

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

February 2016

Technical Report No. 16-07

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of February, 2016. 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.

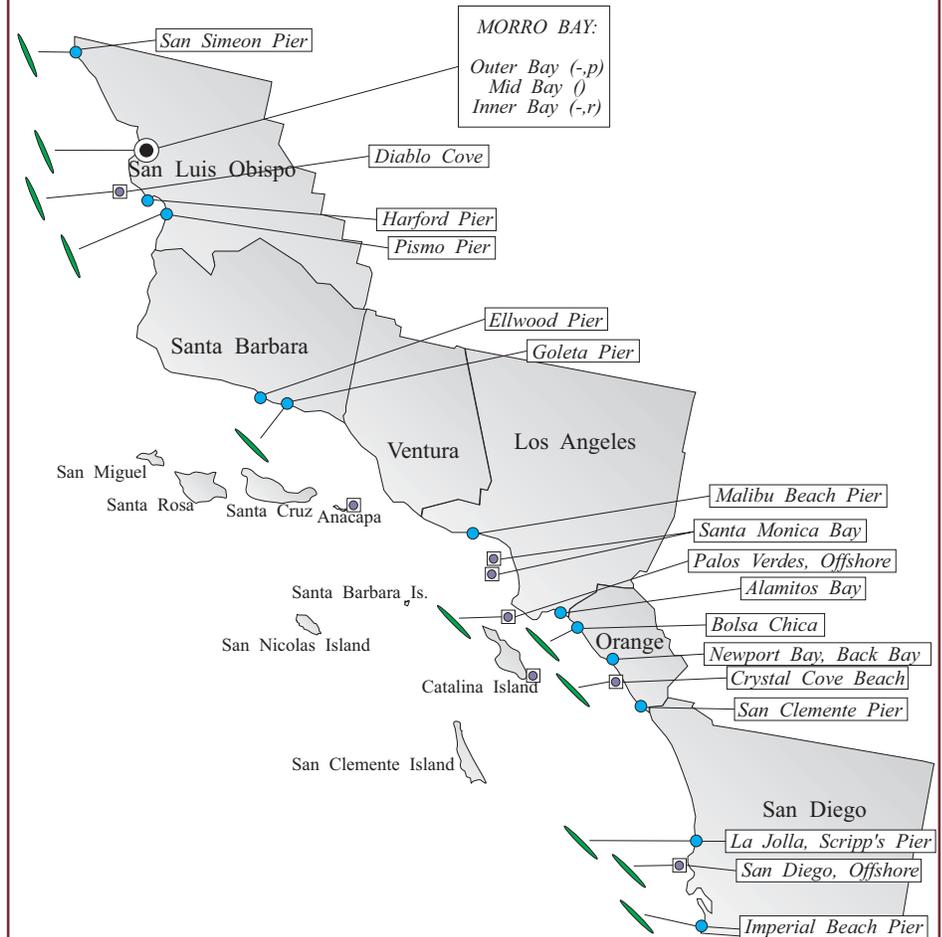
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any southern California sites (Figure 1). PSP toxins were not detected in any bivalve shellfish samples collected in February (Figure 3).

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during February, 2016.



Relative Abundance of Known Toxin Producers

Alexandrium Species

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

Pseudo-nitzschia Species

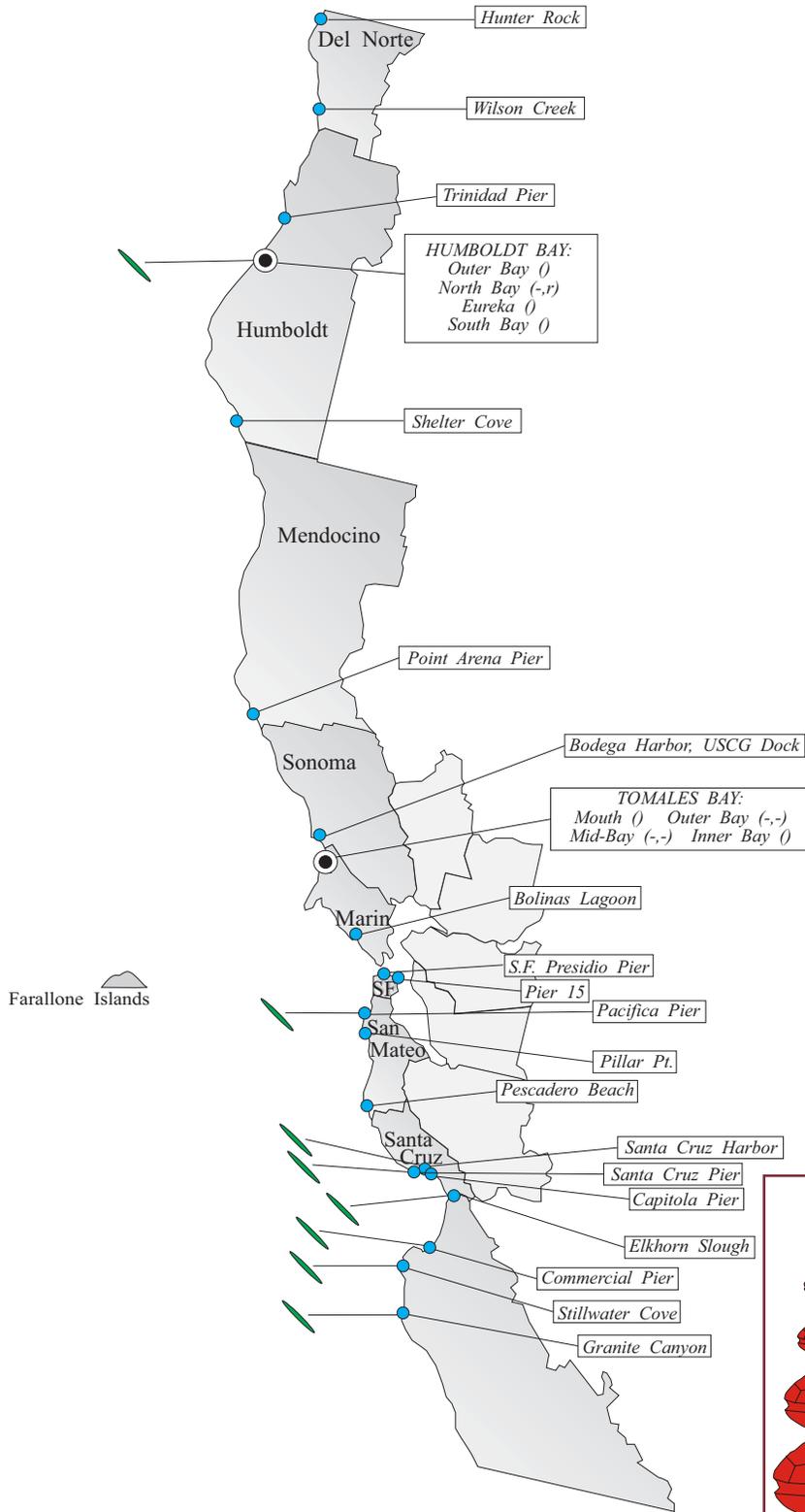
- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

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 February, 2016.



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Domoic Acid

Pseudo-nitzschia was observed at select sampling sites in all southern California counties except Ventura (Figure 1). The cell mass was low at all locations. It should be noted that the majority of *Pseudo-nitzschia* observed was a nontoxic species in the *delicatissima* complex. Domoic acid was not detected in bivalve shellfish samples collected during February (Figure 3).

Rock crab samples were collected in Santa Barbara County by the CDPH Food and Drug Branch (FDB) and the California Department of Fish and Wildlife (DFW). The samples from offshore around the northern Channel Islands exhibited a range of domoic acid concentrations from <2.5-550 ppm.

A summary of the crab sample data can be found at:

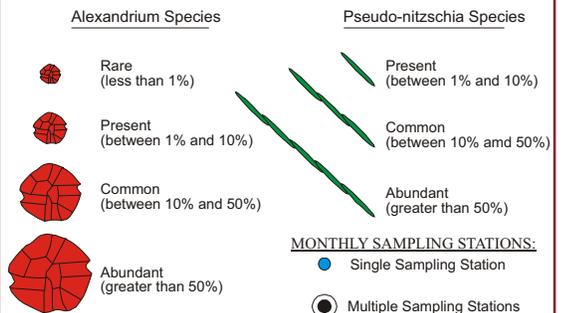
<http://www.cdph.ca.gov/HealthInfo/Pages/fdbDomoicAcidInfo.aspx>

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at sites in all southern California counties, except Ventura. The dinoflagellate *Ceratium furca* was common in Santa Barbara County at Ellwood and Goleta Piers, in Los Angeles County at an offshore site in Santa Monica Bay and in Orange County at Crystal Cove Beach.

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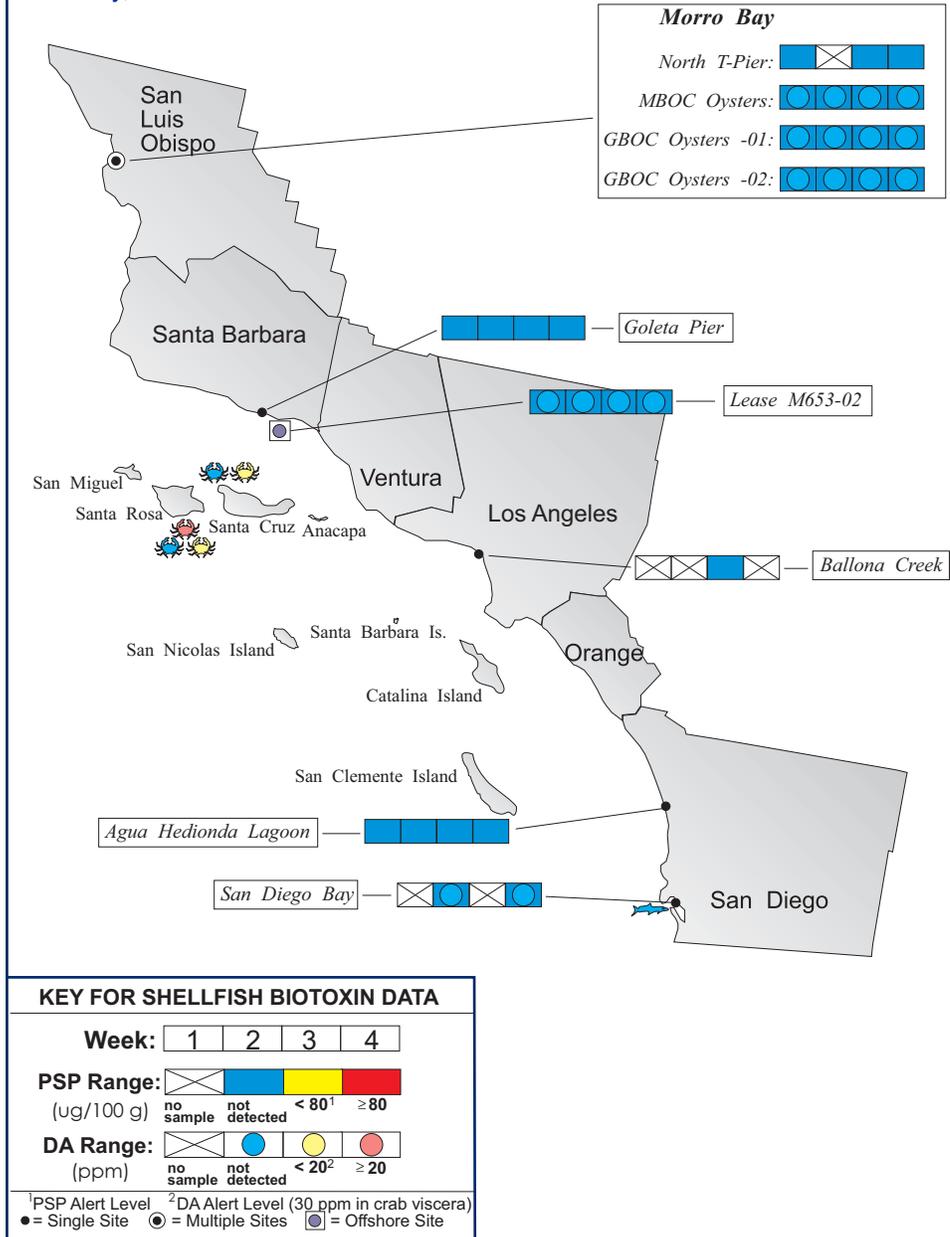
Relative Abundance of Known Toxin Producers



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 February, 2016.



Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any northern California sites (Figure 2). PSP toxins were not detected in any bivalve shellfish samples collected in February (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed in Humboldt Bay and between San Mateo and Monterey counties (Figure 2). Cell mass was low at all locations. Domoic acid was detected in razor clam samples collected by the Del Norte County Health Department from South Beach in Del Norte County on February 6, with concentrations ranging from 60-81 ppm in the meat and 55-68 ppm in the viscera.

FDB and DFW continued to collect crab samples along the entire northern California coast. Concentrations of domoic acid in Dungeness crab viscera ranged from <2.5-82 ppm in Humboldt County, 7.7-93 ppm in Mendocino County, and <2.5-66 ppm in Sonoma County. Dungeness crabs collected from Del Norte and San Mateo counties contained low levels of domoic acid in the viscera. By February 6, Dungeness crabs collected from San Francisco and San Mateo counties were all under the 30 ppm alert level in the viscera for two consecutive groups of samples from each area. Rock crab samples from Monterey County

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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

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exhibited a range of domoic acid concentrations in the viscera from <2.5-55 ppm.

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at select sites in Marin, San Mateo and Santa Cruz counties. The diatom *Asterionella* was abundant at Hunter Rock in Del Norte County.



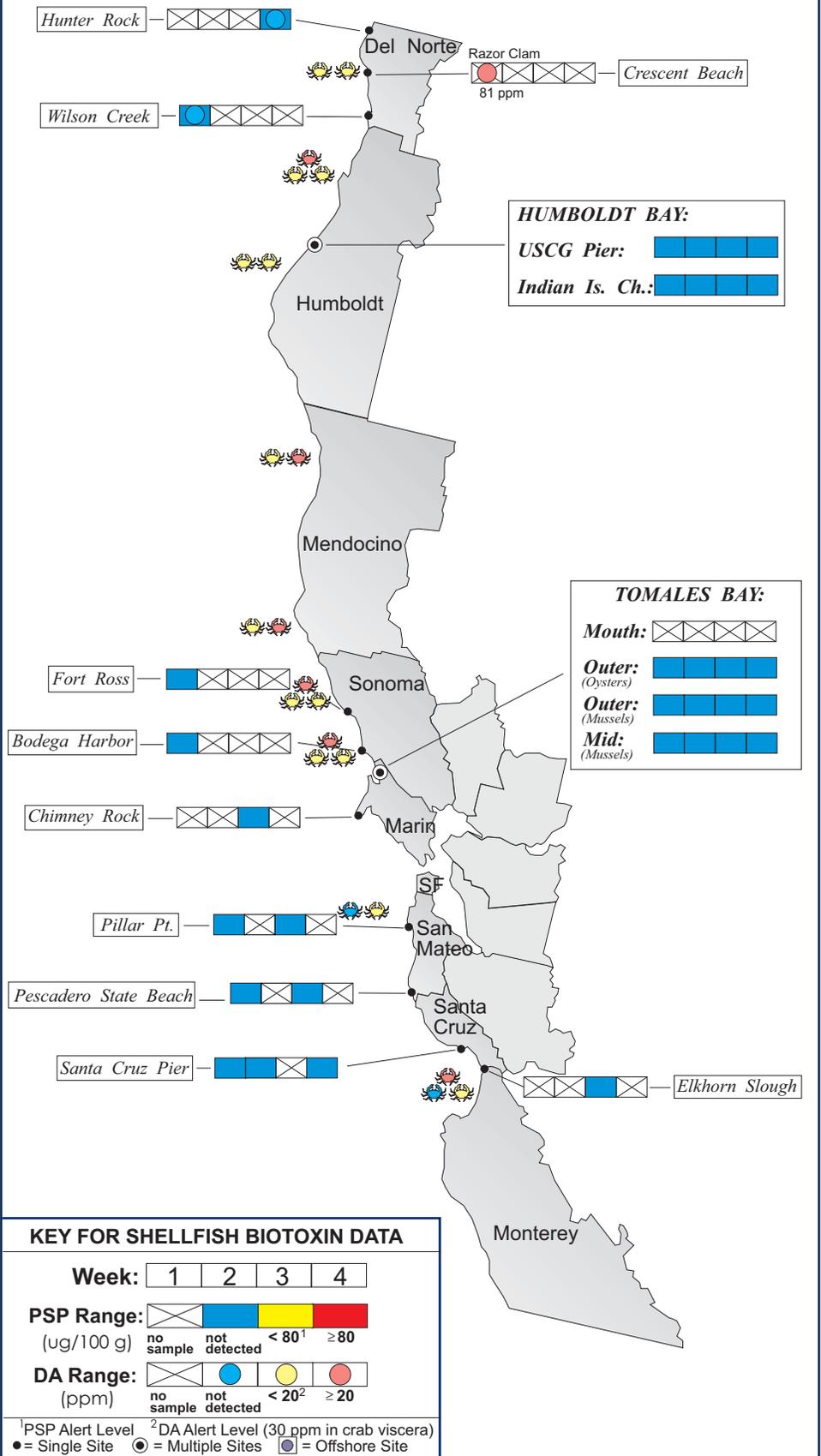
QUARANTINES:

The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for Del Norte, Humboldt, Santa Cruz, Monterey, and Santa Barbara counties. The quarantine was later lifted for all counties. However, the December 9 Health Advisory warning consumers not to eat recreationally harvested razor clams from Humboldt and Del Norte counties remains in effect due to elevated levels of domoic acid.

On February 11 the Health Advisory for Dungeness crabs was lifted for state waters south of latitude 38° 00' N near Point Reyes in Marin County. Despite the lifting of the health advisory in this area consumers were still advised to avoid eating the viscera (internal organs, also known as "crab butter") of crabs. The advisory remains in effect for Dungeness crab caught in state waters north of Latitude 38° 00' N and for rock crabs caught in state waters around Santa Cruz, Santa Rosa, the San Miguel Islands and areas north of Latitude 35° 40' N (near Piedras Blancas Light Station, in San Luis Obispo County), due to continued elevated levels of domoic acid in crabs caught in those areas.

Consumers of Washington clams, also known as butter clams (*Saxidomus*

Figure 4. Distribution of shellfish biotoxins in Northern California during February, 2016.



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Table 1. Program participants collecting phytoplankton samples during February, 2016.

AGENCY	#	AGENCY	#
DEL NORTE COUNTY			
Yurok Tribe Environmental Program	1	Tolowa Dee-ni' Nation	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>)	2
SONOMA COUNTY			
		CDPH Marine Biotoxin Program	1
MARIN COUNTY			
CDPH Volunteers (<i>Anderson, Clyde</i>)	6	Hog Island Oyster Company	5
SAN FRANCISCO COUNTY			
		CDPH Volunteer (<i>Eugenia McNaughton</i>)	1
Monte Vista High School	1	Exploratorium	2
SAN MATEO COUNTY			
San Mateo County Environmental Health Dept.	4	The Marine Mammal Center (<i>Stan Jensen</i>)	5
SANTA CRUZ COUNTY			
U.C. Santa Cruz	4	San Lorenzo Valley High School	1
Santa Cruz County Envir. Health Department	2	The Otter Project (<i>Jeff Palsgaard</i>)	4
MONTEREY COUNTY			
The Otter Project (<i>Rose, Noke</i>)	5	Marine Pollution Studies Laboratory	1
Monterey Abalone Company	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	5
Coastal Discovery Center, San Simeon	4	Tenera Environmental	4
Friends of the Sea Otter (<i>Kelly Cherry</i>)	5	CDPH Volunteer (<i>Allison Plemons</i>)	3
SANTA BARBARA COUNTY			
CDPH Volunteer (<i>Sylvia Short</i>)	1	U.C. Santa Barbara	4
VENTURA COUNTY			
		National Park Service	2
LOS ANGELES COUNTY			
		Long Beach Marine Institute	2
Los Angeles County Sanitation District	2	CDPH Volunteers (<i>Cal Parsons</i>)	1
Los Angeles County Health Department	1	City of Los Angeles Envir Monitoring Division	3
ORANGE COUNTY			
California Department of Fish and Wildlife	4	Amigos de Bolsa Chica	4
Crystal Cove Alliance	3	CDPH Volunteer (<i>Truong Nguyen</i>)	2
SAN DIEGO COUNTY			
		Sea Camp/HABNet	4
Scripps Institute of Oceanography	4	Tijuana River National Estuary Research	4

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nutalli), 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.

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

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Table 2. CDPH program participants submitting shellfish samples during February, 2016.

COUNTY	AGENCY	#
Del Norte	Tolowa Dee-ni' Nation	1
	Yurok Tribe Environmental Program	1
	Del Norte County Health Department	6
Humboldt	CDPH Food and Drug Branch	18
	Coast Seafood Company	8
	CDPH Food and Drug Branch	60
Mendocino	CDPH Food and Drug Branch	36
	Sonoma	1
Marin	CDPH Marine Biotoxin Program	1
	CDPH Volunteer (<i>John Morozumi</i>)	1
	CDPH Food and Drug Branch	48
	Cove Mussel Company	4
	Hog Island Oyster Company	4
San Francisco	Starbird Mariculture	5
	CDPH Marine Biotoxin Program	1
	None Submitted	
	San Mateo	4
San Mateo	San Mateo County Environmental Health Department	4
	CDPH Food and Drug Branch	6
Santa Cruz	U.C. Santa Cruz	3
Monterey	CDPH Volunteer (<i>Katherine Neylan</i>)	1
	CDPH Food and Drug Branch	17
San Luis Obispo	Grassy Bar Oyster Company	10
	Morro Bay Oyster Company	7
Santa Barbara	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	4
	CDPH Food and Drug Branch	35
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department Burke	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	4

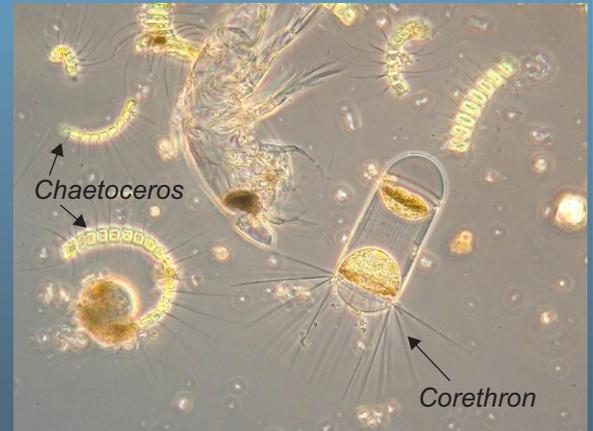
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shellfish tissue. These toxins may also accumulate in seafood species such as crab, lobster, and small finfish like sardines and anchovies.

Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



PHYTOPLANKTON GALLERY



Multiple chains of the diatom *Chaetoceros* and the singular diatom *Corethron*. *Corethron* typically has many spines radiating from both ends of the cell.



The chain diatom *Asterionella* was abundant in the sample from Hunter Rock in Del Norte County at the end of February.



The chain diatom *Hemialaus*. This species was found to be common at Bolsa Chica in Orange County in February.