

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 January 2013 Technical Report No. 13-07

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of January, 2013. 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 sampling locations in January (Figure 1). PSP toxins were not detected in any shellfish samples collected throughout the month (Figure 3).

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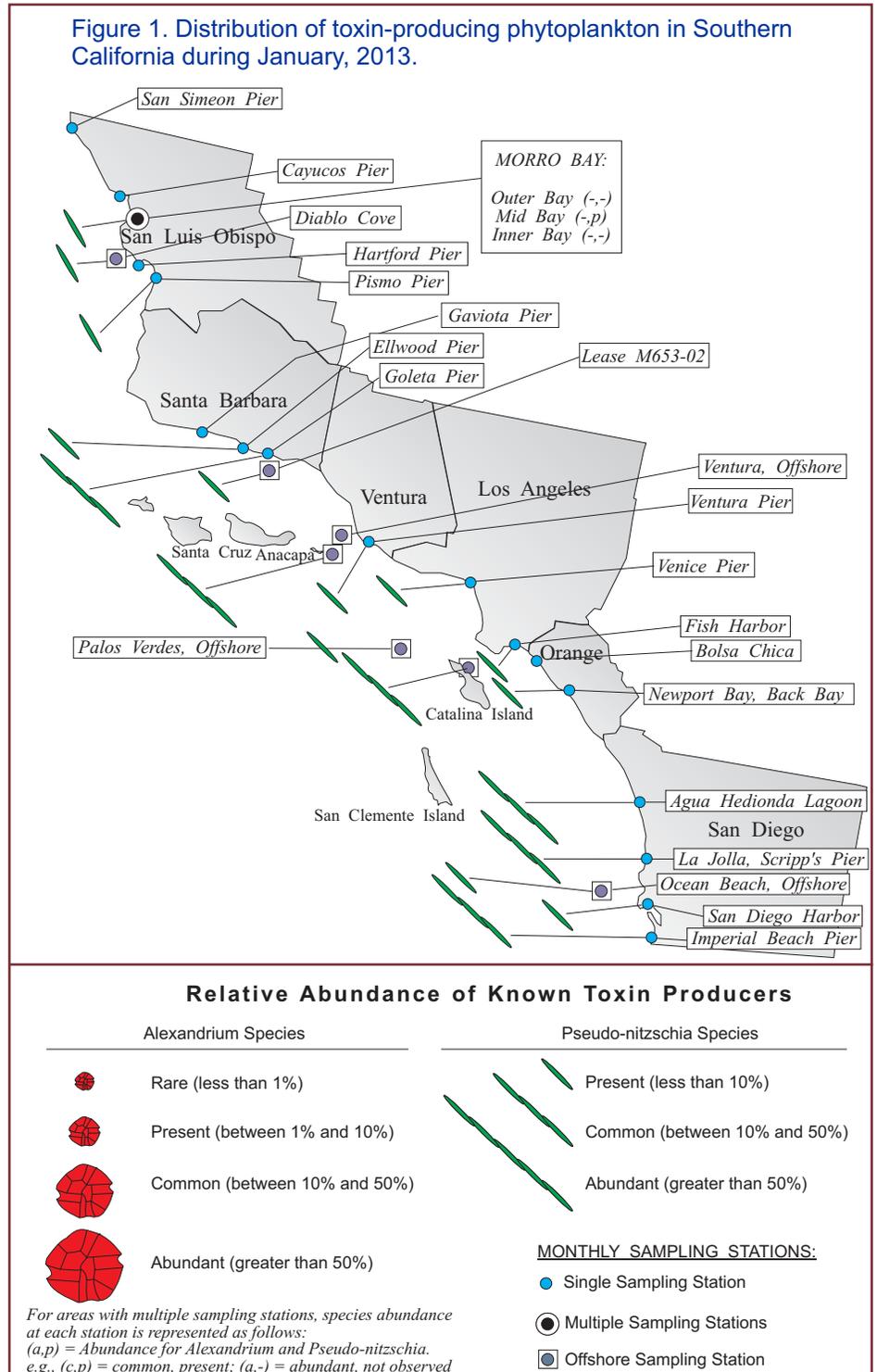
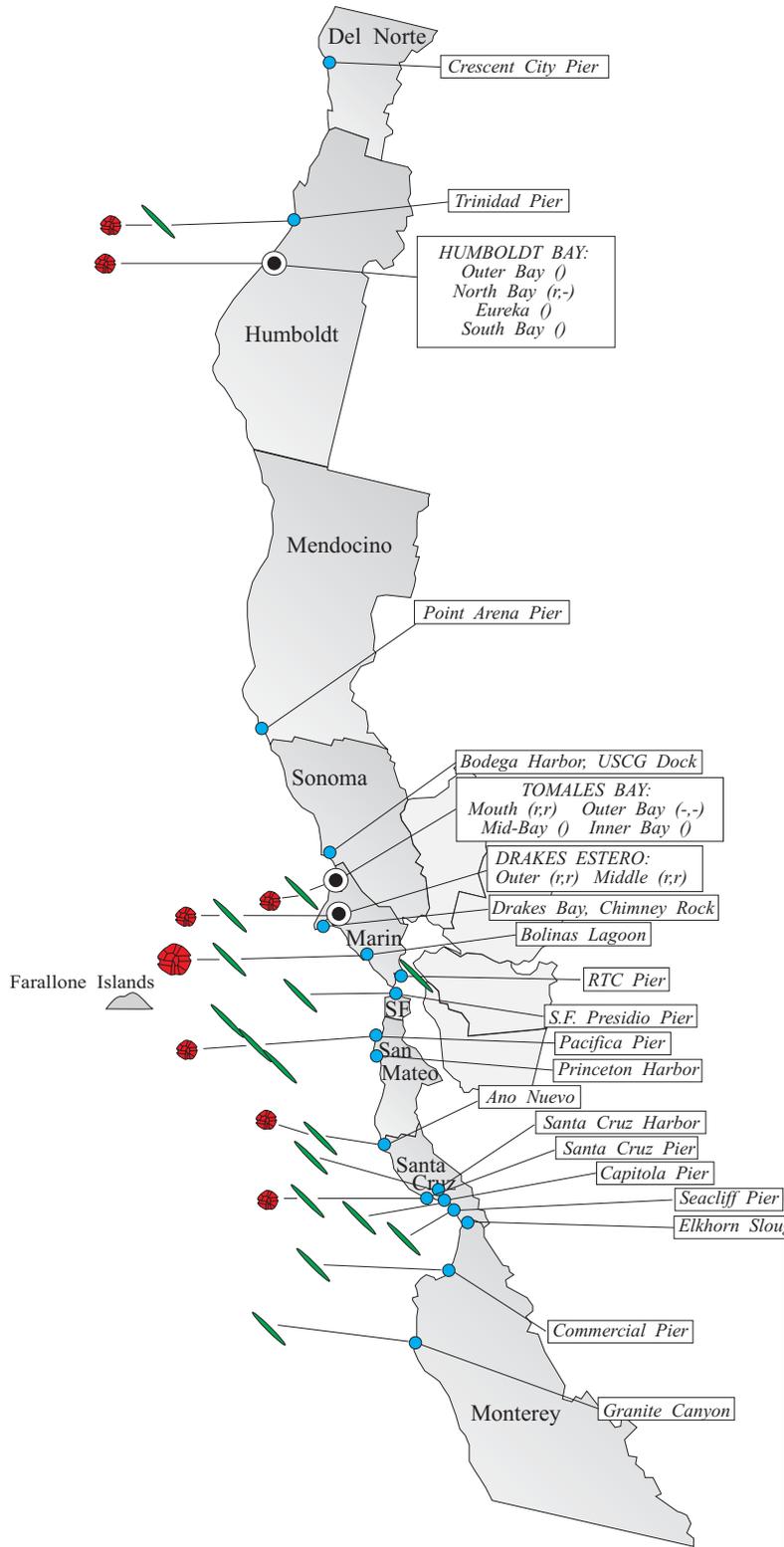


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during January, 2013.



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Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast (Figure 1). The relative abundance of this diatom increased at sites between Santa Barbara and San Diego counties, however the overall cell mass was low. Domoic acid was not detected in any shellfish samples analyzed during January (Figure 3).

Non-toxic Species

The diatom *Chaetoceros* was common to abundant along the southern California coast and offshore.

Northern California Summary:

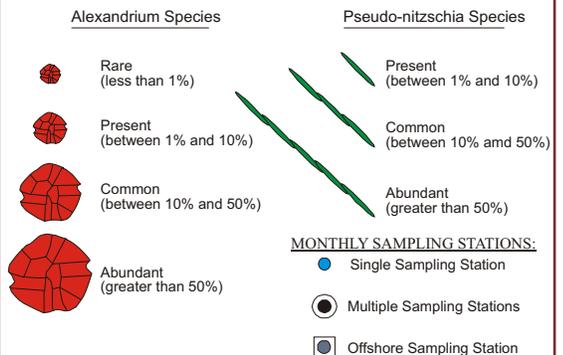
Paralytic Shellfish Poisoning

Alexandrium was observed along most of the northern California coast in January (Figure 2). The relative abundance of this dinoflagellate was low at all locations.

The elevated concentrations of PSP toxins detected in northern California from October through December increased in January at all locations (Figure 4). Mussels at the Wilson Creek site north of the Klamath River mouth in Del Norte County increased dramatically to 2055 ug/100 g by January 8. The previous sample collected on December 10 by the Yurok Tribe Environmental Program contained 179 ug/100g of the PSP

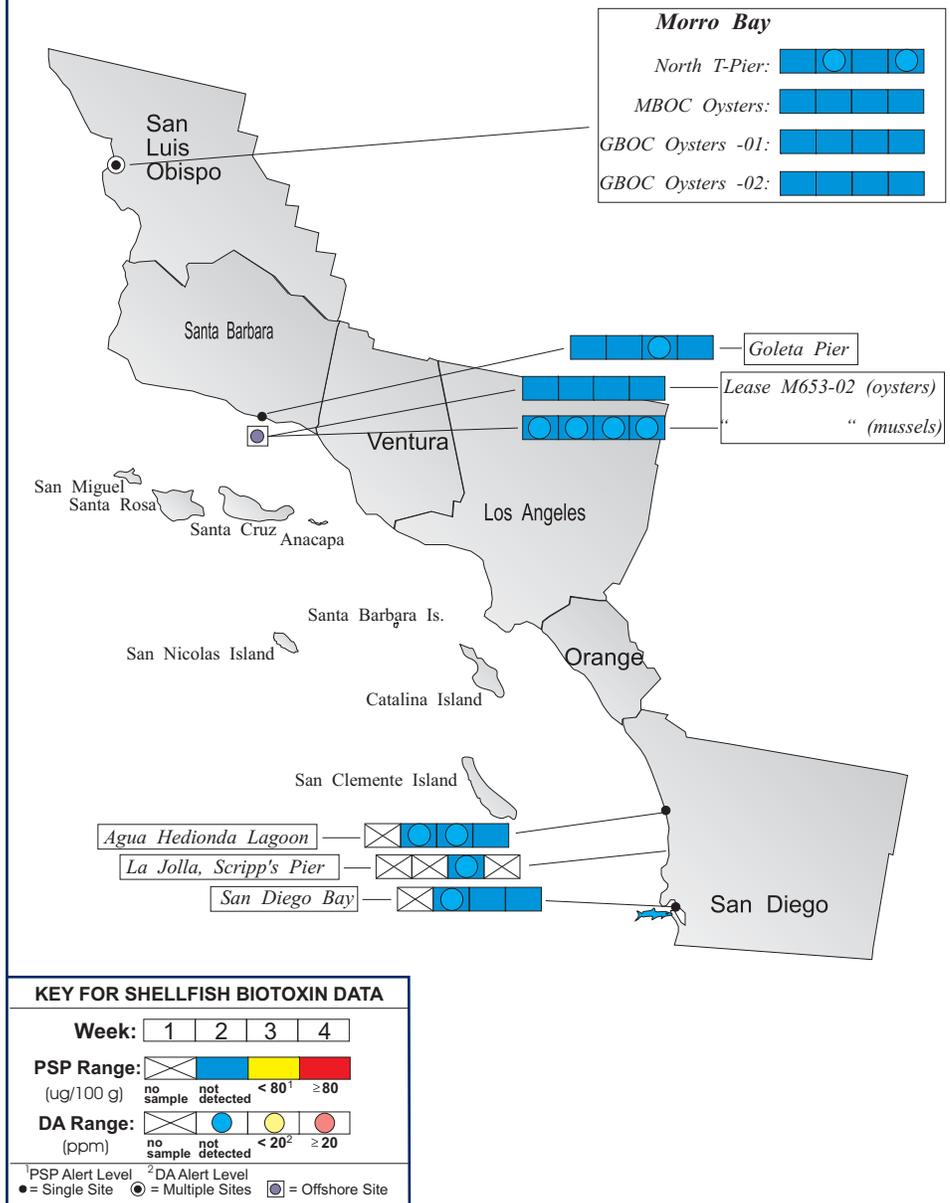
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Relative Abundance of Known Toxin Producers



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

Figure 3. Distribution of shellfish biotoxins in Southern California during January, 2013.



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toxins. PSP toxins also exceeded the alert level farther north at Point St. George throughout the month. Toxin concentrations exceeding the alert level were also detected along the entire Humboldt County coast. The low levels of toxins detected inside Humboldt Bay in December steadily increased through the first two weeks of January, declining but remaining above the alert level throughout the month. Lower levels of these toxins were detected from Sonoma through Santa Cruz counties. By mid-month the PSP toxins exceeded the alert level in sentinel mussels inside Drakes Estero (Marin County).

Domoic Acid

Pseudo-nitzschia was observed at several sampling sites in January (Figure 2). Cell mass and relative abundance were low throughout the month.

Non-toxic Species

Despite the prevalence of *Alexandrium* and the resultant high levels of PSP toxins along the coast, diatoms dominated the phytoplankton assemblage. *Skeletonema* was common to abundant along the entire northern California coast. *Chaetoceros* was also common at many sites.



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 health advisory issued on November 6 for all bivalve shellfish in Del Norte County remained in effect in January. This action was taken because of the dangerous levels of PSP toxins detected and followed the extension of the annual mussel quarantine for Humboldt and Del Norte counties on October 31.

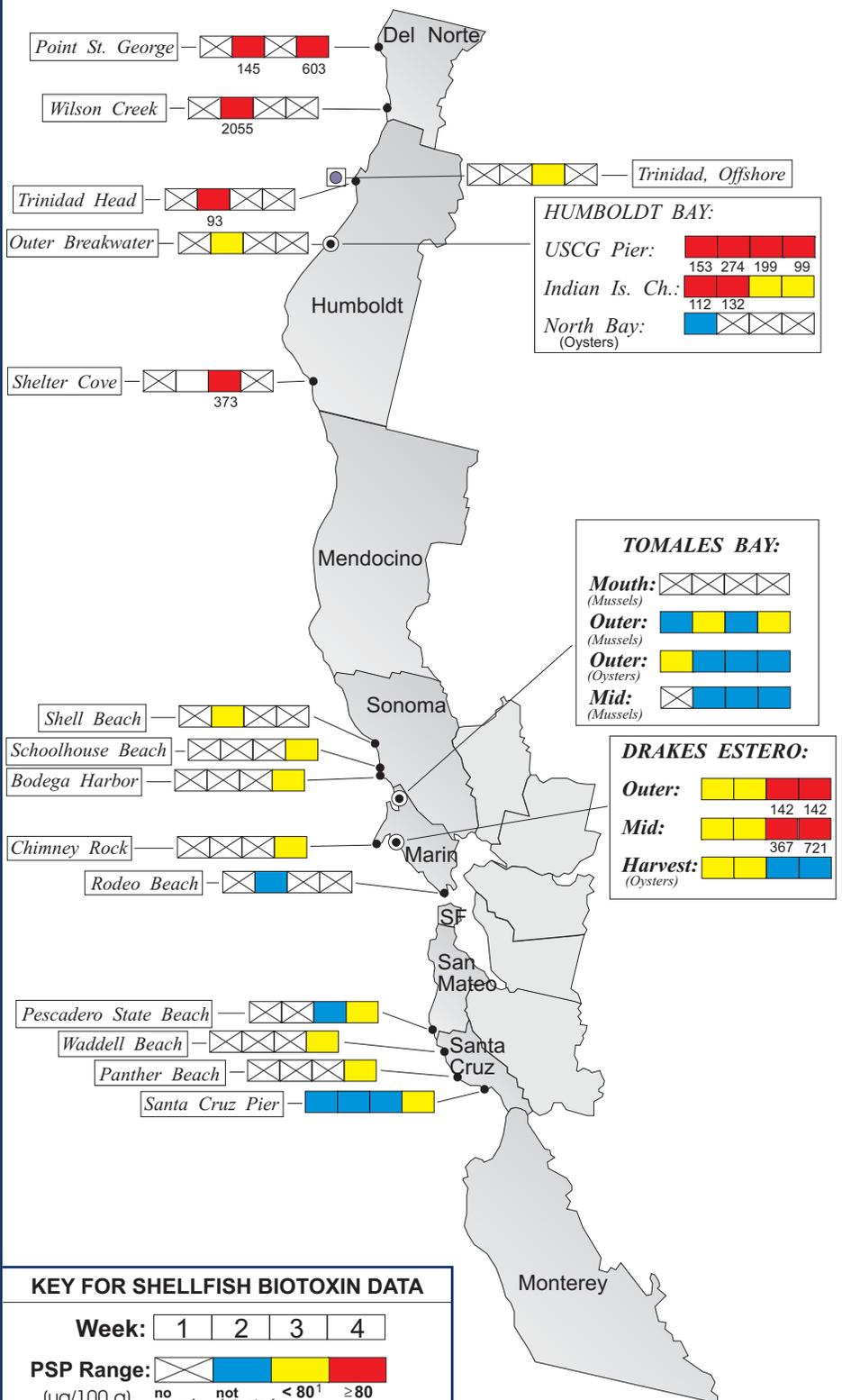
The health advisory issued on September 14 for the northern Channel Islands remained in effect. This alert was issued as a result of high levels of domoic acid in samples of crab viscera, also known as 'crab butter'. The advisory warned consumers to avoid eating bivalve shellfish or the internal organs of crab, lobster, and small finfish like sardines and anchovies from the affected region. It has been difficult to obtain samples for reevaluating this advisory. Any persons are agencies capable of providing samples of rock crab viscera can contact this program for more information (see the bottom of page 3 for details).

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 affect the human central

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Figure 4. Distribution of shellfish biotoxins in Northern California during January, 2013.



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: (ppm) no sample not detected < 20² ≥ 20

¹PSP Alert Level ²DA Alert Level
 ● = Single Site ○ = Multiple Sites ◐ = Offshore Site

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during January, 2013.

COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	2
	California Department of Fish and Wildlife (Eureka)	1
Humboldt	Coast Seafood Company	14
	Humboldt County Environmental Health Department	1
	California Department of Fish and Wildlife (Eureka)	2
Mendocino	CDPH Volunteer (<i>Georgianna Woods</i>)	1
	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	2
	CDPH Volunteer (<i>James Sanders</i>)	1
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	37
	Hog Island Oyster Company	5
	Marin Oyster Company	2
	Point Reyes Oyster Company	3
	CDPH Marine Biotoxin Program	1
San Francisco	CDPH Volunteer (<i>Peter Schmidt</i>)	1
	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
	CDPH Volunteer (<i>Devon Padilla</i>)	2
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	8
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	5
Ventura	None Submitted	
Los Angeles	None Submitted	
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	3
	Scripps Institute of Oceanography	1
	U.S. Navy Marine Mammal Program	4

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nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are 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. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during January, 2013.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	5
	Humboldt State University Marine Lab	2
Mendocino	CDPH Volunteer (<i>Marie DeSantis</i>)	3
Sonoma	CDPH Marine Biotoxin Program	1
Marin	Drakes Bay Oyster Company	16
	CDPH Volunteer (<i>Brent Anderson</i>)	5
	SFSU, Romberg Tiburon Center	3
	CDPH Marine Biotoxin Program	1
Contra Costa	None Submitted	
Alameda	None Submitted	
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	2
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	5
	Friends of the Sea Otter (<i>Aric Bickel</i>)	2
	San Mateo County Environmental Health Department	2
	U.C. Santa Cruz	1
Santa Cruz	Santa Cruz County Environmental Health Department	3
	U.C. Santa Cruz	4
Monterey	Friends of the Sea Otter (<i>Janis Chaffin</i>)	4
	Monterey Abalone Company	3
	Marine Pollution Studies Laboratory	4
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	4
	Grassy Bar Oyster Company	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	2
	Tenera Environmental	3
	The Marine Mammal Center (<i>P.J. Webb, Tim Lytsell</i>)	2
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	4
	HABNet/CDPH Volunteer (<i>Boyd Grant</i>)	1
	Santa Barbara Mariculture Company	3
	U.C. Santa Barbara	5
Ventura	CDPH Volunteer (<i>Fred Burgess</i>)	1
	National Park Service	2
Los Angeles	CDPH Volunteer (<i>Fred Burgess</i>)	1
	Los Angeles County Sanitation District	3
	Catalina Island Marine Institute	4
	Southern California Marine Institute	1
Orange	California Department of Fish and Game	4
San Diego	Carlsbad Aquafarms, Inc.	2
	San Diego Whale Watch	1
	Scripps Institute of Oceanography	4
	Tijuana River National Estuary Research Reserve	4
	U.S. Navy Marine Mammal Program	3

PHYTOPLANKTON GALLERY



A chained diatom named Achnanthes.



A chain of four Alexandrium cells.



The chain-forming diatom Melosira is typically observed in calmer areas, such as Bolinas Lagoon and Drakes Estero.