

Contingency Plan Report
Second Quarter 2014

Ambient Monitoring

MWRA gathers data near the discharge outfall location in Massachusetts Bay on various thresholds in the Contingency Plan related to its Deer Island outfall NPDES discharge permit. **This report shows** ambient monitoring **results** relevant to Contingency Plan thresholds **that became available in the April-June 2014 time period**. There were no Contingency Plan threshold exceedances in the results available in this time period.

NUISANCE ALGAE – February-April 2014

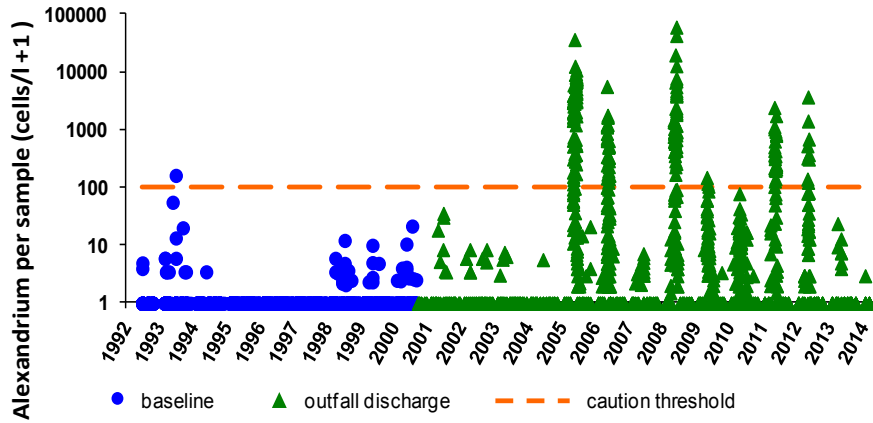
There were no exceedances of [nuisance algae thresholds](#) in the period covered by this report.

ALEXANDRIUM

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

So far in 2014, *Alexandrium* has been almost entirely absent from Massachusetts Bay. Final data have been received for MWRA water column monitoring surveys in February, March, and April, while draft results have been reported for surveys in May and June. In the May-June time period when *Alexandrium* has historically bloomed in Massachusetts Bay, preliminary data show that levels remained very low. The figure below shows *Alexandrium* in the nearfield since 1992. The bottom figure shows the same data but includes only final results for the dates covered by this report and does not include preliminary data from May and June. Note logarithmic scale for graphs.

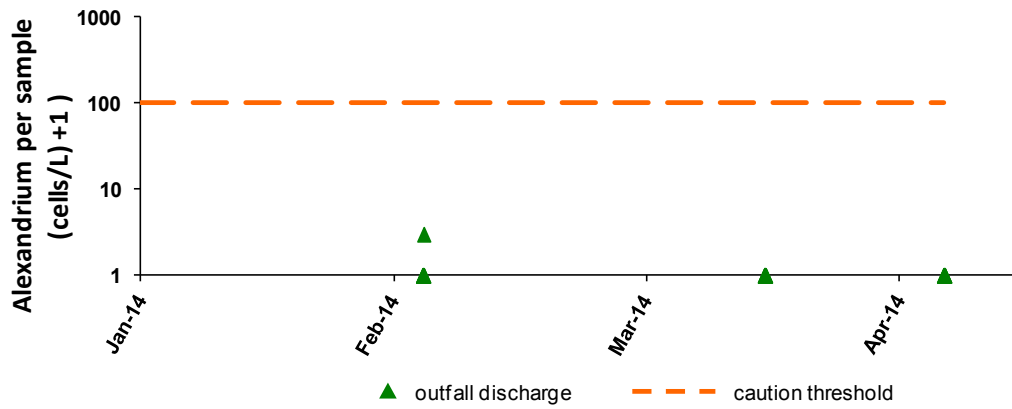
Alexandrium abundances from MWRA’s water quality monitoring surveys are consistent with the results of regional monitoring in 2014 for the paralytic shellfish poisoning (PSP) toxicity that *Alexandrium* causes. Shellfish beds in western Maine, coastal New Hampshire, and in Massachusetts north of Gloucester all developed toxicity in late May and early June, and were closed by state regulators. Moderately high counts of *Alexandrium* were observed in coastal and offshore waters north of Cape Ann at about the same time. Detectable PSP toxicity did not extend south of Cape Ann (Gloucester) into Massachusetts Bay, though, consistent with cell counts from MWRA’s monitoring. By late June, toxicity and cell counts were declining in North Shore shellfish and water samples.



February-June results for Alexandrium per-sample abundance (cells/liter)

Caution threshold	100
Spring 2014	2*

* maximum of DNA-probe samples collected between February 2014 and April 2014.



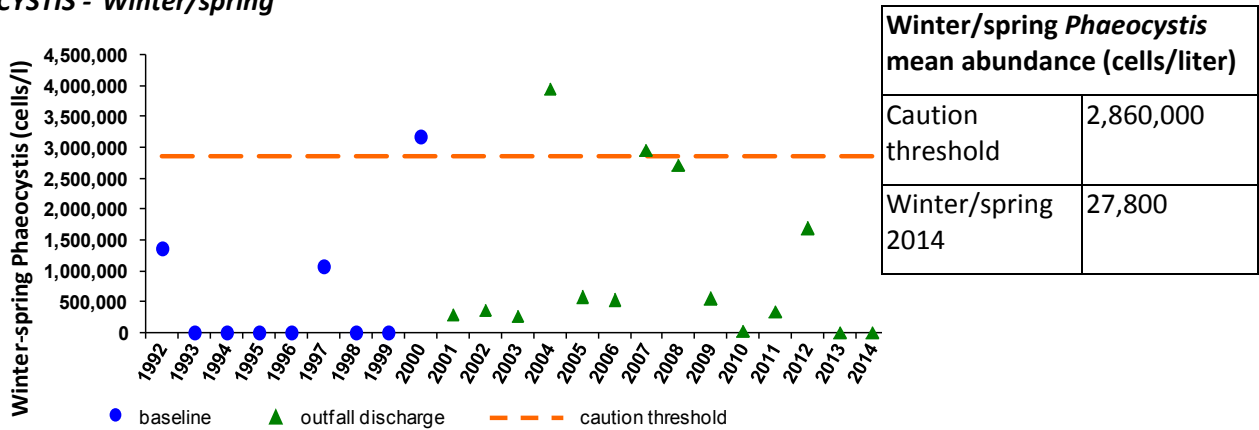
PHAEOCYSTIS and PSEUDONITZSCHIA

The nuisance algae *Phaeocystis* and *Pseudonitzschia* did not exceed the [nuisance algae thresholds](#) during winter/spring 2014 (February through April), which included three surveys.

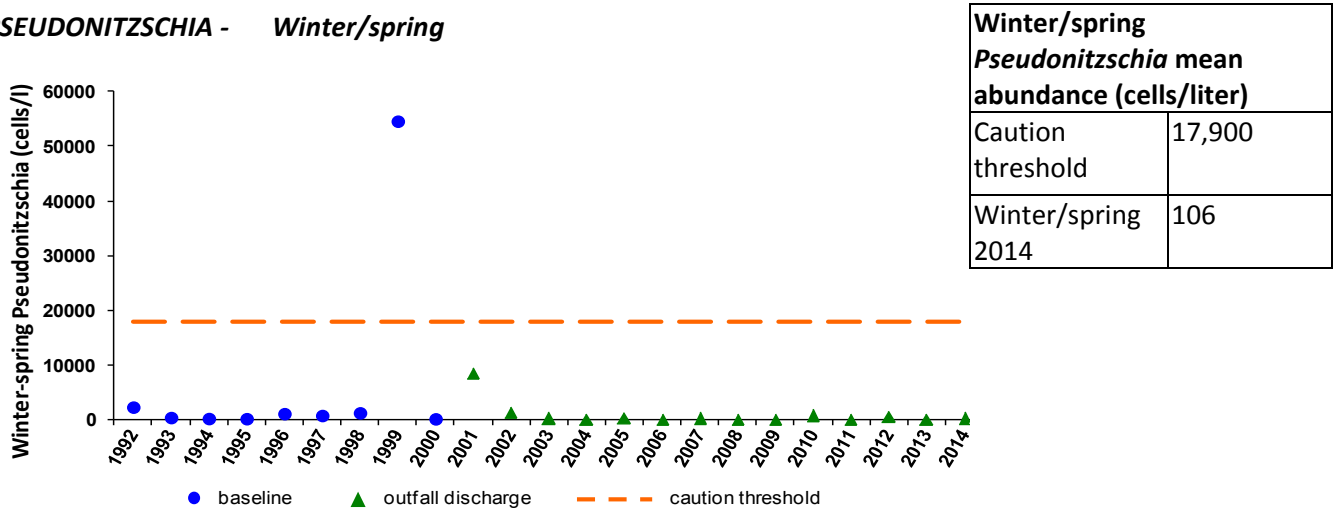
Unlike many recent years, there was no large spring bloom of *Phaeocystis pouchetii* in Massachusetts Bay. Average nearfield abundance was well below the threshold. Low abundances of *Pseudonitzschia* were observed in the nearfield in winter/spring 2014, same as in several other post-diversion years.

In the figures below, we compare *Phaeocystis* and *Pseudonitzschia* data to the nuisance algae thresholds for winter/spring. The graphs include data since the start of the monitoring program in 1992; however, the seasonal average values for 1992-2010 are calculated using a subset of all results reflecting the modified design that began in 2011, *i.e.* three winter/spring surveys. This enables us to better compare the threshold results across years. The previous reports are at <http://www.mwra.state.ma.us/harbor/html/archive2013.htm>.

PHAEOCYSTIS - Winter/spring



PSEUDONITZSCHIA - Winter/spring

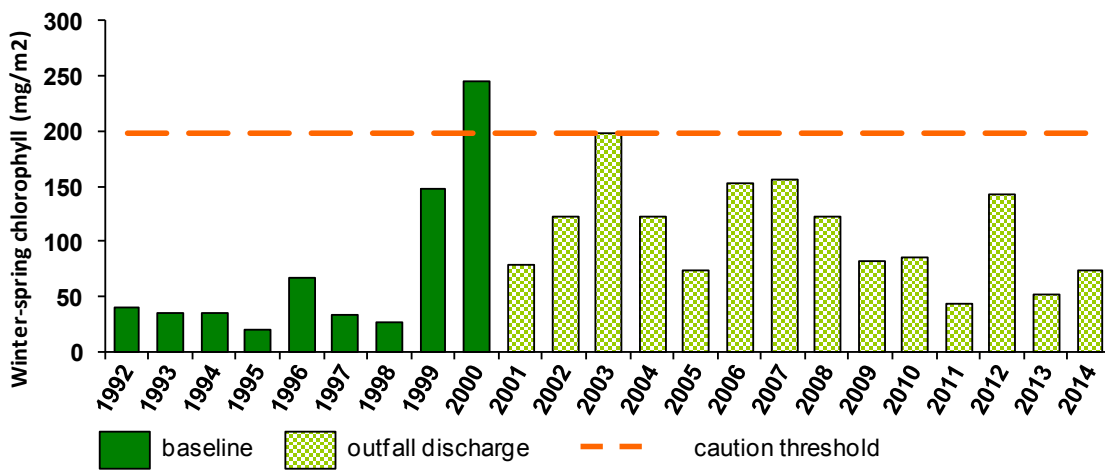


CHLOROPHYLL February- April 2014

There were no [chlorophyll threshold](#) exceedances in this period. The nearfield mean areal average chlorophyll in winter/spring 2014 (February-April) was 75.4 mg/m², well below the caution level threshold for winter/spring of 199 mg/m². The spring 2014 value is similar to several previous baseline and post-diversion years.

The figure compares chlorophyll data for winter/spring 2014 (February-April), which included three surveys, to the corresponding threshold. The graph includes data since the start of the monitoring program in 1992; however, the seasonal average values for 1992-2010 are calculated using a subset of all results reflecting the modified design that began in 2011, *i.e.* three winter/spring surveys. This enables us to better compare the threshold results across years. The previous reports are at <http://www.mwra.state.ma.us/harbor/html/archive2013.htm>.

Winter/spring



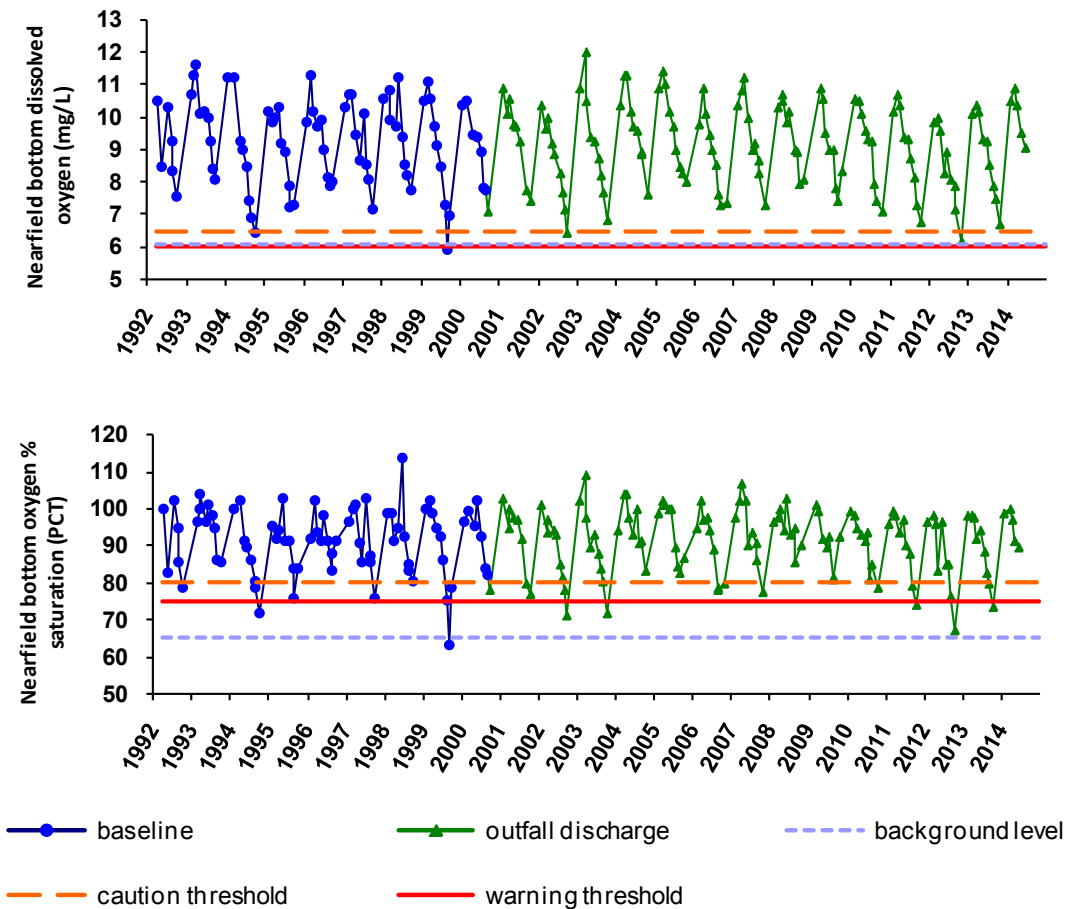
DISSOLVED OXYGEN – June 2014

Measurements of dissolved oxygen (DO) concentration in June 2014 did not fall below background levels and thus did not exceed thresholds.

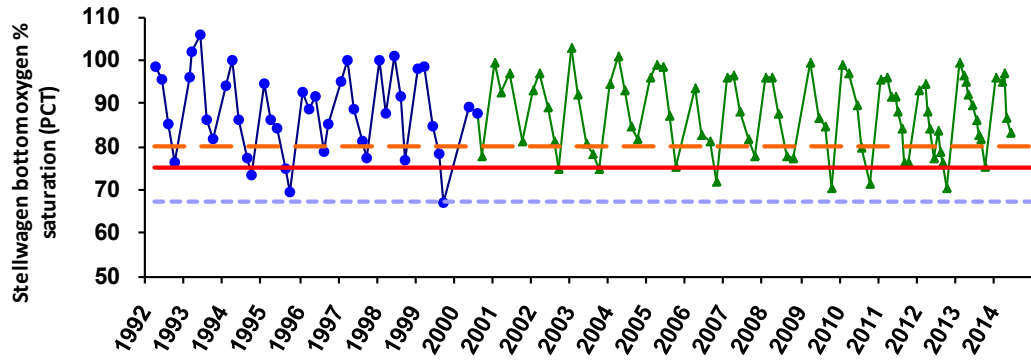
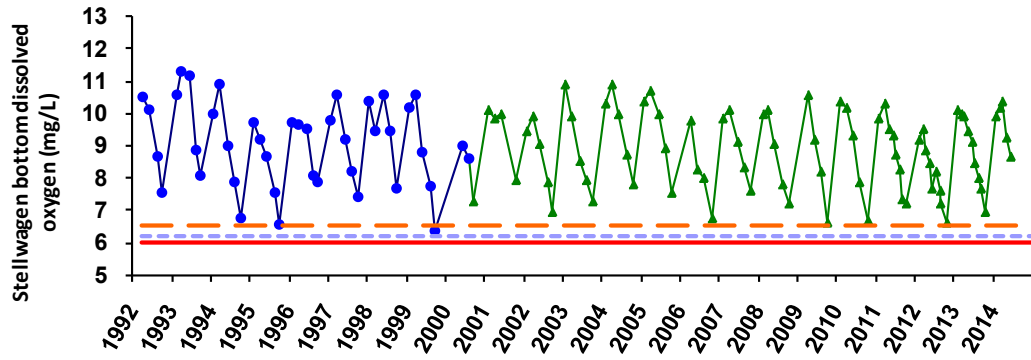
The current reporting period for [dissolved oxygen thresholds](#) is June 2014. During this period there was one survey. Oxygen levels were similar to those seen in most baseline years. The graphs below show the natural annual fluctuation of DO and percent saturation, which is typically lowest in early autumn. The 1992-2010 data are from the reduced set of sampling stations included in the modified study 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 previous reports are at <http://www.mwra.state.ma.us/harbor/html/archive2013.htm>.

Nearfield oxygen levels in June 2014 were high in near-bottom waters as is typical for June.

NEARFIELD



STELLWAGEN BASIN



- baseline
- ▲— outfall discharge
- background level
- caution threshold
- warning threshold