

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 2014

Technical Report No. 14-12

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of May, 2014. 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:

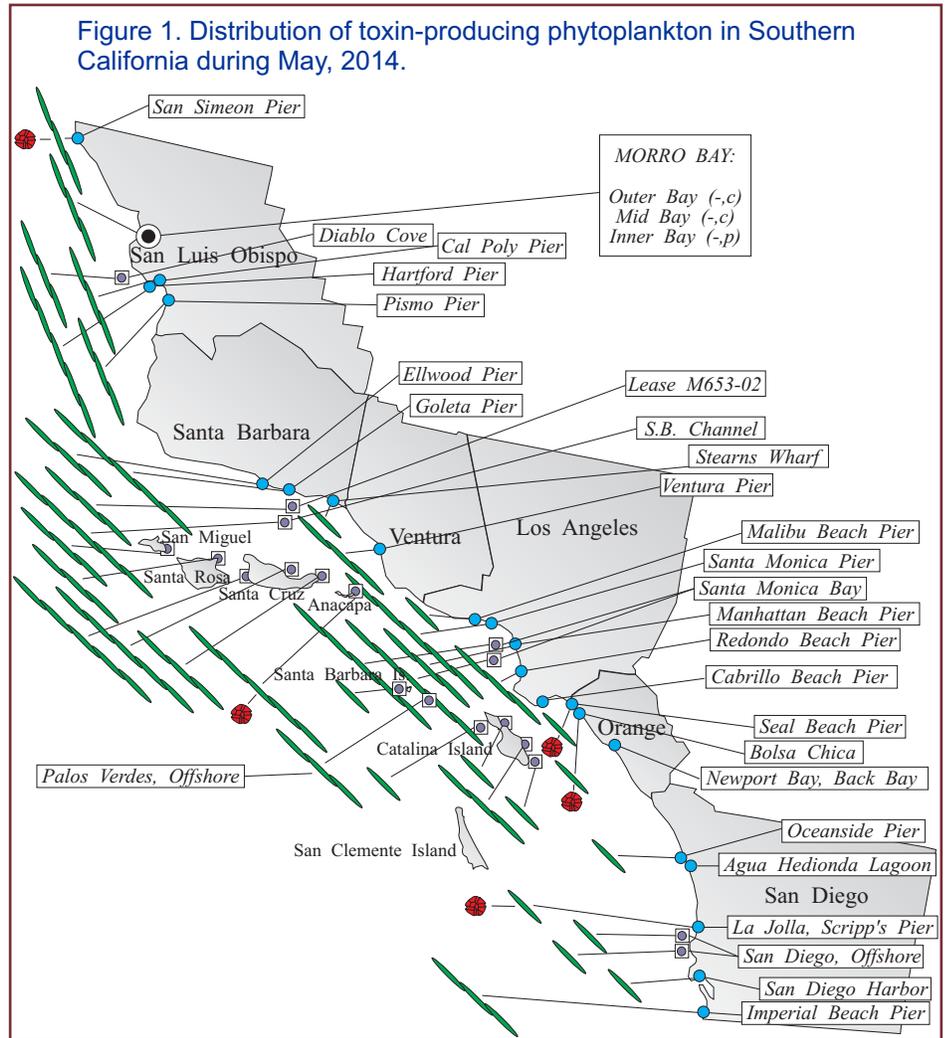
Paralytic Shellfish Poisoning

Alexandrium was observed at five sites in four counties in May (Figure 1). PSP toxins were not detected in any shellfish samples in May (Figure 3).

Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast (Figure 1).

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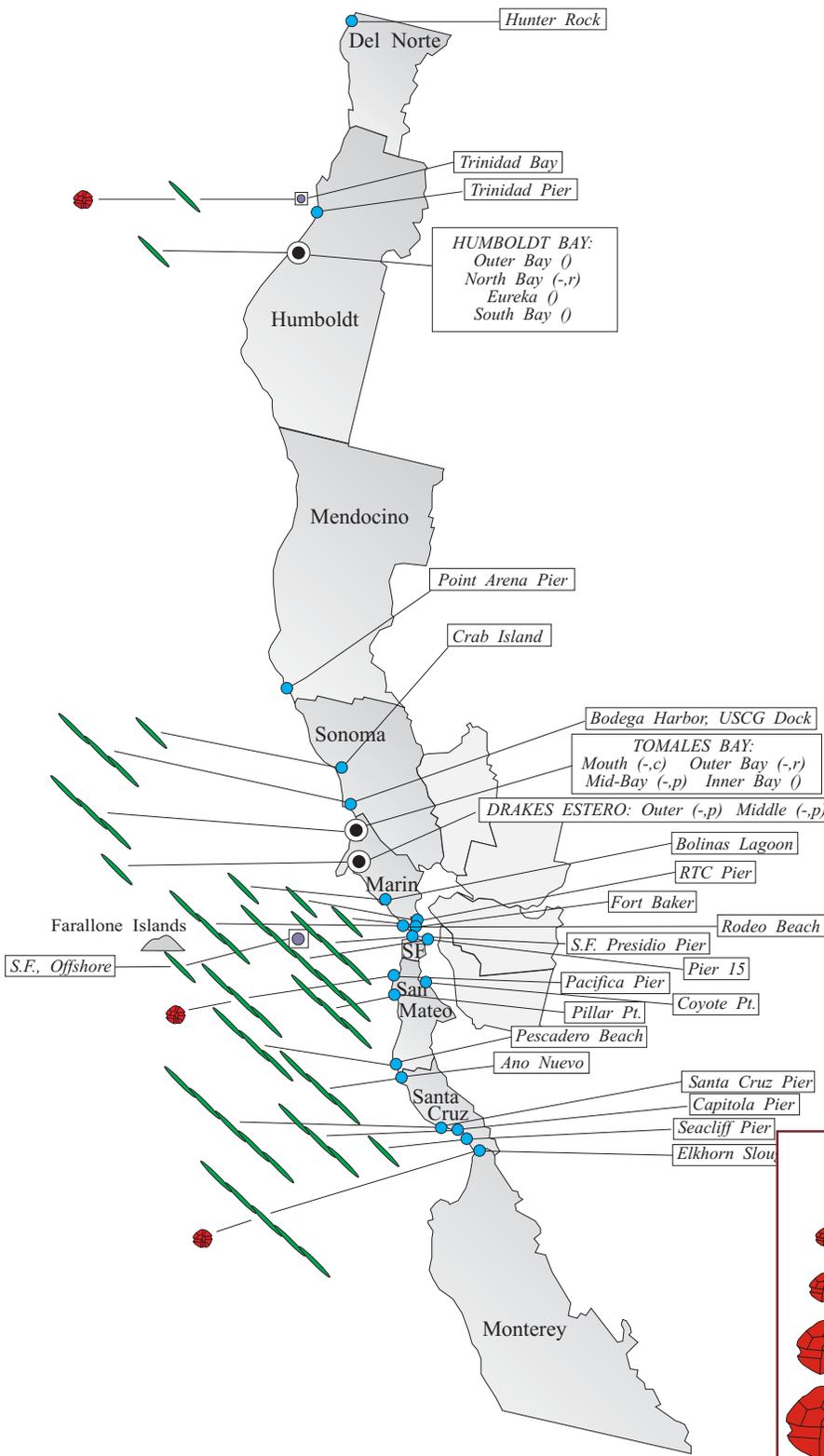
Relative Abundance of Known Toxin Producers			
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during May, 2014.



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 The percent composition of this diatom increased at most southern California sampling sites, however the cell mass was generally low. The highest relative abundances were observed at Hartford Pier (May 13) and Santa Rosa Island (May 13). Domoic acid was detected from Santa Barbara to Los Angeles counties (Figure 3). Shellfish samples increased above the alert level at the following locations: offshore aquiculture lease (Santa Barbara; May 30) and Deer Creek (May 21). Goleta Pier and Portuguese Bend had low levels of domoic acid.

Non-Toxic Species

The diatom *Chaetoceros* was ubiquitous along the southern California coast. *Skeletonema* and *Thalassiosira* were also common at a few San Luis Obispo sites. The dinoflagellate *Ceratium furca* was common offshore of Palos Verdes at the beginning of the month.

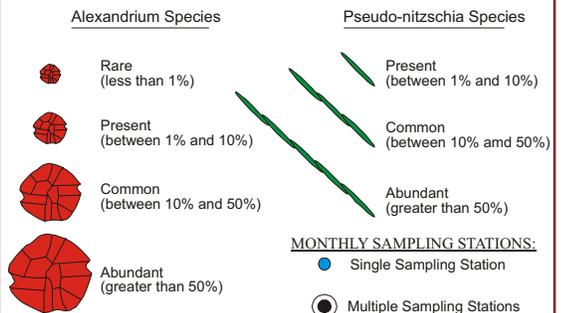
Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was rare and observed at only three sites in May (Figure 2). Low levels of the PSP toxins were detected at sites in Del Norte and Humboldt counties, including Trinidad Head and the inner Humboldt Bay sentinel station. These toxins were detected at the outer Humboldt Bay sentinel mussel station the entire month and at Santa Cruz Pier in the last week of May.

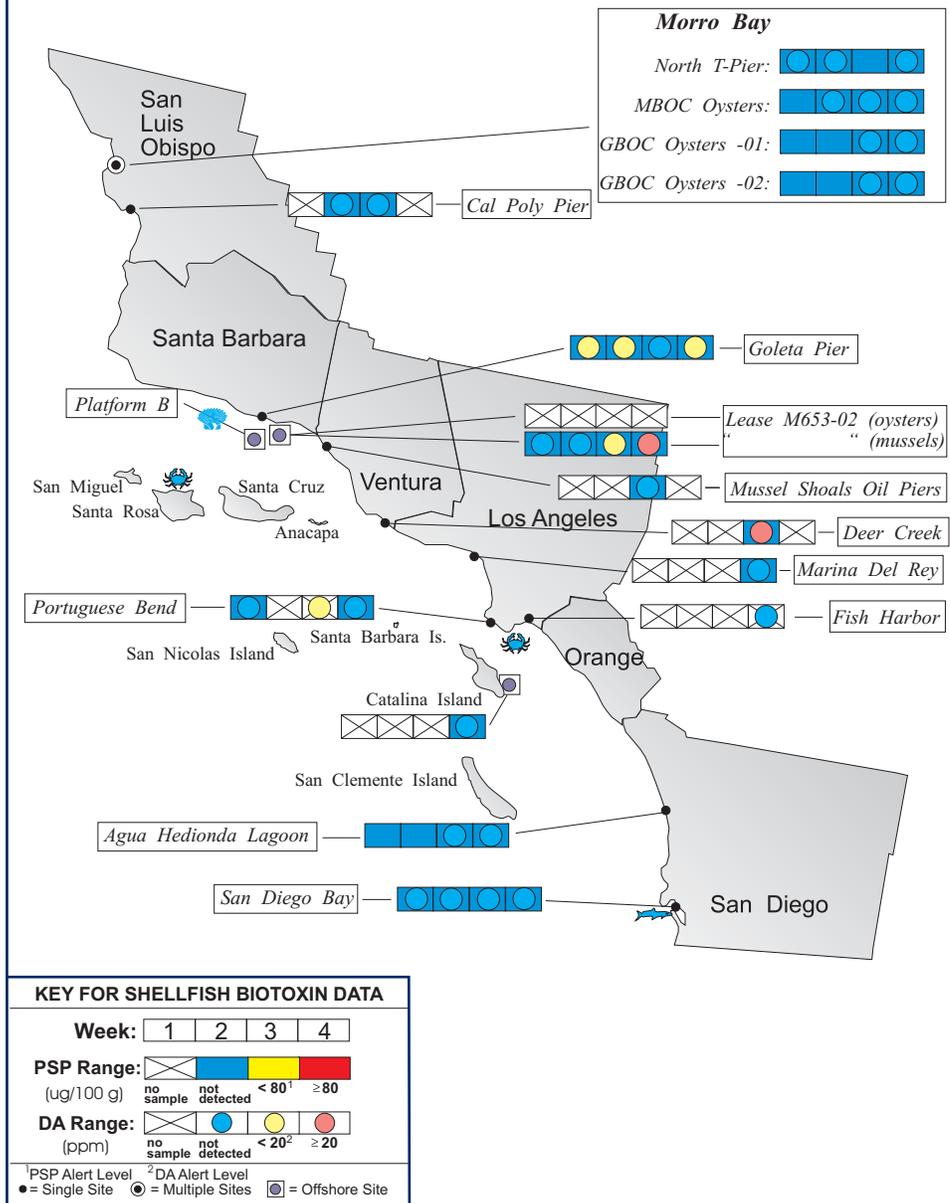
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Relative Abundance of Known Toxin Producers



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 May, 2014.



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Domoic Acid

Pseudo-nitzschia was observed at most sampling sites in May, staying the same or decreasing in relative abundance at most sites compared to observations in April (Figure 2). The highest relative abundance of *Pseudo-nitzschia* was observed at Rodeo Beach in Marin (May 2).

Domoic acid decreased in Santa Cruz, Monterey and southern San Mateo counties in May. It was detected in low levels for the first week of May at China Beach (San Francisco County), Mussel Rock (San Mateo County) and at Elkhorn Slough (Monterey County). Fish samples were collected by the CDPH Food and Drug Branch from Monterey Bay. All sardine samples were below the alert level. The majority of anchovy samples exceeded the alert level. The highest concentration detected was 97 ppm. The majority of crab samples were below the detection limit for domoic acid in the viscera. Only one crab sample exceeded the alert level at 44 ppm.

Non-Toxic Species

The diatoms *Skeletonema* and *Chaetoceros* were common at sites between Humboldt and Santa Cruz counties. *Leptocylindrus minimus* was common in mid Tomales Bay at the end of the month.



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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QUARANTINES:

The annual mussel quarantine began on May 1. This annual quarantine applies to sporharvested mussels along the entire California coastline, including all bays and estuaries.

On April 4 the Department issued a Health Advisory warning consumers not to eat recreationally harvested bivalve shellfish (i.e., mussels, clams and scallops) from Santa Cruz and Monterey counties. This advisory was issued because of elevated levels of domoic acid in shellfish samples from this region.

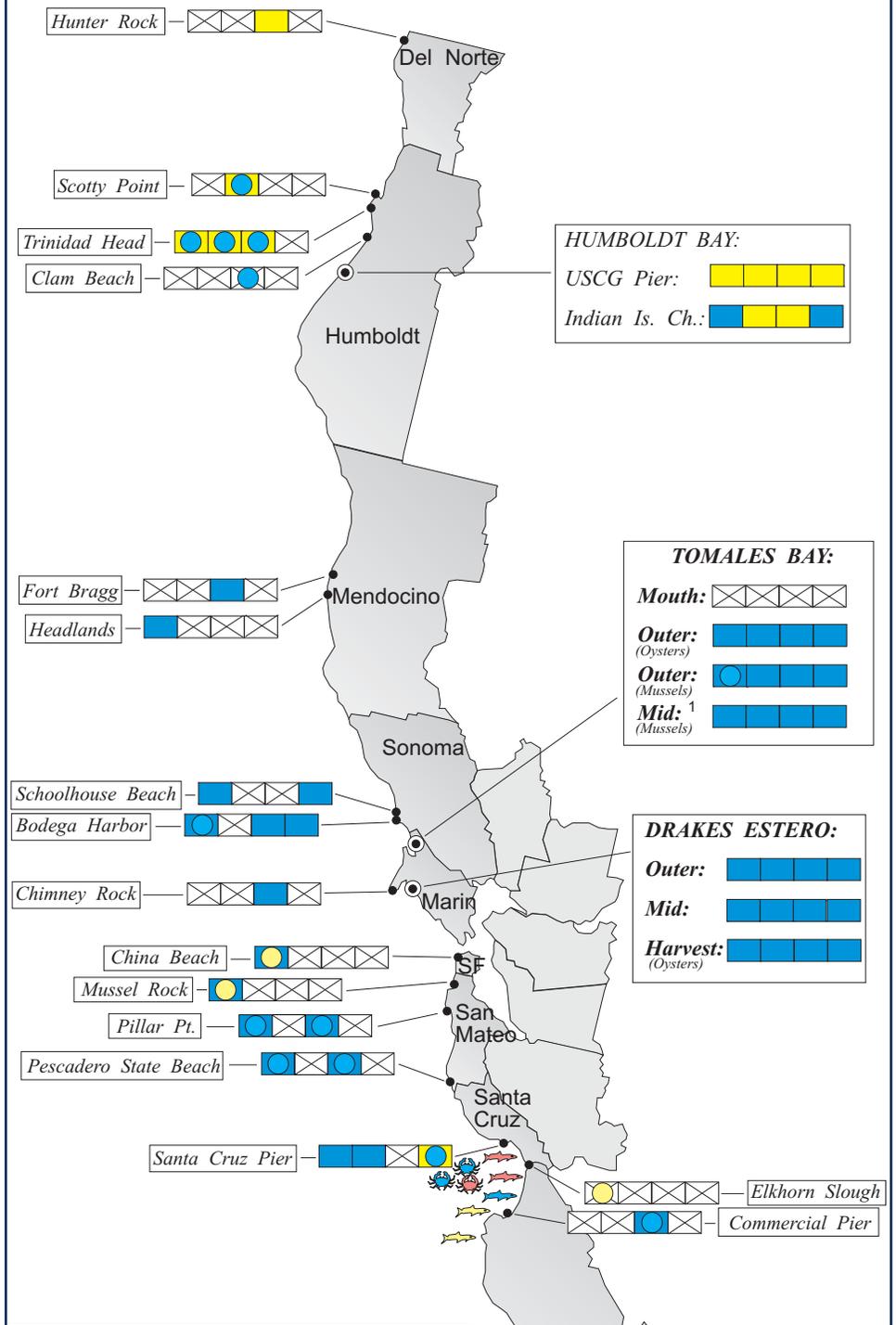
On April 10 the Department issued an additional Health Advisory for Monterey and Santa Cruz counties that advised the public to avoid consuming the viscera of crab, as well as sardines and anchovies. As with the April 4 advisory, this action was taken due to the detection of high levels of domoic acid in several samples of finfish in the region.

Due to the duration of the domoic acid event in Santa Cruz and Monterey, an updated Health Advisory was issued on April 28 to ensure the public was aware of the continued risk associated with consuming bivalve shellfish or the viscera of crab and small finfish like anchovy and sardine.

The September 14 health advisory for the northern Channel Islands remained in effect. 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 due to persistent elevated levels of domoic acid in crab viscera samples.

Consumers of Washington clams, also

Figure 4. Distribution of shellfish biotoxins in Northern California during May, 2014.



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

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Table 1. Program participants collecting phytoplankton samples during May, 2014.

AGENCY	#	AGENCY	#
DEL NORTE COUNTY		Smith River Rancheria	1
HUMBOLDT COUNTY		Coast Seafood Company	4
		Humboldt State University Marine Lab	6
MENDOCINO COUNTY		CDPH Volunteer (<i>Marie DeSantis</i>)	2
SONOMA COUNTY		Sonoma Coast Watch	1
		CDPH Marine Biotoxin Program	2
MARIN COUNTY		Drakes Bay Oyster Company	9
Golden Gate National Rec. Area	2	CDPH Volunteer (<i>Anderson, Clyde</i>)	6
SFSU, Romberg Tiburon Center	3	Hog Island Oyster Company	4
Sonoma State University	1	NatureBridge	1
SAN FRANCISCO COUNTY		CDPH Volunteer (<i>Eugenia McNaughton</i>)	4
San Francisco Bay Whale Watching Company	1	Exploratorium	4
SAN MATEO COUNTY		The Marine Mammal Center (<i>Stan Jensen</i>)	3
San Mateo County Environmental Health Dept.	5	U.C. Santa Cruz - Ano Nuevo	4
		Friends of the Sea Otter (<i>Diane Larson</i>)	1
SANTA CRUZ COUNTY		U.C. Santa Cruz	4
		Santa Cruz Co. Environmental Health Dept.	3
MONTEREY COUNTY		Friends of the Sea Otter (<i>Janis Chaffin</i>)	3
SAN LUIS OBISPO COUNTY		Friends of the Sea Otter (<i>Kelly Cherry</i>)	4
Morro Bay National Estuary Program	2	Grassy Bar Oyster Company	4
Coastal Discovery Center, San Simeon	3	Tenera Environmental	4
CDPH Marine Biotoxin Program	1	CDPH Volunteer (<i>Al Guild</i>)	4
SANTA BARBARA COUNTY		CDPH Volunteer (<i>Sylvia Short</i>)	2
HABNet/CDPH Volunteers (<i>Freedman</i>)	5	Island Packers/HABNet	1
National Park Service	2	Santa Barbara Mariculture Company	4
Santa Barbara Channel Keeper	1	U.C. Santa Barbara	4
Ty Warner Sea Life Center/HABNet	1		
VENTURA COUNTY		CDPH Volunteer (<i>Fred Burgess</i>)	4
		National Park Service	2
LOS ANGELES COUNTY			
Catalina Island Marine Institute	6	City of Los Angeles Envi. Monitoring Division	3
Tole Mour	6	Los Angeles County Health Department	3
Los Angeles County Sanitation District	4	CDPH Volunteers (<i>Kai Xu, Cal Parsons</i>)	5
ORANGE COUNTY		Amigos de Bolsa Chica	5
California Department of Fish and Wildlife	5	National Oceanic and Atmospheric Admin.	1
SAN DIEGO COUNTY		Carlsbad Aquafarms, Inc.	1
Scripps Institute of Oceanography	3	Sea Camp/HABNet	3
U.S. Navy Marine Mammal Program	4	Tijuana River National Estuary Research	4
		CDPH Volunteer (<i>Cynthia Hall</i>)	2

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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 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

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Table 2. CDPH program participants submitting shellfish samples during May, 2014.

COUNTY	AGENCY	#
Del Norte	Smith River Rancheria	1
Humboldt	Coast Seafood Company	8
	Humboldt State University Marine Lab	7
	Humboldt County Environmental Health Department	1
Mendocino	Mendocino County Environmental Health Department	1
	CDPH Volunteer (<i>Charlie Lorenz</i>)	1
Sonoma	CDPH Marine Biotoxin Program	5
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	CDPH Marine Biotoxin Program	1
	Hog Island Oyster Company	4
Tomales Bay Oyster Company	Tomales Bay Oyster Company	5
	CDPH Volunteer (<i>Will Vaquilar</i>)	1
	San Francisco	CDPH Volunteer (<i>Will Vaquilar</i>)
San Mateo	San Mateo County Environmental Health Department	4
	CDPH Volunteer (<i>Gary Della Maggiora</i>)	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	Monterey Abalone Company	1
	Wild Planet Foods	11
	CDPH Food and Drug Branch	17
	CDPH Marine Biotoxin Program	2
	San Luis Obispo	Grassy Bar Oyster Co.
Morro Bay Oyster Company	Morro Bay Oyster Company	6
	CDPH Marine Biotoxin Program	2
	Santa Barbara	Santa Barbara Mariculture Company
U.C. Santa Barbara	U.C. Santa Barbara	5
	Wild Planet Foods	4
	Ventura	Ventura County Environmental Health Department
Los Angeles	CDPH Volunteer (<i>Cal Parsons</i>)	1
	Los Angeles County Health Department Commerce	2
	Los Angeles County Health Department Torrance	2
	Southern California Marine Institute	1
	CDPH Food and Drug Branch	5
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	5

PHYTOPLANKTON GALLERY



The colony forming diatom *Chaetoceros socialis*.



The centric diatom *Coscinodiscus*.



The diatoms *Guinardia* and *Rhizosolenia*.

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.

