

M o n t h l y M a r i n e B i o t o x i n R e p o r t October 2014

Technical Report No. 14-19

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of October, 2014. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

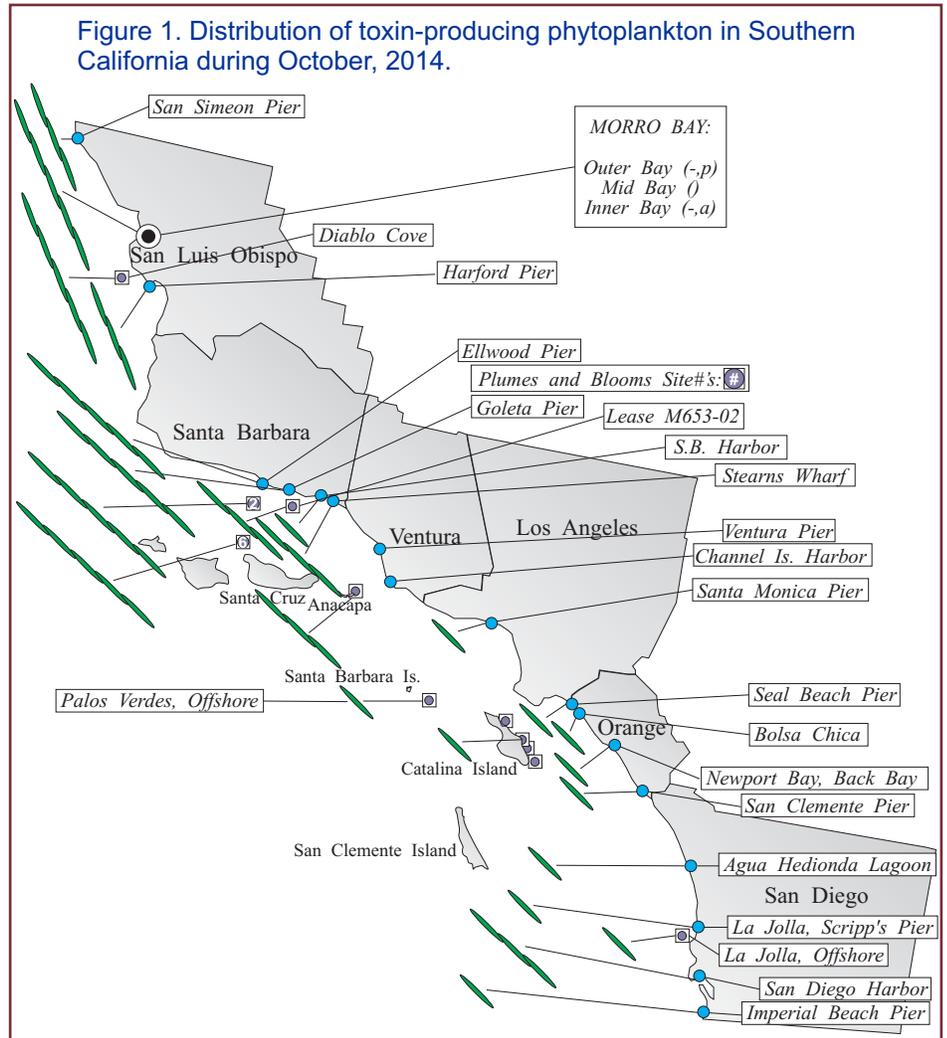
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any Southern California sites in October (Figure 1). Low concentrations of PSP toxins were detected at Fish Harbor in Long Beach where *Alexandrium* was observed at the end of September (Figure 3). PSP toxins below the alert level were also detected in rock scallop

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Relative Abundance of Known Toxin Producers

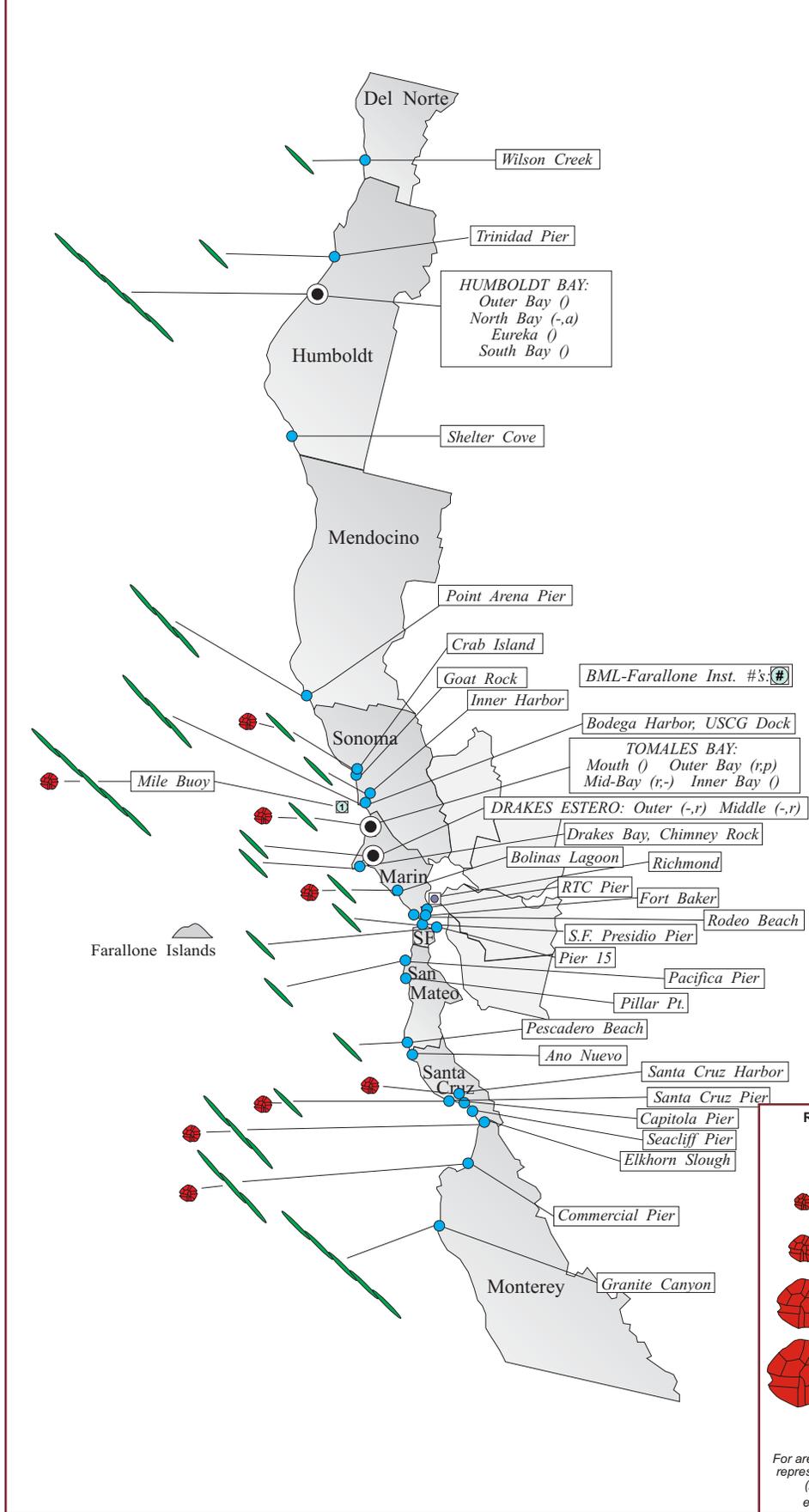
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%) Present (between 1% and 10%) Common (between 10% and 50%) Abundant (greater than 50%)	Present (less than 10%) Common (between 10% and 50%) Abundant (greater than 50%)

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during October, 2014.



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viscera from the Santa Barbara Channel during the last week of October.

Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast (Figure 1). The percent composition of this diatom remained abundant at most stations in San Luis Obispo and Santa Barbara counties. The cell mass remained low at most locations. The highest relative abundance was observed at Diablo Cove (October 9).

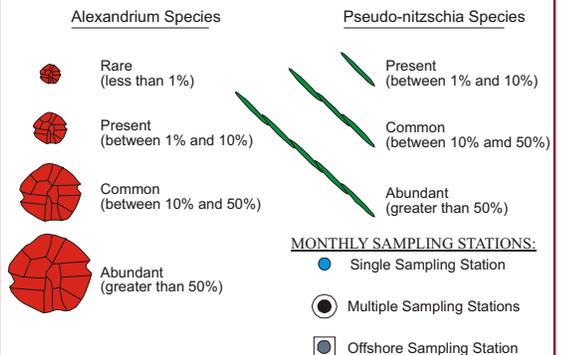
Domoic acid was detected in samples of lobster viscera, also known as lobster tomalley (Figure 3). The concentrations of toxin detected were well above the 20 ppm alert level at sites just offshore of Ventura Harbor and Channel Islands Harbor (Ventura). Domoic acid was also detected in lobster viscera near Port Hueneme Pier and offshore near Anacapa Island but was below the alert level.

Non-Toxic Species

The diatom Chaetoceros remained common to abundant along the southern California coast. The dinoflagellate Ceratium was common at San Luis Obispo sites. Diatoms dominated the rest of the coast, with Bacteriastrium common at various locations

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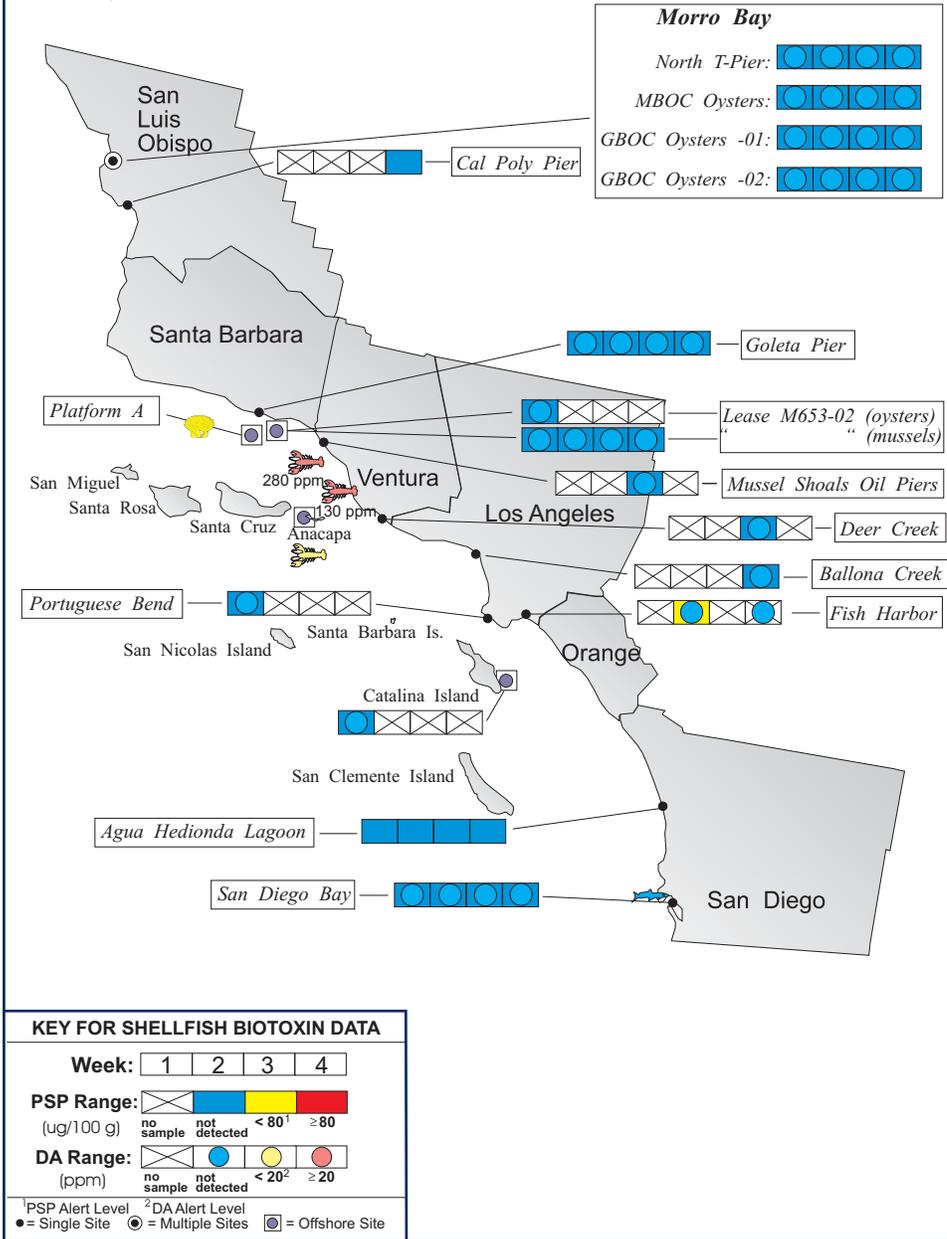
Relative Abundance of Known Toxin Producers



For areas with multiple sampling stations, species abundance at each station is represented as follows:
(A,P) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

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Figure 3. Distribution of shellfish biotoxins in Southern California during October, 2014.



and *Asterionella* abundant at Newport Bay (Orange County).

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at several sampling sites between Sonoma and Monterey counties (Figure 2). Cell numbers were low at all sites. PSP toxins were not detected in any shellfish samples collected throughout the month (Figure 3).

Domoic Acid

Pseudo-nitzschia was observed at sites in all coastal counties in October, decreasing at most sites from Sonoma to San Mateo (Figure 2). The highest relative abundances of *Pseudo-nitzschia* were observed at the Bodega mile buoy (October 21), inside Bodega Harbor (October 24), and in North Humboldt Bay (October 7). Domoic acid was not detected in any shellfish samples.

Non-Toxic Species

A mix of diatoms (*Chaetoceros*) and dinoflagellates were observed along the coast. The dinoflagellates *Prorocentrum micans* and *Ceratium furca* were common to abundant at some locations between Del Norte and Santa Cruz. The diatom *Thalassiosira* was common in San Mateo.



The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

QUARANTINES:

The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for Ventura county.

On October 10 a health advisory was issued warning consumers not to eat recreationally harvested bivalve shellfish, such as mussels, clams or whole scallops, as well as the internal organs of lobster or crab taken from Ventura county. This alert was issued due to high levels of domoic acid in samples of lobster viscera, also known as lobster "tomalley".

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

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Figure 4. Distribution of shellfish biotoxins in Northern California during October, 2014.

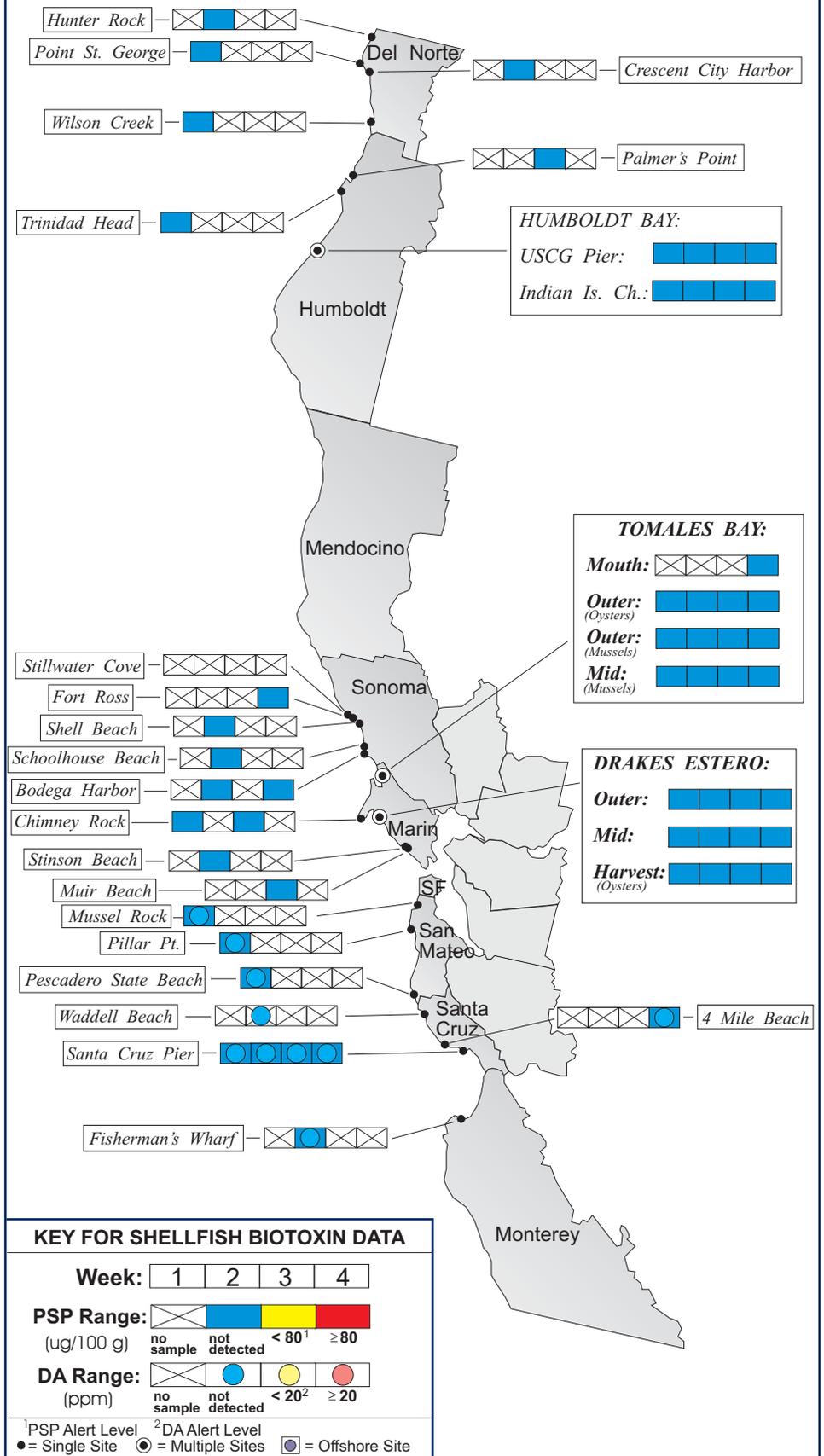


Table 1. Program participants collecting phytoplankton samples during October, 2014.

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AGENCY	#	AGENCY	#
DEL NORTE COUNTY		Yurok Tribe Environmental Program	1
HUMBOLDT COUNTY		Bureau of Land Management	1
Coast Seafood Company	4	Humboldt State University Marine Lab	2
MENDOCINO COUNTY		CDPH Volunteer (<i>Marie DeSantis</i>)	3
SONOMA COUNTY		Bodega Marine Lab	4
CDPH Marine Biotoxin Program	2	Sonoma Coast Watch	4
MARIN COUNTY		Marine Biotoxin Program CDPH	3
Golden Gate National Rec. Area	1	CDPH Volunteer (<i>Anderson, Clyde</i>)	5
SFSU, Romberg Tiburon Center	2	Hog Island Oyster Company	4
Drakes Bay Oyster Company	8	Gulf Farallones National Marine Sanctuary	6
Marine Biotoxin Program CDPH	3	NatureBridge	2
SAN FRANCISCO COUNTY			
CDPH Volunteer (<i>Eugenia McNaughton</i>)	3	Exploratorium	4
SAN MATEO COUNTY		The Marine Mammal Center (<i>Stan Jensen</i>)	1
San Mateo County Environmental Health Dept.	3	U.C. Santa Cruz - Ano Nuevo	1
SANTA CRUZ COUNTY		U.C. Santa Cruz	5
Santa Cruz County Environmental Health Dept	3	San Lorenzo Valley High School	1
MONTEREY COUNTY		Friends of the Sea Otter (<i>Janis Chaffin</i>)	3
Monterey Abalone Company	2	Marine Pollution Studies Laboratory	1
SAN LUIS OBISPO COUNTY		CDPH Volunteer (<i>Vince Shay</i>)	3
Morro Bay National Estuary Program	2	Morro Bay Oyster Company	4
Coastal Discovery Center, San Simeon	6	Tenera Environmental	4
SANTA BARBARA COUNTY			
HABNet/CDPH Volunteers (<i>Amiri</i>)	2	Ty Warner Sea Life Center/HABNet	1
Santa Barbara Channel Keeper	1	Santa Barbara Mariculture Company	3
CDPH Volunteer (<i>Sylvia Short</i>)	2	U.C. Santa Barbara	5
VENTURA COUNTY		Ventura County Environmental Health Dept.	1
CDPH Volunteer (<i>Fred Burgess</i>)	3	National Park Service	1
LOS ANGELES COUNTY		Catalina Island Marine Institute	2
Tole Mour	8	Los Angeles County Health Department	1
Los Angeles County Sanitation District	1	CDPH Volunteers (<i>Cal Parsons</i>)	1
ORANGE COUNTY			
California Department of Fish and Wildlife	5	National Oceanic and Atmospheric Admin.	1
CDPH Volunteer (<i>Truong Nguyen</i>)	4	Amigos de Bolsa Chica	4
SAN DIEGO COUNTY		Carlsbad Aquafarms, Inc.	4
Scripps Institute of Oceanography	4	Sea Camp/HABNet	2
U.S. Navy Marine Mammal Program	4	Tijuana River National Estuary Research	5

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

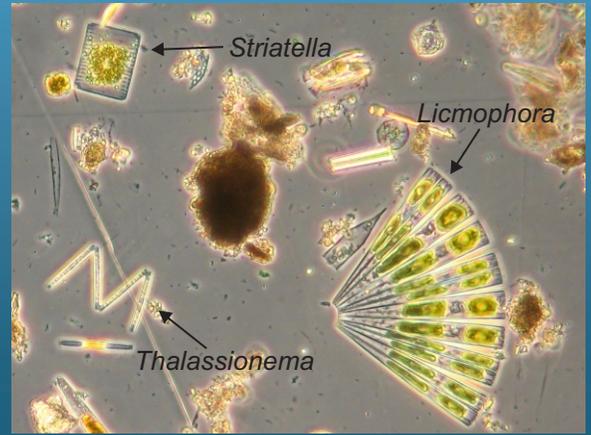
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



Table 2. CDPH program participants submitting shellfish samples during October, 2014.

COUNTY	AGENCY	#
Del Norte	Smith River Rancheria	1
	Yurok Tribe Environmental Program	2
	CDPH Volunteer (Harriet Jenesky)	1
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
	Humboldt State University	1
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	3
	CDPH Volunteer (<i>James Sanders, John Morozumi</i>)	3
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	CDPH Marine Biotoxin Program	2
	Hog Island Oyster Company	4
	Tomales Bay Oyster Company	4
	Starbird Mariculture	1
	CDPH Volunteer (<i>Jamie Sutton, Rand Dobleman</i>)	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
	CDPH Volunteer (<i>Gary Della Maggiora</i>)	1
Santa Cruz	U.C. Santa Cruz	5
	CDPH Volunteer (<i>Joel Herzel, Michael Wolcott</i>)	2
Monterey	CDPH Volunteer (<i>Kyle Mooers</i>)	1
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	6
	CDPH Marine Biotoxin Program	1
Santa Barbara	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	6
Ventura	Ventura County Environmental Health Department	2
	CDPH Volunteer (<i>Bill Weinerth</i>)	5
Los Angeles	CDPH Volunteer (<i>Cal Parsons</i>)	1
	Los Angeles County Health Department	1
	Southern California Marine Institute	2
	Los Angeles County Health Department Torrance	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	5

PHYTOPLANKTON GALLERY



Diatoms Striatella, Thalassionema, and Licmophora.



The dinoflagellate Dinophysis mitra.



The chain diatom Bacteriastrum has radial symmetry.