

# M o n i t o r i n g M a r i n e B i o t o x i n R e p o r t

February 2014

Technical Report No. 14-08

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of February, 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 observed at several sampling locations between Santa Barbara and Orange counties (Figure 1), representing a broader distribution than observed in January. The overall relative abundance declined from the previous month. PSP toxins were not detected in any shellfish samples in

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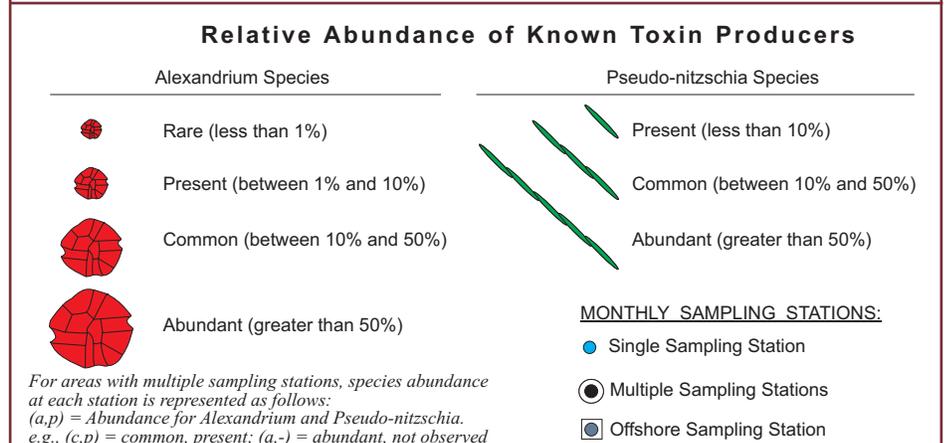
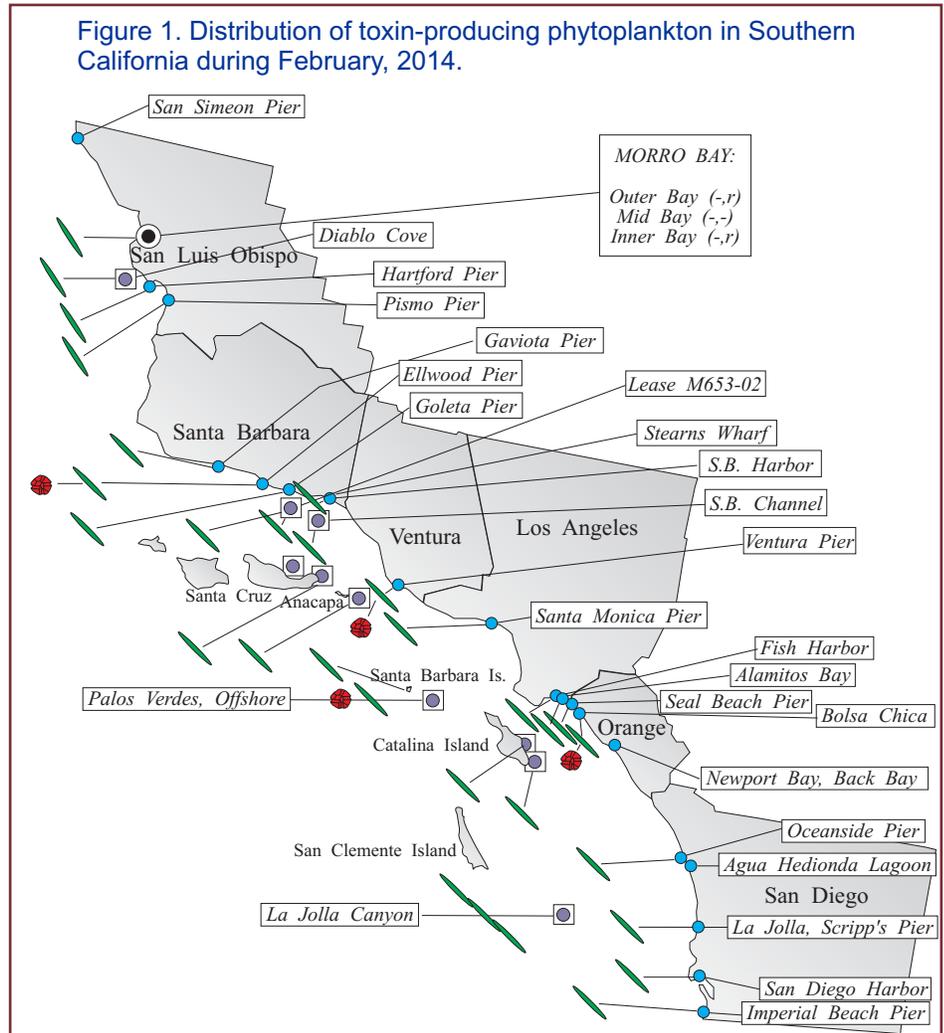
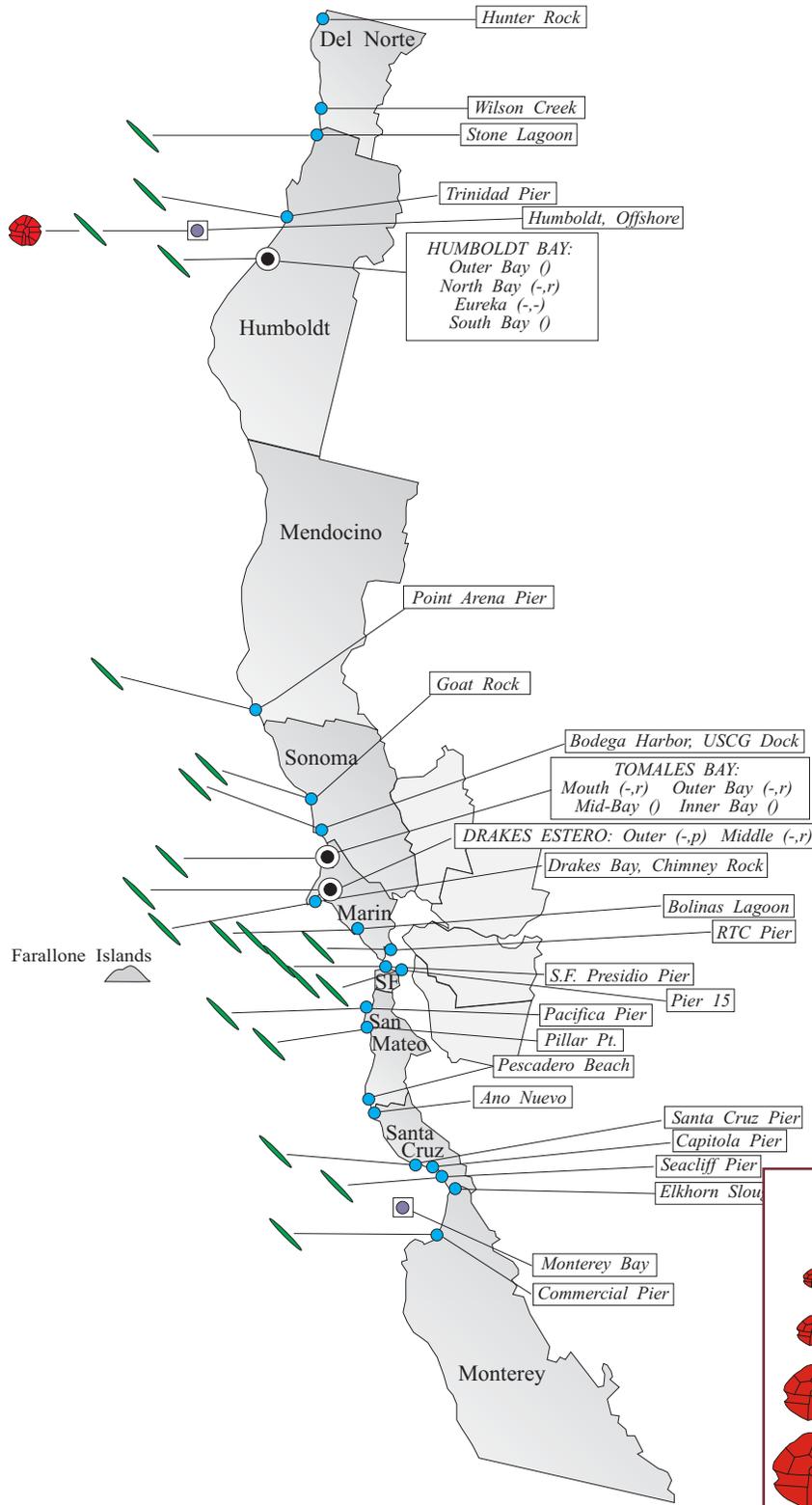


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during February, 2014.



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February (Figure 3).

**Domoic Acid**

*Pseudo-nitzschia* was observed along the entire southern California coast (Figure 1). The relative abundance of this diatom continued to decline from previous months. Domoic acid was not detected in bivalve shellfish during February (Figure 3). Rock crab viscera samples from the northern Channel Islands contained varying levels of domoic acid, ranging from nondetectable to above the alert level. The highest concentration of domoic acid was 95 ppm in a sample collected north of Santa Rosa Island.

**Non-Toxic Species**

The diatom *Chaetoceros* was common to abundant along the southern California coast. The dinoflagellates *Akashiwo sanguinea* and *Prorocentrum* were common at two Los Angeles sites. *Gonyaulax* and *Prorocentrum* were common at Agua Hedionda Lagoon and Oceanside Pier, respectively.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* was only observed at one location in February (Figure 2). Significant numbers of this dinoflagellate were observed offshore of Trinidad, north of Humboldt Bay, on February 24th by the Humboldt State University Marine Lab. PSP toxins remained above the alert level at

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**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

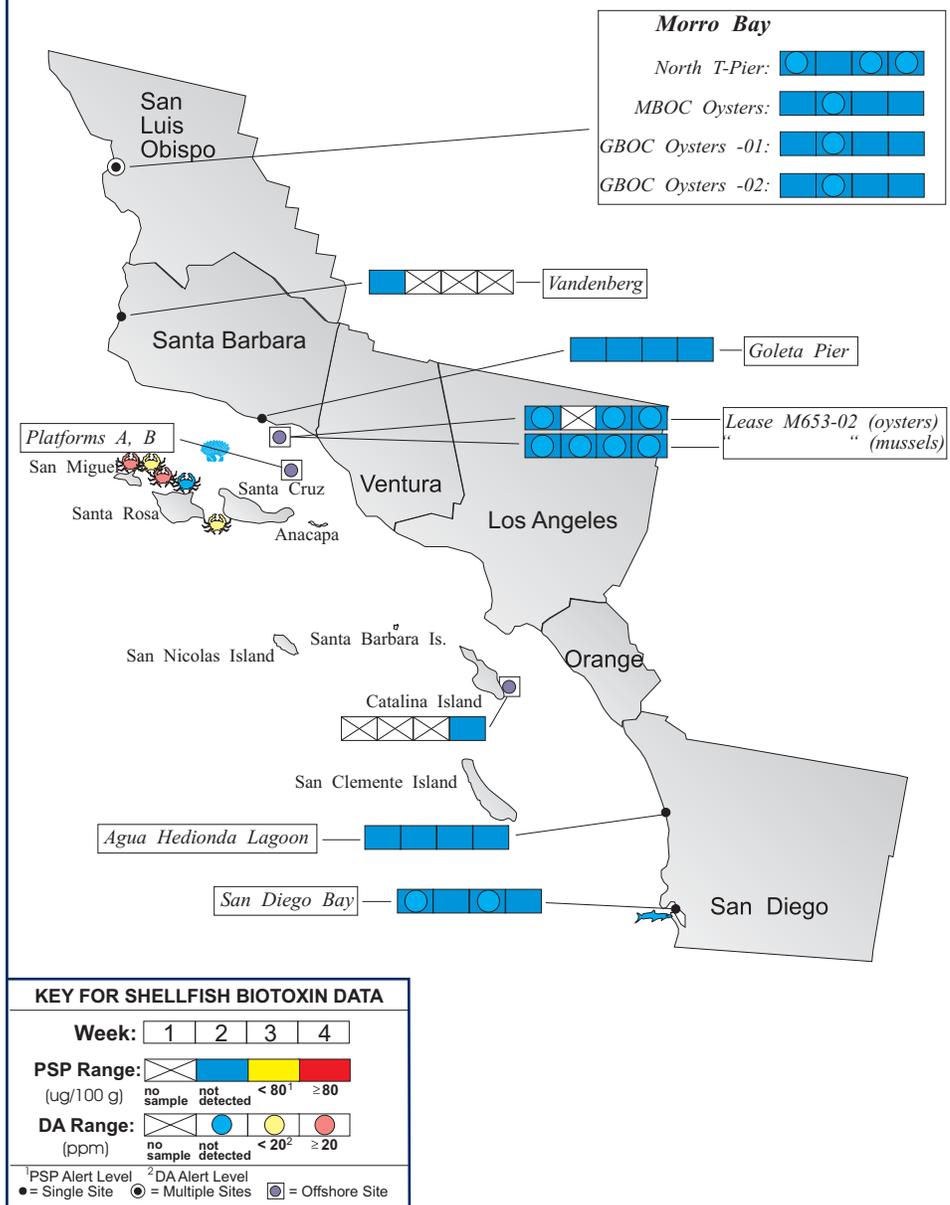
- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

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



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Point St. George (Del Norte County) and at lower levels along much of the northern California coast (Figure 4). By February the PSP toxin concentrations in Tomales Bay shellfish had declined below the detection limit with one exception: mussels from Marconi Cove contained a low level of these toxins through the first week of the month. Likewise, PSP toxin levels dropped below the detection limit in Drakes Estero in February.

**Domoic Acid**

*Pseudo-nitzschia* was observed at most sampling sites in February (Figure 2). The relative abundance of this diatom continued to decline at most locations and remained very low throughout the month.

**Non-Toxic Species**

The diatom *Chaetoceros* was common at several sites from Humboldt to Santa Cruz. Sampling locations in San Mateo had a greater diversity of common species, with the diatoms *Thalassionema*, *Thalassiosira*, and *Skeletonema* the most numerous.



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 February 19 the Department lifted the December 20, 2013 Health Advisory warning consumers not to eat recreationally harvested bivalve shellfish (i.e., mussels, clams and scallops) from the Los Angeles County coastline between Cabrillo Point and the Los Angeles-Orange county line. This advisory was due to elevated levels of the PSP toxins in this region.

On January 24 the Department lifted the Health Advisory for all sporharvested shellfish from Monterey Bay and Tomales Bay that was established due to elevated PSP levels.

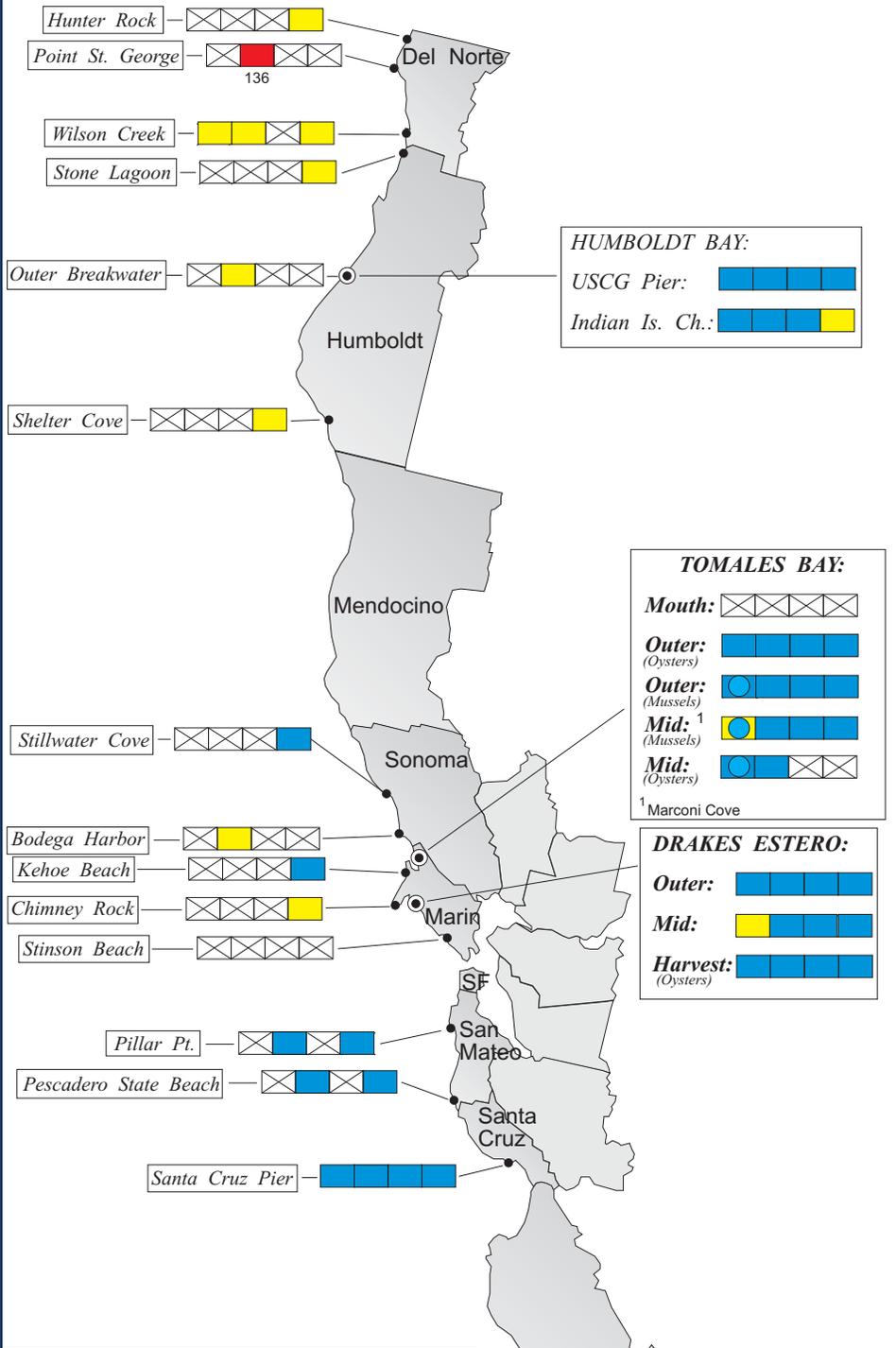
The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for northern Humboldt County. The quarantine on sport-harvested mussels was extended from the northern jetty at the entrance to Humboldt Bay to the Humboldt-Del Norte county line as a result of persistent high levels of the PSP toxins.

The September 14 health advisory for the northern Channel Islands remained in effect. The advisory warned consumers to avoid eating bivalve shellfish or the internal organs of crab, lobster, and small finfish like sardines and anchovies from the affected region due to persistent elevated levels of domoic acid in crab viscera samples.

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.,

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



**KEY FOR SHELLFISH BIOTOXIN DATA**

**Week:** 1 2 3 4

**PSP Range:** (ug/100 g) no sample not detected < 80<sup>1</sup> ≥ 80

**DA Range:** (ppm) no sample not detected < 20<sup>2</sup> ≥ 20

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level  
 ● = Single Site ○ = Multiple Sites ◐ = Offshore Site

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

AGENCY	#	AGENCY	#
<b>DEL NORTE COUNTY</b>		Smith River Rancheria	1
		Yurok Tribe Environmental Group	1
<b>HUMBOLDT COUNTY</b>		Coast Seafood Company	4
Yurok Tribe Environmental Group	1	Humboldt State University Marine Lab	6
<b>MENDOCINO COUNTY</b>		CDPH Volunteer ( <i>Marie DeSantis</i> )	3
<b>SONOMA COUNTY</b>		Sonoma Coast Watch	1
		CDPH Marine Biotoxin Program	1
<b>MARIN COUNTY</b>		Drakes Bay Oyster Company	13
CDPH Marine Biotoxin Program	1	CDPH Volunteer ( <i>Brent Anderson</i> )	4
SFSU, Romberg Tiburon Center	2	Hog Island Oyster Company	5
Sonoma State University	4		
<b>SAN FRANCISCO COUNTY</b>		CDPH Volunteer ( <i>Eugenia McNaughton</i> )	2
San Francisco Bay Whale Watching Company	1	Exploratorium	2
<b>SAN MATEO COUNTY</b>		The Marine Mammal Center ( <i>Stan Jensen</i> )	4
San Mateo County Environmental Health Dept.	6	U.C. Santa Cruz	1
		CDPH Volunteer ( <i>John Lo</i> )	1
<b>SANTA CRUZ COUNTY</b>		U.C. Santa Cruz	4
		Santa Cruz Co. Environmental Health Dept.	3
<b>MONTEREY COUNTY</b>		Friends of the Sea Otter ( <i>Janis Chaffin</i> )	4
Marine Life Studies	3	Monterey Abalone Company	3
CDPH Volunteer ( <i>Jerry Norton</i> )	1		
<b>SAN LUIS OBISPO COUNTY</b>		Friends of the Sea Otter ( <i>Kelly Cherry</i> )	4
Morro Bay National Estuary Program	3	Grassy Bar Oyster Company	4
Coastal Discovery Center, San Simeon	2	Tenera Environmental	2
The Marine Mammal Center ( <i>Webb</i> )	4		
<b>SANTA BARBARA COUNTY</b>		CDPH Volunteer ( <i>Sylvia Short</i> )	4
HABNet/CDPH Volunteers ( <i>Boyd Grant</i> )	4	Island Packers/HABNet	1
National Park Service	3	Santa Barbara Mariculture Company	4
Santa Barbara Channel Keeper	2	U.C. Santa Barbara	4
		Ty Warner Sea Life Center/HABNet	1
<b>VENTURA COUNTY</b>		CDPH Volunteer ( <i>Fred Burgess</i> )	3
National Park Service	1		
<b>LOS ANGELES COUNTY</b>		CDPH Volunteers ( <i>Kai Xu, Cal Parsons</i> )	4
Catalina Island Marine Institute	4	Long Beach Marine Institute	2
Los Angeles County Sanitation District	2	Southern California Marine Institute	1
<b>ORANGE COUNTY</b>		Amigos de Bolsa Chica	4
California Department of Fish and Wildlife	4	CDPH Volunteer ( <i>Jennifer McCarthy</i> )	1
<b>SAN DIEGO COUNTY</b>		Carlsbad Aquafarms, Inc.	3
CDPH Volunteer ( <i>Cynthia Hall</i> )	2	Sea Camp/HABNet	3
Scripps Institute of Oceanography	4	Tijuana River National Estuary Research	4
U.S. Navy Marine Mammal Program	4		

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.

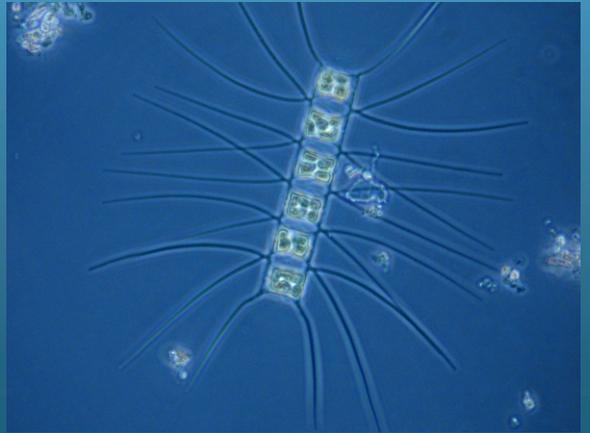
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and 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 February, 2014.

COUNTY	AGENCY	#
Del Norte	California Department of Fish and Wildlife	3
	Smith River Rancheria	1
	Yurok Tribe Environmental Program	1
Humboldt	Coast Seafood Company	8
	California Department of Fish and Wildlife	1
	Yurok Tribe Environmental Program	1
	CDPH Volunteer ( <i>Steve Fox</i> )	1
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	1
	CDPH Volunteer ( <i>John Morozumi</i> )	1
Marin	Cove Mussel Company	6
	CDPH Volunteer ( <i>James Sutton</i> )	1
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
	CDPH Marine Biotoxin Program	2
	Tomales Bay Oyster Company	3
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	4
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	7
	Santa Barbara Seafood Station	5
	U.C. Santa Barbara	5
	Vandenberg AFB	1
Ventura	None Submitted	
Los Angeles	CDPH Volunteer ( <i>Cal Parsons</i> )	1
Orange	Amigos de Bolsa Chica	1
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	5

## PHYTOPLANKTON GALLERY



The short chain of the diatom *Chaetoceros*. Note the different spines on the terminal cells.



A transverse view of a centric diatom cell.



A bryozoan cyphonaute larva. Bryozoans are small, sessile colonial invertebrates.