



MASSACHUSETTS WATER RESOURCES AUTHORITY
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November 13, 2015

Ms. Susan Studlien
Office of Environmental Stewardship
U.S. EPA Region I
5 Post Office Square, Suite 100
Mail code OES04-5
Boston, MA 02109-3912

Mr. David Ferris
Division of Wastewater Management
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

Re: Massachusetts Water Resources Authority, Permit Number MA0103284
Notification Pursuant to Part I.8. Contingency Plan: *Phaeocystis*

Dear Ms. Studlien and Mr. Ferris:

One of the nuisance algae that the Massachusetts Water Resources Authority ("MWRA") monitors in its outfall ambient monitoring program is *Phaeocystis pouchetii*. Reporting on seasonal abundances of *Phaeocystis* in the outfall nearfield area is part of the Contingency Plan.¹ MWRA has received *Phaeocystis* results from samples collected through August 18, 2015. On Monday, November 9, MWRA completed QA review of summer plankton data (samples collected between May 1 and August 31, 2015) and calculated the average nearfield summer abundance of *Phaeocystis* to compare with the Contingency Plan threshold.

One of the eight plankton samples collected in the nearfield on May 11, 2015 contained *Phaeocystis*, with an abundance of about 13,000 cells per liter in a midwater sample. It was not present in other nearfield samples from that survey. Additionally, *Phaeocystis* was present in five of twelve samples collected in the farfield, both north and south of the vicinity of MWRA's outfall. *Phaeocystis* was not observed in samples collected in June, July or August 2015.

This result corresponds to a calculated nearfield summer seasonal mean for May through August surveys of 408 cells/L. This is above the Caution Level threshold of 357 cells/L in summer samples, which triggers a notification under the Contingency Plan. This letter constitutes the notification for the threshold exceedance.

¹ Massachusetts Water Resources Authority Contingency Plan Revision 1. 2001. Report 2001-ms-071.
<http://www.mwra.state.ma.us/harbor/enquad/trlist.html>.

Parameter	Specific Parameter	Baseline	Caution Level Threshold	Warning Level Threshold	2015 Results
<i>Phaeocystis pouchetii</i>	Winter/spring	470,000 cells/L	2,020,000 cells/L	None	13,800 cells/L
	Summer	79 cells/L	357 cells/L		408 cells/L Caution Level Exceedance

No adverse aesthetic or other impacts were observed from this year's very small *Phaeocystis* bloom. Figure 1 shows that while the absolute levels were low in comparison to many blooms, the temporal pattern was relatively typical, with the organism first detected in February, and peaking in abundance in March, although at levels lower than observed in many years. Lower nearfield abundances were observed during the April and May surveys. Figure 2 shows the winter-spring seasonal means, and Figure 3 shows the summer seasonal means, plotted against the corresponding thresholds. There is no obvious association between the 2015 bloom and MWRA's outfall, as the cells were observed throughout the region.

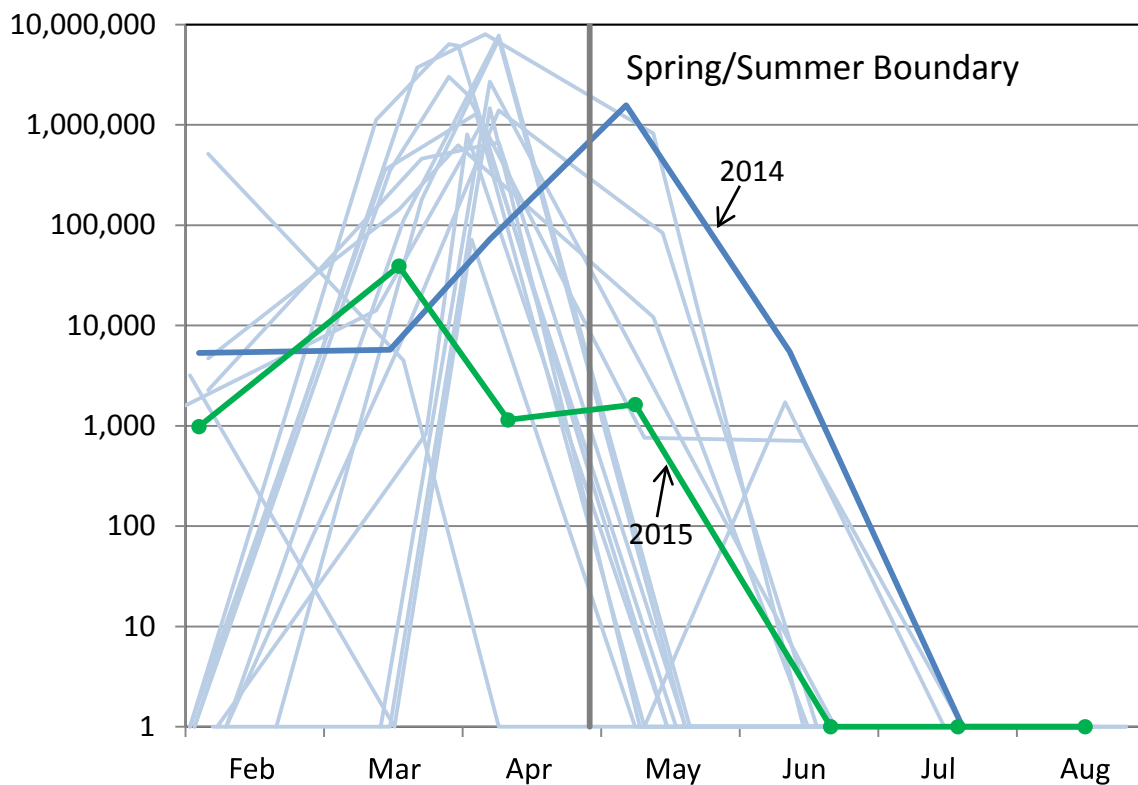


Figure 1. Patterns of survey mean *Phaeocystis* abundances (cells/liter) in the nearfield, 1992-2013 (light blue lines) 2014 (thick blue line) and 2015 (green symbols and line).

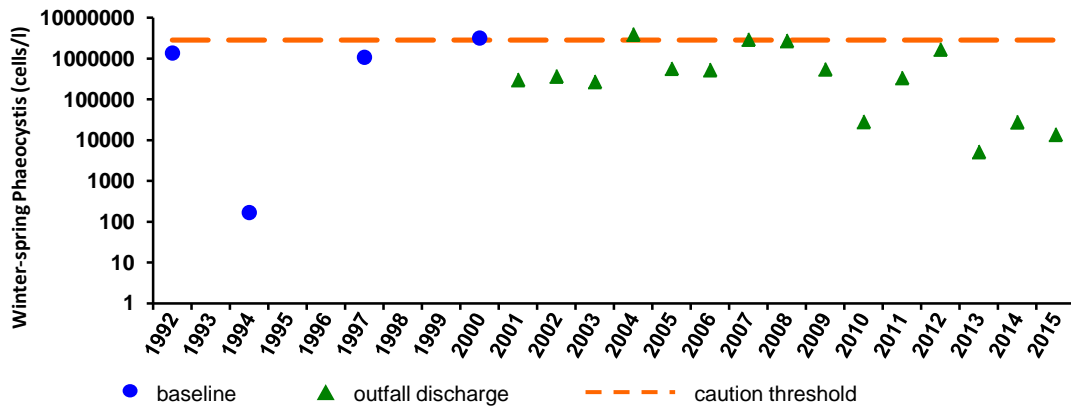


Figure 2. Winter-spring nearfield seasonal mean *Phaeocystis* counts 1992-2015 (note logarithmic scale).

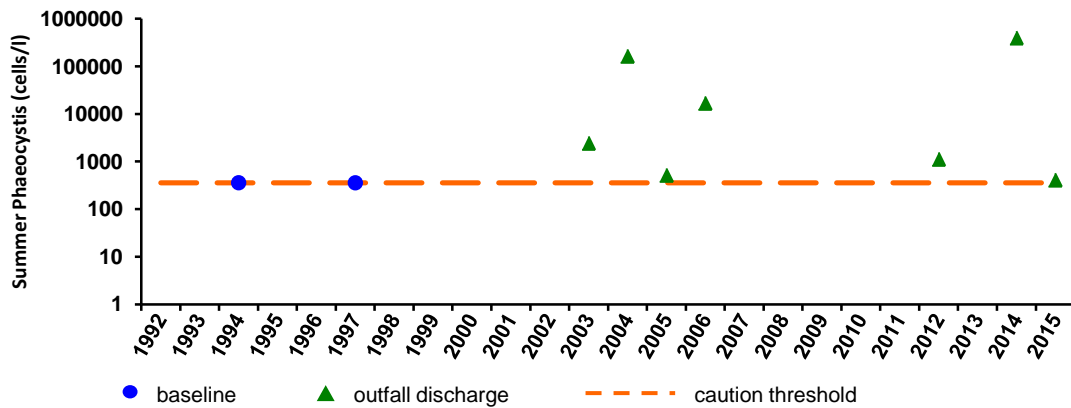


Figure 3. Summer nearfield seasonal mean *Phaeocystis* counts 1992-2015 (note logarithmic scale).

Phaeocystis was only rarely observed after May 1 in baseline years during which it bloomed, which accounts for the extremely low May-August threshold of 357 cells per liter. However, cells were observed in May or June samples every year from 2002² through 2006, again in 2012, 2014, and this year (2015).

MWRA evaluated possible causes for the apparent increased occurrence of *Phaeocystis* in summer samples in the water column annual report for 2004³, and has continued its evaluation of the blooms of *Phaeocystis* in Massachusetts Bay since then. More recent evaluations by MWRA's project team of the biology of *Phaeocystis* in the Massachusetts Bay system were discussed at the September 23, 2014 meeting of the Outfall Monitoring Science Advisory Panel (OMSAP). A manuscript incorporating those evaluations (among other work) has recently been accepted for publication⁴. These evaluations, with which OMSAP has concurred, have uniformly failed to find evidence MWRA's discharge substantially contributes to the blooms.

Similarly, while the evaluation of the relatively low abundances of *Phaeocystis pouchetii* observed in 2015 is just beginning, all indications are that MWRA's discharge played no role.

Threshold revision recommendations. At the last meeting of EPA and DEP's Outfall Monitoring Science Advisory Panel (September 23, 2014), OMSAP members requested that MWRA review its data for *Phaeocystis pouchetii* abundance and make recommendations for possible changes to the Contingency Plan thresholds for this species that might reduce the frequency of threshold exceedances, as the observed blooms do not appear to be influenced by MWRA's discharge. MWRA has conducted that evaluation, and anticipates discussing the results at the next OMSAP meeting.

If you have questions or need additional information, please feel free to call Dr. Betsy Reilley at (617) 788 - 4940.

Sincerely,

Michael J. Hornbrook
Chief Operating Officer

² *Phaeocystis* was observed during a survey on May 1, 2002 and resulted in a threshold exceedance that year, reported at <http://www.mwra.state.ma.us/harbor/pdf/20021209amx.pdf>. Since the survey during which it was observed was dropped from the Ambient Monitoring plan, its data no longer appear in threshold plots like Figure 3.

³ See section 3.4.7 and Appendix D of Libby PS, Geyer WR, Keller AA, Mansfield AD, Turner JT, Borkman D, Oviatt CA. 2006. **2004 Annual Water Column Monitoring Report**. Boston: Massachusetts Water Resources Authority. Report 2006-15. 177 p.

⁴ Borkman DG, Libby PS, Mickelson MJ, Turner JT, Jiang M. 2015. Variability of winter-spring bloom *Phaeocystis pouchetii* abundance in Massachusetts Bay. *Estuaries and Coasts*. Accepted for publication manuscript #ESCO-D-14-00302R1.

Cc:

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