

Program Narrative

2009 Massachusetts Red Tide Technical Assistance and Disaster Relief Proposal

A. Introduction and Background:

The 2008 New England red tide season began with a large and continuing bloom of *Alexandrium fundyense* in mid-coast Maine originating from extensive deepwater *Alexandrium* cyst beds. That year spring rains on the deep snowpack of Maine and New Hampshire resulted in significant runoff to the rivers of Maine, New Hampshire and Massachusetts. This runoff transported nutrients from the land to the near shore while the accompanying easterly winds "drove" the bloom inshore and onto the most productive shellfish areas. The strong Western Maine Coastal Current combined with ongoing easterly winds directed the bloom to the south and west. The bloom quickly advanced through Maine and New Hampshire before pushing into Massachusetts waters. As the bloom grew in geographic extent, the concentration of *Alexandrium* cells increased. The resultant toxicity levels in shellfish rose quickly requiring extensive paralytic shellfish poisoning (PSP) closures (red tide) from the New Hampshire border to the Cape Cod Canal including Boston Harbor.

The Massachusetts Division of Marine Fisheries (*Marine Fisheries*), in accordance with the National Shellfish Sanitation Program (NSSP), affords public health protection through the sanitary classification of all 1,745,723 acres of overlying waters within the states territorial sea. In addition, to protecting the public from shellfish-borne disease, a major aspect of *Marine Fisheries*' shellfish program involves monitoring for PSP. Shellfish program personnel collect shellfish from 15 primary stations weekly from mid-March through mid-November. Samples are sent to *Marine Fisheries*' Annisquam River Marine Fisheries Station (ARMFS) Shellfish Laboratory in Gloucester where bioassays determine the level of toxin in shellfish. As toxin levels rise in shellfish, the frequency of sampling and number of sample sites increase.

Marine Fisheries first posted PSP shellfish area closures on April 11, 2008 closing areas in the Nauset system on Cape Cod. By June 26, 2008, closures reached the maximum extent. By that date, *Marine Fisheries* had closed all coastal areas from the Massachusetts/New Hampshire border to the Cape Cod Canal, including Boston Harbor, the aforementioned Nauset System, Pleasant Bay, part of Nantucket Sound and Nantucket. This was the first PSP closure of Boston Harbor since the 1970's. The closures affected 39 coastal communities, 29 of which have commercial shellfish harvesting. In addition to closure of state waters, *Marine Fisheries* ordered a prohibition on landings of all shellfish and carnivorous snails (with the exception of the adductor muscle of the sea scallop) coming from federal waters directly adjacent to the Commonwealth. This prohibition lasted from June 20, 2008 through July 9, 2008.

The average annual value of economic activity generated by the Massachusetts shellfish industry is estimated to be between \$135 and \$180 million. Between 40% and 60% of the total revenue is generated May through September. Primary industry participants directly affected by red tide related closures include commercial fishermen, wholesale shellfish dealers, and aquaculturists. *Marine Fisheries* estimates the closures affected approximately four hundred (400) full- and part-time commercial fishermen, thirty-five (35) aquaculturists in Eastham, Ipswich, Orleans and Rowley as well as the ocean quahog, surf clam and sea scallop fisheries.

B. Objectives:

In his September 4, 2008 letter to the The Honorable Carlos M. Gutierrez, Governor Deval Patrick requested disaster assistance to aid shellfish fishermen in affected communities. The objectives of this program are designed to provide direct economic assistance to those affected shellfish fishermen, and to mitigate the economic impact of future PSP outbreaks through outreach, research and increased sampling. *Marine Fisheries* will accomplish these objectives by creating and implementing several programs that will have a positive economic impact on the Massachusetts commercial shellfish industry.

1. Develop and implement a Lost Income Subsidy (LIS) program to compensate Massachusetts commercial shellfish harvesters for their economic loss resulting from the 2008 red tide event.
2. Increase monitoring so that future red tide closures can be surgical in their implementation, allowing for closures that may constitute fewer acres and be of a shorter duration.
3. Develop and distribute outreach materials to fishermen, dealers, restaurants and the general public as a means of reducing the negative impact a red tide event often has on the entire seafood industry.

C. Expected Benefits:

A well-developed program will quickly provide economic assistance to those commercial shellfish harvesters directly impacted by the red tide event of 2008. Disaster assistance will keep much of the industry viable and prevent a loss of jobs in this field and a collapse of the industry. A properly developed outreach project will improve public awareness during future red tide outbreaks, and instill consumer confidence in order to help stabilize the local seafood industry. On-going research and increased monitoring will allow *Marine Fisheries* to more accurately assess future outbreaks and execute more timely closures.

D. Proposed Statement of Work:

The Commonwealth proposes conducting a two-phase program that (1) addresses the immediate needs of shellfish harvesters and (2) the ongoing long-term threats to the Commonwealth's shellfish industries by "red tide". Our recommendations are designed

to expedite deliverance of funds to affected fishermen and fishing communities and augment monitoring and research efforts in Massachusetts and the Gulf of Maine. This proposal builds upon existing cooperative relationships with the Woods Hole Oceanographic Institution (WHOI), the National Oceanographic and Atmospheric Administration (NOAA) and the States of Maine and New Hampshire by funding new and existing regional monitoring and outreach initiatives.

Phase 1: Direct Assistance to Commercial Shellfishermen

Job 1. Lost Income Subsidy

The first phase of the program is a Lost Income Subsidy (LIS) for qualifying fishermen, and aquaculturists. *Marine Fisheries* will establish qualification criteria based in large part on the 2005 Massachusetts Red Tide Technical Assistance and Disaster Relief Program. New criteria will need to be developed for contaminated area fishermen (Master and Subordinate Diggers) working in greater Boston Harbor, the Pines River in Revere and Saugus and the Merrimack River in Newburyport. Criteria were not previously developed for these shellfish areas and fisheries as they were unaffected by the 2005 red tide event. *Marine Fisheries* will complete distribution of Phase 1 payments within the first year of the project. Total payments will not exceed 100% of the \$1.2 million loss calculated by *Marine Fisheries*.

2008 PSP closures were estimated to have an impact on shellfish harvesters of approximately \$1.2 million. This figure represents the ex-vessel value of shellfish that were harvested in 2007 for the species, areas and time periods closed due to PSP in 2008. The data used to achieve this estimate were reported by Massachusetts seafood dealers, who are required to report every shellfish transaction made directly with fishermen, including the area from which the shellfish were harvested, into SAFIS. SAFIS (Standard Atlantic Fishery Information System) is a dealer-reporting database fully implemented by *Marine Fisheries* for seafood dealer reporting in 2005. The year 2007 was chosen as a representative baseline year because it is the most recent year with both complete dealer reporting in SAFIS and relatively few PSP closures. From the list of 31 PSP notices that *Marine Fisheries* issued in 2008, a total of 838 distinct species/area/date closures were identified. The value of shellfish reported harvested in 2007 was then determined for each species/area/date combination. The total estimated impact is simply the summation of the value that each distinct closure represents.

Process:

1. In order to ensure that potential participants are aware of this program, *Marine Fisheries* will maintain a website link with detailed information on this program. The site will be updated weekly throughout the Phase 1 process. In addition, *Marine Fisheries* will complete a direct mailing with program information to all 2008 Massachusetts commercial shellfish permit holders at least 3 weeks prior to the start of the application process.
2. *Marine Fisheries* will develop a formula used to determine the amount of economic relief individuals may receive through this program. This information will be posted on the *Marine Fisheries* website for a four-week period, during

- which time the public may submit comment on the proposed disbursement formula. The disbursement formula may be modified based on public comment.
3. *Marine Fisheries* will compare the list of Massachusetts commercial fishermen that held an active shellfish permit during the red tide event of 2008 to the detailed reports of shellfish they sold in the Commonwealth during the previous season. Using this information, *Marine Fisheries* will compile a list of all fishermen that are potentially eligible to receive economic assistance through this program.
 4. All potential applicants identified by *Marine Fisheries* will receive a direct mailing on the program along with an application packet. Applicants will have 6 weeks to file a complete application with *Marine Fisheries*. Each week, *Marine Fisheries* will update the website with a list of applicants and the status of their application (i.e., complete, incomplete or denied). During the 6-week application period, the *Marine Fisheries* program coordinator will work with applicants to ensure their applications are accurately completed and submitted by the application deadline. The application packet will also be posted on the *Marine Fisheries* website and available for download and submittal by other individuals not identified through the records review process.
 5. An Appeals Process will be developed for those applicants that are denied acceptance into the program. Applicants can be denied based on catch records and/or for fisheries enforcement violations. Appeals will be granted based on existing records on file with *Marine Fisheries* and/or existing dealer reporting records available through SAFIS. If *Marine Fisheries* makes an error in the review of existing records, applicants will be given the opportunity to work with the Division to correct any errors. The appeals process will be available to applicants from the time they are notified of their denial until 3 weeks after the close of the application period. Applicants will have a three-week period to file an appeal, and *Marine Fisheries* will have an additional two weeks to resolve all appeals. Appeals will be presented to an appeal board made up of at least two *Marine Fisheries* employees and one industry representative.
 6. Lost Income Subsidy payments will be mailed out to approved applicants within 30 days of the completion of the appeals process.

Job 2. Health Insurance Coverage

Marine Fisheries has identified the fishermen likely affected by the red tide event of 2008, and estimated their direct economic loss. If some of the identified fishermen do not apply or are deemed ineligible for the program, the remaining funds will be used to fund an Insurance Subsidy Program (ISP). In 2003 and again in 2008/2009, *Marine Fisheries* administered an ISP through the Fishing Partnership Health Plan. Funds were made available to eligible fishing families through the ISP. With rising cost of insurance and a requirement to have health insurance in Massachusetts, we recommend an expanded program over several years (at least two) through third party/parties. We further recommend that no more than 10%, or \$120,000, be allocated (if available) for this program.

Total Cost for Phase 1: \$1,200,000

Phase 2: Monitoring and Outreach

The second phase of the program consists of monitoring and outreach. Monitoring has two components, *Alexandrium* Cyst Surveys by the Woods Hole Oceanographic Institution and *Marine Fisheries* toxicity sampling. At fishermen meetings during the 2008 event Massachusetts shellfishermen and their legislators pressed *Marine Fisheries* to develop the capability for “surgical” closures and reopening by expanding sampling and increasing laboratory throughput. Increased personnel and equipment would allow for expanded coverage and resolution of PSP events.

Job 1. Regional Cyst Bed Mapping Collaboration

This Project would be a joint, co-funded Maine, New Hampshire and Massachusetts effort to support scientists from the Woods Hole Oceanographic Institute (WHOI) to map the size and location of *Alexandrium* cyst beds in the western Gulf of Maine. Such information has proven to be a valuable tool for anticipating the severity of future red tide events. Advance knowledge of the approaching bloom has been helpful to state program managers, the commercial industry, and the public in making the necessary preparations for possible closures to lessen economic impacts.

Annual *Alexandrium* cyst maps, produced by WHOI since 2004, have proven to be a valuable predictive tool for state program managers, and critical to the ongoing development of a [red tide predictive model](http://omgrhe.meas.ncsu.edu/Redtide/Redtide_07/) (see: http://omgrhe.meas.ncsu.edu/Redtide/Redtide_07/) for the Gulf of Maine. Cyst mapping is expensive, with the largest component being ship time on NOAA research vessels. With a commitment of \$150,000 to WHOI from each of the three New England states, NOAA would contribute the required ship time for the next two years and fund an existing proposal to perform statistical analysis of the current cyst bed mapping method. The goal of the statistical analysis project is to determine if a simpler, less costly sampling design would yield similar quality cyst data as the current sampling design.

Job 2. Laboratory Staff, Supplies and Equipment

In order to improve *Marine Fisheries*' management of the PSP program and increase sampling capacity, additional field and laboratory staff are needed. *Marine Fisheries*' proposes to hire a Shellfish Biologist dedicated to the coordination of both existing and expanded PSP program activities; a laboratory technician to assist in the ARMFS Shellfish Laboratory; and two (2) seasonal field technicians to assist in shellfish collection, one based in each of the *Marine Fisheries* facilities in Gloucester and New Bedford. These additional positions, along with new equipment and laboratory renovations would allow approximately 40 or more additional samples to be processed each week. Added sampling may allow for smaller, more precise closures while still ensuring public health protection, and would hasten reopening by species and individual areas after a toxic bloom abates.

Additional equipment and supplies will be purchased to allow more throughput at the PSP laboratory including but not limited to: centrifuge, hot plates, blenders,

thermometers, reagents, and microscopes. Two (2) vehicles will be rented for 3 months for 2 seasons for the seasonal field technicians. This will allow technicians maximum flexibility to collect samples without relying on the limited *Marine Fisheries* fleet.

Equipment List and Justification of Need			
Item	Quantity	Justification	Total Cost
4 place burner/stirrer hotplates	3	The PSP lab currently has one unit. 2 Units would allow us to run eight samples at a time rather than four. In addition, the other hot plates would serve as back up and as the preheat stations before the samples need to go under the hood, which will cut down on preparation time for the assay	\$6,000.00
Industrial Blenders	6	The lab will process surf clams and carnivorous snails. The meats from these species are tough and require an industrial blender to grind for processing. These species don't have much liquid in the meat and the pasty homogenized meats burn out the blender motors over time. Six such blenders are needed during processing as it is necessary to alternate blenders to reduce downtime; the motor needs to cool off between samples to prevent burnout	\$9,600.00
Hood	1	The PSP lab currently has one small hood that can only accommodate one 4 place burner/stirrer hotplate. The additional hood would allow us to process up to 12 samples at a time	\$5,100.00
Centrifuge and Rotor	1/each	The PSP lab currently has one old centrifuge that allows for the processing of 6 samples at one time. A replacement will serve as a backup and allow for twice the throughput.	\$1,700.00

Job 3. Lab Renovation

The *Marine Fisheries* ARMFS Shellfish Laboratory is housed in the former reactor building of the NMFS Northeast Fisheries Center Tech Lab built in 1960. Except for the removal of the reactor, there have been no changes to the layout of the building. Increasing PSP laboratory throughput requires the above additional equipment, which will subsequently require minor building renovation.

Job 4. Outreach

Maine, Massachusetts, and New Hampshire have agreed to collaborate on production of outreach materials for widespread distribution in New England. During previous PSP closures there was concern the public received ambiguous and possibly inaccurate information from sensationalized media reports. These outreach materials would be used during the next severe PSP bloom to mitigate adverse economic effects of red tide closures by making sure the public receives clear, accurate, and objective information about the risks of red tide and paralytic shellfish poisoning.

Following the 2008 PSP event, the states of New Hampshire, Maine, and Massachusetts continue to recognize the need for ongoing and improved outreach to the public during bloom events. Delivery of clear and accurate information regarding harvest closures, consumption advisories, and the availability of wholesome seafood in the

commercial markets is critical to avoiding unnecessary economic losses. In this project, the states will collaborate on the identification of audiences, the construction of messages, and the development of a variety of outreach products (video, web, print). The outreach products will be created for use regionally across New England to deliver a clear and consistent message. After collaborating on production, each state will then independently implement and distribute materials as needed.

Total Cost for Phase 2: \$800,000

E. Budget:

2009 Mass Red Tide Technical and Economic Assistance Budget				
Phase 1, Lost Income Subsidy (LIS)	Year 1	Year 2	Total Cost	424A Obj. Class
Direct payments to industry	\$1,200,000.00	\$0.00	\$1,200,000.00	h. Other
Subtotal Subsidy Program:	\$1,200,000.00	\$0.00	\$1,200,000.00	
Phase 2, Red Tide Monitoring and Outreach				
Personnel:				
Aquatic Biologist III	\$48,280.00	\$49,624.00	\$97,904.00	a. Personnel
Lab Technician II	\$39,942.00	\$40,999.00	\$80,941.00	a. Personnel
Fringe (24.5%)	\$21,614.39	\$22,202.64	\$43,817.03	b. Fringe Benefits
*Seasonal Field Personnel (2) March-Sept	\$36,400.00	\$36,400.00	\$72,800.00	f. Contractual
Indirect (25.26%)	\$31,479.52	\$32,086.01	\$63,565.53	j. Indirect Charges
Federal chargebacks (Medicare, etc) (1.35%)	\$1,682.40	\$1,714.81	\$3,397.20	b. Fringe Benefits
Sub-Total Personnel Costs:	\$179,398.30	\$183,026.46		
Other Charges:				
Contract with Don Anderson PhD, MBL	\$75,000.00	\$75,000.00	\$150,000.00	f. Contractual
Outreach Program with Maine and New Hampshire	\$40,000.00	\$0.00	\$40,000.00	h. Other
Field Supplies	\$750.00	\$500.00	\$1,250.00	h. Other
Lab Supplies	\$3,700.00	\$3,500.00	\$7,200.00	h. Other
Lab Equipment (see itemized list in narrative)	\$22,400.00	\$0.00	\$22,400.00	d. Equipment
Vehicle Lease (2) for 4 months	\$6,000.00	\$6,000.00	\$12,000.00	h. Other
Travel (mileage charge)	\$3,600.00	\$3,600.00	\$7,200.00	c. Travel
Lab Renovation	\$98,600.00	\$0.00	\$98,600.00	g. Construction
Subtotal Other Monitoring & Outreach Charges:	\$250,050.00	\$88,600.00	\$338,650.00	
Subtotal Red Tide Monitoring and Outreach	\$429,448.30	\$271,626.46	\$701,074.76	
Grant Administration				
Personnel:				
*Program Coordinator II 1/2 time	\$20,800.00	\$20,800.00	\$41,600.00	f. Contractual
Federal chargebacks (Medicare, etc) (1.35%)	\$280.80	\$280.80	\$561.60	b. Fringe Benefits
Indirect (25.26%)	\$5,254.08	\$5,254.08	\$10,508.16	j. Indirect Charges
Subtotal Personnel:	\$26,334.88	\$26,334.88	\$52,669.76	
Other Administrative Charges:				
*Audit, Fee for Service		\$15,000.00	\$15,000.00	f. Contractual
*Data entry and payments processing	\$10,000.00		\$10,000.00	a. Personnel
Federal chargebacks (Medicare, etc) (1.35%)	\$135.00		\$135.00	b. Fringe Benefits
Indirect (25.26%)	\$2,526.00	\$3,789.00	\$6,315.00	j. Indirect Charges
Supplies	\$3,800.00	\$805.48	\$4,605.48	e. Supplies
Printing Costs	\$5,000.00	\$1,000.00	\$6,000.00	h. Other
Direct Mailings to Industry	\$4,200.00	\$0.00	\$4,200.00	h. Other
Subtotal Other Administrative Charges:	\$25,661.00	\$20,594.48	\$46,255.48	
Subtotal Grant Administration	\$51,995.88	\$46,929.36	\$98,925.24	
Total Cost Per Year:	\$1,681,444.18	\$318,555.82		
Total Program Cost:		\$2,000,000.00		