

# 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

June 2016

Technical Report No. 16-16

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 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). A low level of PSP toxin was detected in a mussel sample from Cal Poly Pier, San Luis Obispo collected the second week of June (Figure 3).

#### Domoic Acid

*Pseudo-nitzschia* was observed in all

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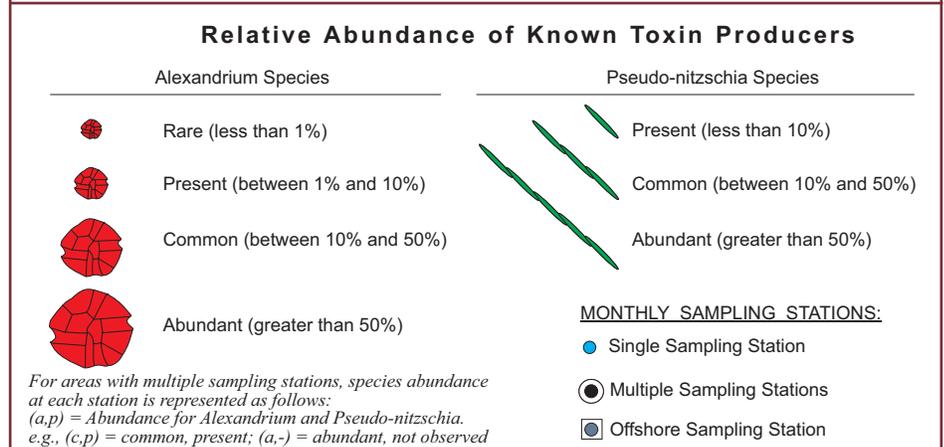
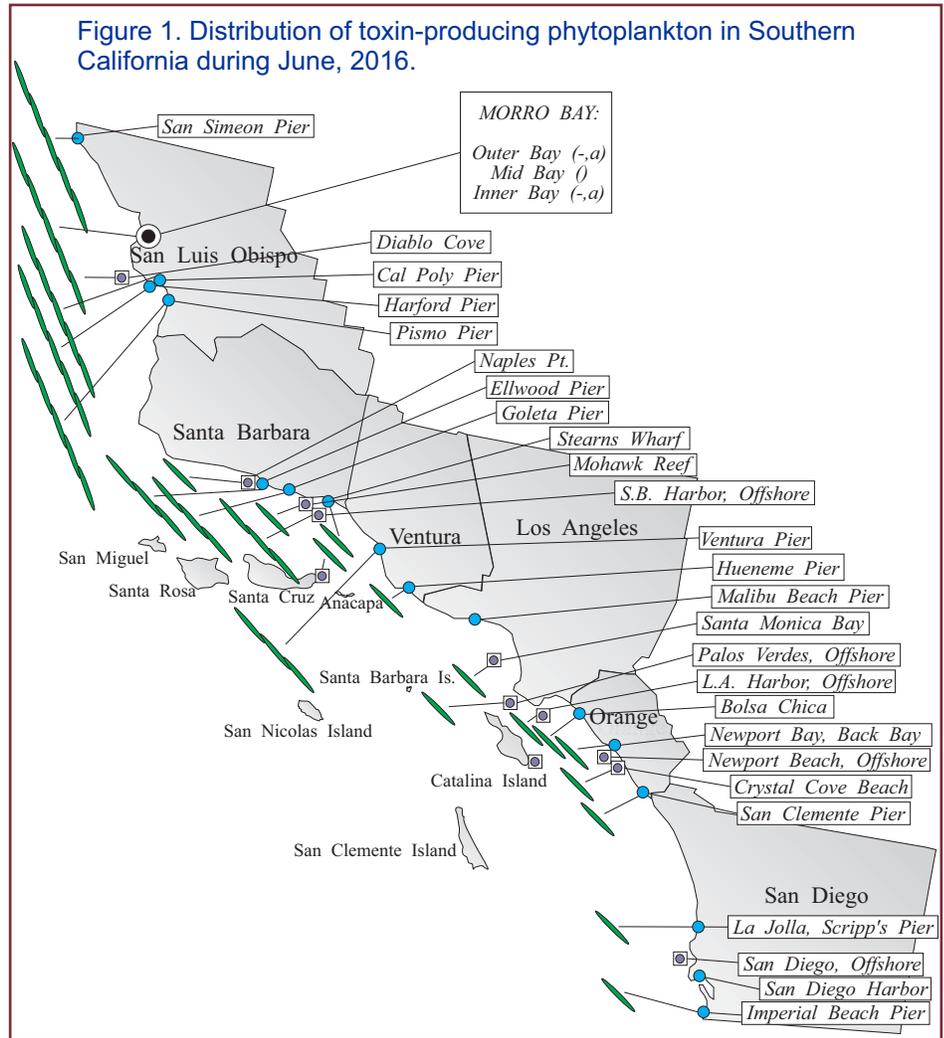
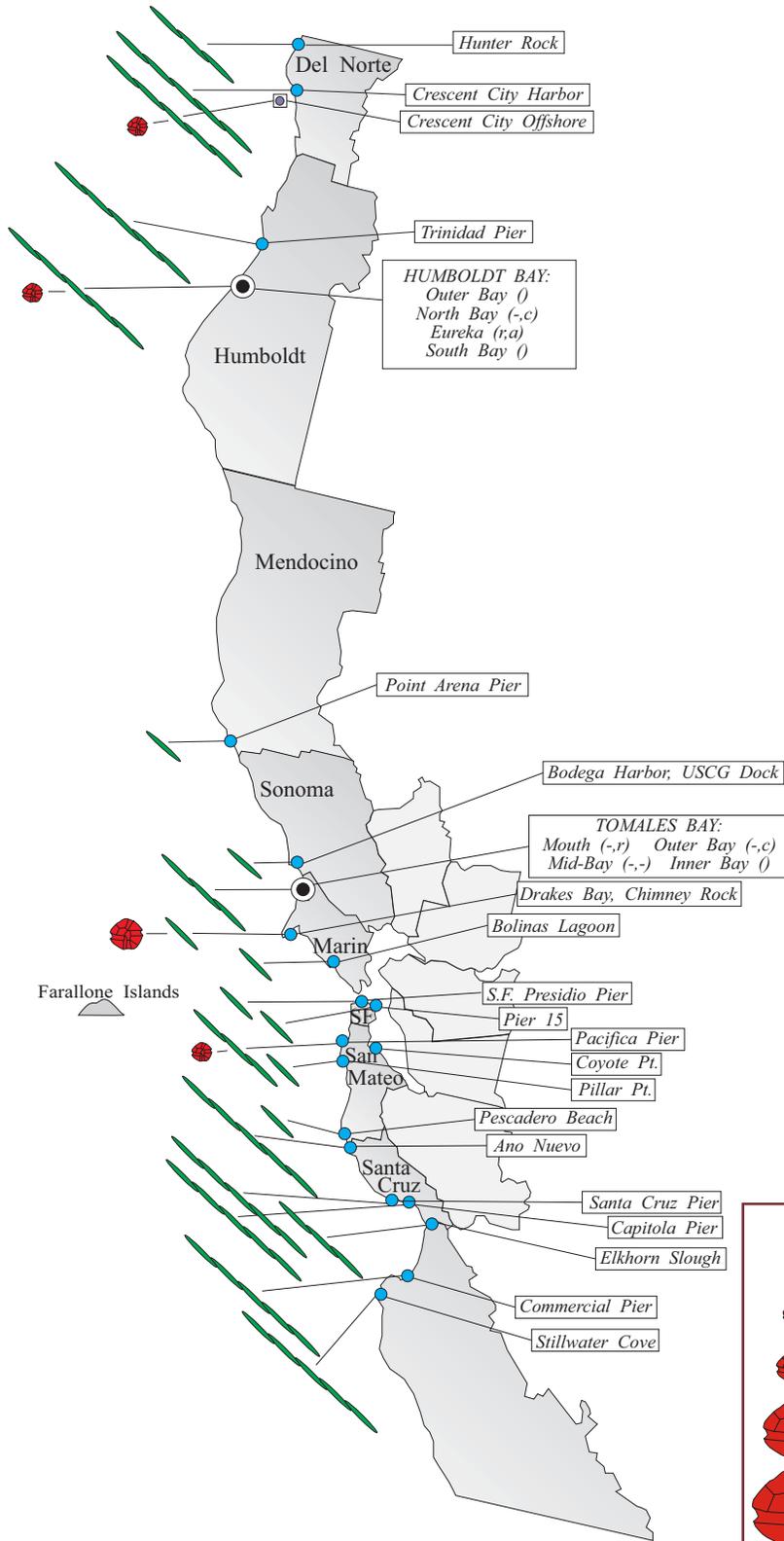


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during June, 2016.



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southern California counties in June. The percent composition of this diatom increased at sites in San Luis Obispo and Santa Barbara counties, and decreased in Los Angeles county compared to May. The highest relative abundance was observed at Diablo Cove (San Luis Obispo) during the last week of June (Figure 1). Domoic acid was detected above the alert level in a mussel sample collected from Cal Poly Pier (San Luis Obispo) on June 13. Low concentrations of domoic acid were detected at select sites in San Luis Obispo and Santa Barbara counties (Figure 3), including oyster samples from Morro Bay (San Luis Obispo).

**Non-Toxic Species**

The diatom *Chaetoceros* and the dinoflagellate *Ceratium* were common to abundant between San Luis Obispo and San Diego counties. The diatom *Skeletonema* was common to abundant in San Luis Obispo, Santa Barbara and Los Angeles Counties. The dinoflagellate *Prorocentrum* was common to abundant in Orange and San Diego counties.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

Low numbers of *Alexandrium* were observed at four sampling sites between Del Norte and San Mateo counties (Figure 2). PSP toxins below the alert level were detected in the sentinel mussels at Chimney Rock in Marin

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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:**

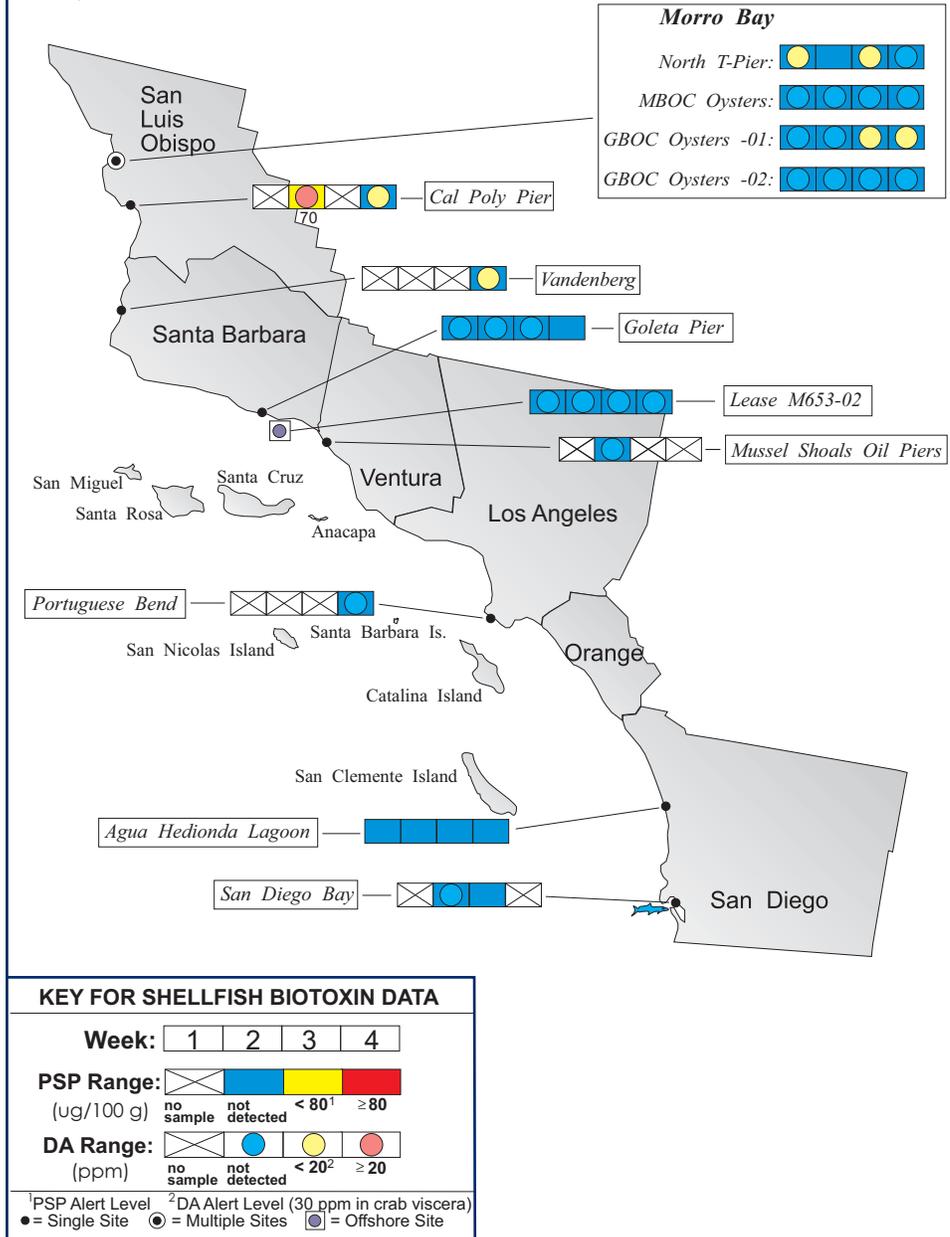
- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

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

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



County, and from a mussel sample collected at Santa Cruz Pier (Figure 4).

**Domoic Acid**

*Pseudo-nitzschia* was observed in all northern California counties (Figure 2). The percent composition of this diatom increased at sites in Del Norte, Humboldt, Mendocino, Marin, Santa Cruz, and Monterey counties compared to May. The highest relative abundance was observed at Trinidad Pier during the second week of June. Mussel samples from Santa Cruz Pier and Monterey Commercial Pier tested above the alert level for domoic acid. Low levels of domoic acid were detected in mussels from Del Norte and Humboldt counties, as well as in a gaper clam sample from Humboldt County. Concentrations of domoic acid increased in razor clam samples from Clam Beach in Humboldt County compared to May. Concentrations of domoic acid ranged from 30 -140 ppm in meat samples, and 24-87 ppm in the viscera (Figure 4). Razor clams from Crescent Beach in Del Norte County also had elevated concentrations of domoic acid, ranging from 18-160 ppm in meat, and 28-130 in the viscera. The health advisory and fishery closure for razor clams remains in effect.

CDPH Food & Drug Branch (FDB) and the California Department of Fish & Wildlife (DFW) collected rock crab samples from

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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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Sonoma and San Mateo counties. Rock crab samples exhibited a range of domoic acid concentrations in the viscera from 8.1-160 ppm in Sonoma County, and from <2.5-48 ppm in San Mateo County. Summaries of crab sample data can be found here:

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

**Non-Toxic Species**

The diatoms *Chaetoceros* and *Skeletonema* were common to abundant from Del Norte to Marin counties. The diatom *Coscinodiscus* was abundant at Pacifica Pier, San Mateo County.



**QUARANTINES:**

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.

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 persistent elevated levels of domoic acid.

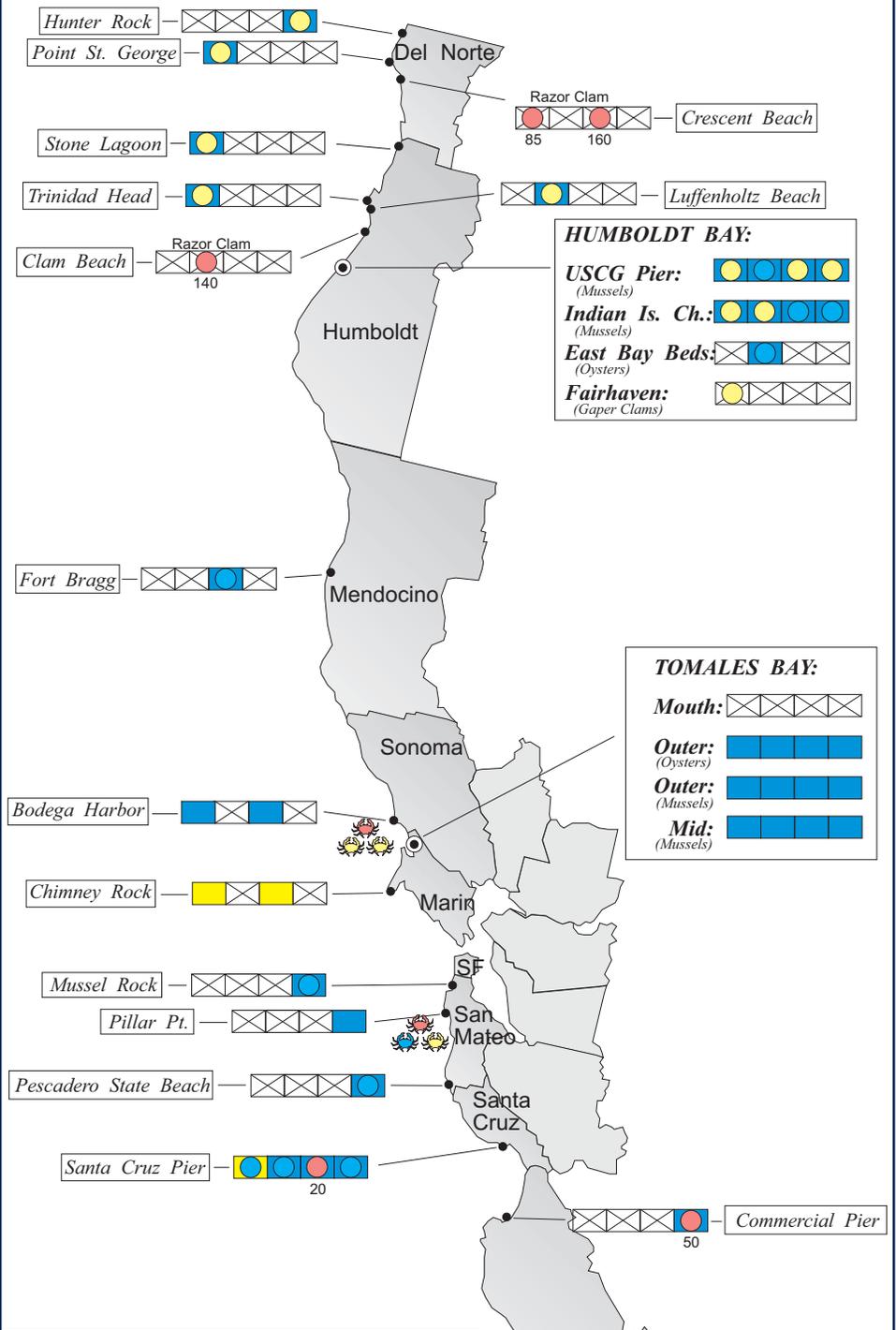
Current information for rock crab Health Advisories is located at:

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

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

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



**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 (30 ppm in crab viscera)  
 ● = Single Site ○ = Multiple Sites ◐ = Offshore Site

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

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AGENCY	#	AGENCY	#
<b>DEL NORTE COUNTY</b>			
CDPH Volunteer ( <i>Jim Hooper</i> )	2	Tolowa Dee-ni' Nation	1
<b>HUMBOLDT COUNTY</b>			
Coast Seafood Company	4	Humboldt State University Marine Lab	2
Bureau of Land Management	1	CDPH Volunteer ( <i>Giovannetti</i> )	2
<b>MENDOCINO COUNTY</b>			
		CDPH Volunteer ( <i>Marie DeSantis</i> )	2
<b>SONOMA COUNTY</b>			
		CDPH Marine Biotoxin Program	2
<b>MARIN COUNTY</b>			
		CDPH Marine Biotoxin Program	4
CDPH Volunteer ( <i>Anderson</i> )	3	Hog Island Oyster Company	3
<b>SAN FRANCISCO COUNTY</b>			
CDPH Volunteer ( <i>Eugenia McNaughton</i> )	1	Exploratorium	4
<b>SAN MATEO COUNTY</b>			
U.C. Santa Cruz - Ano Nuevo	2	The Marine Mammal Center ( <i>Stan Jensen</i> )	4
San Mateo County Environmental Health Dept.	3	Friends of the Sea Otter ( <i>Diane Larson</i> )	1
<b>SANTA CRUZ COUNTY</b>			
		U.C. Santa Cruz	5
Santa Cruz County Envir. Health Department	2	CDPH Volunteer ( <i>Jeff Palsgaard</i> )	3
<b>MONTEREY COUNTY</b>			
		Friends of the Sea Otter ( <i>Janis Chaffin</i> )	1
The Otter Project ( <i>Rose, Noke</i> )	4	Monterey Abalone Company	3
<b>SAN LUIS OBISPO COUNTY</b>			
		CDPH Marine Biotoxin Program	1
Morro Bay National Estuary Program	1	Morro Bay Oyster Company	3
Monterey Bay National Marine Sanctuary	4	Tenera Environmental	2
Friends of the Sea Otter ( <i>Cherry, Peterson</i> )	5	CDPH Volunteer ( <i>Alison Plemons</i> )	2
<b>SANTA BARBARA COUNTY</b>			
		National Park Service	1
Santa Barbara Channel Keeper	7	CDPH Volunteer ( <i>Sylvia Short</i> )	3
HABNet Volunteers	2	U.C. Santa Barbara	5
<b>VENTURA COUNTY</b>			
Ventura County Environmental Health Dept	1	CDPH Volunteer ( <i>Fred Burgess</i> )	5
<b>LOS ANGELES COUNTY</b>			
Los Angeles County Sanitation District	3	Los Angeles County Health Department	1
City of Los Angeles Envir. Monitoring Division	2	CDPH Volunteer ( <i>Cal Parsons</i> )	1
<b>ORANGE COUNTY</b>			
		Orange County Health Care Agency	1
California Department of Fish and Wildlife	4	Amigos de Bolsa Chica	4
Crystal Cove Alliance	1	CDPH Volunteer ( <i>Truong Nguyen</i> )	2
<b>SAN DIEGO COUNTY</b>			
Scripps Institute of Oceanography	4	Tijuana River National Estuary Research	4
Sea Camp/HABNet	3	U.S. Navy Marine Mammal Program	5
Crystal Cove Alliance	3	CDPH Volunteer ( <i>Truong Nguyen</i> )	2
<b>SAN DIEGO COUNTY</b>			
Scripps Institute of Oceanography	4	Tijuana River National Estuary Research	4
Sea Camp/HABNet	5	U.S. Navy Marine Mammal Program	2

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 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.



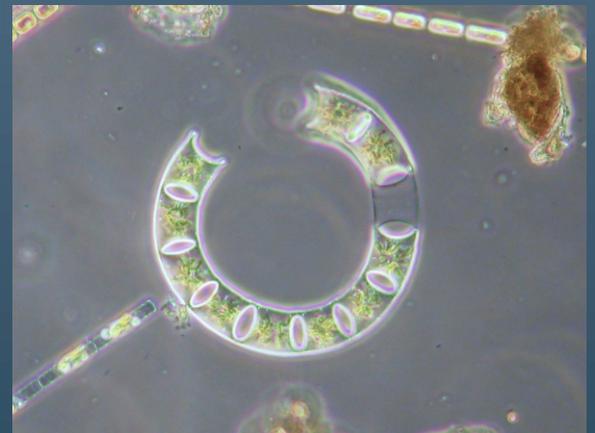
Table 2. CDPH program participants submitting shellfish samples during June, 2016.

COUNTY	AGENCY	#
Del Norte	Tolowa Dee-ni' Nation	1
	Yurok Tribe Environmental Program	1
	CDPH Volunteer ( <i>Ken Graves</i> )	18
Humboldt	Coast Seafood Company	9
	Humboldt County Environmental Health Department	1
	Yurok Tribe Environmental Program	2
	CDPH Marine Biotoxin Program	18
CDPH Volunteer ( <i>Eberle</i> )		1
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	CDPH Marine Biotoxin Program	2
	CDPH Food and Drug Branch	6
Marin	Cove Mussel Company	5
	Hog Island Oyster Company	4
	Starbird Mariculture	4
	CDPH Marine Biotoxin Program	2
San Francisco	None Submitted	
San Mateo	CDPH Volunteer ( <i>Gary Della Maggiora</i> )	1
	San Mateo County Environmental Health Department	2
	CDPH Food and Drug Branch	17
Santa Cruz	U.C. Santa Cruz	5
Monterey	Monterey Abalone Company	1
San Luis Obispo	Grassy Bar Oyster Company	12
	Morro Bay Oyster Company	7
	CDPH Marine Biotoxin Program	1
	California Polytechnic State University	1
Santa Barbara	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	5
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department Torrance	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarm, Inc.	4
	U.S. Navy Marine Mammal Program	2

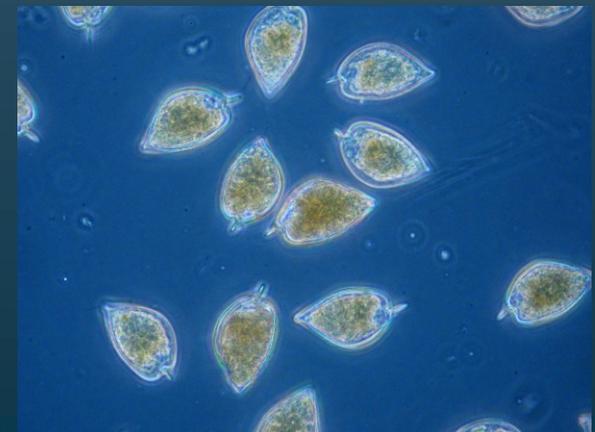
## PHYTOPLANKTON GALLERY



A collection of dinoflagellates which often occur together – *Dinophysis*, *Ceratium*, and *Protoperidinium*.



The chain forming diatom *Eucampia* often occurs with other chain forming diatoms, but in smaller numbers.



The dinoflagellate *Prorocentrum micans* was common to abundant in coastal waters of Orange and San Diego counties in June.