

# M o n i t h l y M a r i n e B i o t o x i n R e p o r t

August 2014

Technical Report No. 14-17

**INTRODUCTION:**

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

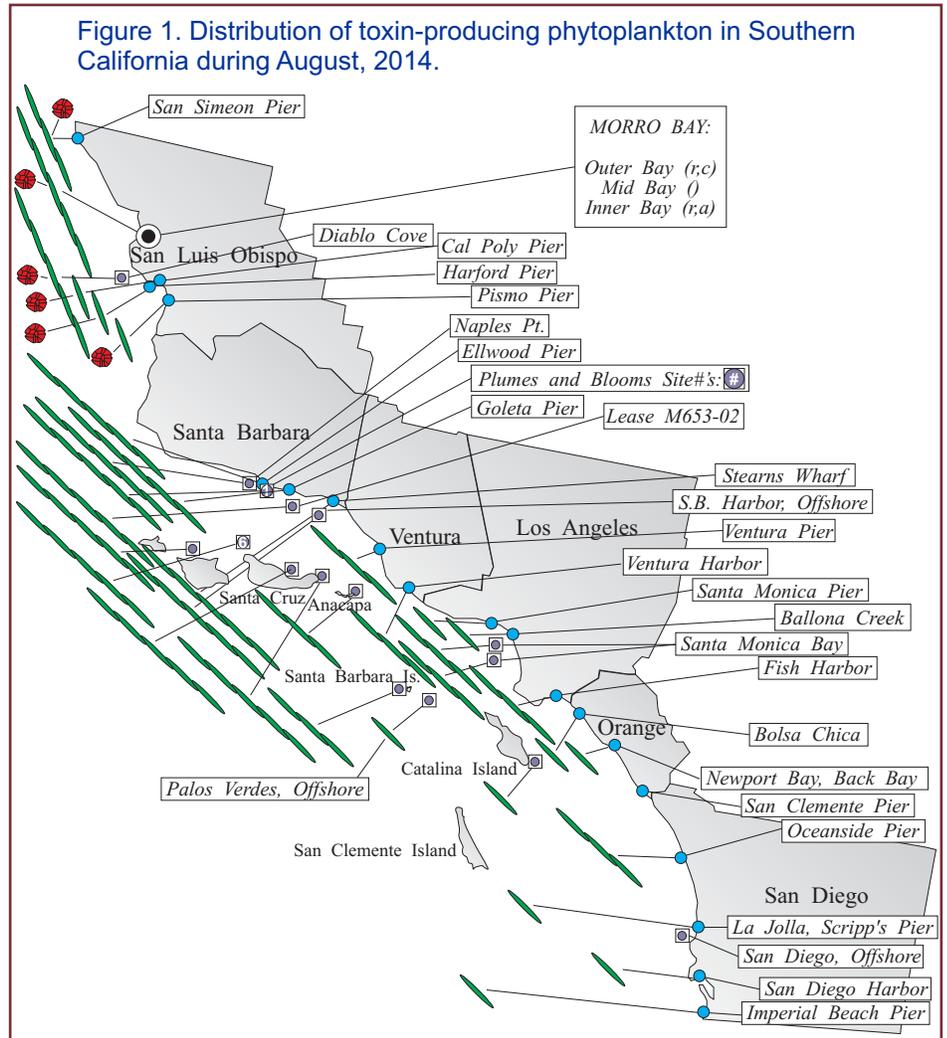
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All 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 in very low numbers at all sampling sites in San Luis Obispo County (Figure 1). Low levels of the PSP toxins were detected in two samples from Santa Barbara County (Figure 3): in a scallop viscera sample from an offshore oil platform (August 19) and in a mussel sample from an

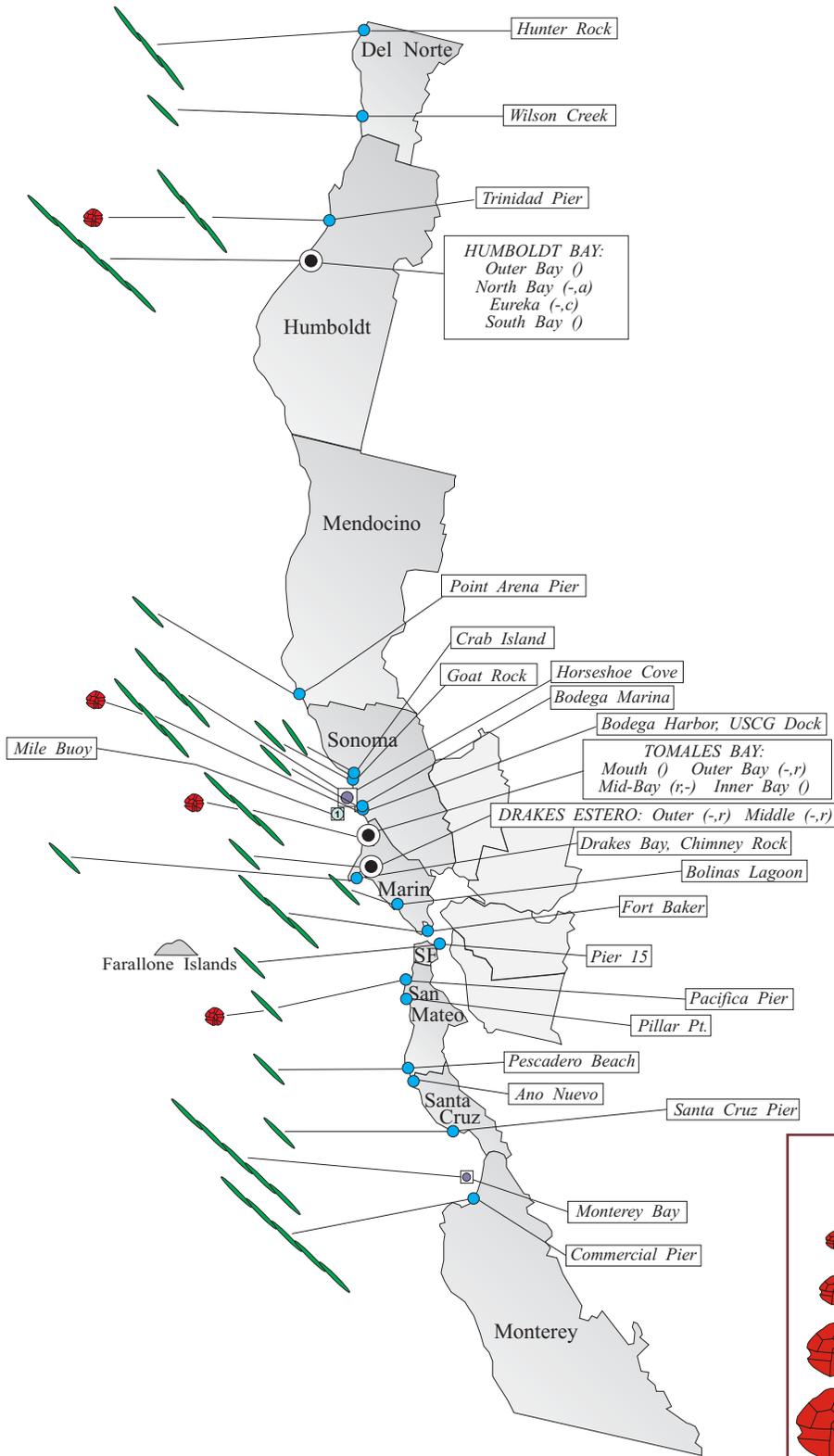
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Relative Abundance of Known Toxin Producers			
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		
<b>MONTHLY SAMPLING STATIONS:</b>			
			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 August, 2014.



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aquaculture lease offshore of Arroyo Burro Beach (August 25 and 27).

**Domoic Acid**

*Pseudo-nitzschia* was observed along the entire southern California coast (Figure 1). The percent composition of this diatom was abundant at most stations in San Luis Obispo and Santa Barbara counties, including offshore at the Channel Islands. The cell mass, however, was low at most locations. The highest relative abundances were observed at Diablo Cove (August 7, 21), Santa Barbara Channel (Plumes and Blooms station 1, August 22), and in Santa Monica Bay (August 5). Domoic acid was not detected in any shellfish samples (Figure 3).

**Non-Toxic Species**

The diatom *Chaetoceros* dominated the assemblage along the southern California coast. Dinoflagellates (*Protoperdinium*, *Ceratium*) were locally common, particularly at sites in San Diego County.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* was observed at scattered locations along the northern California coast (Figure 2), representing a significant decline from observations in July. Cell numbers were low at the few sites where this dinoflagellate was observed.

The high levels of PSP toxins detected in Marin and Sonoma counties in July

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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%)

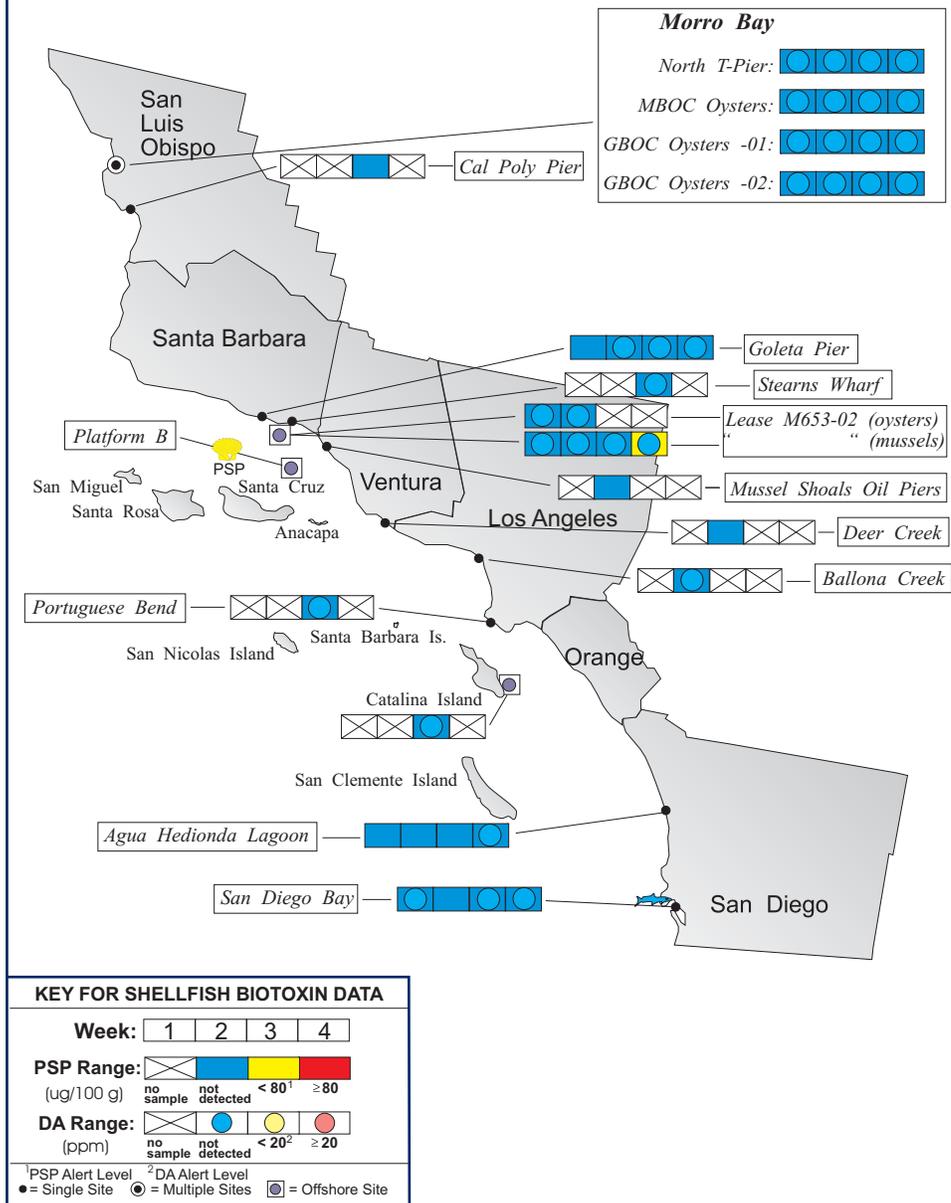
**MONTHLY SAMPLING STATIONS:**

- 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

Figure 3. Distribution of shellfish biotoxins in Southern California during August, 2014.



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decreased significantly by August (Figure 4). Toxin concentrations above the alert level persisted at the Bodega Harbor sentinel mussel station through the first week of August (104 ug/100 g), then declined but remained detectable by the end of the month. A high concentration of the PSP toxins (349 ug/100 g) was also detected in mussels from the Mendocino Headlands (August 17). Low levels of the PSP toxins were detected in Fort Bragg (Mendocino County), Humboldt Bay, and Hunter Rock (Del Norte County).

**Domoic Acid**

*Pseudo-nitzschia* was observed along the entire northern California coast in August (Figure 2). This diatom increased in abundance at sites in Humboldt and Del Norte counties, but declined elsewhere compared to observations in July. The highest relative abundances of *Pseudo-nitzschia* were observed in Humboldt Bay at the small boat basin (August 19), at Hunter Rock in Del Norte County (August 1), and at the Monterey commercial wharf (August 26). Domoic acid was not detected in any shellfish samples in August.

**Non-Toxic Species**

The diatoms *Skeletonema* and *Chaetoceros* were the most abundant genera in samples from Del Norte and

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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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Humboldt counties. In contrast the dinoflagellates *Prorocentrum* and *Ceratium furca* were common to abundant between Sonoma and Monterey counties.



**QUARANTINES:**

On July 11 CDPH lifted the April 4 and April 28, 2014 health advisories warning consumers not to eat recreationally harvested bivalve shellfish or the internal organs of commercially or recreationally caught anchovy, sardines, or crab taken from Monterey and Santa Cruz counties. The annual mussel quarantine began on May 1. This annual quarantine applies to sport-harvested 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. 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

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

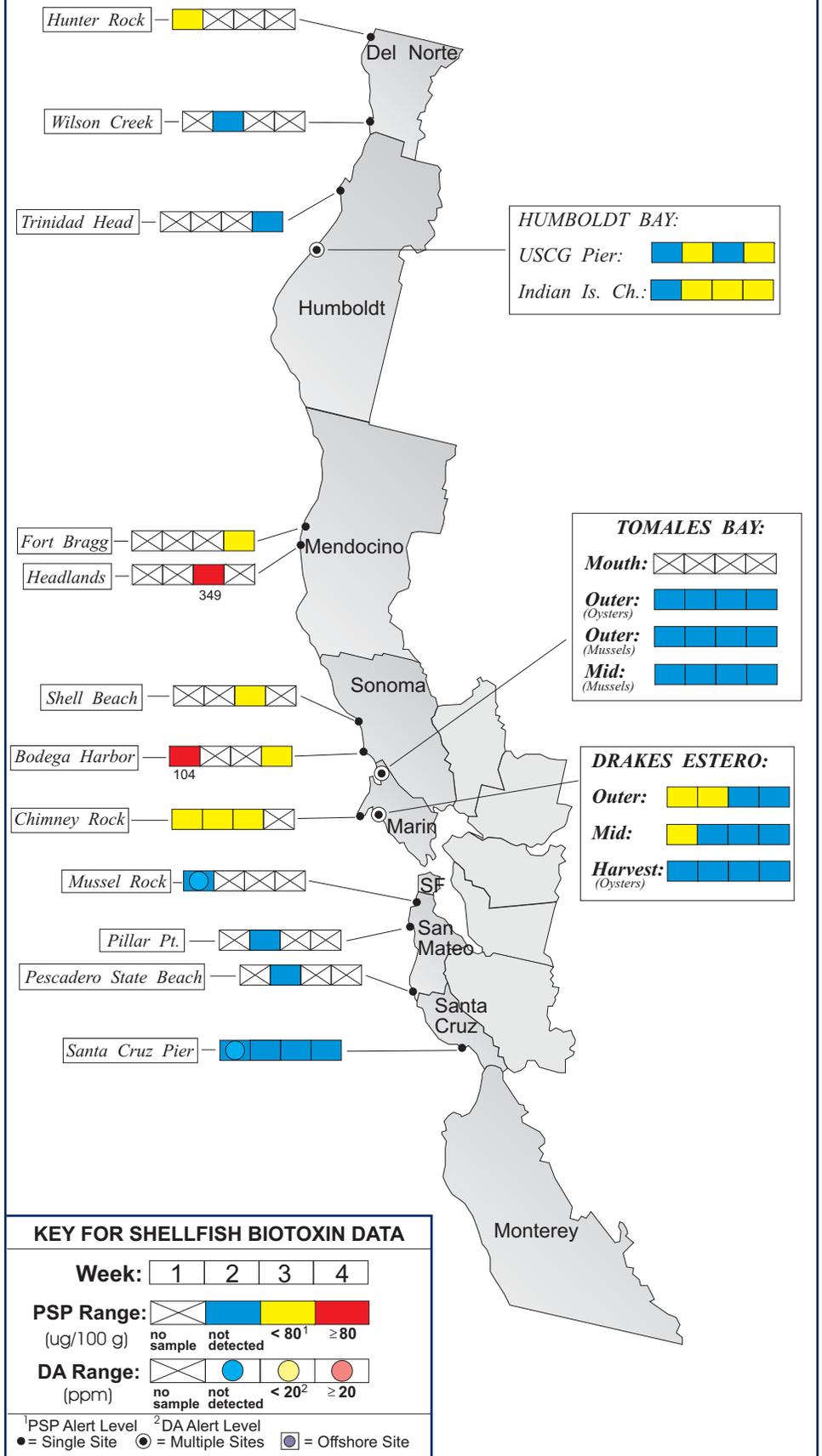


Table 1. Program participants collecting phytoplankton samples during August, 2014. (Continued from Page 4)

AGENCY	#	AGENCY	#
<b>DEL NORTE COUNTY</b>			
Smith River Rancheria	1	Yurok Tribe Environmental Program	1
<b>HUMBOLDT COUNTY</b>			
Coast Seafood Company	4	Humboldt State University Marine Lab	4
<b>MENDOCINO COUNTY</b>			
		CDPH Volunteer ( <i>Marie DeSantis</i> )	4
<b>SONOMA COUNTY</b>			
Bodega Marine Lab	6	Sonoma Coast Watch	5
CDPH Marine Biotoxin Program	2		
<b>MARIN COUNTY</b>			
		CDPH Marine Biotoxin Program	3
NatureBridge	1	CDPH Volunteer ( <i>Anderson, Clyde</i> )	5
Drakes Bay Oyster Company	8	Hog Island Oyster Company	4
<b>SAN FRANCISCO COUNTY</b>			
		Exploratorium	3
<b>SAN MATEO COUNTY</b>			
San Mateo County Environmental Health Dept.	3	U.C. Santa Cruz - Ano Nuevo	1
The Marine Mammal Center ( <i>Stan Jensen</i> )	4		
<b>SANTA CRUZ COUNTY</b>			
		U.C. Santa Cruz	4
<b>MONTEREY COUNTY</b>			
Monterey Abalone Company	1	Marine Life Studies	2
<b>SAN LUIS OBISPO COUNTY</b>			
		CDPH Marine Biotoxin Program	2
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> )	3	CDPH Volunteer ( <i>Al Guild</i> )	4
<b>SANTA BARBARA COUNTY</b>			
		CDPH Volunteer ( <i>Sylvia Short</i> )	3
HABNet/CDPH Volunteers ( <i>Amiri</i> )	6	Ty Warner Sea Life Center/HABNet	1
Santa Barbara Channel Keeper	3	Santa Barbara Mariculture Company	5
National Park Service	2	U.C. Santa Barbara	4
Tole Mour	1		
<b>VENTURA COUNTY</b>			
CDPH Volunteer ( <i>Fred Burgess</i> )	3	National Park Service	2
Ventura County Environmental Health Dept.	1		
<b>LOS ANGELES COUNTY</b>			
		City of L. A. Environmental Monitoring Division	3
Los Angeles County Health Department	1	Southern California Marine Institute	1
Los Angeles County Sanitation District	2	CDPH Volunteers ( <i>Cal Parsons, Kai Xu</i> )	2
<b>ORANGE COUNTY</b>			
California Department of Fish and Wildlife	4	National Oceanic and Atmospheric Admin.	1
CDPH Volunteer ( <i>Truong Nguyen</i> )	3	Amigos de Bolsa Chica	4
<b>SAN DIEGO COUNTY</b>			
Scripps Institute of Oceanography	4	Sea Camp/HABNet	1
U.S. Navy Marine Mammal Program	4	Tijuana River National Estuary Research	4

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.

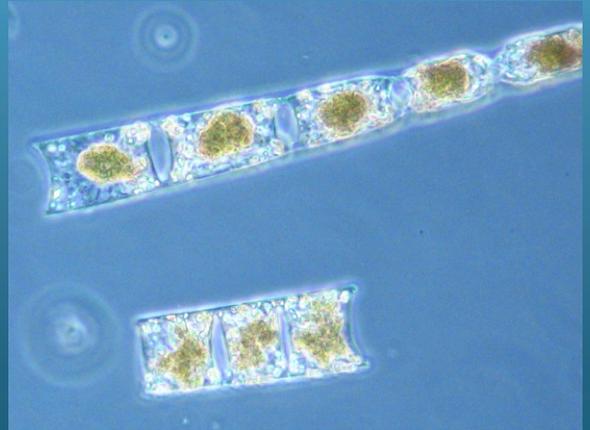
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. 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 August, 2014.

COUNTY	AGENCY	#
Del Norte	Smith River Rancheria	1
	Yurok Tribe Environmental Program	1
Humboldt	Coast Seafood Company	8
	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	2
	CDPH Volunteer ( <i>James Sanders</i> )	1
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	CDPH Marine Biotoxin Program	3
	Hog Island Oyster Company	4
	Tomales Bay Oyster Company	5
	Marin Oyster Company	1
San Francisco	None Submitted	
	San Mateo County Environmental Health Department	2
San Mateo	San Mateo County Environmental Health Department	2
	CDPH Volunteer ( <i>Gary Della Maggiora</i> )	1
Santa Cruz	U.C. Santa Cruz	1
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	6
	CDPH Marine Biotoxin Program	1
Santa Barbara	Santa Barbara Mariculture Company	7
	U.C. Santa Barbara	5
	Ty Warner Sea Life Center/HABNet	1
Ventura	Ventura County Environmental Health Department	2
Los Angeles	CDPH Volunteer ( <i>Cal Parsons</i> )	1
	Los Angeles County Health Department Sims Mann	1
	Los Angeles County Health Department Torrance	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	5

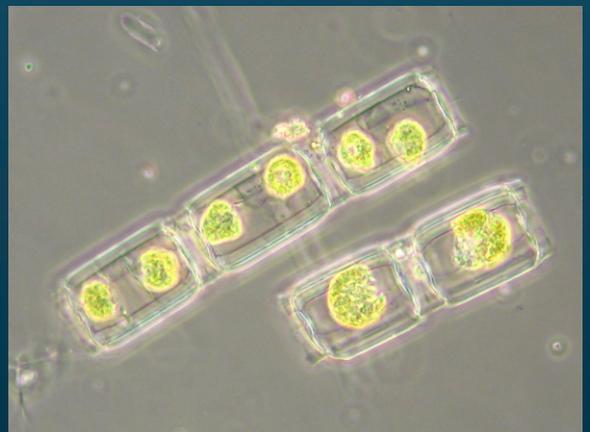
## PHYTOPLANKTON GALLERY



An unusual diatom, *Climacodium*, was observed in several samples from the southern California region.



The dinoflagellate *Protoceratium* has been observed in samples from several sites between San Mateo and Sonoma counties.



*Lithodesmium* is a chain-forming diatom with triangular shaped cells.