

# 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

May 2015

Technical Report No. 15-12

**INTRODUCTION:**

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

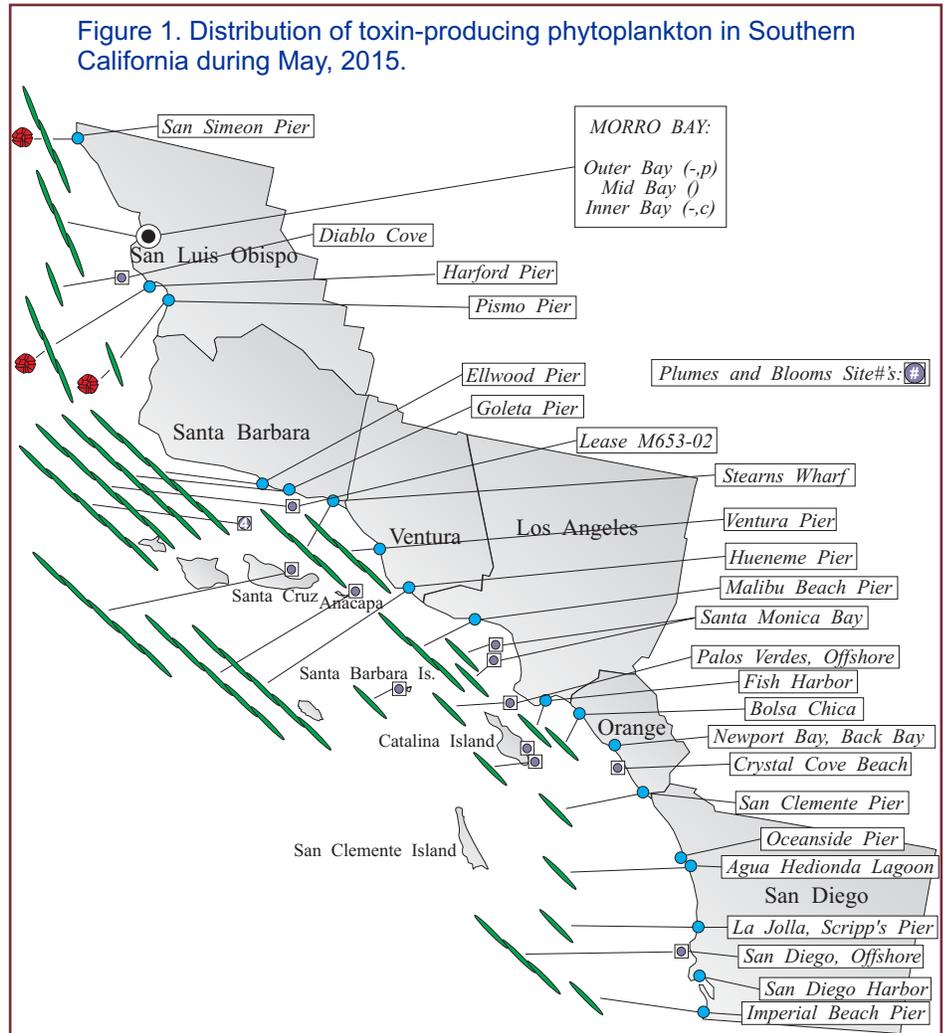
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All 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 three sites in San Luis Obispo County in May (Figure 1). PSP toxins below the alert level were detected in a rock scallop viscera sample from the Santa Barbara Channel during the second week of May (Figure 3).

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Relative Abundance of Known Toxin Producers	
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 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 2. Distribution of toxin-producing phytoplankton in Northern California during May, 2015.

**Domoic Acid**

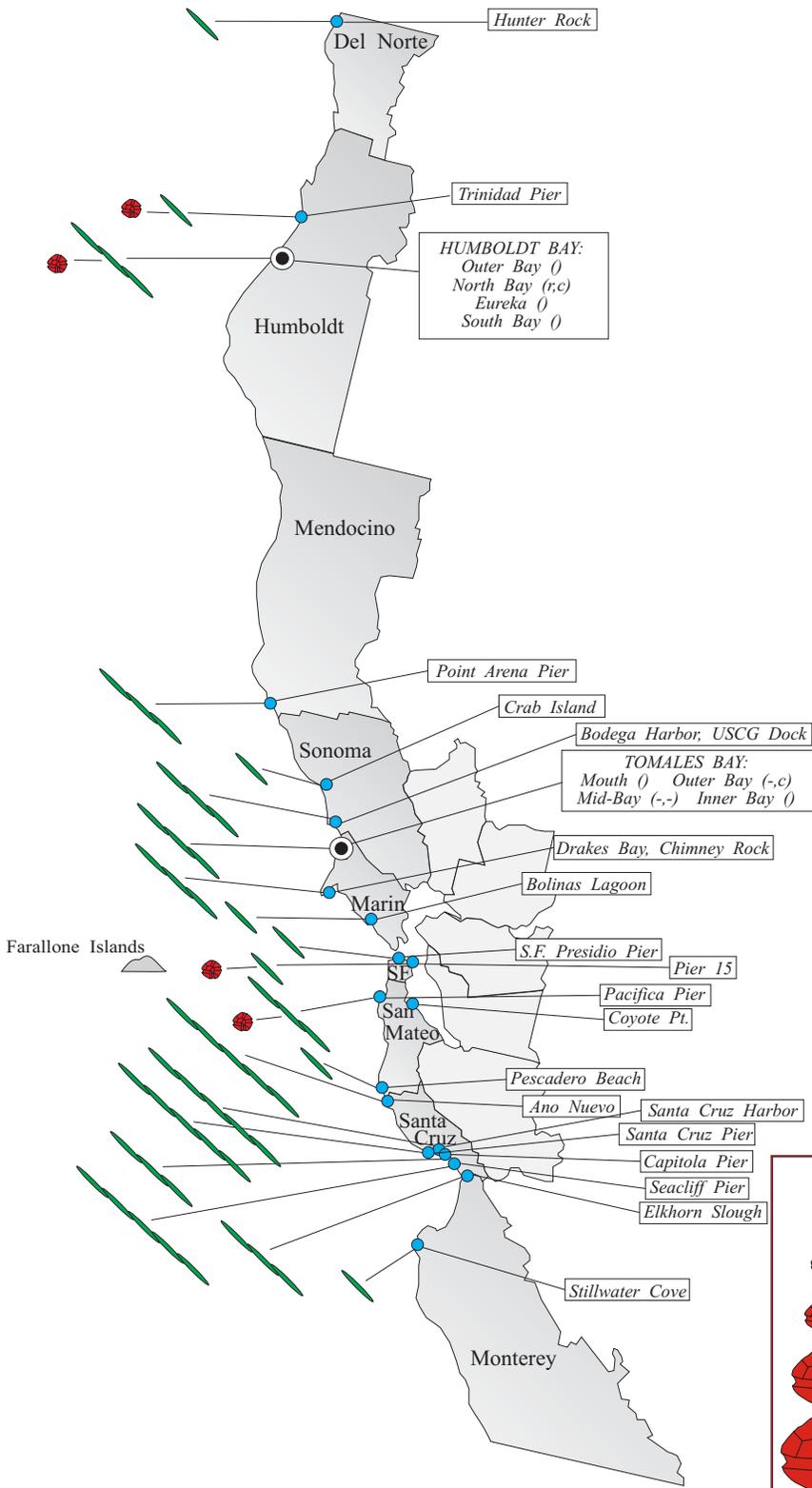
*Pseudo-nitzschia* was observed at the majority of sampling sites in all Southern California counties (Figure 1). The percent composition of this diatom dramatically increased compared to April particularly in Santa Barbara and Ventura counties. The highest relative abundance was observed at Diablo Cove (San Luis Obispo County) during the first week of May. The cell mass was low at most locations.

Domoic acid was detected from Santa Barbara to Los Angeles counties (Figure 3). Shellfish samples increased above the alert level at the following locations: Goleta Pier (May 13), offshore aquiculture lease (Santa Barbara; May 12), and Deer Creek (May 21). Mussel Shoals (Ventura County) and Leo Carrillo Beach (Los Angeles County) had low levels of domoic acid. Viscera from a lobster sample collected at Catalina Island on May 13 was below the detection limit.

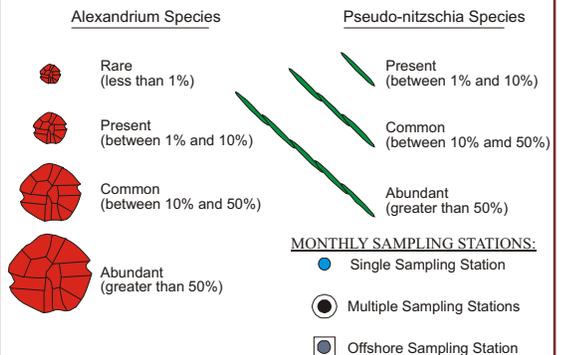
**Non-Toxic Species**

The diatom *Chaetoceros* was common to abundant at most sites except in Ventura and Orange counties. The diatoms *Rhizosolenia* and *Thalassiosira* were common at sites in San Luis Obispo. The dinoflagellate *Ceratium furca* was common to abundant at sites in Los Angeles and San Diego counties.

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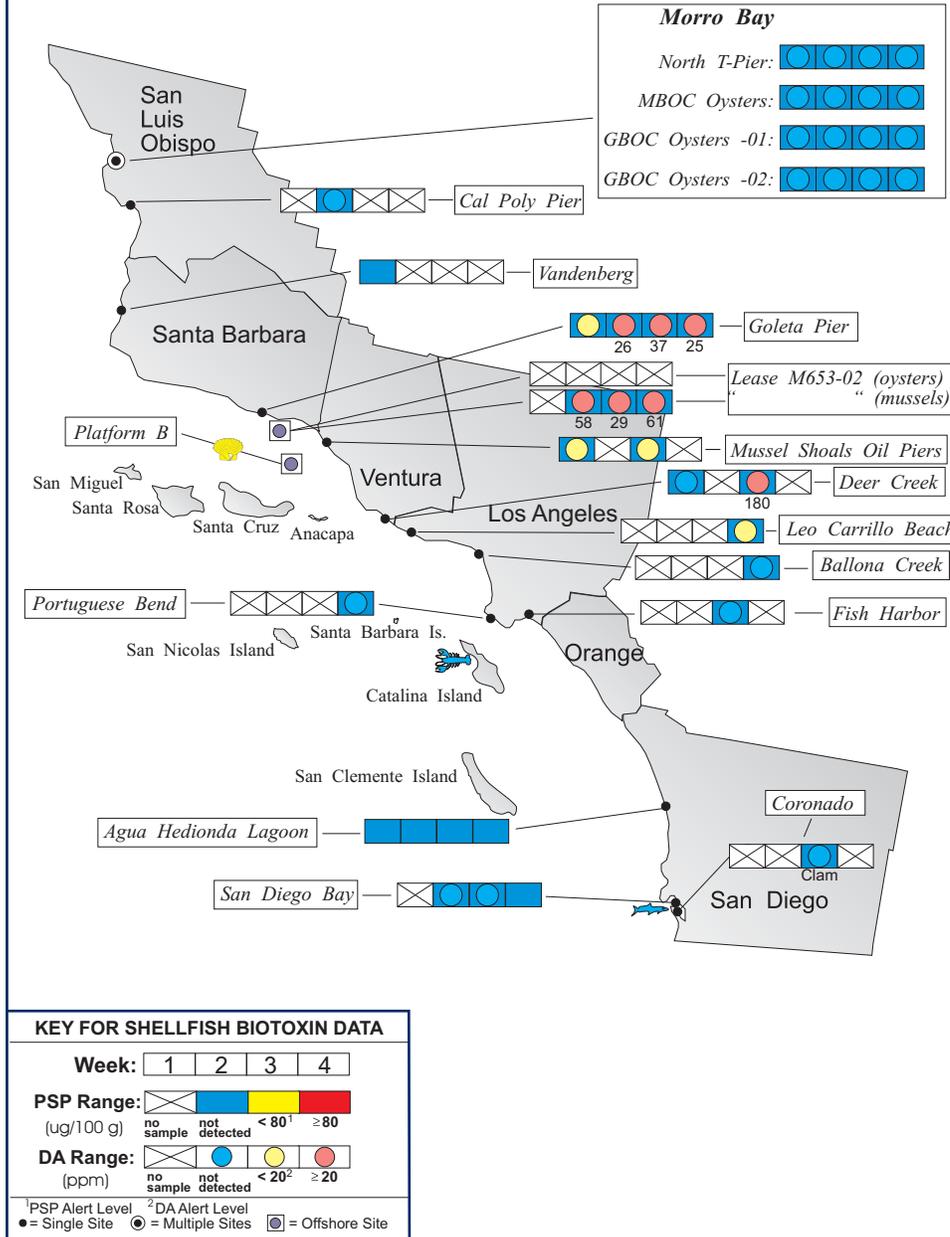
**Relative Abundance of Known Toxin Producers**



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 May, 2015.



The dinoflagellate *Prorocentrum* was common at a few sites in Orange and San Diego counties.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* was observed at four sampling sites between Humboldt and San Mateo counties (Figure 2). Cell numbers were low at all sites.

Low levels of PSP toxins were detected in mussel samples collected at sites in Sonoma, Marin, San Mateo and Santa Cruz counties (Figure 4).

**Domoic Acid**

*Pseudo-nitzschia* was observed at the majority of sampling sites in all northern California counties (Figure 2). The percent composition of this diatom increased at select sites between Mendocino and Monterey compared to April. The highest relative abundance and cell mass was observed at Santa Cruz Pier during the third week of the month. The cell mass was low at most locations.

Domoic acid was detected from Humboldt to Monterey counties (Figure 4). Shellfish samples increased above the alert level at the following locations: Santa Cruz Pier (May 6), Pescadero State Beach (May 7), and Davenport (May 9). Low concentrations of domoic acid were detected in razor clam samples from Clam Beach (Humboldt

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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.

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(510) 412-4635

For Recorded Biotoxin Information Call:  
(800) 553-4133

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County) and Doran Beach (Sonoma County). Crab samples were collected from Pillar Point Harbor and offshore of Half Moon Bay at the end of May. All three crab samples from Pillar Point Harbor exceed the alert level in the viscera, with the highest at 180 ppm of domoic acid. Only one of the crabs collected offshore of Half Moon Bay exceeded the alert level in the viscera. Fish samples were collected by CDPH Food and Drug Branch from Monterey Bay at the end of May. The anchovy sample had a concentration of 220 ppm of domoic acid and the sardine and mackerel sample was below the detection limit.

**Non-Toxic Species**

The diatom *Skeletonema* was common to abundant at most sites from Del Norte to San Mateo counties. The diatom *Chaetoceros* was common to abundant at Pacifica Pier (San Mateo County) and Tomales Bay (Marin County). The diatom *Melosira* was common at Crab Island (Sonoma 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.

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.

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

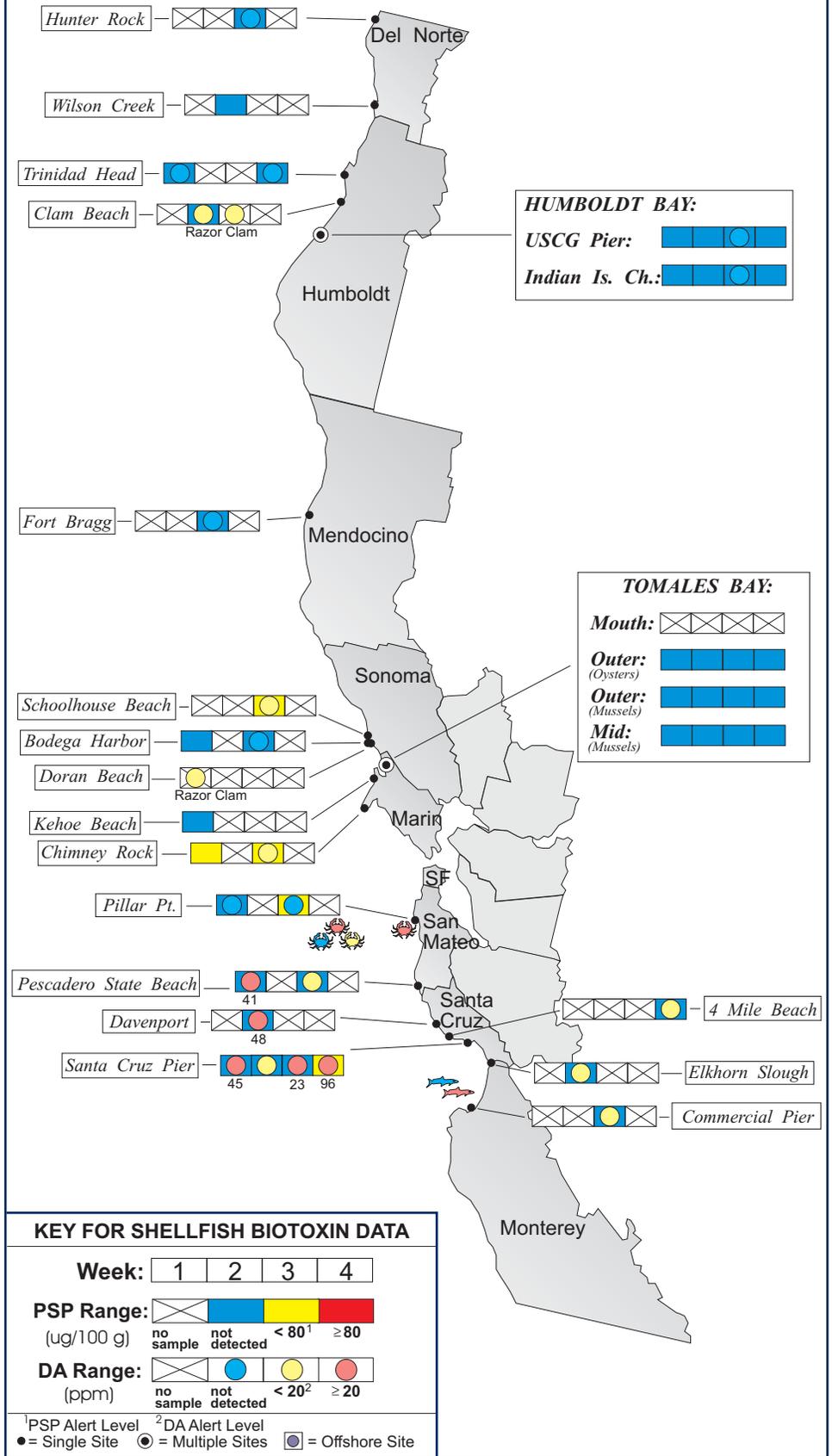


Table 1. Program participants collecting phytoplankton samples during May, 2015.

AGENCY	#	AGENCY	#
<b>DEL NORTE COUNTY</b>		Tolowa Dee-ni' Nation	1
<b>HUMBOLDT COUNTY</b>			
Coast Seafood Company	4	Humboldt State University Marine Lab	2
<b>MENDOCINO COUNTY</b>		CDPH Volunteer ( <i>Marie DeSantis</i> )	3
<b>SONOMA COUNTY</b>			
CDPH Marine Biotxin Program	1	Bodega Marine Lab & Farallone Institute	2
<b>MARIN COUNTY</b>		Hog Island Oyster Company	2
CDPH Marine Biotxin Program	2	CDPH Volunteer ( <i>Anderson, Clyde</i> )	5
<b>SAN FRANCISCO COUNTY</b>			
CDPH Volunteer ( <i>Eugenia McNaughton</i> )	2	Exploratorium	5
<b>SAN MATEO COUNTY</b>			
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> )	2	U.C. Santa Cruz - Ano Nuevo	2
<b>SANTA CRUZ COUNTY</b>			
U.C. Santa Cruz	4	San Lorenzo Valley High School	2
Santa Cruz County Envir. Health Department	3	The Otter Project ( <i>Jeff Palsgaard</i> )	5
<b>MONTEREY COUNTY</b>			
The Otter Project ( <i>Connie Rose</i> )	3	Friends of the Sea Otter ( <i>Janis Chaffin</i> )	3
<b>SAN LUIS OBISPO COUNTY</b>			
Morro Bay National Estuary Program	2	Morro Bay Oyster Company	4
Coastal Discovery Center, San Simeon	4	Tenera Environmental	4
Friends of the Sea Otter ( <i>Kelly Cherry</i> )	1	CDPH Volunteer ( <i>Al Guild</i> )	7
<b>SANTA BARBARA COUNTY</b>			
CDPH Volunteer ( <i>Sylvia Short</i> )	1	U.C. Santa Barbara	4
HABNet/CDPH Volunteers ( <i>Amiri</i> )	2	Santa Barbara Mariculture Company	3
Island Packers/HABNet	1	National Park Service	1
<b>VENTURA COUNTY</b>		Ventura County Envir. Health Department	2
National Park Service	2	CDPH Volunteer ( <i>Fred Burgess</i> )	2
<b>LOS ANGELES COUNTY</b>		Catalina Island Marine Institute	1
City of Los Angeles Envir. Monitoring Division	3	CDPH Volunteers ( <i>Cal Parsons</i> )	1
Los Angeles County Health Department	2	Southern California Marine Institute	1
<b>ORANGE COUNTY</b>			
California Department of Fish and Wildlife	4	Amigos de Bolsa Chica	5
Crystal Cove Alliance	2	CDPH Volunteer ( <i>Truong Nguyen</i> )	3
<b>SAN DIEGO COUNTY</b>			
Scripps Institute of Oceanography	4	Carlsbad Aquafarms, Inc.	1
U.S. Navy Marine Mammal Program	4	Tijuana River National Estuary Research	4
Sea Camp/HABNet	2	CDPH Volunteer ( <i>Cynthia Hall</i> )	1

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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 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.

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

COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	1
	Tolowa Dee-ni' Nation	1
Humboldt	Coast Seafood Company	8
	CDPH Volunteer ( <i>Georgianna Wood</i> )	1
	Tolowa Dee-ni' Nation	1
	Humboldt State University	2
	Mendocino County Environmental Health Department	1
Mendocino	Mendocino County Environmental Health Department	1
	Sonoma	3
Sonoma	CDPH Marine Biotoxin Program	3
	CDPH Volunteer ( <i>Charles Horn</i> )	1
Marin	Cove Mussel Company	4
	Hog Island Oyster Company	8
	CDPH Marine Biotoxin Program	3
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	4
	CDPH Volunteer ( <i>Eatinger</i> )	6
Santa Cruz	U.C. Santa Cruz	4
	CDPH Volunteers ( <i>Joel Herzel, Michael Wolcott</i> )	2
Monterey	CDPH Food and Drug Branch	2
	Monterey Abalone Company	1
	CDPH Volunteer ( <i>Katherine Neylan</i> )	1
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	6
	CDPH Marine Biotoxin Program	1
Santa Barbara	Santa Barbara Mariculture Company	3
	U.C. Santa Barbara	5
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	4
Los Angeles	Los Angeles County Health Department Sims	1
	Los Angeles County Health Department Torrance	1
	CDPH Volunteer ( <i>Steven Field</i> )	1
	Southern California Marine Institute	1
	California Department of Fish and Wildlife	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	4
	CDPH Volunteer ( <i>Steve Crooke</i> )	1

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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



The centric diatom *Melosira* forms chains. In May it was common at Crab Island at the mouth of the Russian River in Sonoma County.



The singular diatom *Suriella* is rarely seen.



The dinoflagellate *Ceratum furca* from Stillwater Cove in Monterey. Photo courtesy of Connie Rose.