



Connecticut Marine Biotoxin Management Plan for PSP & Marine Biotoxin Contingency Plan for ASP, DSP, NSP, and AZP

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The Connecticut Department of Agriculture, Bureau of Aquaculture (DoAg) is the lead agency in charge of shellfish sanitation in the state and operates as part of the National Shellfish Sanitation Program (NSSP). DoAg implements all NSSP elements, except for Control of Harvest (Patrol) which is overseen by the CT Department of Energy and Environmental Protection. As part of the Growing Area program, DoAg completes phytoplankton/harmful algal bloom (HAB) and biotoxin monitoring in accordance with the NSSP Model Ordinance (MO). This document meets the minimum requirements of marine biotoxin contingency and management plans outlined in the NSSP-MO.

Introduction to Biotoxins and the NSSP Requirements

Due to their filter feeding nature, shellfish have the ability to concentrate toxigenic phytoplankton, typically dinoflagellates but also some diatoms, in their viscera. The toxins produced by these toxigenic organisms can cause illness and death in humans at sufficient concentrations, are not normally destroyed by cooking or processing, and cannot be detected by taste. Since the dinoflagellates and diatoms are naturally occurring, their presence in the water column or traces of their toxin in shellfish meat do not necessarily constitute a health risk. To protect the consumer, the authority for each state must monitor for harmful algal blooms (HABs) and associated toxins, and evaluate the concentration of toxin present in the shellfish against the levels established in the National Shellfish Program (NSSP) Model Ordinance (MO) to determine what action, if any, should be taken.

There are five types of shellfish poisonings specifically addressed in the NSSP-MO, listed as most to least relevant for shellfish program management in Connecticut: paralytic shellfish poisoning (PSP), amnesic shellfish poisoning (ASP), diarrhetic shellfish poisoning (DSP), neurotoxic shellfish poisoning (NSP) and azaspiracid shellfish poisoning (AZP) (Table 1: Species of Concern). All of these toxins can cause human illness, but PSP, ASP, and NSP are the most dangerous, as they are neurotoxins. DSP and AZP cause gastrointestinal illness, including diarrhea and vomiting. In accordance with Section II Chapter IV @.04 C. (2), for any marine biotoxin for which criteria have not been established under the NSSP-MO, either cell counts of the toxin producing organisms in the water column or biotoxin meat concentrations may be used as the criteria for prohibiting shellfish harvest.

- PSP is caused by saxitoxins produced by the dinoflagellate genus *Alexandrium* (formerly *Gonyaulax*), as well as *Gymnodinium catenatum* and *Pyrodinium bahamense* (not expected in CT waters). *Alexandrium catenella* (formerly *A. fundyense*, *A. tamarense*) naturally occurs in New England, but there is a shift south of Massachusetts Bay from widespread, oceanic blooms in northern New England to isolated, “point-source,” embayment populations in southern New England, including Connecticut (Anderson et al. 2005; Richlen et al. 2012). *A. catenella* toxicity also decreases from northern to southern New England (Anderson et al. 1994). There are toxic and non-toxic *Alexandrium* species in Connecticut.
- ASP is caused by domoic acid produced by the diatom genus *Pseudo-nitzschia*, as well as the Indo-Pacific *Nitzschia navis-varingica* and *Nitzschia bizertensis* (not expected in CT waters). *Pseudo-nitzschia* and associated shellfish closures have had widespread impacts on the U.S. west coast (e.g. McCabe et al. 2016). The first ASP closures in New England occurred in fall 2016 and were associated with *P. australis* (Bates et al. 2018), which has continued to cause annual closures in some locations. There are toxic and non-toxic *Pseudo-nitzschia* species in Connecticut.
- DSP is caused by okadaic acid and dinophysistoxins produced by the dinoflagellate genera *Dinophysis* and *Prorocentrum*. The first DSP closure in New York occurred in 2011, due to a large, localized *Dinophysis acuminata* bloom in a small portion of Northport Harbor (Hattenrath-Lehmann et al. 2013). However, the risk of DSP outbreaks in New England has been rated as low to moderate due to the low cellular toxin quota of New England *Dinophysis* strains (Tong et al. 2015). *Prorocentrum lima* is benthically distributed throughout New England, but the risk of toxin accumulation in shellfish was shown to be low (Maranda et al. 2007a,b). Planktonic *Prorocentrum* species frequently observed in phytoplankton samples do not produce toxins.
- NSP is caused by brevetoxins produced by the dinoflagellate genus *Karenia* (formerly *Gymnodinium*, *Ptychodiscus*). *Karenia* blooms typically extend from the Carolinas south throughout the Gulf Coast, but increased range expansion has been documented, such as *Karenia*

brevis and *Karenia papilionacea* in Delaware (Bott 2014; Fowler et al. 2015). *K. mikimotoi* blooms have been associated with animal kills and hypoxic events in Maine and Massachusetts since 2017 (Leach 2018; WHOI 2021), but this species does not produce brevetoxins (Li et al. 2019). Although a new phenomenon, *K. papilionacea* has been documented more frequently in New England in the fall. The first detection in Connecticut occurred in fall 2021, which coincided with higher cell concentrations in Massachusetts during which time the Massachusetts shellfish program did not detect brevetoxins in shellfish samples. *K. papilionacea* was subsequently detected at a different Connecticut location in fall 2024. *K. papilionacea* is infrequently detected at low cell concentrations in Connecticut, and species that are more toxicogenic like *K. brevis* have not been detected to date.

- AZP is caused by azaspiracids produced by the dinoflagellate genera *Azadinium* and *Amphidoma* (not expected to be observed in CT waters). While AZP has caused closures around the world, there have been none in the U.S. to date (reviewed in Anderson et al. 2021), and U.S. AZP cases have been associated with imported shellfish (Klontz et al. 2009). Toxin-producing *Azadinium* and *Amphidoma* have been detected on the U.S. west coast, but shellfish have not exceeded regulatory guidelines (e.g. Adams et al. 2020). While *Azadinium* and *Amphidoma* were not detected with routine HAB monitoring in the Chesapeake Bay, low concentrations of azaspiracids were detected the same year with routine toxin monitoring, making this the first report on the U.S. east coast (Onofrio et al. 2021).

Table 1: Species of Concern. The harmful algal bloom genus/genera of concern, toxins, illnesses, and FDA toxin concentrations that result in automatic closures.

Organism	Toxin	Illness	Closure level from NSSP-MO
<i>Alexandrium</i>	Saxitoxins	Paralytic Shellfish Poisoning (PSP)	80 µg STX eq./100 grams shellfish
<i>Pseudo-nitzschia</i>	Domoic Acid	Amnesic Shellfish Poisoning (ASP)	2 mg DA/100 grams shellfish (20 ppm)
<i>Prorocentrum</i>	Okadaic Acid & Dinophysistoxins	Diarrhetic Shellfish Poisoning (DSP)	0.16 mg OA eq./kg shellfish (0.16 ppm)
<i>Dinophysis</i>			
<i>Karenia</i>	Brevetoxins	Neurotoxic Shellfish Poisoning (NSP)	0.8 mg PbTx-2 eq./kg shellfish (20
<i>Azadinium & Amphidoma</i>	Azaspiracids	Azaspiracid Shellfish Poisoning (AZP)	0.16 mg AZA-1 eq./kg shellfish (0.16 ppm)

NSSP-MO Section II Chapter IV @.04 B. (4) outlines the marine biotoxin management strategies: phytoplankton monitoring, routine shellfish toxicity monitoring, pre-harvest shellfish toxicity testing, shellfish lot testing, and pre-harvest shellfish toxicity screening and lot testing. The DoAg uses phytoplankton monitoring in combination with routine shellfish toxicity monitoring, and never uses pre-harvest shellfish toxicity testing, shellfish lot testing, or pre-harvest shellfish toxicity screening and lot testing. Although Section II Chapter IV @.04 C. (3) allows for certain shellfish species to be safely exempted from a biotoxin closure, the DoAg never implements species-specific biotoxin harvesting closures and does not have a sufficient dataset to do so. Section II Chapter IV @.04 C. (7) allows a growing area, or portion(s) thereof, to be placed in the controlled access status when the Authority determines that additional requirements are necessary to ensure the safe harvest of product. The NSSP-MO states the controlled access status “can be applied to allow harvesting in areas with biotoxin concerns where routine monitoring or pre-harvest testing is not practical” (Section II Chapter IV. @.03 A.(5)(c)). The DoAg closes growing areas for biotoxins, and has never implemented a controlled access status of approved or conditionally approved areas in Connecticut. The DoAg does not use heat processing (Section II Chapter IV @.04 D.). The DoAg

does not have jurisdiction of any federal waters; the FDA is responsible for classifying growing areas in Federal waters.

History of Biotoxin Events in Connecticut

The suitability of shellfish growing areas can be influenced by the presence of marine biotoxins. States and other countries having shellfish sanitation Memoranda of Understanding (MOU) agreements with the United States are required to have contingency plans to address shellfish-borne intoxications. States and countries with a history of biotoxin closures must also maintain a management plan for the appropriate biotoxin(s). In accordance with the NSSP-MO, the DoAg maintains a Marine Biotoxin Management Plan (MBMP) for PSP and a Marine Biotoxin Contingency Plan (MBCP) for ASP, DSP, NSP, and AZP for the State of Connecticut.

The DoAg has only closed shellfish growing areas due to PSP in Mumford Cove and Palmer Cove in Groton; closures have been sporadic and occurred in 1985, 1992, 2003, 2020, and 2023. The DoAg annually uses phytoplankton and shellfish toxicity monitoring as part of the PSP management plan. Mumford Cove is classified as Conditionally Approved with a seasonal closure from approximately June 1st – October 31st, and Palmer Cove is classified as Restricted Relay with a Conditionally Approved area outside of the cove. No Approved shellfish growing areas are directly adjacent to either cove. While an increase in bloom intensity, frequency, and toxicity has been reported around Long Island since 2006 (Hattenrath et al. 2010; Hattenrath-Lehmann and Gobler 2016), the DoAg has not documented an increase in *Alexandrium* blooms, PSP closures, or bloom toxicity. Furthermore, an independent study showed that *Alexandrium* cell and toxin concentrations were non-detectable to low in a survey of the CT coastline, whereas high cell and toxin concentrations were documented around Long Island (Gobler and Hattenrath-Lehmann 2011). Shellfish growing areas will be closed at an adequate margin of safety because saxitoxin levels in shellfish tissue can change rapidly.

The DoAg has not closed shellfish growing waters due to biotoxin threats beyond PSP. *Pseudo-nitzschia* (ASP) and *Dinophysis* and *Prorocentrum* (DSP) have been documented in CT waters, but their associated toxins have not been detected in shellfish. Of note, there are non-toxic *Alexandrium* spp., *Pseudo-nitzschia* spp., and *Prorocentrum* spp. in CT, and the presence of a toxic species does not always signify that toxin is being produced. *Karenia* spp., *Azadinium* spp., and *Amphidoma* spp. are not expected to occur in CT waters. While *K. papilionacea* was identified in CT waters twice at low cell concentrations (<1,000 cells/L), no *Karenia* species are established or recurrent in Long Island Sound.

Provide an Early Warning System

The DoAg has maintained biotoxin and HAB monitoring programs since 1985 and 1997, respectively. HAB monitoring was established as an early warning system for all shellfish growing areas. As such, the DoAg has a historic HAB monitoring database to support current shellfish classifications. To open new growing areas where historic data is not available for a hydrographically linked waterbody, the DoAg will comply with the required 36 samples over 3 years. The DoAg significantly enhanced the HAB monitoring program starting in 2019 to include semi-quantitative data collection, identification of all HAB species (not just FDA-regulated species), an increase in the frequency and spatial extent of sampling, and HAB monitoring of

newly established stations in recreational shellfishing areas. As such, the DoAg has been establishing a baseline dataset of HAB concentrations in cells/L throughout the monitoring season since 2019.

All field and laboratory staff are trained on the standard operating, safety, and quality control procedures associated with HAB and biotoxin sampling. Detailed collection and analysis procedures are outlined in the 2023 HAB Monitoring Standard Operating Procedure, including a routine sampling station list (Attachment 1). DoAg staff regularly monitor for HABs during March to October using semi-quantitative phytoplankton net tows. The DoAg collects at least 1 phytoplankton sample per month from 15 towns with the highest shellfish harvest. In addition, 5 recreational shellfish programs deliver monthly 500mL grab phytoplankton samples. DoAg opportunistically samples at other boat and land-based locations, as needed.

In addition, phytoplankton and blue mussel samples are taken from historic biotoxin sites, Mumford and Palmer Coves, Groton, every other week between March to May. Historically, PSP closures occurred in May-June, and DoAg began shifting the monitoring season in response to potential climate change impacts in 2020 when the Conditionally Approved area in Mumford Cove was reopened following a long administrative closure due to a lack of sufficient water quality data. In 2020, DoAg detected elevated *A. catenella* cell concentrations and had a positive saxitoxin screening test kit in April, which prompted an immediate closure of the area; the closure lasted through early May. The 2023 PSP closure in Mumford Cove occurred in March-May. DoAg began collecting phytoplankton samples in the adjacent Poquonnock River, where there is a Conditionally Approved area used for recreational harvest, in 2019 and identified *A. catenella* for the first time in 2021. While response monitoring was conducted when *A. catenella* was detected in the Poquonnock River or adjacent areas prior to 2024, the DoAg began including the Poquonnock River in the PSP Management Plan in 2024. Saxitoxin has not been detected above the regulatory limit in the Poquonnock River to date.

Quantitative and qualitative PSP biotoxin testing methods are also used regularly at these three sites. Blue mussels are useful for the early detection of toxins; thus, mussel cages are placed in the coves for an acclimation period of two weeks, subsequently collected every other week, and brought to the DoAg laboratory for testing. The DoAg maintains an NSSP conforming laboratory onsite, with trained and certified staff that perform an Approved NSSP method and an Approved Limited-Use method (AquaBC Chile Rapid Test Kit) for PSP. The lab staff conduct methods in accordance with FDA laboratory guidelines, standard operating procedures, and quality control requirements.

Elevated concentrations of species of concern will trigger increased phytoplankton sample collection and biotoxin testing by DoAg (Table 2: Cell Concentrations that Trigger Biotoxin Testing). In accordance with FDA guidelines, the DoAg only uses biotoxin screening methods to 1) keep an unaffected growing area open with a negative result; 2) precautionarily close a growing area with a positive result; and 3) determine when to perform an approved testing method in a previously closed area. Screening methods are never used to reopen shellfish growing areas under mandatory biotoxin closures. The DoAg laboratory uses an Approved PSP testing method and screening methods for PSP and ASP (AquaBC Chile Rapid Test Kit). In accordance with the NSSP-MO, the DoAg is not required to conduct marine biotoxin management strategies for toxins covered under the Contingency Plan. The DoAg laboratory does not have the equipment or training to perform the approved biotoxin testing methods for ASP (HPLC), DSP (LC-MS/MS), NSP, or AZP. The DoAg would contact the USFDA Office of Food Safety staff member Dr. Jonathan Deeds to coordinate

testing at NSSP conforming laboratories. Conforming laboratories could include federal (FDA), state, or research (Bigelow Laboratory) entities. The complete DoAg response for a HAB/biotoxin closure is outlined below (“define the severity of the problem”).

Table 2: Cell Concentrations that Trigger Biotoxin Testing. The cell concentrations are based upon DoAg’s historic and current dataset, and are consistent with neighboring state’s phytoplankton and biotoxin monitoring programs.

Organism	Toxin	Cell concentration that triggers biotoxin testing
<i>Alexandrium</i>	Saxitoxins	1,000 cells/L <i>Alexandrium catenella</i> or other toxin-producing species
<i>Pseudo-nitzschia</i>	Domoic Acid	30,000 cells/L all <i>Pseudo-nitzschia</i> species
<i>Prorocentrum</i>	Okadaic Acid & Dinophysistoxins	30,000 cells/L <i>Dinophysis</i> or <i>Prorocentrum</i> toxin-producing species
<i>Dinophysis</i>		
<i>Karenia</i>	Brevetoxins	Because <i>K. papilionacea</i> detections in New England are a new phenomenon and the 2017 revision of the NSSP-MO included a closed status criteria for NSP at 5,000 cells/L or 0.8 mg brevetoxin-2 eq./kg, the DoAg has adopted a trigger of 5,000 cells/L for <i>Karenia</i> spp.
<i>Azadinium & Amphidoma</i>	Azspiracids	Not expected to occur in Long Island Sound; therefore, there is no dataset to establish cell concentration triggers.

All DoAg staff have been trained to be on alert for any indication of a HAB, such as water discoloration and fish, marine mammal or bird kills. In addition, a notice is sent to licensed harvesters, the CT Department of Energy and Environmental Protection, and Municipal Marine Police Units annually to remind them of the potential risks, what to look for, and how to report a possible bloom. DoAg has also set up an Early Warning System for the CT Department of Public Health and Municipal Health Departments to report any symptoms or food history which may indicate ingestion of toxin to DoAg (Attachment 2: HAB and PSP Warning System). The current contact lists concerning shellfish toxicity are included at the end of the Contingency and Management Plan.

Define the Severity of the Problem

In the event a bloom is reported to the DoAg:

1. DoAg staff receiving the call will encourage caller to take a sample, if possible. Staff will determine the location, type and extent of the bloom.
2. If the potential for a biotoxin hazard exists, the DoAg will implement a closure in the area of the bloom, as well as in any adjacent areas of concern.
3. Determine if a product recall is necessary.
4. DoAg staff will collect plankton and meat samples (blue mussels and naturally available shellfish species) in the area of concern for biotoxin testing. Emergency sample collection, transportation, and analysis will be completed within 24 hours, in accordance with FDA guidelines, to effectively manage the biotoxin threat. While phytoplankton analysis and biotoxin screening can be completed rapidly, setting up sentinel mussel cages and preparing for approved biotoxin methods will inherently require additional time. Field observations will be made to further adjust the closure.
5. The DoAg maintains precautionary and mandatory closure levels for PSP, ASP, and DSP, and mandatory closure levels for NSP and AZP (Table 3: Precautionary and Mandatory Biotoxin Closure

Levels). In accordance with the NSSP-MO, precautionary closures may be lifted if confirmatory testing using an approved method shows biotoxin levels present in shellfish meats is not equal to or above the regulatory limits, or when the closure is not necessary. A positive result with a screening method will be used to establish a precautionary closure.

Table 3: Precautionary and Mandatory Biotoxin Closure Levels

Toxin	Concentration	Action
Saxitoxin (PSP)	60 µg to <80 µg STX eq./100 grams shellfish; OR positive rapid test kit	Precautionary closure
	≥80 µg STX eq./100 grams shellfish	Mandatory closure
Domoic acid (ASP)	10 to <20 ppm; OR positive rapid test kit	Precautionary closure
	≥20 ppm	Mandatory closure
Okadaic acid (DSP)	0.1 to <0.16 ppm	Precautionary closure
	≥0.16 ppm	Mandatory closure
Brevetoxins (NSP)	0.8 mg PbTx-2 eq./kg shellfish (20 MU/100g)	Mandatory closure
Azaspiracids (AZP)	0.16 mg AZA-1 eq./kg shellfish (0.16 ppm)	Mandatory closure

6. If toxin is present, an event calendar will begin and the area will remain closed. Adjustments are made to the closed area based upon the toxin concentrations and include a safety zone of stations in which biotoxin is absent. It may be appropriate to close growing areas adjacent to known toxic areas until increased sampling can establish toxin free areas and determine when toxin levels have stabilized.
7. Notification of biotoxin threat will be sent to local health departments, the Department of Public Health (DPH), CT Department of Energy and Environmental Protection (DEEP), relevant federal officials, adjacent states, and all DoAg staff members. The DoAg Director, in consultation with DoAg and CT DPH staff, will evaluate if a press release is required to protect public health.
8. DoAg staff will initiate an increased phytoplankton and toxin sampling procedure starting at what is believed to be the locus of the event and expand to surrounding stations. Increased sampling will be at stations of emerging concern based upon tides and currents in the area, and should extend through contaminated stations to those not showing signs of the bloom. The sampling schedule will be adjusted as the bloom progresses to better accommodate changing conditions.
 - a. Any additional caged specimens required for increased sampling will be set-up in the field as soon as possible after the beginning of the event.
 - b. In the event that additional resources are needed, DoAg has access to supplementary emergency funding and maintains adequate funding in the laboratory budget to support additional sampling and monitoring as necessary.
9. Throughout this process, sample locations will be plotted on a map to determine whether the size and intensity of the bloom are increasing or decreasing. The closure will be adjusted, as necessary.
10. Re-opening criteria require at least three samples over 14 days to show the absence of toxin or toxin levels below the mandatory closure limit (Table 3: Precautionary and Mandatory Biotoxin Closure Levels) for all harvestable shellfish species. Clams will hold toxins the longest and should be concentrated on when collecting reopening samples. There are very limited bay scallop resources, but the towns that maintain recreational harvest of bay scallops have been informed about the potential threat of biotoxins and will be consulted if a biotoxin closure occurs. Carnivorous snail fishery permitting is maintained by the DEEP Marine Fisheries Division, and staff have been informed of the potential threat of biotoxins and will be consulted if a biotoxin closure

occurs. The decision to re-open a growing area will also be based upon whether toxin levels in adjacent areas are declining.

11. Event will be documented using:

- a. Copies of all press releases;
- b. Extent of area involved including town(s) and state(s) impacted;
- c. Marine biotoxin concentrations and shellfish species tested;
- d. HAB that closed the area;
- e. Maps and closure progress to reopening;
- f. List of affected beds;
- g. Appropriate records of illness and case history data, used to determine severity as well as adequacy of program;
- h. Shellfish sample results, including analysis of trends, detoxification curves, phytoplankton and water sample analysis and other pertinent environmental observations;
- i. Archive of shellfish homogenates for additional analysis;
- j. Closure and reopening notices for all impacted growing areas; and
- k. Evaluation reports.

In the event biotoxin is found during DoAg sampling:

1. Determine type, location and extent of bloom.
2. Follow above steps 2-11 from "In the event a bloom is reported to the DoAg."

In the event a HAB (closure) is reported from an adjacent state:

1. Increase sampling in areas nearest the reported bloom.
2. If threat is found, follow steps 2-11 from "In the event a bloom is reported to the DoAg."

In the event a biotoxin illness is reported:

1. Immediately close area from which the illness was reported, as well as an appropriate buffer based upon the hydrographic dynamics of the surrounding waters and any other available information, such as HAB monitoring data.
2. Follow steps 3-11 from "In the event a bloom is reported to the DoAg."

In the event FDA random product testing is positive for a regulated toxin:

1. Immediately close area from which the positive result was reported, as well as an appropriate buffer based upon the hydrographic dynamics of the surrounding waters.
2. Follow steps 3-11 from "In the event a bloom is reported to the DoAg."

Respond Effectively to Minimize Illness

Recall Procedures for shellfish that reach market at or above allowable biotoxin levels:

1. Start calendar of events and call a staff meeting to identify strategies and assignments.
2. Embargo the specified batch of shellfish by obtaining a voluntary agreement from the dealer, or having the Local Director of Health or a representative of the Connecticut Department of Consumer Protection institute a formal product embargo. Provide the state of origin, type and level of toxin analyzed, symptoms of illness and food history if illness has been reported, the shellfish species and quantity embargoed, the harvest area, harvest date, location of embargo, quantity embargoed, quantity sold or consumed, and the shipper(s) involved. Determine the need, with the state of origin, for a shipper-initiated recall.
3. Request listing of Connecticut distribution. If distribution list is not available, the original shipper will not or cannot recall the product, or toxin level represents an immediate health hazard, then direct all licensees to hold all designated product remaining in their possession, and acquire records of those who distributed.
4. With state of origin, take action only against specific product relative to the area of harvest and date of harvest, including earlier or later dates as directed by the state of origin, if possible. If specific harvest area and dates are not available or if the product has been mixed with non-contaminated product, an embargo action may be necessary for all those products from the state of origin. If PSP or other biotoxin contaminated product has been mixed with non-contaminated product, the shipment should be destroyed (do not sample in this situation – negative or low sample results may not represent toxin levels of specific shellstock whose individual high dose level could result in illness). Request an accounting of those specific shellfish shipments.
5. Establish a sample and release or destroy protocol for product held by dealers for each particular event. Arrange to resample, if necessary. Different scenarios may call for different actions.
6. Define the size of distribution and quantities and whether the product shipper(s) is continuing to distribute the product. Assess the public health hazard and the extent that implicated shellfish could reach the public. Advise the CT Departments of Public Health and Consumer Protection and the U.S. Food and Drug Administration.
7. Issue a media alert to the public regarding those specific shipments or all state of origin shellfish. Not all shellfish shipments are delivered to wholesale dealers; some deliveries are made to restaurants and retail markets directly. The media alert is dependent upon toxin levels; possible batch mixing; and relative hazard of shellfish and discussions with the CT Bureau leads, FDA and the state of origin.

Necessary information to be gathered for a DoAg or joint press release should include:

1. The PSP or other biotoxin levels, shellfish species, areas, dates and distribution.
2. The town(s), state(s), and extent of area involved and receiving town(s) and state(s).
3. An assessment of whether toxin levels may increase. An assessment of the degree of health hazard that may be associated with the toxin level.
4. An assessment of the extent of potentially contaminated shellfish that may have reached the market place or the public and the need for embargo or product recalls or press release to the media. Product recalls should be initiated by the shellfish dealer(s). Connecticut Department of Consumer Protection, and local Director of Health may embargo product depending upon needs assessment. Request an accounting of those specific shellfish shipments.
5. Any resulting closures and limits on shellfishing in CT or other states, descriptions of any further closings expected, numbers of commercial shellfishing operations and types affected, and impacted recreational shellfishing areas.

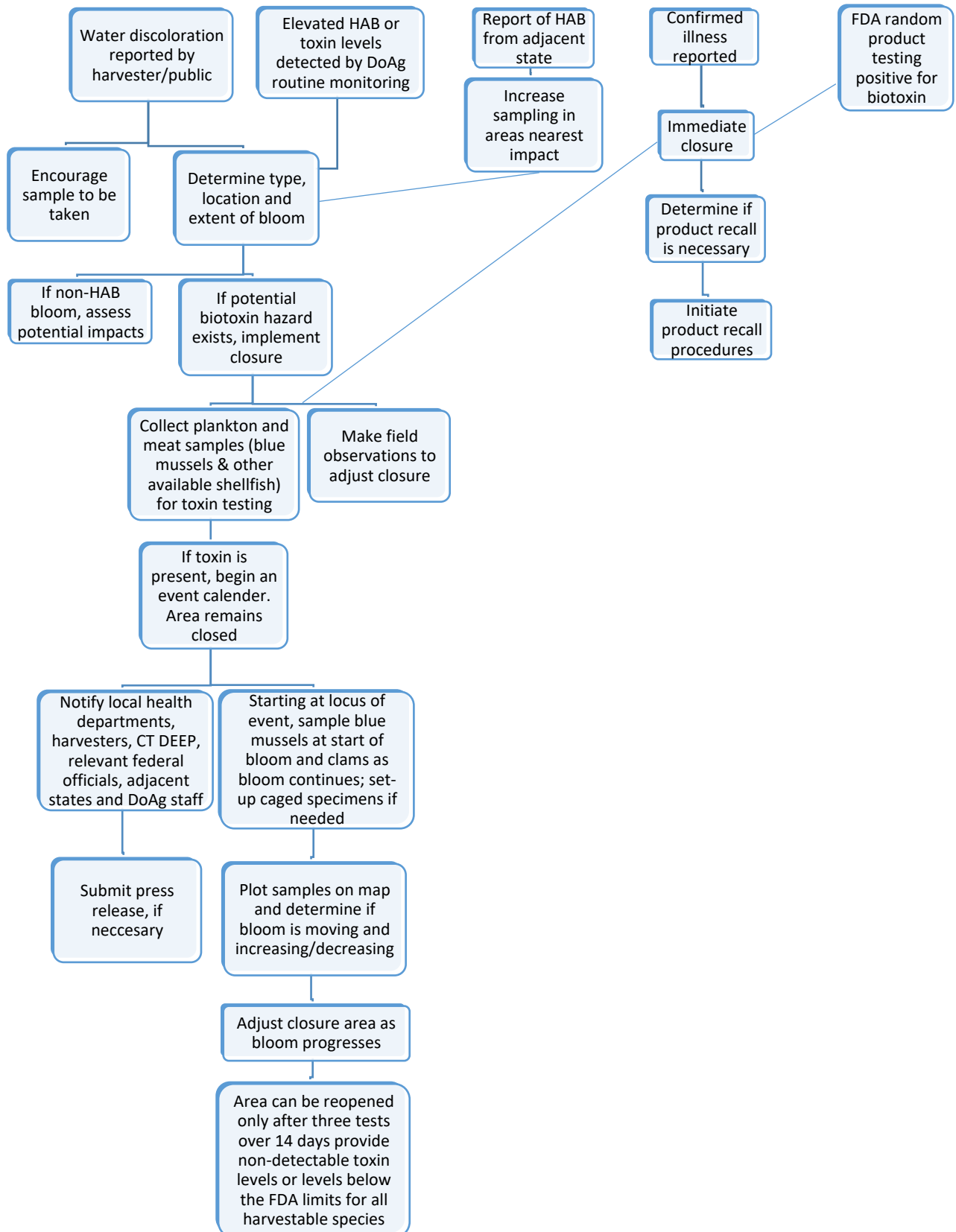
Return Growing Areas to the Open Status of their NSSP Classification

Once a growing area is closed due to biotoxin contamination, the necessary data will be gathered in order to establish when the affected area can be re-opened, as outlined above (“define the severity of the problem”). Consumer education will continue as long as the affected area remains closed.

Re-opening criteria require at least three (3) shellfish toxin samples over 14 days to show the absence of toxin or toxin levels below the mandatory closure limit (Table 3: Precautionary and Mandatory Biotoxin Closure Levels) for all harvestable shellfish, including carnivorous snails and scallops. Clams will hold the toxin the longest and should be concentrated on when collecting reopening samples.

Copies of notices returning growing areas to the open status will be maintained by DoAg with the biotoxin closure records.

Connecticut Biotoxin Contingency Plan Flowchart



Relevant Connecticut General Statutes:

Restrict harvesting: Upon discovery of a contamination event, the DoAg has the right to restrict harvesting,¹ withdraw interstate shipping permits,² and recall potentially toxic shellfish already on the market.³ The powers and duties of the Commissioner of the Department of Agriculture are also defined.⁴

Patrol Program: Connecticut Conservation Officers are responsible for the enforcement of activities within shellfish growing waters.⁵

¹Connecticut General Statutes > Title 26 > Chapter 491 > § 26-192e

(a) The Department of Agriculture may prohibit the taking or harvesting of shellfish from designated areas in tidal flats, shores and coastal waters whenever it finds by examinations or surveys that such flats, shores or coastal waters are contaminated or polluted to the extent that the waters do not meet standards of purity established by said department, in conjunction with the Department of Public Health, or that shellfish obtained there from may be unfit for food or dangerous to the public health. The Department of Agriculture shall classify the coastal waters, shores and tidal flats for the taking of shellfish. The classifications shall be: Approved, conditional, restricted, conditionally restricted, and prohibited. The conditional classification shall include conditional-open and conditional-closed. Any person aggrieved by a classification decision pursuant to this section may appeal such decision in accordance with the provisions of chapter 54. An area may be classified as prohibited for the taking or harvesting of shellfish unless it conforms to the standards established by the department for classifications other than prohibited. The department may specify the activities which may occur within each classified area. Such activities shall be listed on a shellfish license issued by the department. Waters and areas classified as approved or conditional-open shall conform to standards of purity, shall be free from discharge of sewage or other deleterious substances, and the shellfish obtained therefrom shall not be so polluted or contaminated as to be dangerous to the public health. The Department of Agriculture may delegate its authority for the classification of tidal flats, shores and coastal waters for the taking of shellfish pursuant to this section to other state agencies and local agencies.

(b) The department shall, by written order, promulgate definite bounds of the area or areas closed to shellfishing when classified as conditional-closed, conditionally restricted, restricted or prohibited. Such order shall become effective when (1) the closure classification is published in a newspaper having circulation in towns, cities and boroughs in which or adjacent to which any such area is situated; (2) the classification is filed in the offices of the clerk and the director of health in each such town, city or borough, and (3) signs are posted at points on or near every such classified area.

(c) Notwithstanding the provisions of subsection (b) of this section, when the Commissioner of Agriculture, after consultation with the Commissioner of Public Health, finds that tidal flats, shores or coastal waters which may contain shellfish are so contaminated or polluted that a health emergency exists, he may close such area for the duration of such emergency by giving notice of such emergency closure (1) in writing to the municipal or district health authority, and (2) to the general public by publication in a newspaper having general circulation in the town, city or borough within which such area lies. Such notice shall state when the closing shall take effect.

(d) No person shall take or harvest shellfish from areas classified as conditional-closed, restricted, conditionally restricted or prohibited pursuant to subsections (a) and (b) of this section or closed because of a health emergency pursuant to subsection (c) of this section or from areas or parts of areas where shellfish have been transplanted or relayed except in accordance with the terms and conditions of a license issued pursuant to section 26-192c or section 26-192h. The Department of Agriculture may delegate its authority for the classification of coastal waters, shores, and tidal flats for the taking of shellfish pursuant to this section to other state agencies and local agencies.

²[Connecticut General Statutes>Title 26 > Chapter 491>Sec. 26-192c](#)

(a) The Department of Agriculture may inspect shellfish beds and areas in this state where shellfish are grown or harvested, all boats, tools and appliances used in the production and preparation of shellfish and all wharves or buildings where shellfish are stored, transferred, opened, packed or prepared for sale or shipment. The Department of Agriculture may adopt regulations, in accordance with the provisions of chapter 54, after consultation with the Department of Public Health, for the sanitary growth, production, purification and preparation of shellfish. Such regulations shall incorporate by reference the provisions of the National Shellfish Sanitation Program Model Ordinance, as amended from time to time. Each commercial harvester, producer or shipper of shellfish shall obtain from said department a license on which shall be stated information regarding the identification of the license holder and any conditions pertaining to the character of such licensee's shellfish operations. Said department may establish a fee for each type of shellfish license it issues. The department may require that shellfish shipments be tagged or containers marked to identify the shipper by name and location and the source of the shipment and furnish such other pertinent information as may apply. Any license granted under the authority of this section may be revoked by said department for cause, after notification and hearing. No person, firm or corporation shall make any shipments or deliveries of shellfish after the license of such person, firm or corporation has been suspended or revoked. Any license may be suspended pending revocation proceedings, or amended, if shellfishing operations or harvesting areas are a public health hazard or if the licensee has violated any provision of this section, section 26-192e, 26-192f or 26-192h or any applicable department regulation or any section of the Public Health Code concerning shellfishing. The department may refuse to issue a license if the applicant has violated any provision of this section, section 26-192e, 26-192f or 26-192h or any applicable department regulation or any section of the public health code concerning shellfish.

³[Connecticut General Statutes>Title 22>Chapter 422>§22-4d and 22-6](#)

Sec. 22-4d. Cease and desist orders.

(a) The Commissioner of Agriculture, whenever he finds after investigation that (1) any person is causing, engaging in or maintaining, or is about to cause, engage in or maintain, any condition or activity which, in his judgment, will result in or is likely to result in imminent and substantial harm to any animal, or to public health within the jurisdiction of the commissioner under the provisions of this title, (2) there is a violation of the terms and conditions of a permit issued by him that is in his judgment substantial and continuous and it appears prejudicial to the interests of the people of the state to delay action until an opportunity for a hearing can be provided, or (3) any person is conducting, has conducted, or is about to conduct an activity which will result in or is likely to result in imminent and substantial harm to the animal, or to public health within the jurisdiction of the commissioner under the provisions of this title for which a license is required under the provisions of this title without obtaining such license, may, without prior hearing, issue a cease and desist order in writing to such person to discontinue, abate or alleviate such condition or activity.

(b) The commissioner shall serve any cease and desist order issued pursuant to this section in accordance with the provisions of sections 33-296, 33-297, 33-1050, 33-1051 and 52-57, as applicable. The commissioner may also cause a copy of the order to be posted upon property which is the subject of the order, and no action for trespass shall lie for such posting. Such cease and desist order shall be binding upon all persons against whom it is issued, their agents and any independent contractor engaged by such persons.

(c) Upon receipt of such order such person shall immediately comply with such order. The commissioner shall hold a hearing within ten days of the date of receipt of such order by all persons served with such order to provide any such person an opportunity to be heard and show that such condition does not exist or such violation has not occurred or a license was not required or all required licenses were obtained. All briefs or legal memoranda to be presented in connection with such hearing shall be filed not later than ten

days after such hearing. Such order shall remain in effect until fifteen days after the hearing within which time a new decision based on the hearing shall be made.

(d) The Attorney General, upon the request of the commissioner, may institute an action in the superior court for the judicial district of Hartford to enjoin any person from violating a cease and desist order issued pursuant to this section and to compel compliance with such order.

⁴[Sec. 22-6. Powers and duties of commissioner.](#)

The Commissioner of Agriculture shall be the administrative head of the Department of Agriculture. He shall encourage and promote the development of agriculture within the state and collect and publish information and statistics in regard to the agricultural and animal industries and interests of the state and submit the same to the Governor in his annual report. He shall, annually, visit different sections of the state and investigate the methods and wants of practical husbandry, the adaptation of agricultural products to soil, climate and markets, and, as far as practicable, visit agricultural fairs within the state, encourage the establishment of farmers' clubs, agricultural libraries and reading rooms and disseminate agricultural information by lectures or otherwise. In cooperation with The University of Connecticut, he may prepare and publish bulletins containing information concerning the cost of production of farm products. He is authorized to hold an annual state exhibit at the Eastern States Exposition at West Springfield, Massachusetts. He is authorized to enter into an agreement with the United States Department of Agriculture for cooperative work in the collection and publication of agricultural statistics. The commissioner shall have the authority to charge such fees as he may deem reasonable for publications of information by any of the component agencies of the Department of Agriculture. The commissioner shall review any proposed capital project which would convert twenty-five or more acres of prime farmland or one acre or more of shellfish grounds to a nonagricultural use and if such project promotes agriculture or the goal of agricultural land preservation or if there is no reasonable alternative site for the project he shall file a statement with the Bond Commission so indicating. The commissioner shall file a statement with the Bond Commission for any proposed capital project which would convert or impair any shellfish grounds and shall include in such statement any comments he deems appropriate for the protection of such grounds. The commissioner shall administer those provisions of sections 12-107a, 12-107b, 12-107c and 12-107e which address the assessment of farmland and open space. The commissioner may request the Attorney General to bring an action in the Superior Court for injunctive relief requiring compliance with any statute, regulation, order or permit administered, adopted or issued by him. The Commissioner of Agriculture may designate as his agent (1) any deputy commissioner to exercise all or part of the authority, powers and duties of the commissioner in his absence and (2) any deputy commissioner or any employee to exercise such authority of the commissioner as he delegates for the administration or enforcement of any applicable statute, regulation, permit or order, except the authority to render a final decision after a hearing.

⁵[Connecticut General Statutes > Title 26 > Chapter 491 > § 26-192g - Enforcement](#)

The provisions of sections 26-192e and 26-192f relating to the unauthorized taking of shellfish in contaminated and posted areas shall be enforced by local directors of health. Local police departments and the state shellfish police shall assist to effectively prevent the harvesting of shellfish in classified areas which are closed to shellfishing when requested by a local director of health.

Current Contact Lists:

Connecticut Shellfish Sanitation Program:

Connecticut Department of Agriculture, Bureau of Aquaculture

PO Box 97 | 190 Rogers Avenue, Milford, CT 06460 | (203) 874-0696 | Fax: (203) 783-9976

Director

David Carey
(203) 874-0696 ext. 103
Cell: (860) 719-1426
David.Carey@ct.gov

Shellfish Growing Area Lead

Alissa Dragan, Supervising Environmental Analyst
(203) 874-0696 ext. 119
Cell: (860) 818-7034
Alissa.Dragan@ct.gov

Harmful Algal Bloom Specialist

Emily Marquis, Environmental Analyst II
Cell: (860) 929-6414
Emily.Marquis@ct.gov

Shellfish Standardization Officer (SSO), Illness Investigation Lead

Jenifer Yeadon, Environmental Analyst III
(203) 874-0969 ext. 121
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Jenifer.Yeadon@ct.gov

Laboratory Supervisor

Joseph DeCrescenzo, Fisheries Biologist 2
(203) 874-0696 ext. 125
Cell: (860) 808-8631
Joseph.DeCrescenzo@ct.gov

In the absence of supervisory personnel,
contact Commissioner Bryan Hurlburt,
Department of Agriculture, (860) 713-2500.

Marine Biotoxin Analysis:

Connecticut Department of Agriculture, Bureau of Aquaculture Laboratory

Joseph DeCrescenzo, Fisheries Biologist 2
Andrea Staak, Fisheries Biologist I
Emily Marquis, Environmental Analyst II

Bigelow Laboratory

PO Box 380
60 Bigelow Drive, East Boothbay, ME 04544

Dr. Steve Archer - (207) 315-2567 ext. 314

United States Food and Drug Administration (USFDA)

Amy Fitzpatrick, Regional Shellfish Specialist
Northeast Regional Office, USFDA
(781) 587-7558
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Jonathan Deeds, Ph.D.
Office of Food Safety, Center for Food Safety
and Applied Nutrition, USFDA
Jonathan.Deeds@fda.hhs.gov

Additional State of Connecticut Contacts:

CT Department of Energy and Environmental Protection,
Marine Police District Headquarters
Captain Keith Williams
(860) 434-9840 | keith.williams@ct.gov
24 Hour Emergency Dispatch Center: (860) 424-3333

CT Department of Energy and Environmental
Protection, Marine Fisheries
(860) 434-6043
deep.marine.fisheries@ct.gov

CT Department of Public Health, Food Protection
Program
410 Capitol Avenue
PO Box 340308, MS # 11 FDP
Hartford, CT 06134
Tel: (860) 509-7297
Fax: (860) 706-5854
dph.foodprotectionprogram@ct.gov

Frank Greene, Director
Food Division, CT Department of Consumer
Protection (860) 713-6160
After regular business hours: (860) 483-0269
Frank.greene@ct.gov

Local Health Departments:

The Directory of Local Directors of Health in Connecticut, including relevant contact information, is available online: [Local Health Administration - Site Map](#)

Connecticut Shellfish Harvester Call list:

The updated harvest contact list frequently changes. DoAg maintains the most updated version and will use this in the event of a biotoxin closure or illness.

Neighboring State Shellfish Sanitation Program Contacts:

Rhode Island

Program Supervisor

David Borkman
Department of Environmental Management
Office of Water Resources, Shellfish Water
Quality Program
(401) 222-4700 ext. 277-7412
david.borkman@dem.ri.gov

Dealer Certification

Jarrod Olbres
Department of Health
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Laboratory

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New York

Chief

Debra Barnes
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Laboratory

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Shellfish Growing Area

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Shellfish Inspection

William M. Athawes
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(631) 444-0494
william.athawes@dec.ny.gov

Please refer to the Interstate Shellfish Sanitation Conference for additional contacts:

[SSCA | Interstate Shellfish Sanitation Conference](#)

University Contacts:

CT Sea Grant Extension Program UCONN

Tessa Getchis, Senior Extension Educator
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Woods Hole Oceanographic Institution

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