

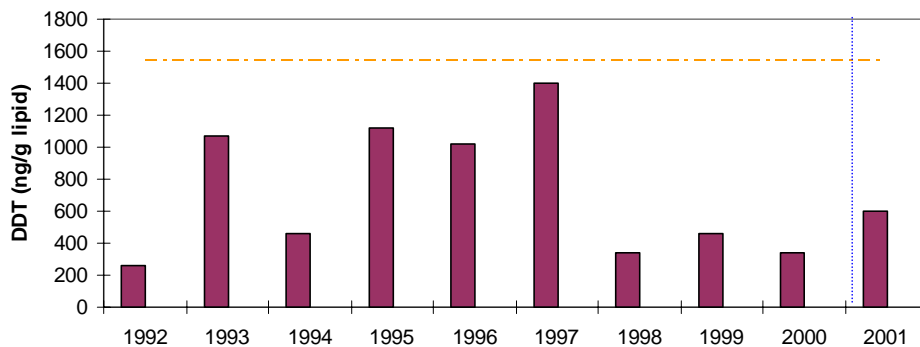
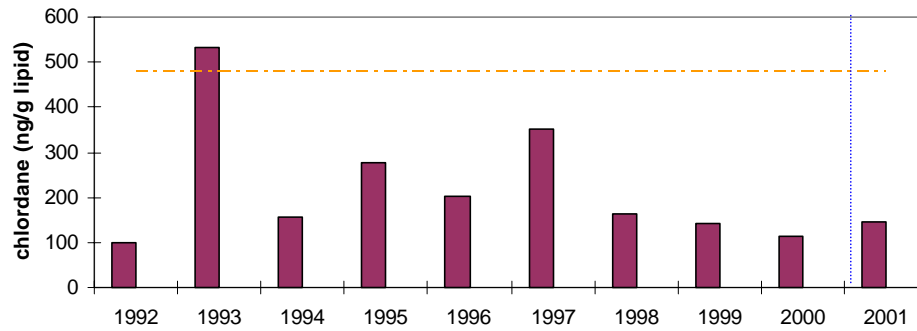
Massachusetts Water Resources Authority Contingency Plan Report on Ambient Monitoring Third Quarter 2001

MWRA gathers data from the outfall location in Massachusetts Bay on various thresholds outlined in its Deer Island outfall discharge permit. This report shows relevant ambient monitoring results that became available in the previous quarter.

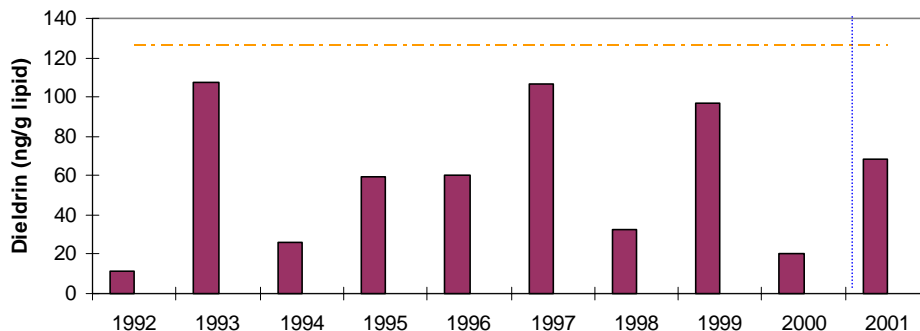
FISH AND SHELLFISH TISSUE CONTAMINATION

The fish tissue contamination thresholds are designed to identify unexpected effects on marine life. Contaminants are measured in three species of seafood: flounder, lobster, and mussels. FDA Action Limits are available for mercury and PCBs in flounder, lobster, and mussels; for these measurements, caution and warning thresholds are set at 50% and 80% of the FDA 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.

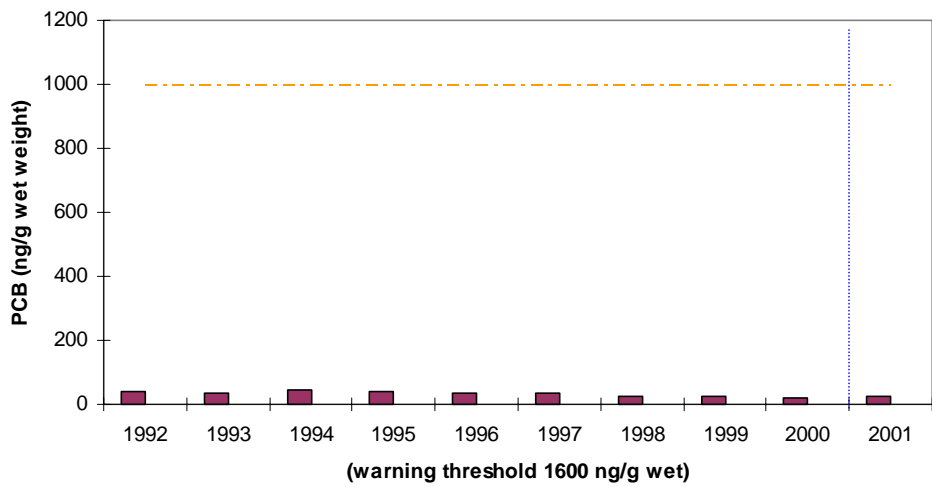
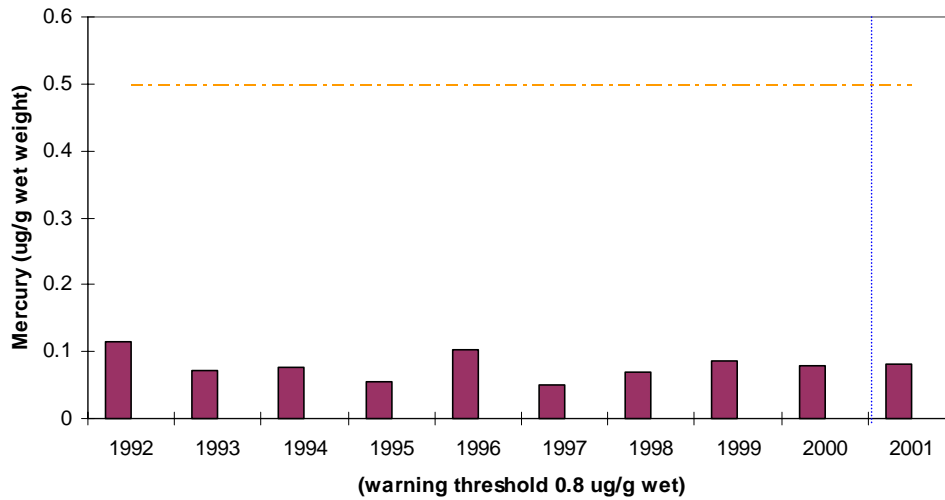
Post-discharge data available so far include tissue contamination in winter flounder, which were sampled in April 2001.



tissue contaminant level
 caution level
 outfall start-up



Flounder tissue contaminant levels (continued on next page)

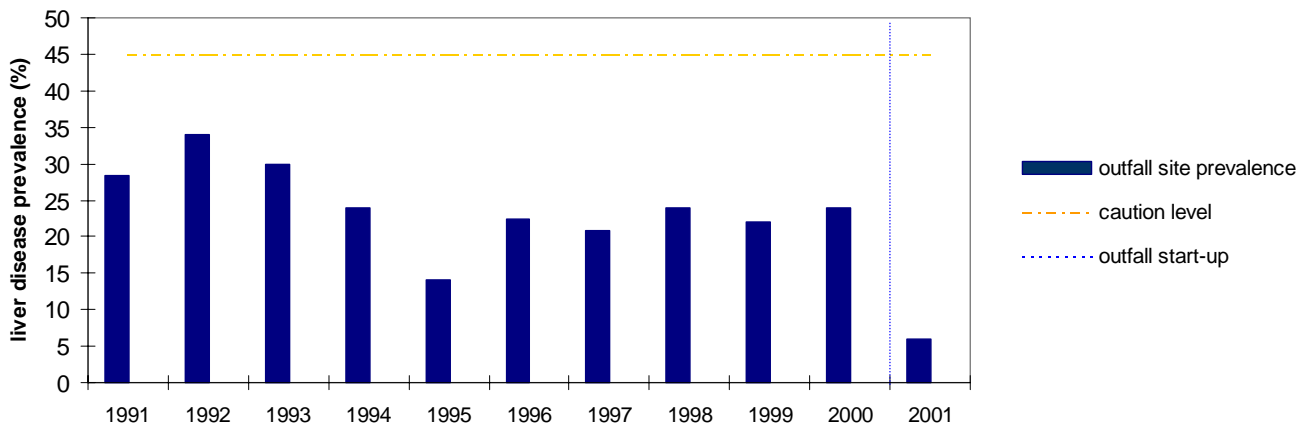


- tissue contaminant level
- caution level
- outfall start-up

Flounder tissue contaminant levels (continued)

FLOUNDER LIVER DISEASE

Another measure of the effects of pollution is the incidence of disease in winter flounder. The flounder liver disease graph is based on data from Boston Harbor, where flounder liver disease rates were historically quite high but which dropped considerably during the 1980s. However, if the prevalence of an early-stage liver disease at the outfall site were to approach the levels seen in Boston Harbor during the baseline monitoring period (1991-2000), a caution threshold would be exceeded. The first annual sample of post-discharge monitoring showed that the prevalence of liver disease was low at the outfall site and did not exceed the threshold.



DISSOLVED OXYGEN

The concentration of dissolved oxygen (DO) in the water indicates the balance between production by algae and consumption by aquatic organisms and the decomposition of organic matter. Excessive organic matter may result in oxygen depletion, which may in turn adversely affect the aquatic ecosystem. The amount of oxygen that the water can hold is related to water temperature, salinity, and pressure; thus the percent saturation of dissolved oxygen is a measure that takes these factors into account. Monitoring locations for which there are DO thresholds include the "nearfield", the group of stations within about three miles from the outfall, and "Stellwagen Basin", a deep area nine miles east of the outfall. Thresholds apply to the part of the year when the water column is stratified, *i.e.* from June - October. The current reporting period for dissolved oxygen thresholds is June 2001. During this period there was one combined nearfield/farfield survey.

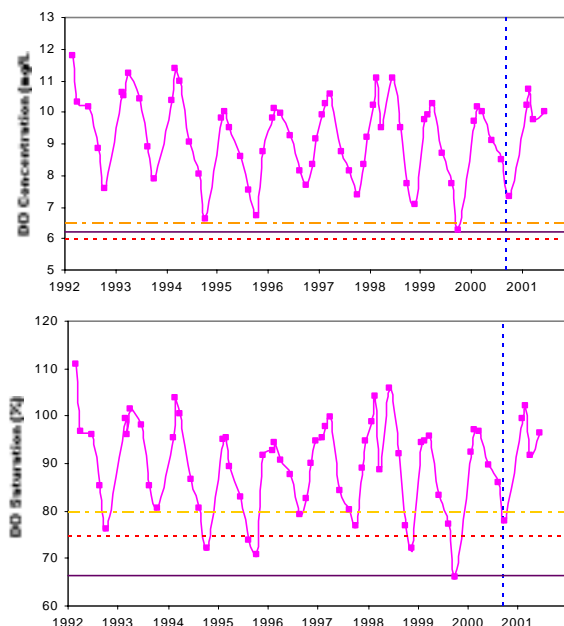
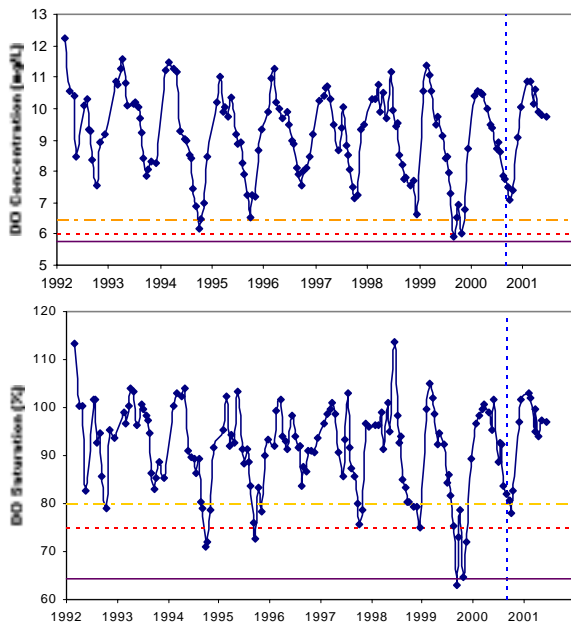
Dissolved oxygen concentration and percent saturation naturally fall below the numerical thresholds on occasion during the baseline period. The state standard, on which the thresholds were based, allows an exception if background conditions are lower, as is the case here. The thresholds have accordingly been modified (see www.mwra.state.ma.us/harbor/html/20010601cpr.pdf) to mirror the state standard, and a threshold is not exceeded unless the value falls below the threshold and below background.

Parameter	Location	Caution	Warning	Background
Dissolved Oxygen (mg/L)	Nearfield	6.5	6.0	5.75
	Stellwagen Basin	6.5	6.0	6.2
Percent Oxygen Saturation (%)	Nearfield	80	75	64.3
	Stellwagen Basin	80	75	66.3

Measurements of dissolved oxygen (DO) concentration and percent saturation in June 2001 did not exceed thresholds. The graphs below include data since the start of the monitoring program in 1992, and reflect the natural fluctuation of DO and percent saturation, which is typically lowest in early fall.

NEARFIELD

STELLWAGEN BASIN



- - - - - caution level
 _____ background level
 ◆ nearfield survey mean

- - - - - warning level
 outfall start-up
 ■ Stellwagen Basin survey mean

NUISANCE ALGAE

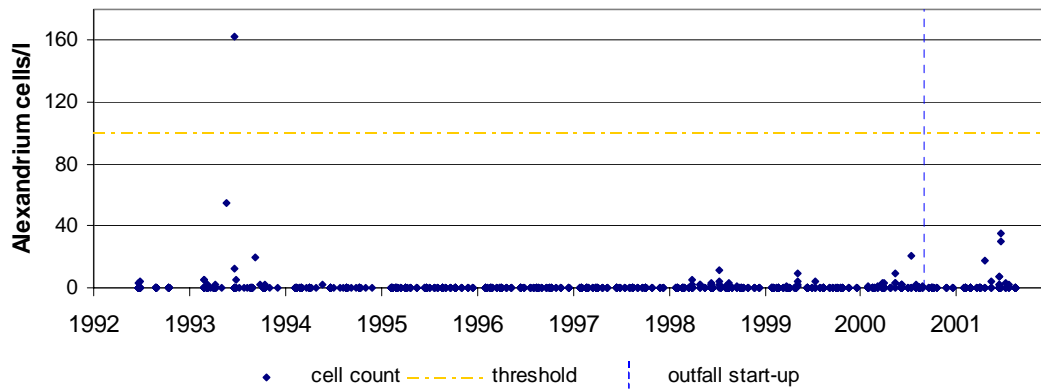
Nuisance algal blooms are less predictable than the normal, beneficial algal blooms which produce food and oxygen; some nuisance blooms did occur during the baseline monitoring period. There is public concern that effluent nutrients could feed a red tide bloom in the vicinity of the new outfall, or otherwise increase the abundance of nuisance algae. Therefore, the Contingency Plan has thresholds for abundance of *Alexandrium*, *Phaeocystis pouchetii*, and *Pseudonitzschia*, which are triggered if the abundance of any of these becomes unusually high. The data available for threshold reporting this quarter include per-sample results for *Alexandrium* in May and June. (The thresholds for *Phaeocystis pouchetii* and *Pseudonitzschia* are seasonal thresholds, and not all data for the summer season are yet available.)

ALEXANDRIUM

No samples exceeded the threshold of 100 cells/liter during the present reporting period (early summer). *Alexandrium tamarensis* typically may bloom during April to June and can cause paralytic shellfish poisoning, known as PSP or red tide; it has been periodically found in Massachusetts since the 1970s. Toxicity is generally not found in shellfish until much higher cell counts are seen in the overlying waters. In the early summer, historically the time of highest *Alexandrium* counts, *Alexandrium* cells (*Alexandrium tamarensis* plus unidentified *Alexandrium* spp.) were observed in a few samples.

Autumn <i>Alexandrium</i> per-sample abundance (cells/l)	
caution threshold	100
May-June 2001*	35

* maximum of all samples collected between May 1, 2001 and June 30, 2001.



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