

Contingency Plan Report First Quarter 2016

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** for Contingency Plan thresholds **that became available January through March 2016**. All 2015 outfall monitoring data are now final, the last of which are reported here. Results in this report include nuisance algae abundances and contaminant chemistry concentrations from lobster and mussel tissue. There were no contingency plan threshold exceedances for the data in this report. No final 2016 data relevant to the Contingency Plan thresholds were available when this report was prepared, although draft *Alexandrium* results from February 2016 are mentioned below. Previous Contingency Plan reports are available at: <http://www.mwra.state.ma.us/harbor/html/contingency.htm>.

NUISANCE ALGAE – AUTUMN 2015

PHAEOCYSTIS and PSEUDONITZSCHIA

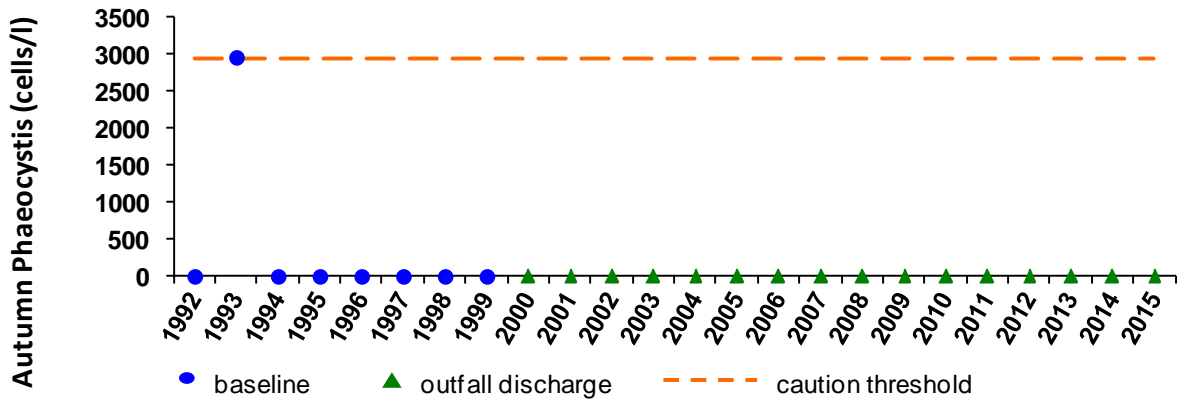
For both *Phaeocystis* and *Pseudonitzschia* [nuisance algae](#) species, mean seasonal abundances are compared against threshold values derived from the 95th percentile of seasonal baseline means. This report compares autumn 2015 seasonal means from surveys done in September and October against threshold values.

No cells of the nuisance alga *Phaeocystis* were observed in samples collected in autumn 2015, so there was no threshold exceedance for this species.

Pseudonitzschia was observed in one sample in September and in three samples in October out of a total of eight nearfield samples collected each month. Abundances of *Pseudonitzschia* ranged from 0 to 3,726 cells per liter, and the seasonal mean of 294 cells per liter was well below the threshold value of 27,500 cells per liter.

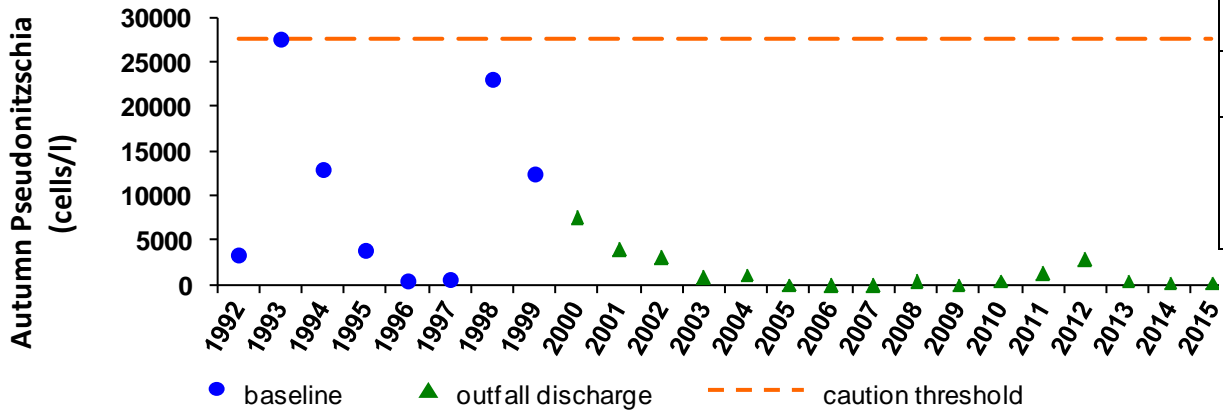
In the figures below, we compare *Phaeocystis* and *Pseudonitzschia* data to the nuisance algae thresholds for the autumn seasonal threshold. The graphs include data since the start of the monitoring program in 1992; however, the seasonal average values for 1992-2010 are calculated using a subset of all results reflecting the modified design that began in 2011, i.e. four summer surveys. This enables us to better compare the threshold results across years.

Phaeocystis – autumn 2015



Autumn <i>Phaeocystis</i> mean abundance (cells/liter)	
Caution threshold	2,960
Autumn 2015 seasonal mean	0

Pseudonitzschia – autumn 2015



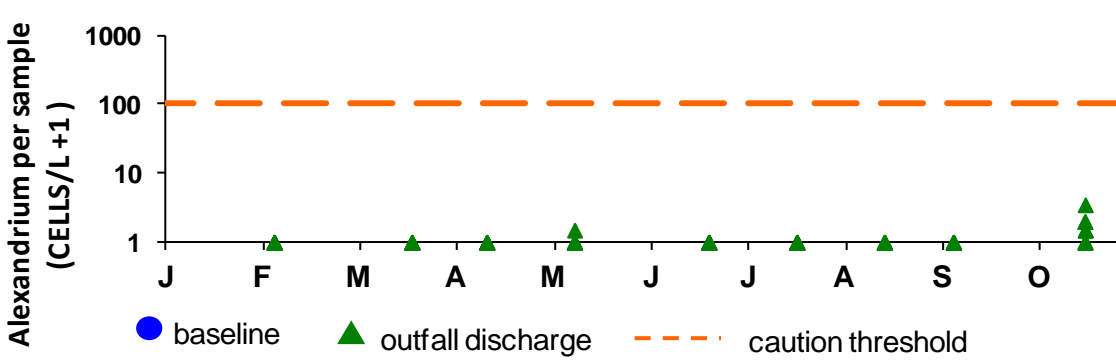
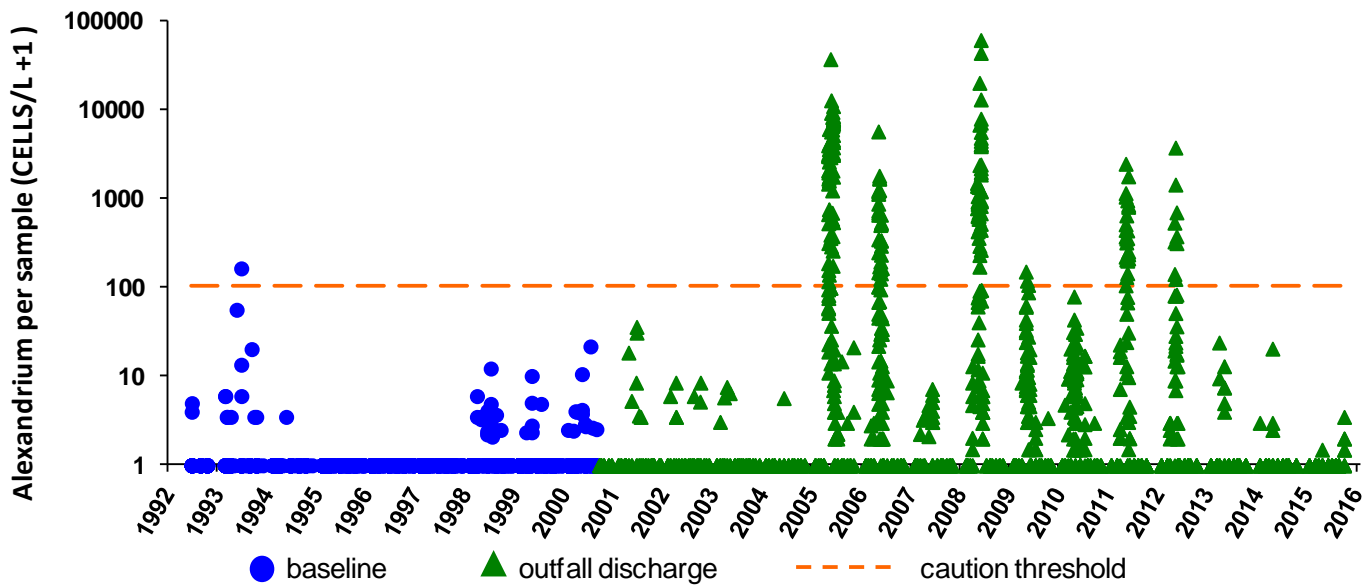
Autumn <i>Pseudonitzschia</i> mean abundance (cells/liter)	
Caution threshold	27,500
Autumn 2015 seasonal mean	294

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.

For most of 2015, *Alexandrium* was almost entirely absent from Massachusetts Bay. Previously shown as preliminary results in the 2015 3rd quarter report, final results confirm that in autumn of 2015, *Alexandrium* cells were found in October only at a maximum of 2.5 cells per liter, well below the threshold limit of 100 cells per liter.

In the figures below, we compare *Alexandrium* data to the threshold for each sample in September 2015. The first includes data since the start of the monitoring program in 1992. To better display recent values, the second figure shows data for 2015 only (Note logarithmic scale for each graph). Draft data from the first water column survey in February 2016 indicate that *Alexandrium* was absent from Mass. Bay (this is normal).



October <i>Alexandrium</i> per-sample abundance (cells/liter)	
Caution threshold	100
October 2015	2.5*
* maximum of all samples collected October 12, 2015	

FISH AND SHELLFISH TISSUE CONTAMINANTS – LOBSTER AND MUSSELS 2015

The fish and shellfish tissue contaminant thresholds are designed to identify unexpected effects on marine life. Levels of contaminants in tissues are measured every third year. There were no exceedances of tissue contamination thresholds in 2015.

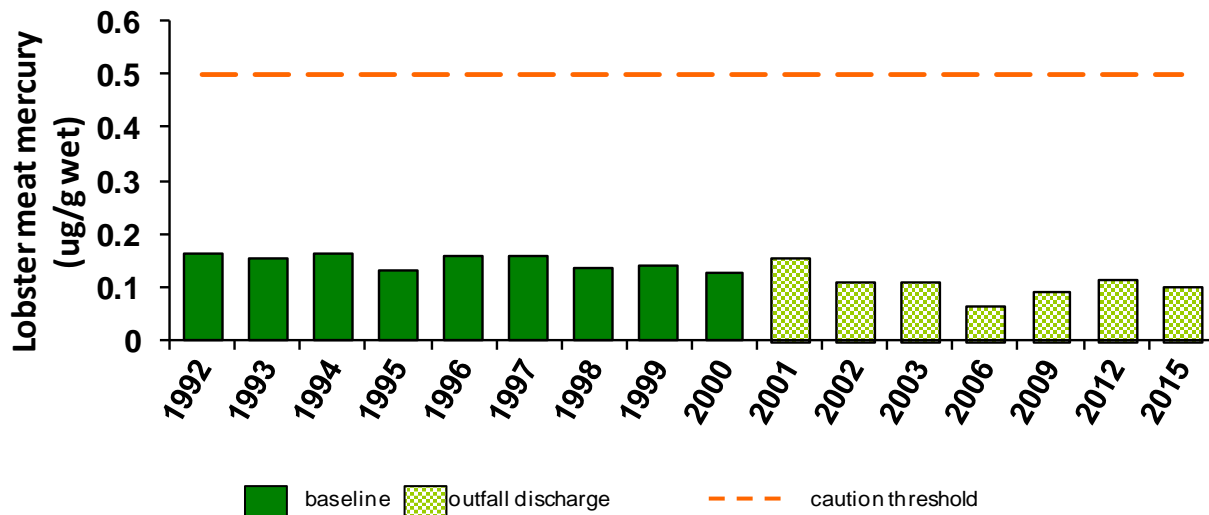
Contaminants are measured in three species of seafood: flounder, lobster, and mussels. For mercury and PCBs in flounder, lobster, and mussels, caution and warning thresholds are set at 50% and 80% of the FDA action limits. The threshold for lead in mussels is based on EPA risk assessment of lead in drinking water. Other fish/shellfish tissue contamination thresholds are based on change from baseline conditions at the outfall site.

Data available this quarter include results of tissue chemistry analyses in lobsters and mussels from the outfall site.

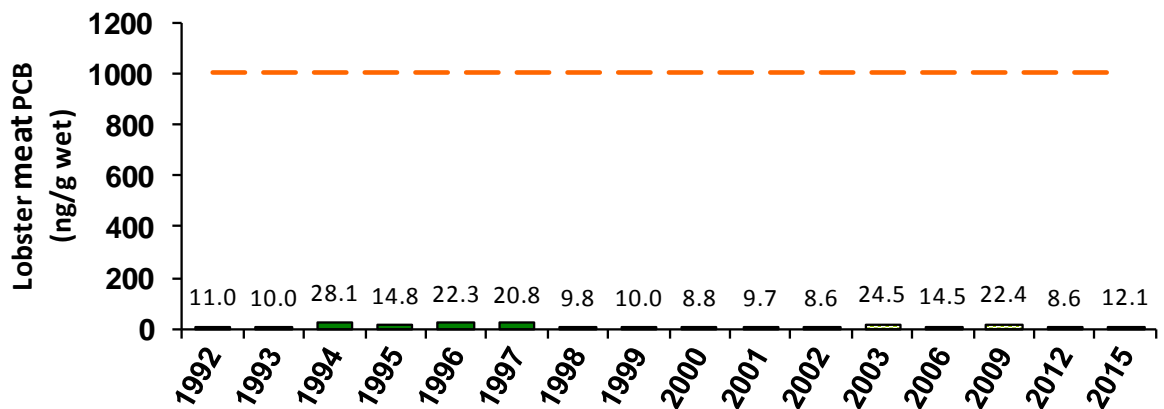
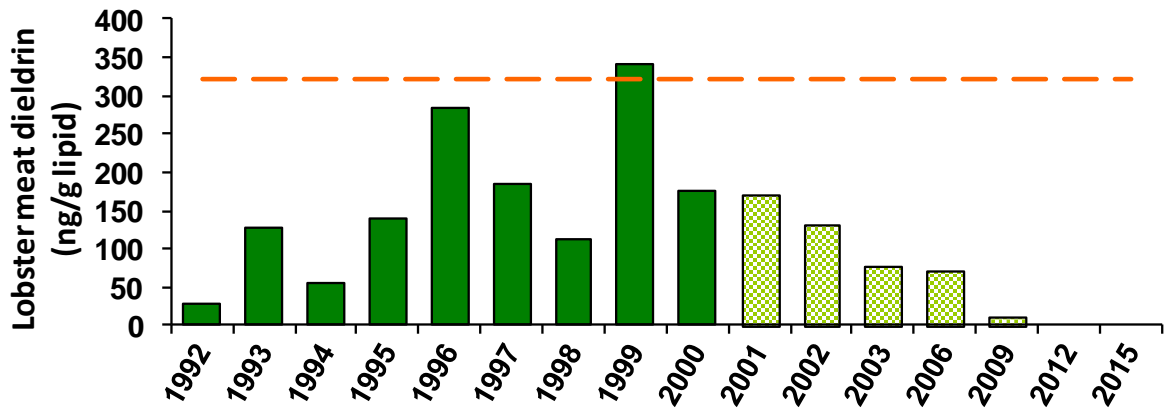
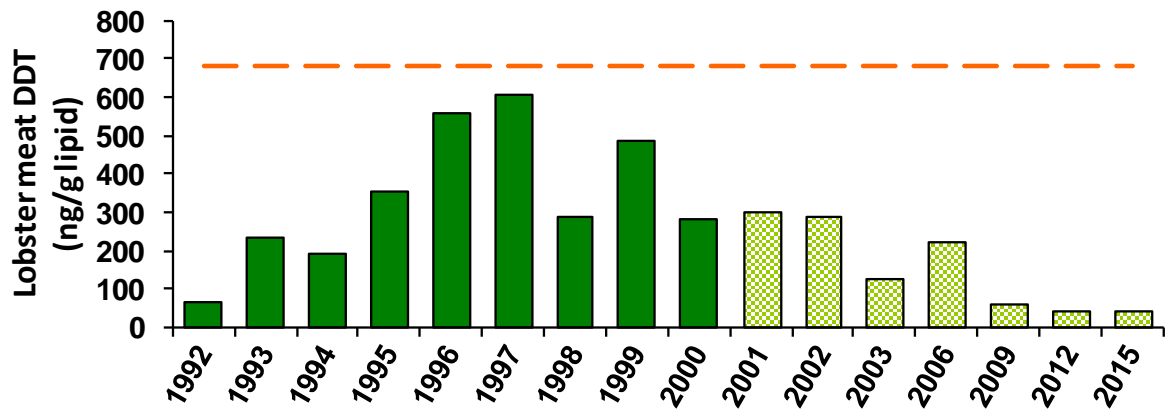
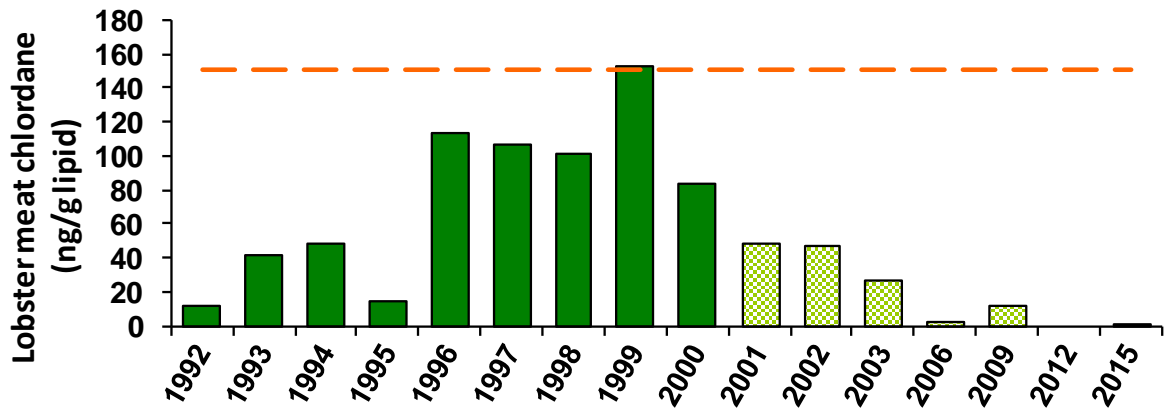
LOBSTER

Lobsters were sampled near the Mass. Bay outfall site in October 2015. Contaminant mean concentrations reported are from three composites of lobster meat (seven lobsters for each composite). Mean concentrations of all contaminants remain low and well below threshold levels. Lobster meat mercury concentrations remained low and similar to other years. Chlordane was lower than measured in all prior years but 2012. DDTs were lower than measured in all previous years. Dieldrin was not detected as was the case for 2012. Lobster meat PCBs were slightly below the arithmetic mean for all years where it was measured.

Mercury



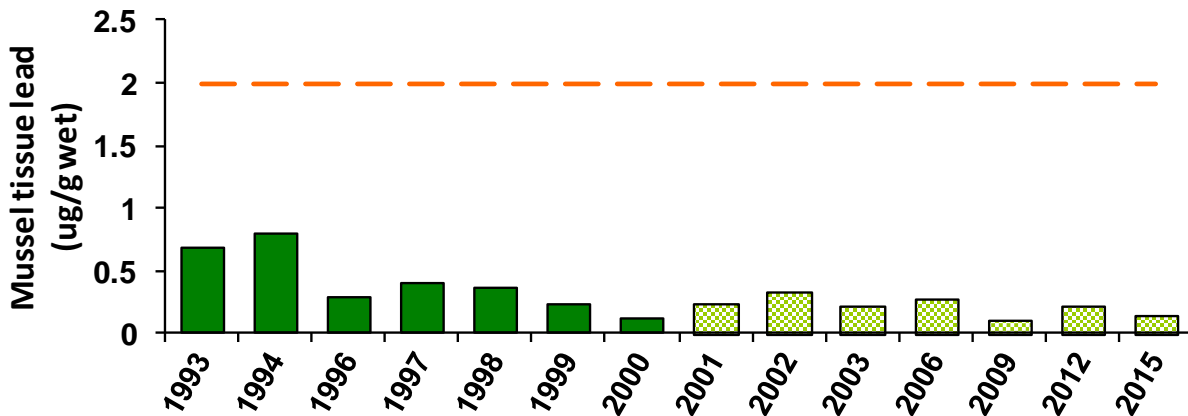
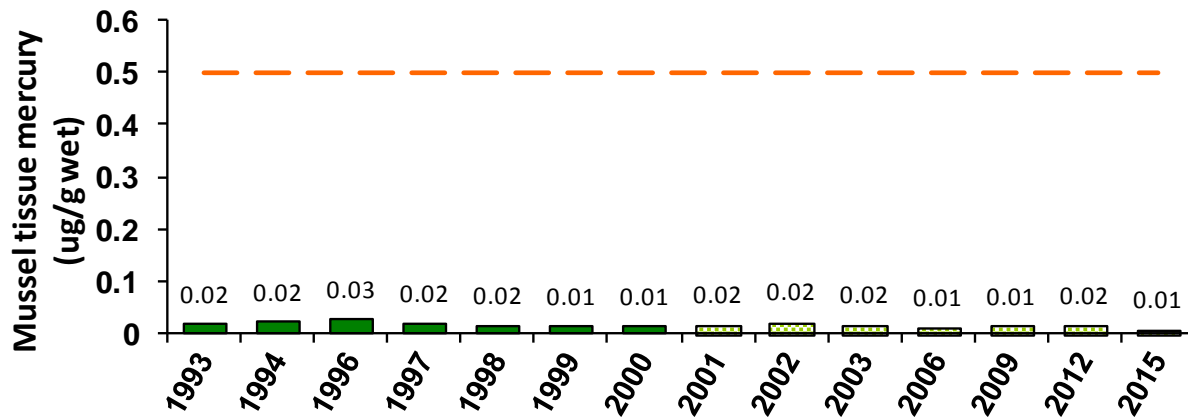
Organic contaminants



MUSSELS

Mussels were collected in August 2015 after a 60-day deployment in arrays near the Mass. Bay outfall site. Contaminant mean concentrations are reported from analysis of 8 composites of mussel soft tissue (25 mussels in each composite). Concentrations of all contaminants reported remain very low and well below threshold levels. Mussel mercury and lead concentrations remained low and similar to other years. Chlordane and DDTs were lower than measured in all previous years. Dieldrin was not detected as was the case for 2009 and 2012. Mussel PAHs were lower than all other post-discharge years except for 2012.

Metals lead and mercury



Organic contaminants

