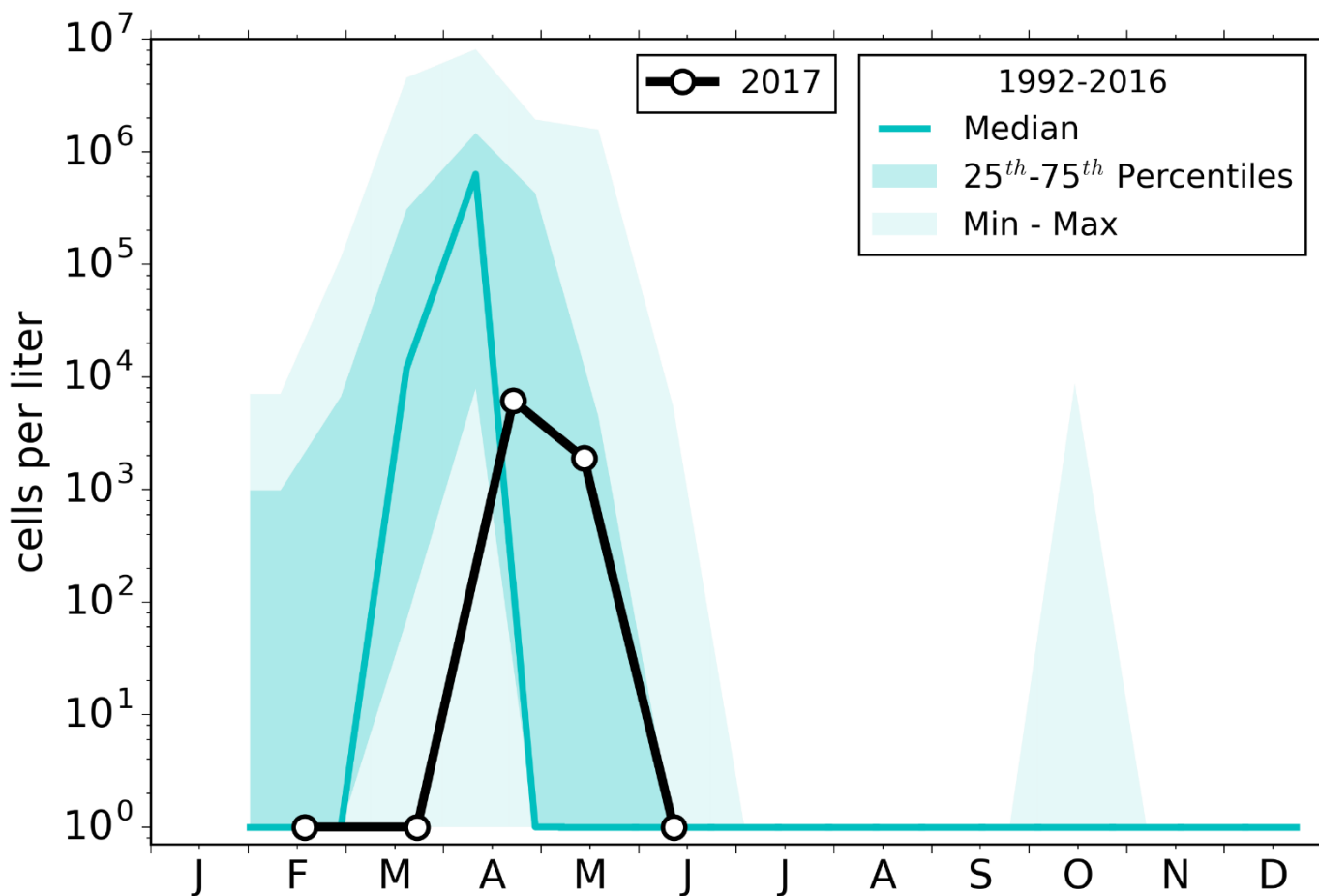
● baseline ● outfall discharge - - - caution threshold

PHAEOCYSTIS – Early Summer (May-June) 2017

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, did not result from 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. This quarter, results for May and June 2017 became available.

The figure below shows the 2017 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 for May and June 2017 was within the range of the historical seasonal pattern.



DISSOLVED OXYGEN (DO) – June - September 2017

Dissolved oxygen (DO) thresholds are tested on results from June-October when lower solubility due to warmer temperatures has the potential to reduce oxygen concentration and saturation. DO data from the October 2017 survey are not yet available. There were no threshold exceedances for these thresholds in summer 2017.

The current reporting period for [dissolved oxygen thresholds](#) is June-September 2017. During this period there were four regular surveys. The graphs below show the natural annual fluctuation of DO and percent saturation, which are typically lowest in early autumn. The 1992-2010 data shown are subsets of all data reflecting the modified design that began in 2011, i.e. nine surveys per year, and one station rather than four in Stellwagen Basin. This enables us to better compare the threshold results across years. The “background” represents low dissolved oxygen conditions observed during the baseline period; the threshold is not exceeded unless the value falls below the threshold and below background. Bottom-water oxygen percent saturation and concentration in both the nearfield and Stellwagen Basin remained above caution levels and well above background levels, thus there were no exceedances during this period.

