

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 2015

Technical Report No. 15-21

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of October, 2015. 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 observed at Scripp's Pier in San Diego County in October (Figure 1). Cell numbers were low. PSP toxins were not detected in any bivalve shellfish samples collected in October (Figure 3).

Domoic Acid

Pseudo-nitzschia was observed at select

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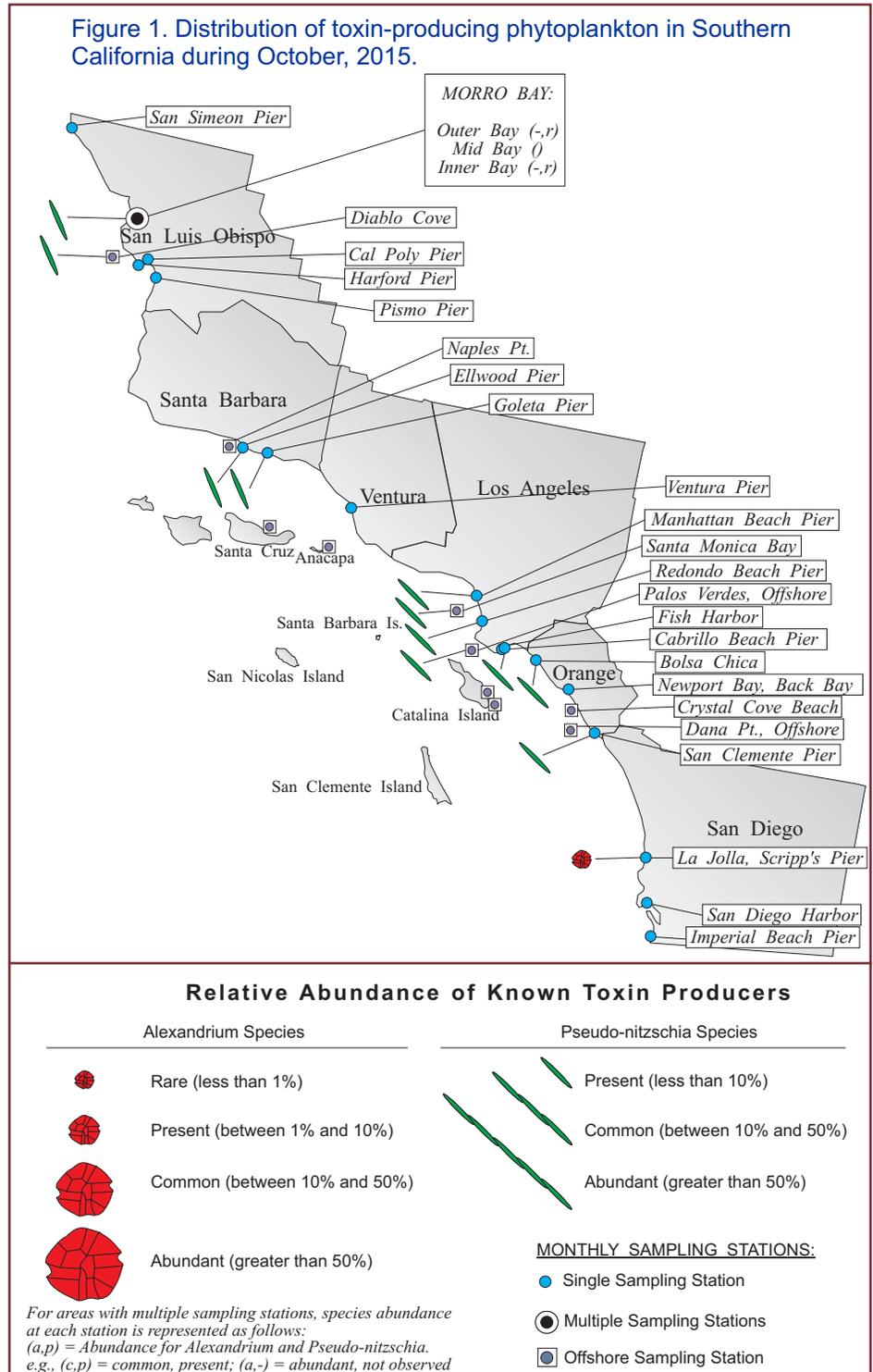
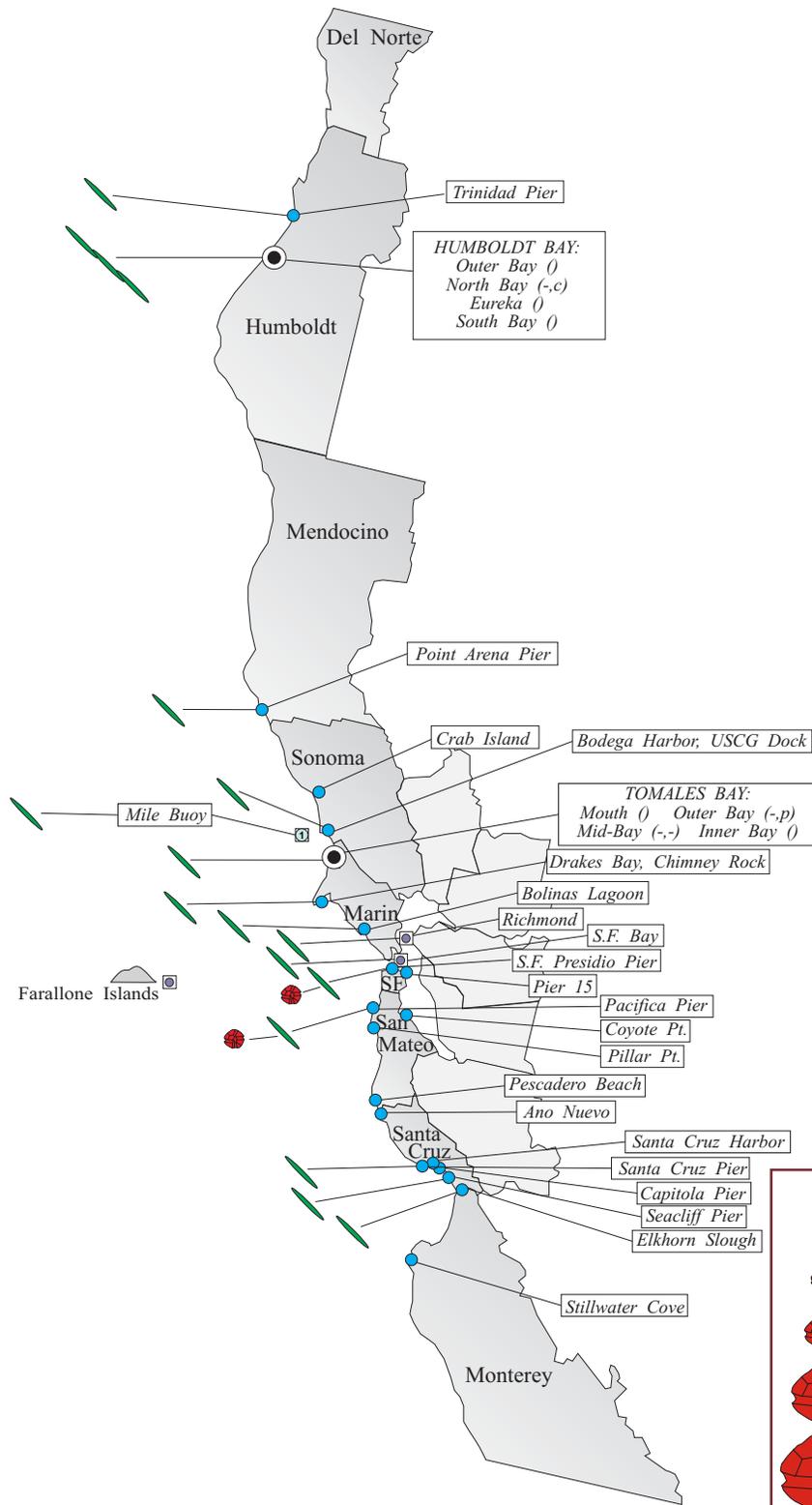


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during October, 2015.



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sampling sites in San Luis Obispo, Santa Barbara, Los Angeles, and Orange counties (Figure 1). The percent composition of this diatom decreased at sites in San Luis Obispo County. The cell mass was low at all locations. Domoic acid was not detected in bivalve shellfish samples analyzed during October (Figure 3). Crab samples were collected by the CDPH Food and Drug Branch. Three of the six rock crab samples collected in Santa Barbara County exceeded the domoic acid alert level in the viscera with concentrations ranging from <2.5-68 ppm. Dungeness crab, rock crabs, and spider crabs from San Luis Obispo County contained low levels of domoic acid.

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at sites in all Southern California counties. The diatom *Bacteriastrum* was common to abundant at select sites in Santa Barbara and Ventura counties.

Northern California Summary:

Paralytic Shellfish Poisoning

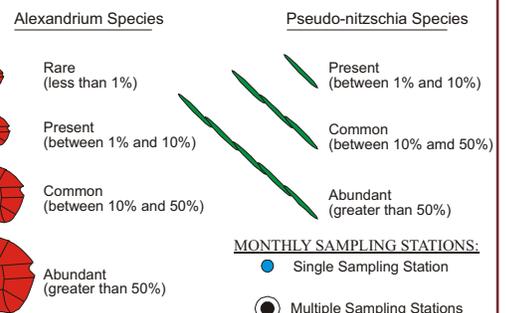
Alexandrium was observed at sites in San Francisco and San Mateo counties (Figure 2). Cell numbers were low at all sites. PSP toxins were not detected in any bivalve shellfish samples in October (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at sites between Humboldt and Monterey counties

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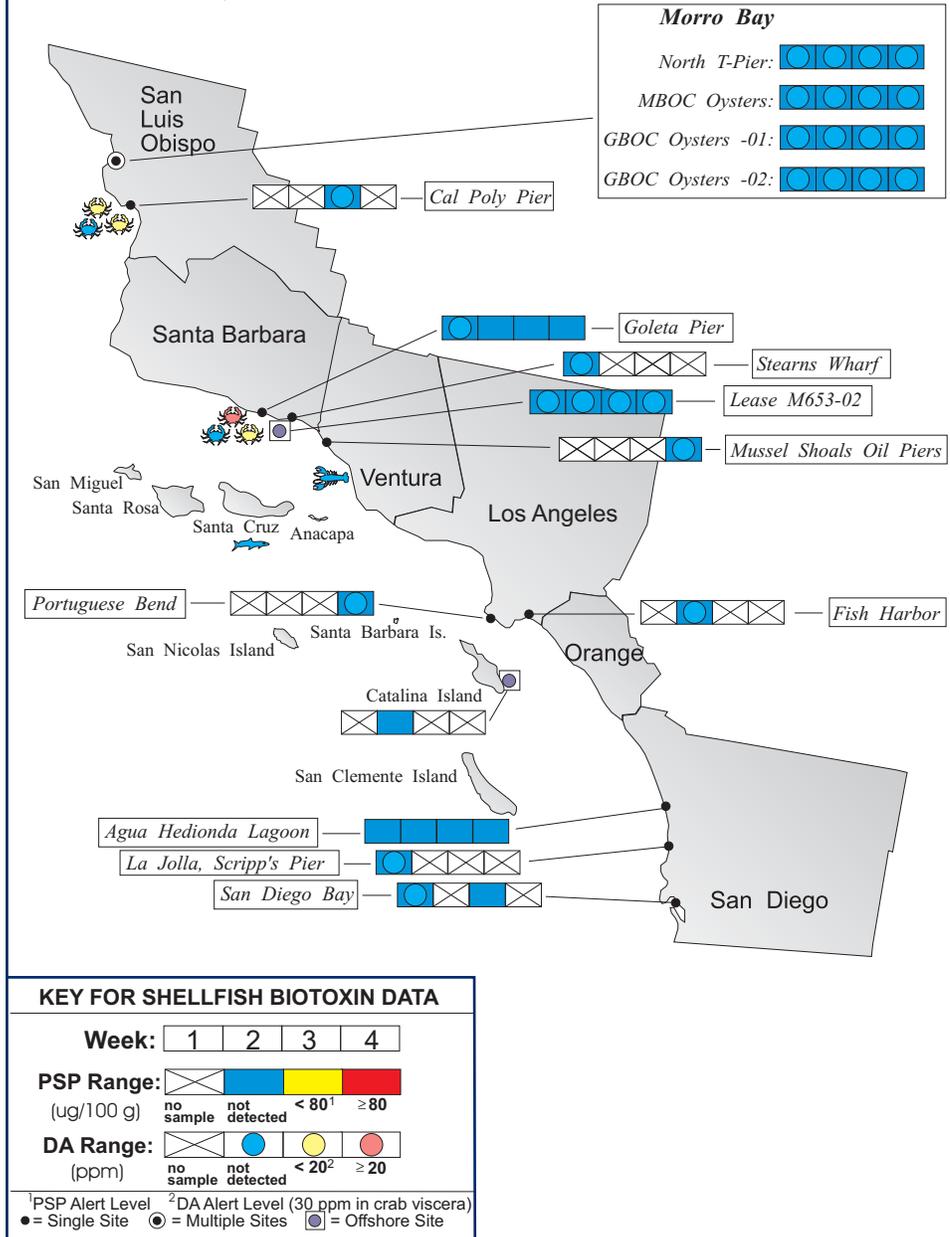
Relative Abundance of Known Toxin Producers



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, 2015.



(Figure 2). No phytoplankton samples were collected from Del Norte County in October. The percent composition of this diatom decreased at the majority of sites compared to September. Cell mass was low at all locations. Domoic acid was detected above the alert level in mussels from Hunter Rock in Del Norte County during the second week of October. A razor clam sample collected at Moonstone Beach in Humboldt County contained 300 ppm domoic acid on October 28. Dungeness crab samples were collected by the CDPH Food and Drug Branch in October. The majority of the Dungeness crab samples - all 20 from Humboldt County, three of six from Sonoma County, and 10 of 12 from San Mateo County - exceeded the alert level in the viscera, with concentrations ranging from 37-140 ppm, 21-40 ppm, and 16-130 ppm respectively. Dungeness crabs collected from Mendocino County contained low levels of domoic acid in the viscera.

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at sites in Humboldt and San Francisco to Santa Cruz counties. At San Francisco sites the diatoms *Thalassiosira*, *Coscinodiscus*, and *Pleurosigma* were common to abundant. The unarmored dinoflagellate *Akashiwo* was common to abundant at Pacifica Pier in San Mateo County.



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:

On August 26 the Department issued a Health Advisory warning consumers not to eat recreationally harvested bivalve shellfish from Humboldt and Del Norte counties. Only the white meat of scallops should be consumed and the viscera discarded.

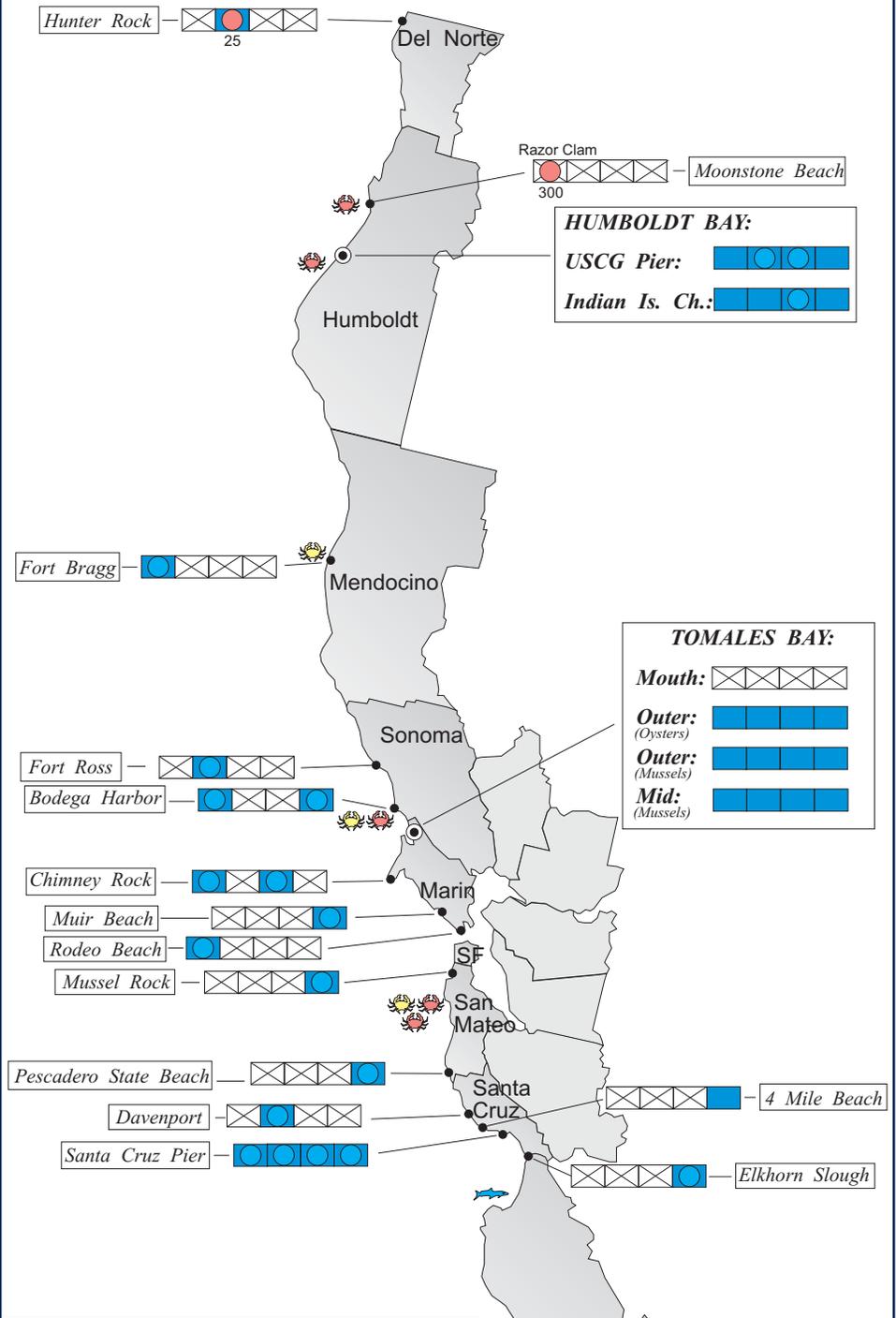
A Health Advisory remains in effect for recreationally harvested mussels and clams, the internal organs of scallops, and the internal organs and meat of commercially or recreationally caught anchovy, sardines, and crabs taken from Monterey, Santa Cruz and Santa Barbara counties. This advisory was issued because of elevated levels of domoic acid in samples from this region.

The annual mussel quarantine began on May 1. This annual quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries.

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

Figure 4. Distribution of shellfish biotoxins in Northern California during October, 2015.



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: (ppm) no sample not detected < 20² ≥ 20

¹PSP Alert Level ²DA Alert Level (30 ppm in crab viscera)
 ● = Single Site ○ = Multiple Sites ◐ = Offshore Site

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Table 1. Program participants collecting phytoplankton samples during October, 2015.

AGENCY	#	AGENCY	#
HUMBOLDT COUNTY			
Coast Seafood Company	3	Humboldt State University Marine Lab	1
MENDOCINO COUNTY			
		CDPH Volunteer (<i>Marie De Santis</i>)	3
SONOMA COUNTY			
		CDPH Marine Biotoxin Program	2
Sonoma Coast Watch	1	Bodega Marine Lab & Farallone Institute	1
MARIN COUNTY			
		CDPH Volunteers (<i>Anderson, Clyde</i>)	6
CDPH Marine Biotoxin Program	3	Hog Island Oyster Company	4
CONTRA COSTA COUNTY			
		CDPH Marine Biotoxin Program	1
SAN FRANCISCO COUNTY			
		Monte Vista High School	1
CDPH Volunteer (<i>Eugenia McNaughton</i>)	2	Exploratorium	4
San Francisco Bay Whale Watching Company	1	CDPH Marine Biotoxin Program	1
SAN MATEO COUNTY			
		CDPH Marine Biotoxin Program	1
San Mateo County Environmental Health Dept.	3	The Marine Mammal Center (<i>Stan Jensen</i>)	4
Friends of the Sea Otter (<i>Diane Larson</i>)	3	U.C. Santa Cruz - Ano Nuevo	1
SANTA CRUZ COUNTY			
U.C. Santa Cruz	4	San Lorenzo Valley High School	1
Santa Cruz County Envir. Health Department	3	The Otter Project (<i>Jeff Palsgaard</i>)	5
MONTEREY COUNTY			
The Otter Project (<i>Rose, Noke</i>)	3	Friends of the Sea Otter (<i>Janis Chaffin</i>)	1
SAN LUIS OBISPO COUNTY			
Morro Bay National Estuary Program	2	Morro Bay Oyster Company	4
Central Coast Aquarium	1	CDPH Volunteer (<i>Alison Plemons</i>)	4
Coastal Discovery Center, San Simeon	4	Tenera Environmental	5
Friends of the Sea Otter (<i>Cherry, Carducci</i>)	2	CDPH Marine Biotoxin Program	1
SANTA BARBARA COUNTY			
CDPH Volunteer (<i>Sylvia Short</i>)	3	U.C. Santa Barbara	4
Santa Barbara Channel Keeper	1	Island Packers/HABNet	1
VENTURA COUNTY			
National Park Service	1	CDPH Volunteer (<i>Fred Burgess</i>)	3
LOS ANGELES COUNTY			
Los Angeles County Sanitation District	2	CDPH Volunteers (<i>Cal Parsons</i>)	1
Los Angeles County Health Department	3	City of Los Angeles Envir Monitoring Division	2
Southern California Marine Institute	1	Catalina Island Marine Institute	1
ORANGE COUNTY			
		CDPH Volunteer (<i>Truong Nguyen</i>)	2
California Department of Fish and Wildlife	4	Amigos de Bolsa Chica	5
Crystal Cove Alliance	2	Ocean Institute	1
SAN DIEGO COUNTY			
		Scripps Institute of Oceanography	3
U.S. Navy Marine Mammal Program	1	Tijuana River National Estuary Research	3

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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.

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.



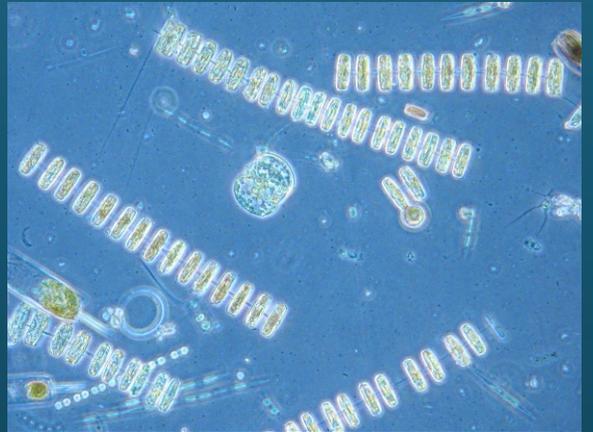
Table 2. CDPH program participants submitting shellfish samples during October, 2015.

COUNTY	AGENCY	#
Del Norte	Tolowa Dee-ni' Nation	1
Humboldt	Coast Seafood Company	8
	California Department of Fish and Wildlife	1
	CDPH Food and Drug Branch	20
Mendocino	Mendocino County Environmental Health Department	1
	CDPH Food and Drug Branch	6
Sonoma	CDPH Marine Biotoxin Program	2
	CDPH Volunteer (<i>John Morozumi</i>)	1
	CDPH Food and Drug Branch	6
Marin	Cove Mussel Company	4
	Hog Island Oyster Company	8
	CDPH Marine Biotoxin Program	2
	CDPH Volunteers (<i>Rand Dobleman, Peter Schmidt</i>)	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
	CDPH Volunteer (<i>Chris Eatinger</i>)	12
	CDPH Volunteer (<i>Gary Della Maggiora</i>)	1
Santa Cruz	U.C. Santa Cruz	4
	CDPH Volunteer (<i>Joel Herzal, Michael Wolcott</i>)	2
Monterey	CDPH Volunteer (<i>Katherine Neylan</i>)	1
	CDPH Food and Drug Branch	4
	Marcus Food Co.	1
	CDPH Volunteer (<i>Mayer</i>)	1
San Luis Obispo	Grassy Bar Oyster Company	10
	Morro Bay Oyster Company	6
	CDPH Marine Biotoxin Program	1
	CDPH Food and Drug Branch	11
Santa Barbara	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	CDPH Food and Drug Branch	6
	Ty Warner Sea Life Center/HABNet	1
	Marcus Food Co.	1
Ventura	Ventura County Environmental Health Department	1
	CDPH Volunteer (<i>Nick Atsley</i>)	1
Los Angeles	Southern California Marine Institute	1
	Los Angeles County Health Department	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1
	U.S. Navy Marine Mammal Program	2

PHYTOPLANKTON GALLERY



The diatom *Eucampia* forms spiral chains.



A chain forming species of the centric diatom *Thalassiosira*. The cells are connected with a cytoplasmic thread..



A singular *Coscinodiscus* centric diatom. This is a top or valve view of the disk shaped cell.