

# 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

March 2016

Technical Report No. 16-08

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of March, 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 observed at Pismo Pier in San Luis Obispo County and at Imperial Beach Pier in San Diego County (Figure 1). Cell numbers were low at all sites. PSP toxins were not detected in any bivalve shellfish samples collected in March (Figure 3).

(Continued on Page 2)

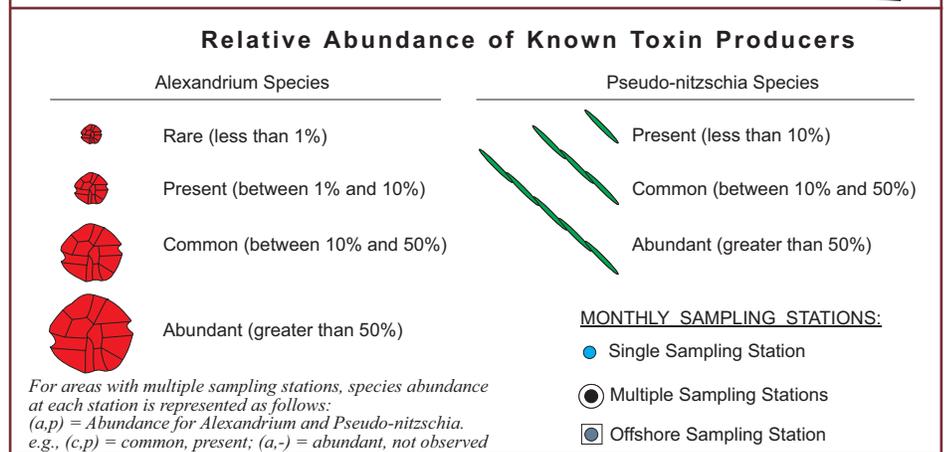
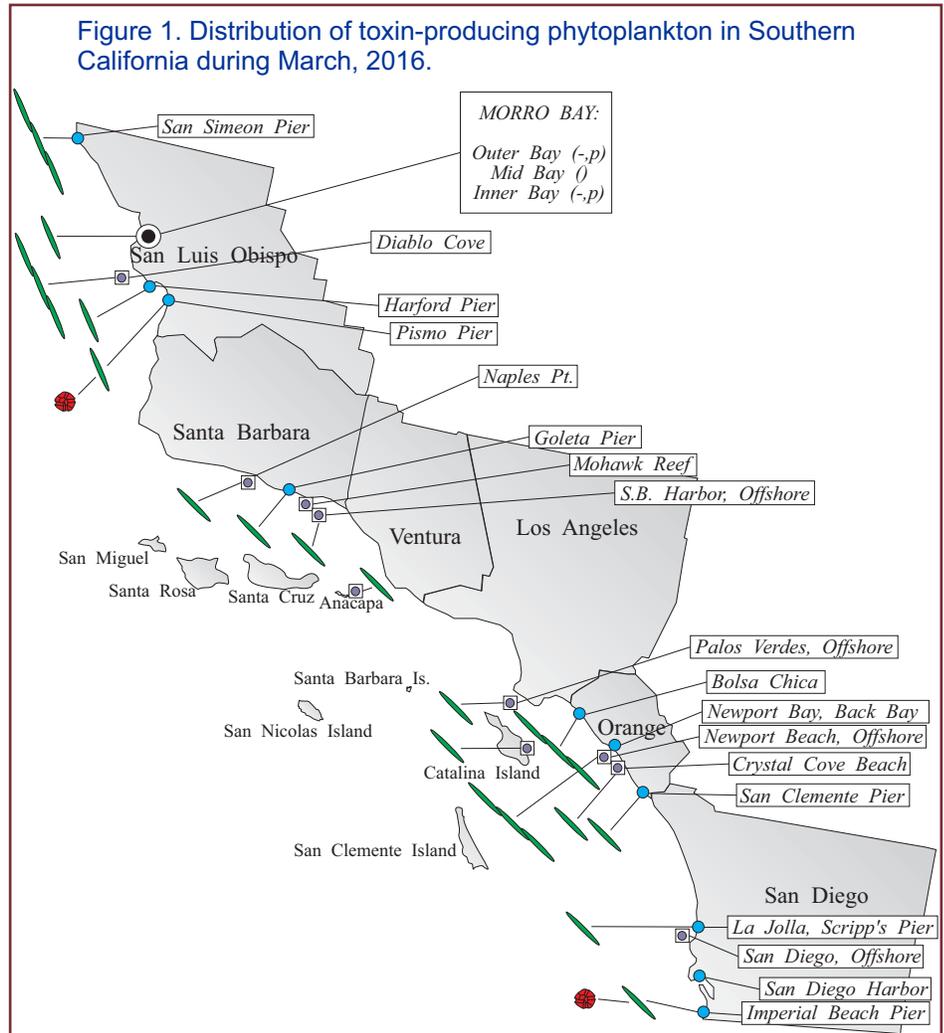
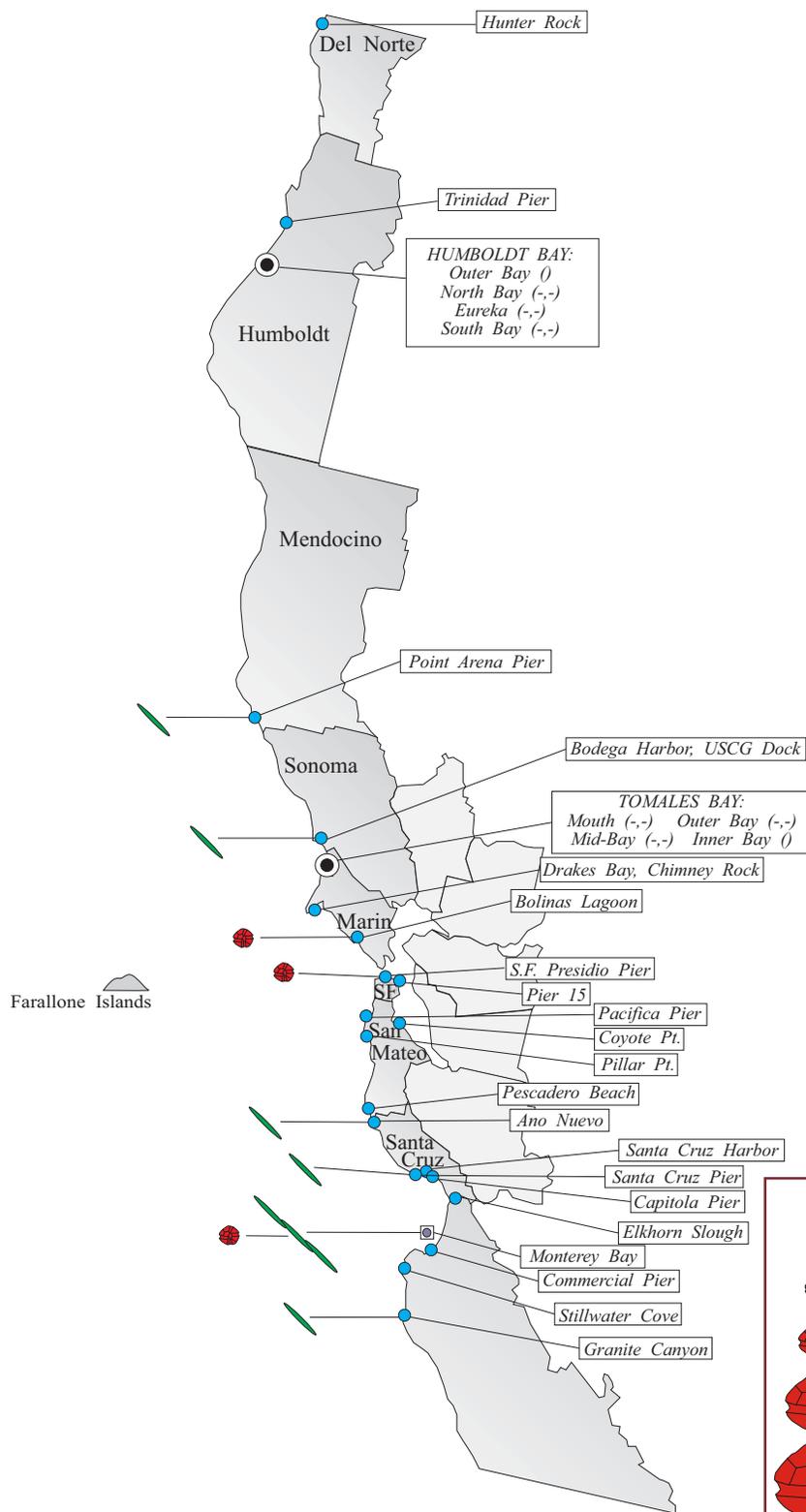


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during March, 2016.



(Continued from Page 1)

**Domoic Acid**

*Pseudo-nitzschia* was observed at select sampling sites in all southern California counties (Figure 1). The cell mass was low at all locations. The percent composition of this diatom increased in San Luis Obispo and Orange counties. Domoic acid was not detected in bivalve shellfish samples collected during March (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 contained low levels of domoic acid with concentrations ranging from <2.5-30 ppm.

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

[http://www.cdph.ca.gov/HealthInfo/Pages/fd\\_bDomoicAcidInfo.aspx](http://www.cdph.ca.gov/HealthInfo/Pages/fd_bDomoicAcidInfo.aspx)

**Non-Toxic Species**

The diatom *Chaetoceros* was common to abundant at sites in all southern California counties. The dinoflagellate *Ceratium furca* was common to abundant offshore of the Santa Barbara Harbor and at Scripps Pier in San Diego County.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* was observed at three sampling sites between Marin and Monterey counties (Figure 2). Cell numbers were low at all sites.

(Continued on Page 3)

**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:**

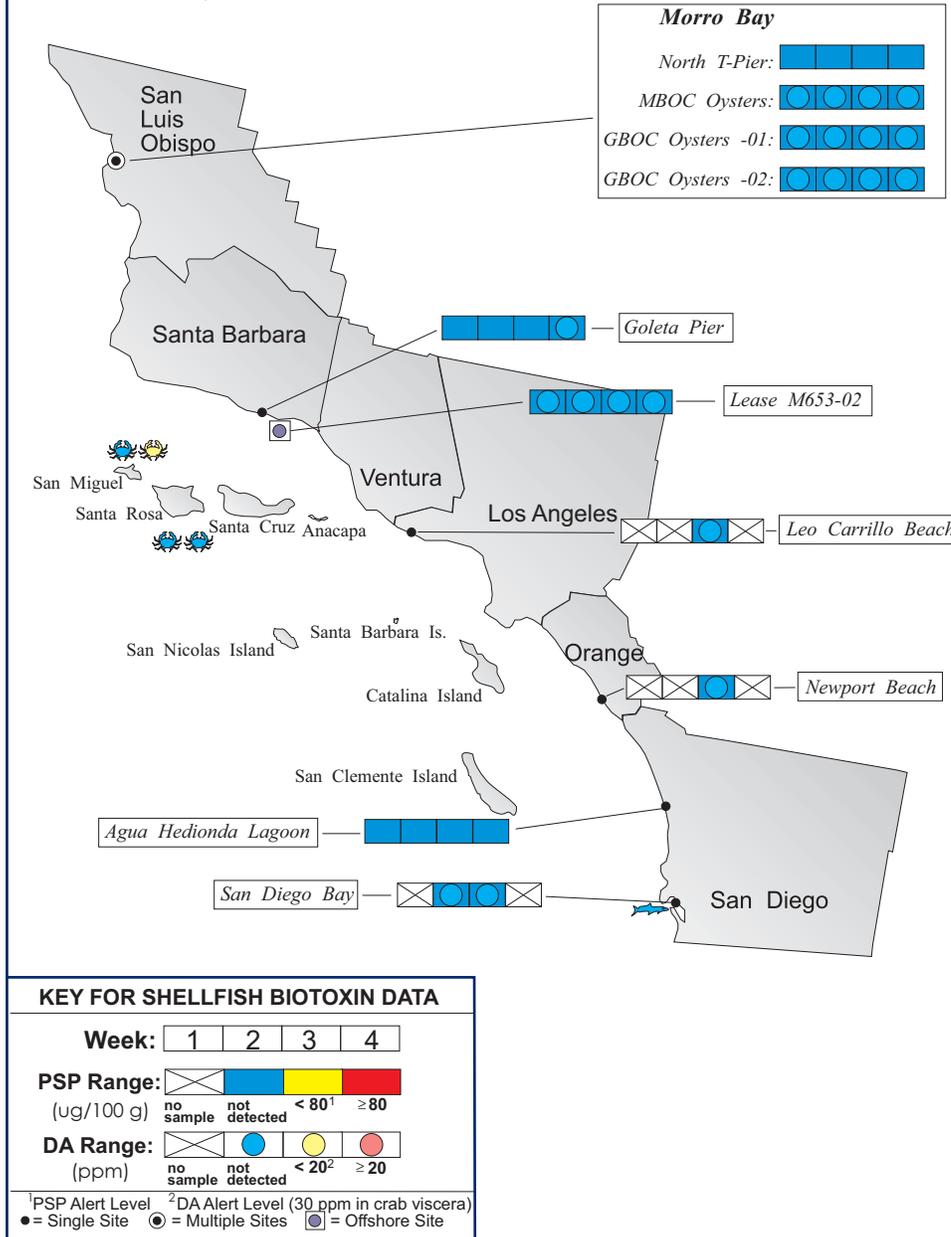
- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

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

(Continued from Page 2)

Figure 3. Distribution of shellfish biotoxins in Southern California during March, 2016.



PSP toxins were not detected in any bivalve shellfish samples collected in March (Figure 4).

**Domoic Acid**

*Pseudo-nitzschia* was observed in between Mendocino and Monterey counties (Figure 2). Cell mass was low at all locations. Domoic acid was not detected in bivalve shellfish samples collected in March (Figure 4).

FDB and DFW continued to collect crab samples along the entire northern California coast. Concentrations of domoic acid in Dungeness crab viscera ranged from <2.5-41 ppm in Humboldt County, 3.6-39 ppm in Mendocino County, and <2.5-38 ppm in Sonoma County. By the end of February, Dungeness crabs collected from locations near Salt Point and Bodega Bay in Sonoma County were all under the alert level in the viscera for two consecutive groups of samples from each area. Rock crab samples from Monterey County exhibited a range of domoic acid concentrations in the viscera from <2.5-42 ppm.

**Non-Toxic Species**

The diatom *Chaetoceros* was common to abundant at select sites in Humboldt, Marin, San Mateo and Monterey counties. The diatom *Coscinodiscus* was common to abundant at select sites in San Francisco and San Mateo counties.



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

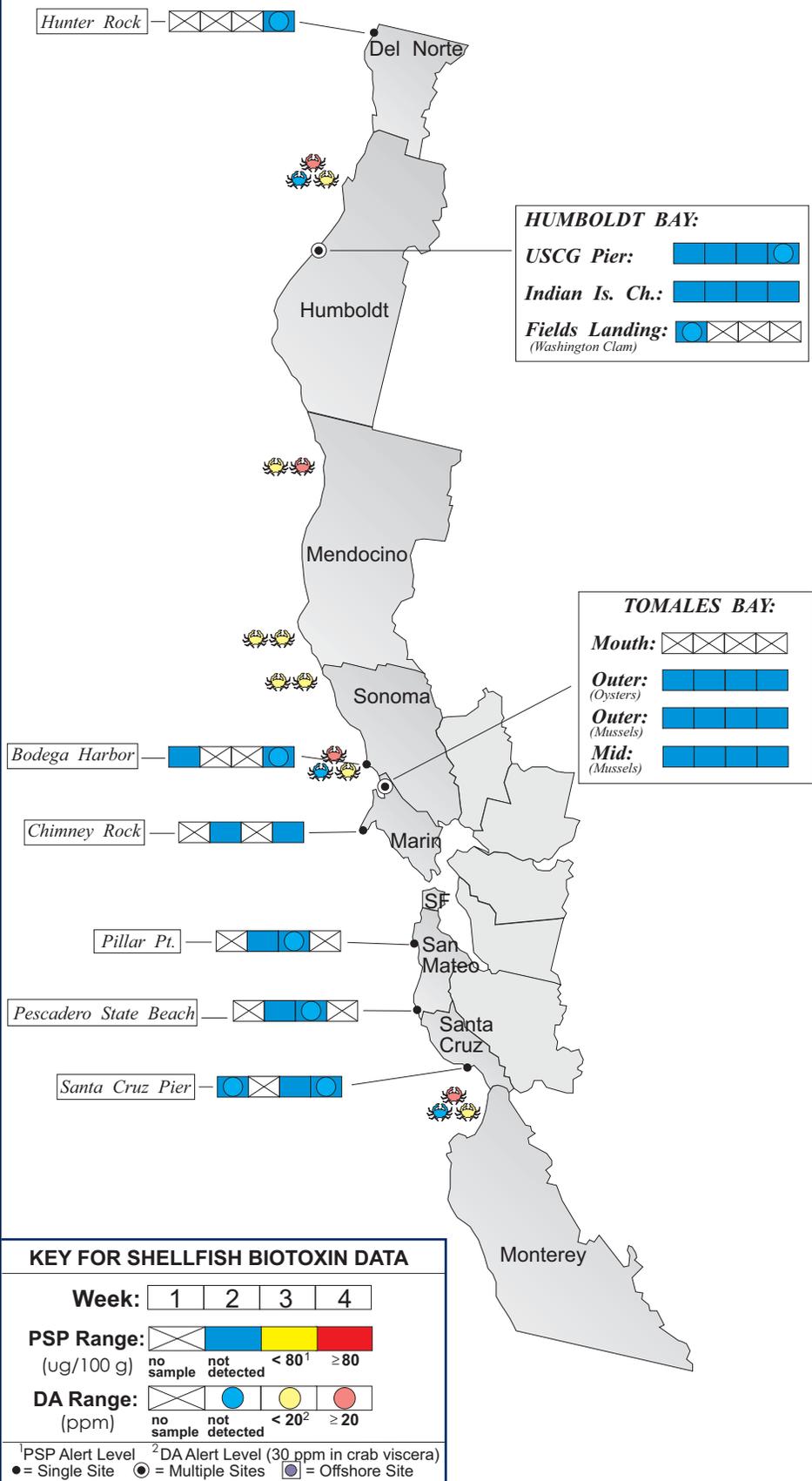
**QUARANTINES:**

The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for 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 March 18 the Health Advisory for Dungeness crabs was lifted for state waters south of latitude 38° 46.1' N near Gualala in Sonoma 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° 46.1' N due to continued elevated levels of domoic acid in crabs caught in those areas.

On March 28 the Health Advisory for rock crabs was lifted for state waters around the Santa Cruz, Santa Rosa and San Miguel Islands (Channel Islands), with the exception of one area between Santa Rosa Island and Santa Cruz Island. The advisory remains in effect for rock crabs caught in state waters near the Channel Islands within an area bounded by straight lines connecting the following points in the order listed: (1) 34° 7.75' N lat. 120° 0.00' W long.; (2) 34° 7.75' N lat. 119° 50.00' W long.; (3) 33° 53.00' N lat. 119° 50.00' W long.; (4) 33° 53.00' N lat. 120° 0.00' W long.; and (5) 34° 7.75' N lat. 120° 0.00' W long. The Health Advisory remains in effect for rock crab north of Latitude 35° 40' N

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



(Continued on Page 5)

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

(Continued from Page 4)

AGENCY	#	AGENCY	#
<b>DEL NORTE COUNTY</b>		Tolowa Dee-ni' Nation	1
<b>HUMBOLDT COUNTY</b>		CDPH Volunteers ( <i>Roy, Giovannetti</i> )	3
Coast Seafood Company	5	Humboldt State University Marine Lab	1
<b>MENDOCINO COUNTY</b>		CDPH Volunteer ( <i>Marie DeSantis</i> )	3
<b>SONOMA COUNTY</b>		CDPH Marine Biotoxin Program	2
<b>MARIN COUNTY</b>		CDPH Marine Biotoxin Program	2
CDPH Volunteers ( <i>Anderson, Clyde</i> )	6	Hog Island Oyster Company	4
<b>SAN FRANCISCO COUNTY</b>		CDPH Volunteer ( <i>Eugenia McNaughton</i> )	1
Monte Vista High School	1	Exploratorium	3
<b>SAN MATEO COUNTY</b>			
San Mateo County Environmental Health Dept.	4	The Marine Mammal Center ( <i>Stan Jensen</i> )	3
Friends of the Sea Otter ( <i>Diane Larson</i> )	1	U.C. Santa Cruz - Ano Nuevo	1
<b>SANTA CRUZ COUNTY</b>			
U.C. Santa Cruz	5	San Lorenzo Valley High School	1
Santa Cruz County Envir. Health Department	3	The Otter Project ( <i>Jeff Palsgaard</i> )	4
<b>MONTEREY COUNTY</b>		Marine Life Studies	2
The Otter Project ( <i>Rose, Noke</i> )	3	Marine Pollution Studies Laboratory	1
Monterey Abalone Company	2	Friends of the Sea Otter ( <i>Janis Chaffin</i> )	1
<b>SAN LUIS OBISPO COUNTY</b>			
Morro Bay National Estuary Program	1	Morro Bay Oyster Company	4
Coastal Discovery Center, San Simeon	3	Tenera Environmental	4
Friends of the Sea Otter ( <i>Kelly Cherry</i> )	5	CDPH Volunteer ( <i>Allison Plemons</i> )	4
<b>SANTA BARBARA COUNTY</b>			
Santa Barbara Channel Keeper	5	U.C. Santa Barbara	5
<b>VENTURA COUNTY</b>		National Park Service	1
<b>LOS ANGELES COUNTY</b>			
Los Angeles County Sanitation District	4	Catalina Island Marine Institute	6
<b>ORANGE COUNTY</b>		Orange County Health Care Agency	1
California Department of Fish and Wildlife	3	Amigos de Bolsa Chica	4
Crystal Cove Alliance	3	CDPH Volunteer ( <i>Truong Nguyen</i> )	2
<b>SAN DIEGO COUNTY</b>		U.S. Navy Marine Mammal Program	2
Scripps Institute of Oceanography	3	Tijuana River National Estuary Research	5

(near Piedras Blancas Light Station, in San Luis Obispo County).

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.

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

(Continued on Page 6)

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

COUNTY	AGENCY	#
Del Norte	Tolowa Dee-ni' Nation	1
Humboldt	Coast Seafood Company	10
	Wiyot Tribe	1
	CDPH Food and Drug Branch	24
Mendocino	CDPH Food and Drug Branch	30
Sonoma	CDPH Marine Biotoxin Program	2
	CDPH Food and Drug Branch	12
Marin	Cove Mussel Company	4
	Hog Island Oyster Company	4
	Starbird Mariculture	5
	CDPH Marine Biotoxin Program	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	4
Santa Cruz	U.C. Santa Cruz	3
Monterey	CDPH Food and Drug Branch	12
San Luis Obispo	Grassy Bar Oyster Company	13
	Morro Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	5
	CDPH Food and Drug Branch	23
Ventura	None Submitted	
Los Angeles	CDPH Volunteer ( <i>Steven Field</i> )	1
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	4

(Continued from Page 5)

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 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.

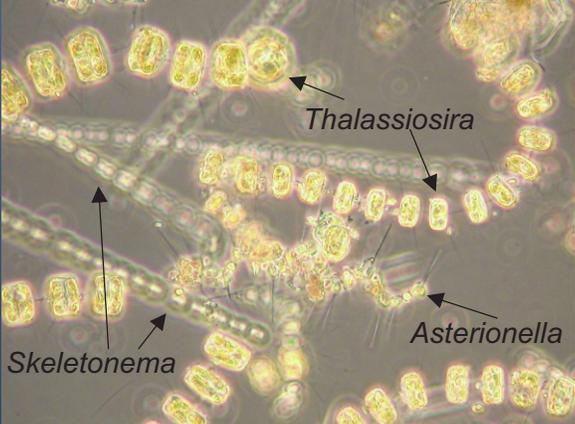


## PHYTOPLANKTON GALLERY



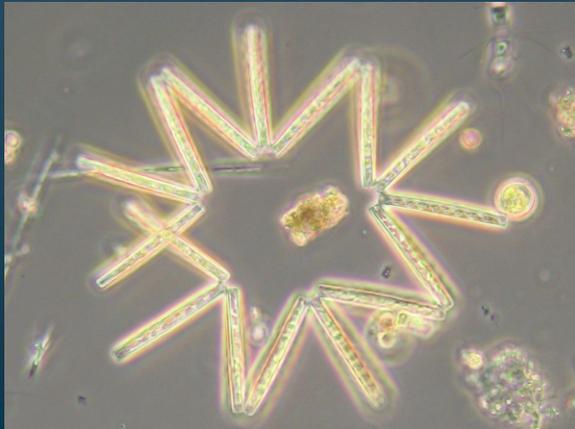
*Asterionella*  
*Thalassiosira*

Chain diatoms *Asterionella* and *Thalassiosira*. *Asterionella* is a pennate diatom with a single spike appendage that forms circular chains. *Thalassiosira* is a centric diatom that forms straight chains.



*Thalassiosira*  
*Asterionella*  
*Skeletonema*

In March diatoms increased with *Asterionella*, *Thalassiosira* and *Skeletonema* commonly occurring together in the samples.



The chain diatom *Thalassionema* forms a zig-zag pattern with connections at ends of cells.