

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 2015

Technical Report No. 15-10

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of March, 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 offshore of Dana Point (Orange County) during the first week of March (Figure 1). Cell numbers were low. PSP toxins below the alert level were detected in rock scallop viscera from the Santa Barbara Channel during the last week of March (Figure 3).

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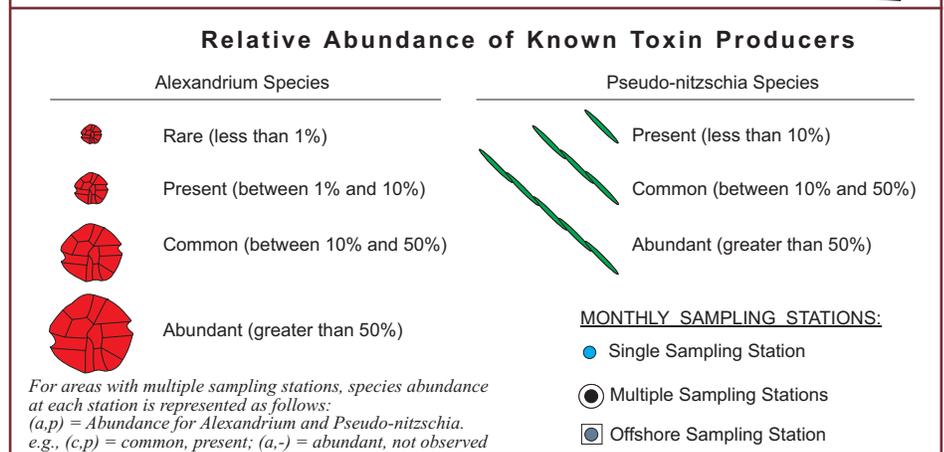
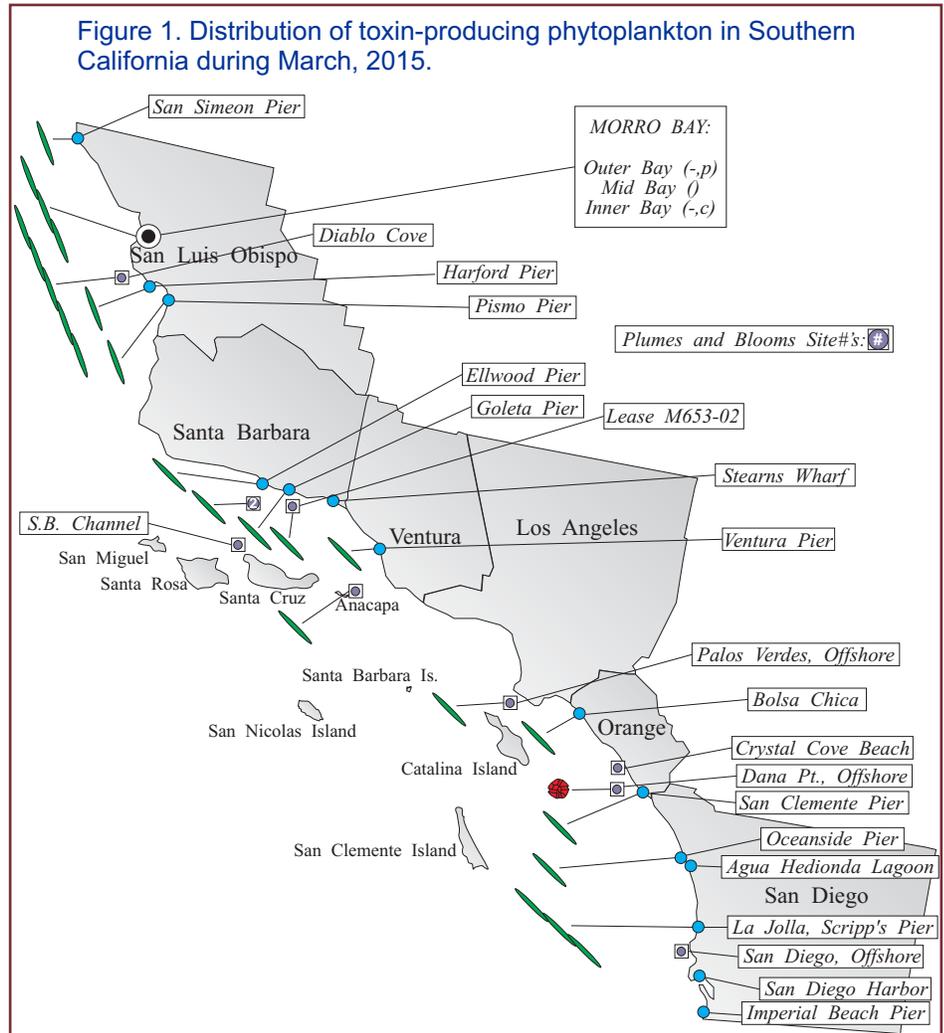
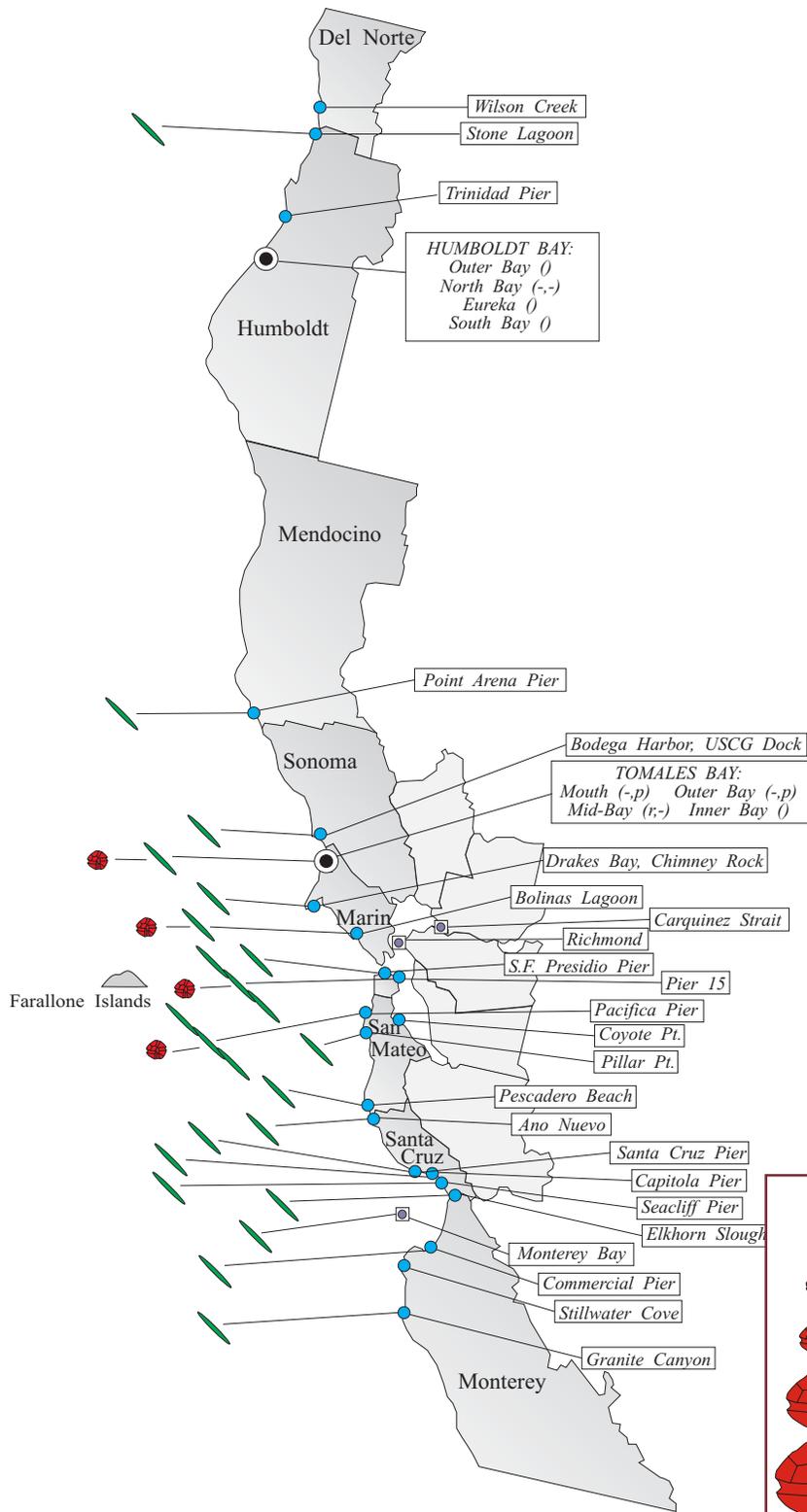


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during March, 2015.



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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 increased in Morro Bay and Diablo Cove (San Luis Obispo) compared to February. The highest relative abundance was observed at Diablo Cove during the first week of March. The percent composition for the rest of the stations remained low. The cell mass was low at most locations.

Domoic acid was not detected in any bivalve shellfish samples collected in March (Figure 3).

Non-Toxic Species

A mix of diatoms and dinoflagellates was observed along the coast. The dinoflagellate *Ceratium furca* was common to abundant at sites in San Luis Obispo, Los Angeles, Orange, and San Diego counties. The diatom *Chaetoceros* was common to abundant at most sites in all counties except for San Diego. The diatom *Bacteriastrium* was common at select sites in Santa Barbara, Orange, and San Diego counties.

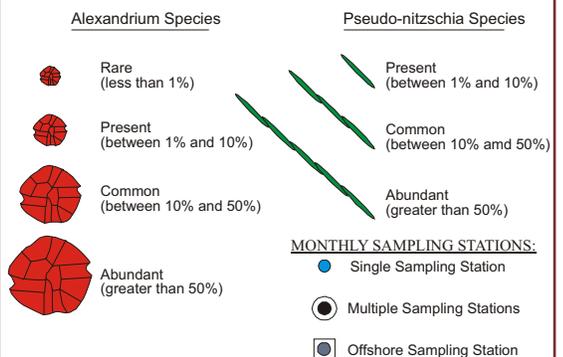
Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at four sampling sites representing Marin, San Francisco, and

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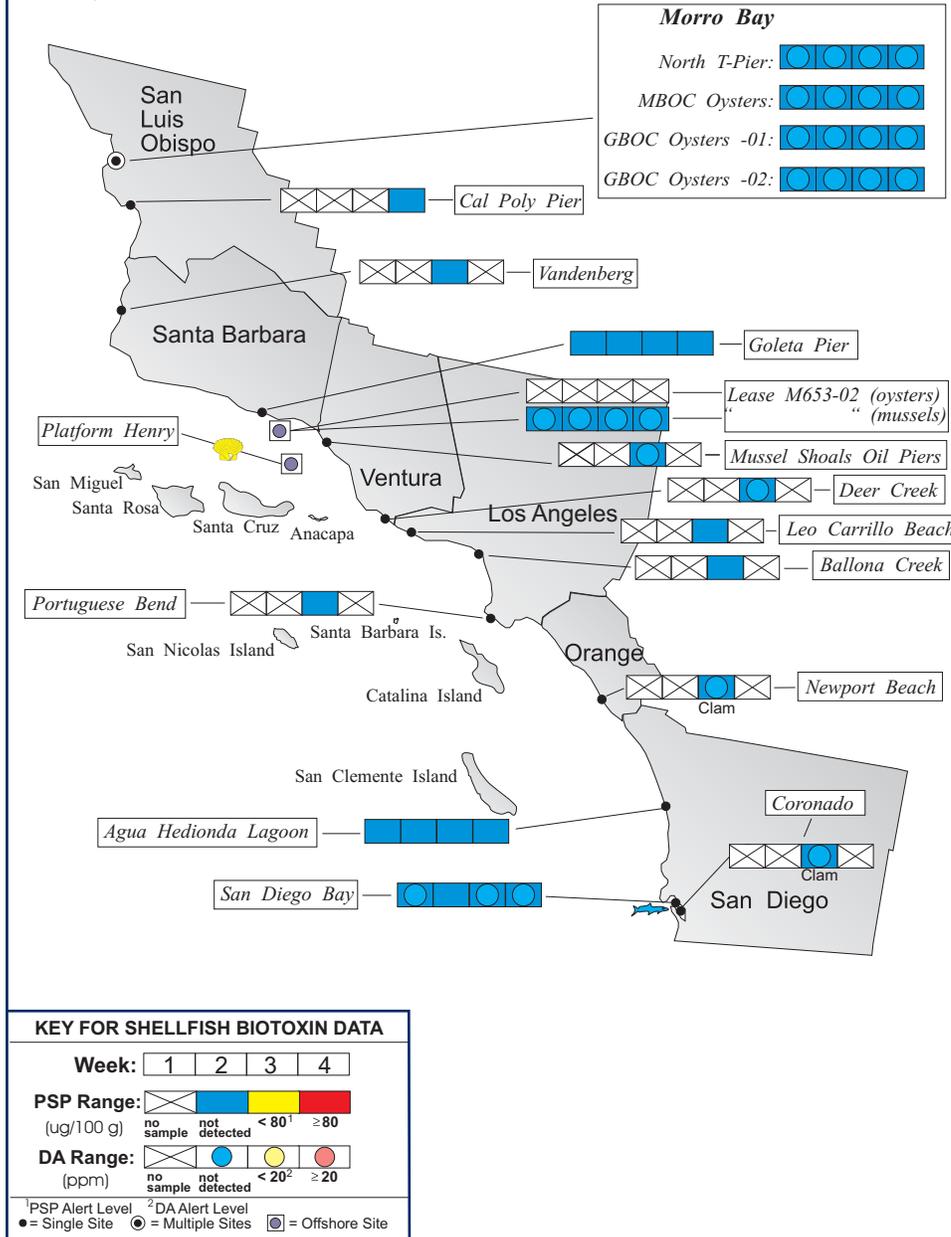
Relative Abundance of Known Toxin Producers



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 March, 2015.



San Mateo counties (Figure 2). Cell numbers were low at all sites. PSP toxins were not detected in any bivalve shellfish samples collected in March (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at sites between Humboldt and Monterey counties, increasing in range compared to observations in February (Figure 2). The highest relative abundance was at Pacifica Pier (San Mateo County) during the last week of the month. The cell mass was low at most locations.

Domoic acid was not detected in any bivalve shellfish samples collected in March (Figure 4).

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant along the Northern California coast. The diatom *Skeletonema* was common at select sites in Humboldt, Mendocino, and San Mateo counties. The dinoflagellate *Certium furca* was common to abundant at select sites in Santa Cruz and Monterey 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 Ventura 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

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

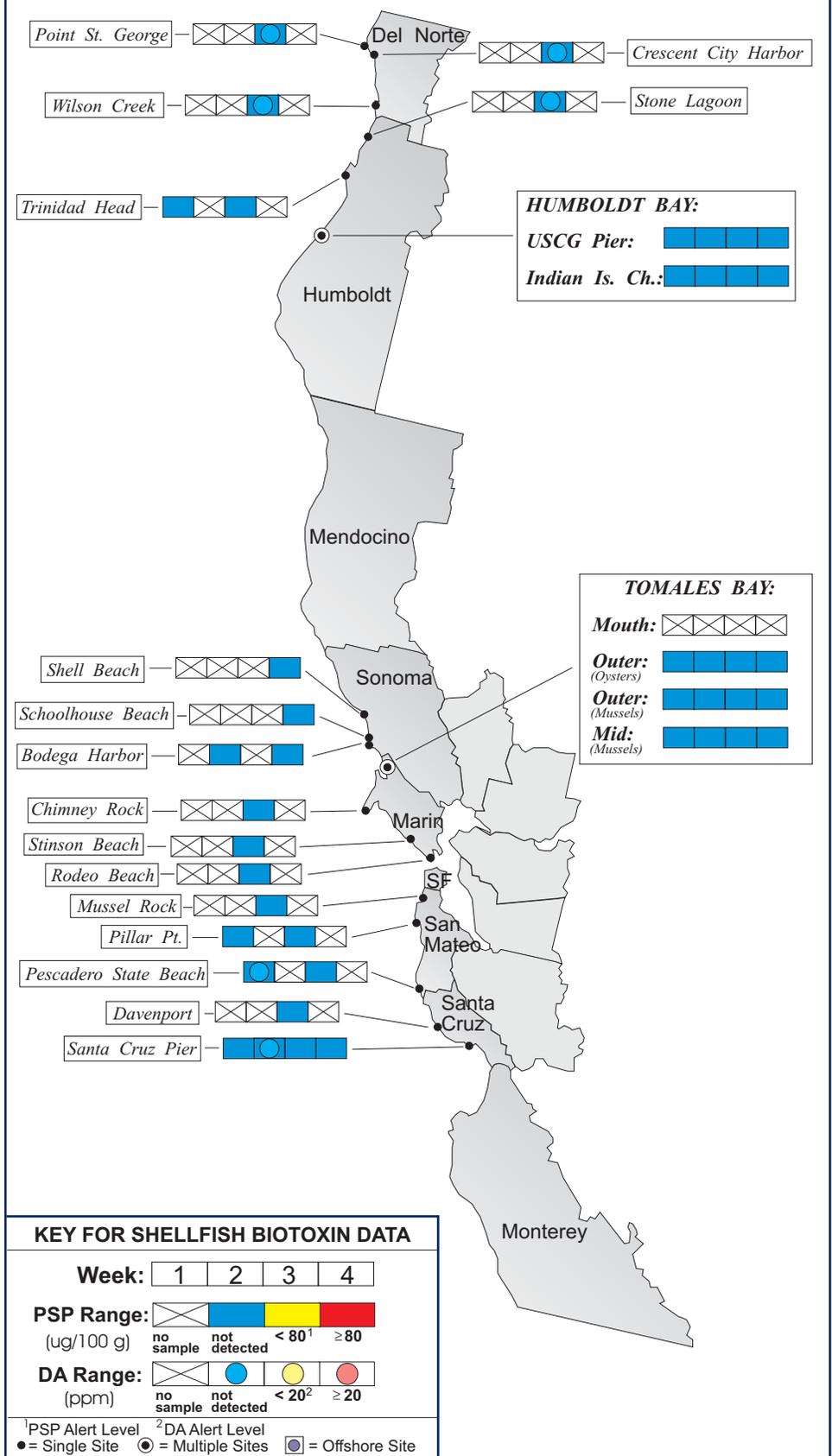


Table 1. Program participants collecting phytoplankton samples during March, 2015.

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AGENCY	#	AGENCY	#
DEL NORTE COUNTY		Yurok Tribe Environmental Program	1
HUMBOLDT COUNTY		Yurok Tribe Environmental Program	1
Coast Seafood Company	5	Humboldt State University Marine Lab	3
MENDOCINO COUNTY		CDPH Volunteer (<i>Marie DeSantis</i>)	3
SONOMA COUNTY		CDPH Marine Biotoxin Program	2
MARIN COUNTY		Hog Island Oyster Company	4
CDPH Marine Biotoxin Program	2	CDPH Volunteer (<i>Anderson, Clyde</i>)	7
CONTRA COSTA COUNTY		CDPH Marine Biotoxin Program	4
SAN FRANCISCO COUNTY			
CDPH Volunteer (<i>Eugenia McNaughton</i>)	1	Exploratorium	3
SAN MATEO COUNTY			
San Mateo County Envir. Health Department	6	Friends of the Sea Otter (<i>Diane Larson</i>)	1
The Marine Mammal Center	5	U.C. Santa Cruz - Ano Nuevo	2
SANTA CRUZ COUNTY			
U.C. Santa Cruz	4	Santa Cruz County Envir. Health Department	3
MONTEREY COUNTY			
Marine Life Studies	2	Friends of the Sea Otter (<i>Janis Chaffin</i>)	3
Marine Pollution Studies Laboratory	1	Monterey Abalone Company	2
Monterey Bay Whale Watch	1	The Otter Project	2
SAN LUIS OBISPO COUNTY			
Morro Bay National Estuary Program	2	Morro Bay Oyster Company	5
Coastal Discovery Center, San Simeon	5	Tenera Environmental	4
Friends of the Sea Otter (<i>Cherry</i>)	5	CDPH Volunteer (<i>Al Guild</i>)	5
SANTA BARBARA COUNTY		HABNet/CDPH Volunteers (<i>Amiri</i>)	2
CDPH Volunteer (<i>Sylvia Short</i>)	3	U.C. Santa Barbara	4
Santa Barbara Channel Keeper	1	Santa Barbara Mariculture Company	5
VENTURA COUNTY			
National Park Service	1	CDPH Volunteer (<i>Fred Burgess</i>)	4
LOS ANGELES COUNTY		Los Angeles County Sanitation District	2
ORANGE COUNTY			
CDPH Volunteer (<i>Truong Nguyen</i>)	4	Amigos de Bolsa Chica	4
Crystal Cove Alliance	3	Ocean Institute	2
SAN DIEGO COUNTY			
U.S. Navy Marine Mammal Program	3	Tijuana River National Estuary Research	4
Scripps Institute of Oceanography	5	Carlsbad Aquafarms, Inc.	2
Sea Camp/HABNet	2	CDPH Volunteer (<i>Cynthia Hall</i>)	1

cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

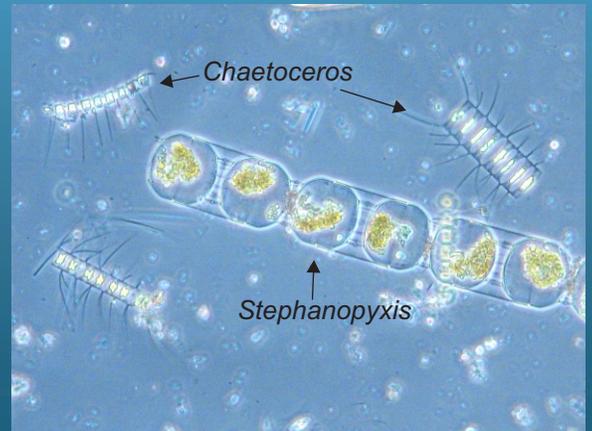
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and 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 March, 2015.

COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	2
	California Department of Fish and Game	1
Humboldt	Coast Seafood Company	10
	Humboldt County Environmental Health Department	1
	Yurok Tribe Environmental Program	1
	Humboldt State University	1
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	3
	CDPH Volunteer (<i>James Sanders</i>)	1
Marin	Cove Mussel Company	5
	Hog Island Oyster Company	10
	CDPH Marine Biotoxin Program	1
	CDPH Volunteers (<i>Dobleman, Sutton, Schmidt</i>)	3
San Francisco	None Submitted	
San Mateo	CDPH Volunteer (<i>Gary Della Maggiora</i>)	1
	San Mateo County Environmental Health Department	4
Santa Cruz	U.C. Santa Cruz	4
	CDPH Volunteer (<i>Joel Herzel</i>)	1
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	13
	Morro Bay Oyster Company	8
	CDPH Marine Biotoxin Program	1
Santa Barbara	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	5
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department Burke	1
	Los Angeles County Health Department Torrance	1
	Southern California Marine Institute	1
	CDPH Volunteer (<i>Steven Field</i>)	1
Orange	CDPH Volunteer (<i>Steve Croke</i>)	1
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	6
	CDPH Volunteer (<i>Steve Croke</i>)	1

PHYTOPLANKTON GALLERY



The chain diatoms *Chaetoceros* and *Stephanopyxis*. Collected in March 2015 from Pismo Pier in San Luis Obispo County.



Pleurosigma is a singular diatom with a sigmoid shape.



The diatom *Skeletonema* has short cells that form a straight chain.