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June 10, 2011

Mr. Stephen Perkins
U.S. Environmental Protection Agency
Water Enforcement
OES4-SMR
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Ms. Ann Lowery
Bureau of Resource Protection
Department of Environmental Protection
1 Winter Street
Boston, MA 02108

RE: Massachusetts Water Resources Authority
Permit Number MA 0103284
MWRA Contingency Plan Threshold Exceedance: Red Tide 2011,
Correction to Contingency Plan notification and additional data

Dear Mr. Perkins and Ms. Lowery:

On May 25, 2011, MWRA notified you of a Contingency Plan¹ threshold exceedance for the red-tide alga, *Alexandrium*. MWRA was recently notified by the laboratory that conducts the analyses to enumerate the *Alexandrium* cells in water samples that its quality assurance procedures had found errors in the results for that May 20, 2011 survey. The laboratory has provided MWRA with corrected data which are in Table 1. In general, the corrected data have higher counts than previously reported, but the overall spatial and depth patterns are similar. MWRA measures *Alexandrium* in its normally-scheduled water column ("WC") surveys as well as the rapid response ("AF") surveys; the stations differ for these two survey designs. Table 1 also includes data from the routine April 7 survey, and additional surveys carried out since May 20 according to MWRA's rapid response plan.² Stations sampled during WC surveys are shown on Figure 1, AF survey stations are shown on Figure 2.

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

² Libby S. 2006. Standing Survey Plan: Rapid Response *Alexandrium* Survey. Boston: Massachusetts Water Resources Authority. Report 2006-05. 19 p. Retrieved from <http://www.mwra.state.ma.us/harbor/enquad/trlist.html>

Table 1 MWRA *Alexandrium fundyense* data April 7, 2011-June 1, 2011*

Region	Station	<i>Alexandrium fundyense</i> cells per liter									
		April 7 (WC)		May 20 (WC)		May 25 (AF)			June 1 (AF)		
		Depth		Depth		Depth (meters)			Depth (meters)		
		Surface	Chl. Max.	Surface	Chl. Max.	1	10	20	1	10	20
Nearfield	N01	1	2	443	221						
	N04	2	0	1,147	372	644	12	10	358	77	0
	N07	22	1	2,453	105						
	N10					205	130		950	143	
	N16					319	23		436	0	
	N18	18	6	1,047	511	353	50	3	199	67	0
Farfield	AF9					199	24		95	3	
	AF10					669	2		68	190	
	AF8					95	4		80	6	
	F22	9	0	830	241	811	415	23	156	53	0
	AF6					148	10		21	103	
	F17					1,598	66		40	180	
	F23	0	1	6	13						
	F15	9	2	1,107	32						
	AF5					1,304	520		386	6	
	F31					125	148		851	247	
	F13	4	2	846	51	701	429	4	572	746	8
	F10	38	4	358	27						
	AF4					685	758		41	66	
	F07					1,463	480		12	17	
	F06	32	16	102	8	924	891		0	208	
	F05					510	894		83	0	
AF2					1,581	2,931					
AF1					124	24	8				

*Notes:

WC indicates routine water column survey, AC indicates rapid response *Alexandrium* survey

Empty gray cell indicates no sample collected

Chl. Max. indicates that the sample depth was at the maximum chlorophyll concentration through the water column

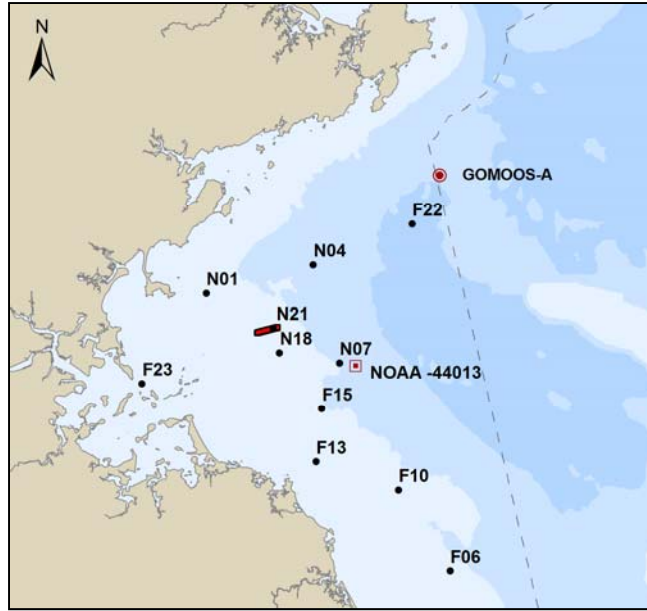


Figure 1 “WC” stations sampled during routine water column monitoring.

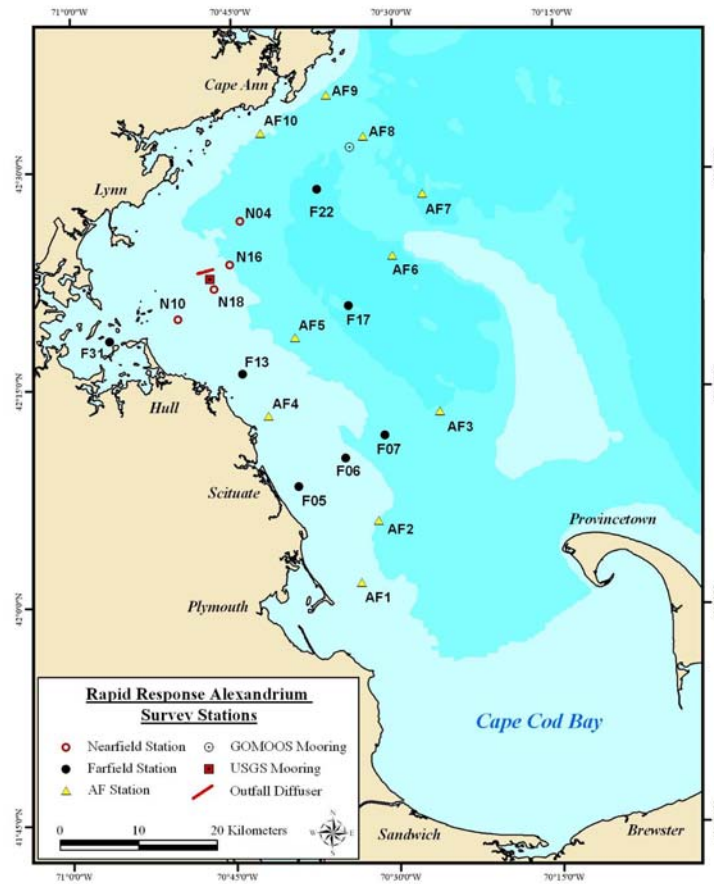


Figure 2 “AF” stations sampled during rapid response monitoring for *Alexandrium* (red tide).

As described previously, MWRA staff began tracking the progress of this year's *Alexandrium* bloom in March 2011, receiving frequent updates from Maine shellfish monitoring staff, Woods Hole Oceanographic Institution scientists and New Hampshire shellfisheries regulators. So far, this year's pattern of red tide shellfish bed closures has been typical, beginning in coastal Maine and then advecting southward. On May 19, MWRA was notified by the Massachusetts Division of Marine Fisheries (DMF) that shellfish beds were closed on the north shore. Prevailing winds from the northeast favored moving the red tide cells into Massachusetts Bay. Experimental computer modeling³ done by the Woods Hole Oceanographic Institution and North Carolina State University predicted the presence of *Alexandrium* in Massachusetts Bay. Therefore, the finding of *Alexandrium* in Massachusetts Bay was as expected. On May 25, DMF closed shellfish beds south to the Duxbury-Plymouth line, except in Boston Harbor.

MWRA has carried out weekly *Alexandrium* surveys since the threshold exceedance. The pattern of the bloom has been typical, moving from the north to the south; by June 1 it appeared that the bloom was beginning to subside. Consistent with previous findings, there are to date no indications that the outfall discharge has exacerbated the bloom. MWRA will continue regular sampling for *Alexandrium* until cell counts in the nearfield are below 100 cells/liter. An update on this year's red tide event will be presented at the next Outfall Monitoring Science Advisory Panel meeting which is scheduled for June 30, 2011 in Woods Hole.

If you have questions or need additional information, please call me at (617) 788-4940.

Sincerely,

Andrea Rex, Ph.D.
Director, Environmental Quality Department

³ Ruoying He, Yizhen Li, Dennis McGillicuddy, Don Anderson, Bruce Keafer: Gulf of Maine *Alexandrium fundyense* Model Results – 2011. Retrieved from <http://omglnx3.meas.ncsu.edu/GOMTOX/2011forecast/>

Cc:

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