

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

December 2008

Technical Report No. 08-29

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of December, 2008. 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.

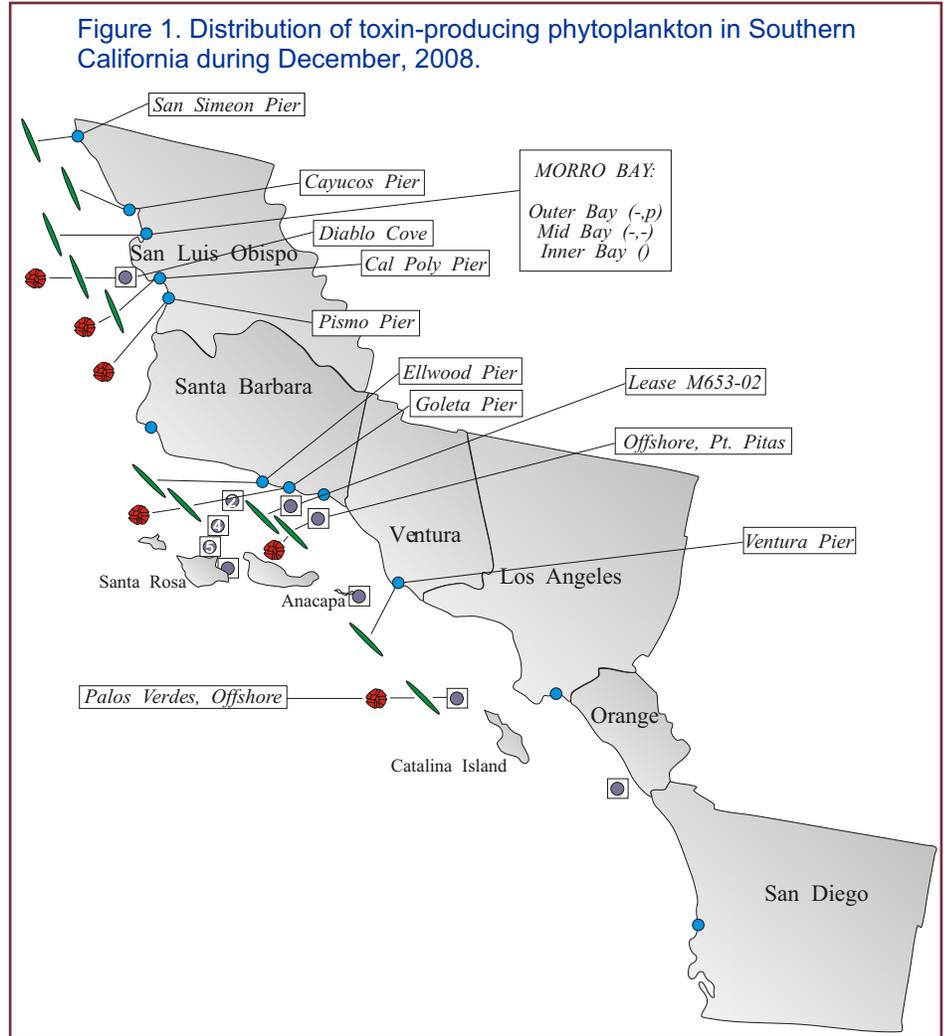
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All 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 several sampling stations during December (Figure 1). This dinoflagellate was observed in very low numbers at sites in San Luis Obispo, Santa Barbara, and Los Angeles counties, including

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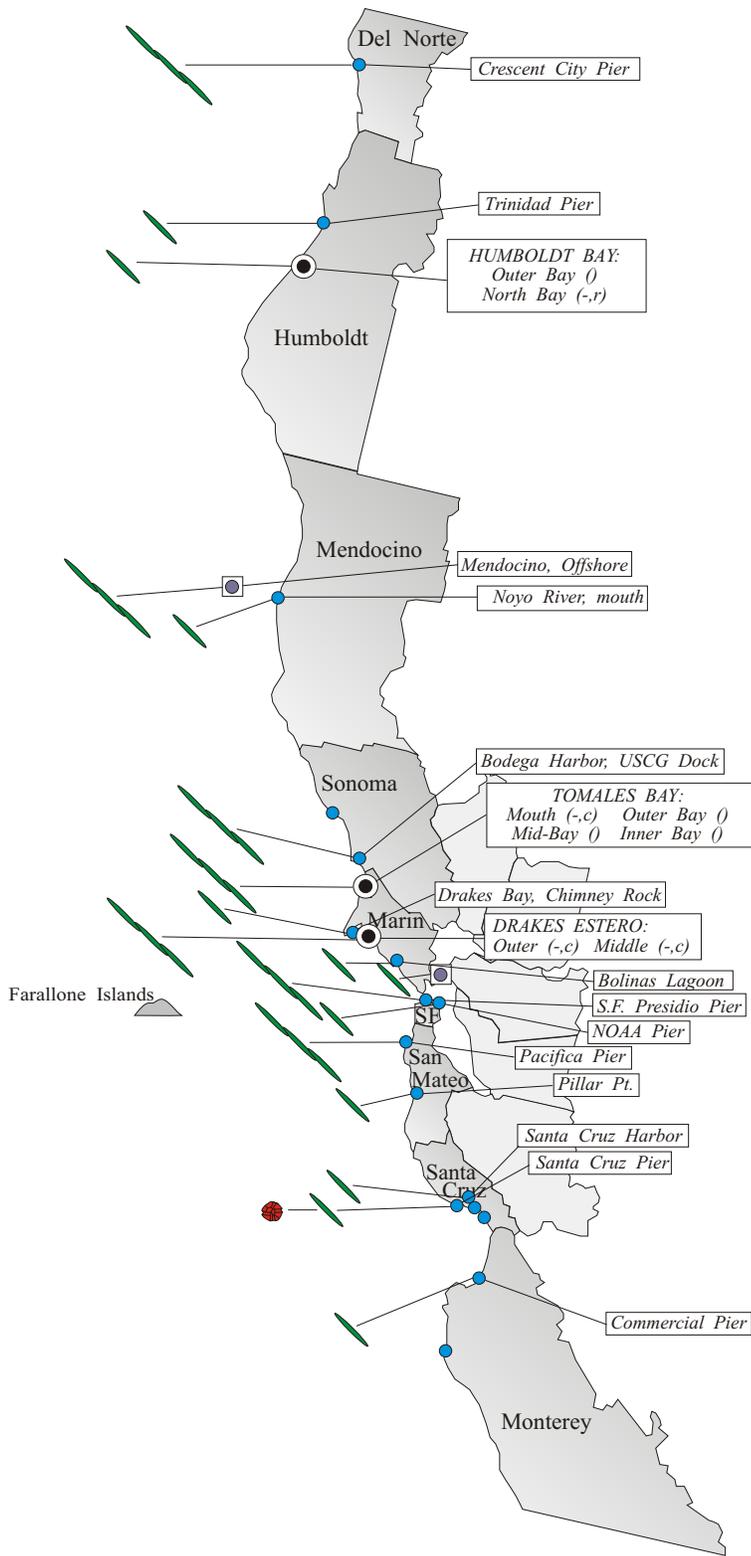


Relative Abundance of Known Toxin Producers

Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%) Present (between 1% and 10%) Common (between 10% and 50%) Abundant (greater than 50%)	Present (less than 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 2. Distribution of toxin-producing phytoplankton in Northern California during December, 2008.



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three offshore locations (Diablo Cove, Pt. Pitas, and Palos Verdes). This represents an increase in the geographic distribution of *Alexandrium* when compared to observations in November.

Low concentrations of PSP toxins were detected in a sentinel mussel sample from Cal Poly Pier in Avila (38 ug/100 g, December 8) and in a sample of lobster viscera (37 ug/100g) collected near Anacapa Island on December 31 (Figure 3).

Domoic Acid

Pseudo-nitzschia was detected at sites between San Luis Obispo and Los Angeles counties in December (Figure 1). The distribution of this diatom was reduced from observations in November and the relative abundance remained low at all sites.

Domoic acid was not detected in any shellfish samples collected along the southern California coast in December. A moderate concentration of domoic acid (37 ppm) was detected in a sample of lobster viscera collected near Anacapa Island on December 31 (Figure 3).

Non-toxic Species

Overall, phytoplankton diversity and abundance was greatly reduced in December along most of the southern

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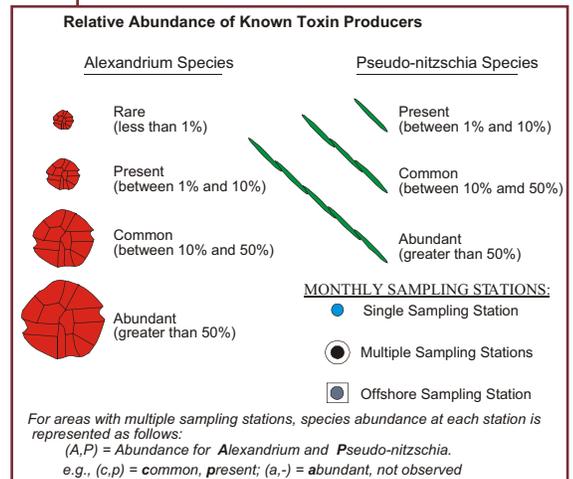
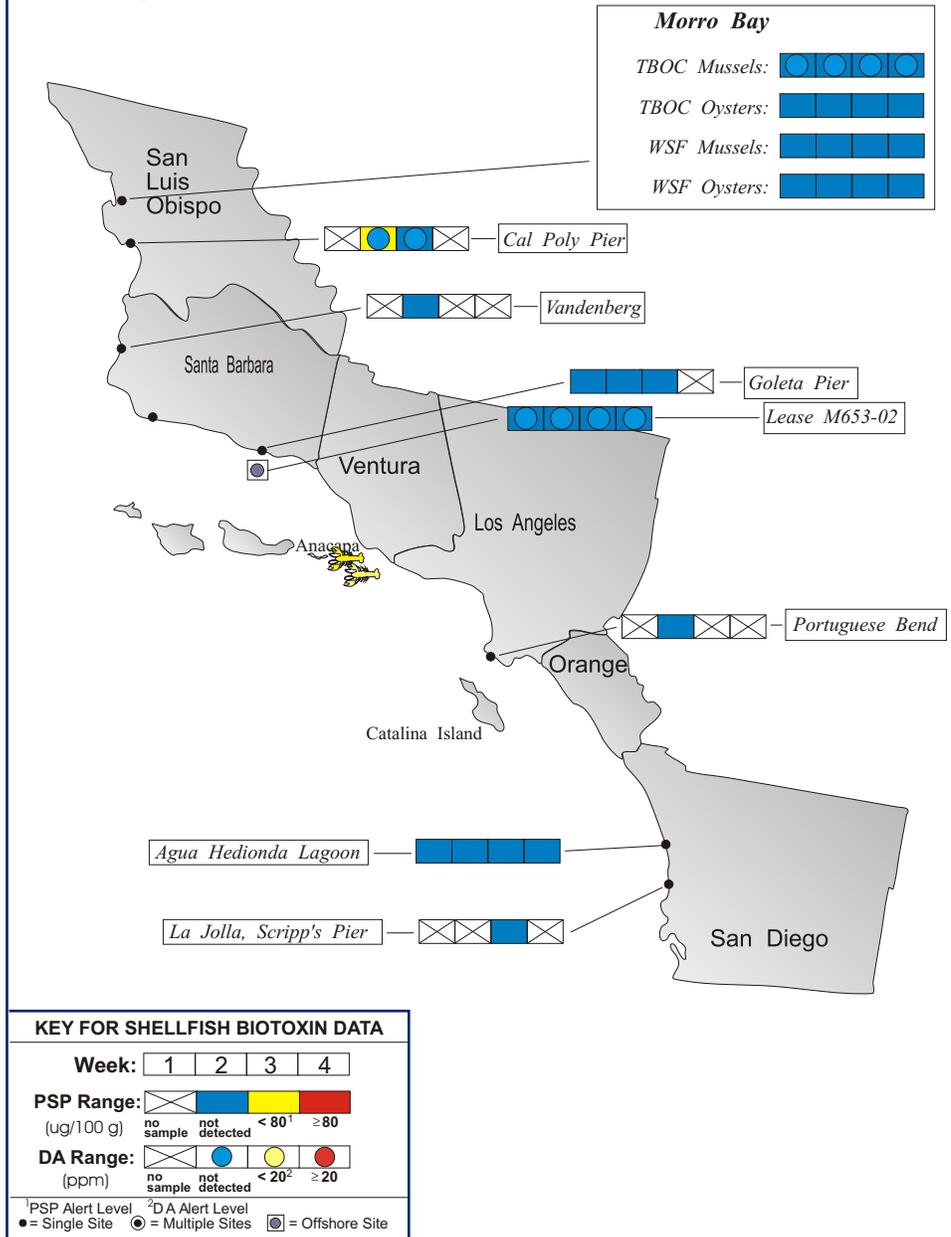


Figure 3. Distribution of shellfish biotoxins in Southern California during December, 2008.



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California coast, with a mix of dinoflagellates and diatoms at most locations. The dinoflagellates *Prorocentrum* and *Akashiwo* were common at sites in Avila and Santa Barbara, while the diatom *Chaetoceros* was also common at these sites and in San Simeon, Diablo Cove, and offshore of Palos Verdes.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium numbers and geographic distribution continued to decline in December, with observations of this dinoflagellate restricted to one northern California sampling site (Figure 2). This dinoflagellate was observed in very low numbers at Santa Cruz Pier on December 3 and 10.

Low levels of the PSP toxins continued to be detected in mussels from Crescent City (Del Norte County). A sample collected on December 10 contained 39 ug/100g of these toxins.

Domoic Acid

Pseudo-nitzschia was observed along all northern California counties in December (Figure 2). The relative abundance increased at sites in San Francisco, Marin,

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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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Sonoma, and Del Norte counties compared to observations in November. The highest relative abundances were observed in samples from Pacifica Pier (December 2 and 9) and Tomales Bay (December 3). Domoic acid was not detected in any shellfish samples collected in December.

Non-toxic Species

A low diversity of diatom and dinoflagellate species continued to be observed along the northern California coast in December. The Del Norte and Humboldt coast was dominated by the diatoms *Skeletonema*, *Chaetoceros*, and *Thalassiosira*, while Marin sites contained both *Chaetoceros* and the dinoflagellate *Prorocentrum*. This dinoflagellate was also common in Bodega Harbor and Monterey Bay.

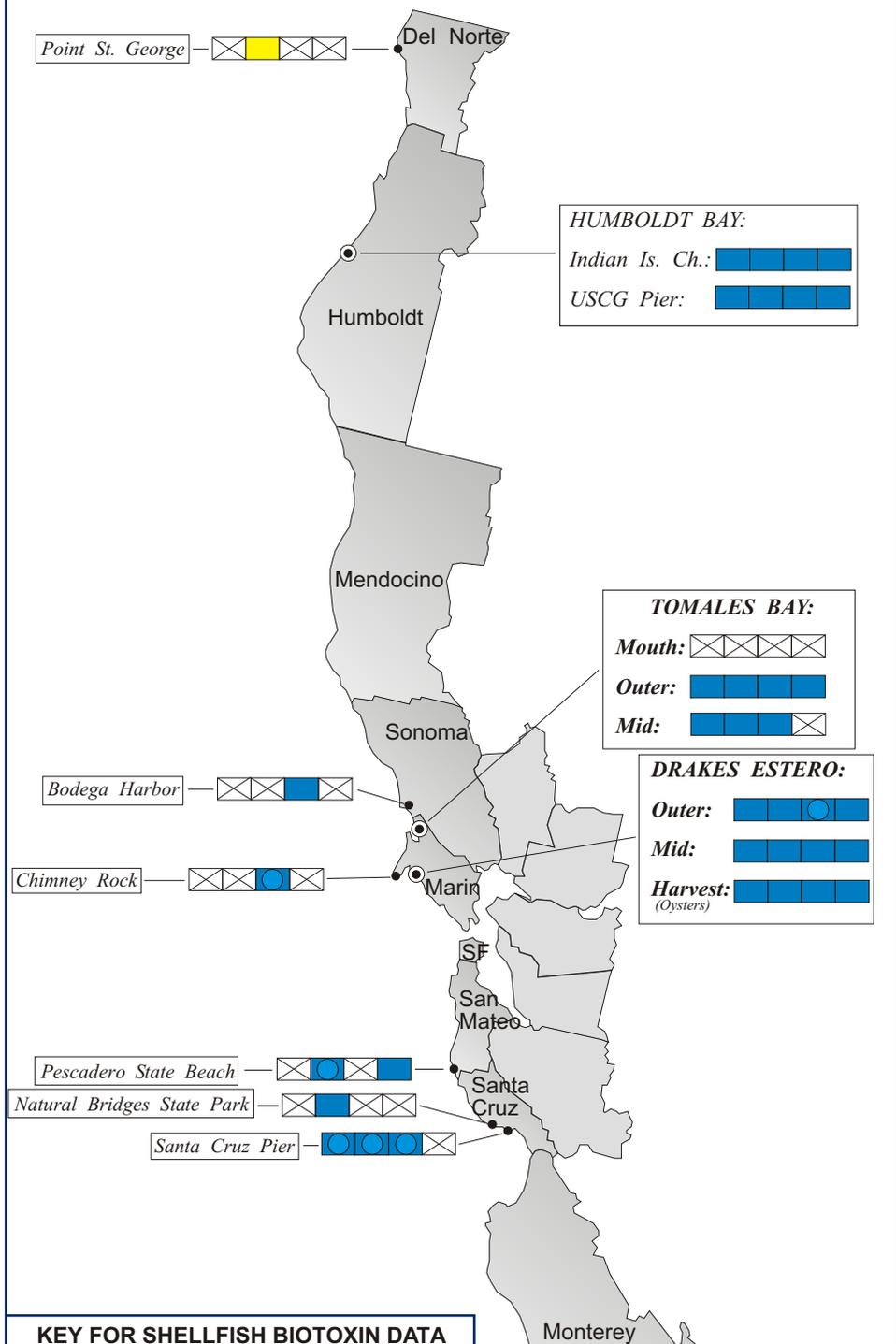


QUARANTINES:

The annual mussel quarantine, which began on May 1, was rescinded on schedule at midnight on October 31. The annual quarantine applies specifically to sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the year, not just within the quarantine period. This allows the detection of unexpected increases in biotoxin activity outside of the routine quarantine period. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively. All certified shellfish growers are required to submit at least weekly samples of

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Figure 4. Distribution of shellfish biotoxins in Northern California during December, 2008.



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 December, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	10
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Monitoring Program	1
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	4
	Marin Oyster Company	4
	CDPH Marine Biotoxin Monitoring Program	1
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	Santa Cruz County Environmental Health Department	1
	U.C. Santa Cruz	3
Monterey	None Submitted	
San Luis Obispo	Cal Poly	2
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	10
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	3
Ventura	CDPH Volunteer (<i>Bill Weinerth</i>)	1
Los Angeles	Los Angeles County Health Department	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1

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 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 other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

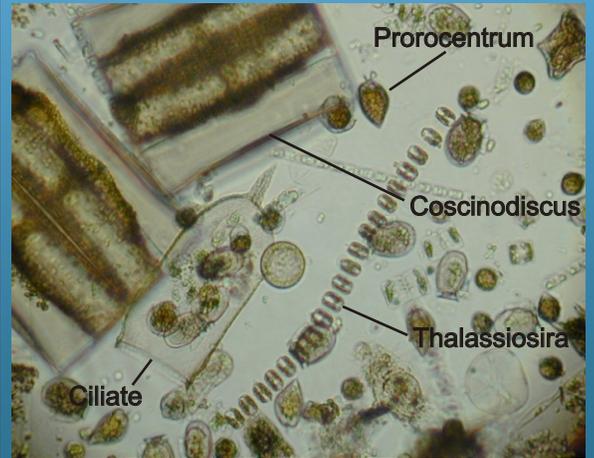
Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can

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

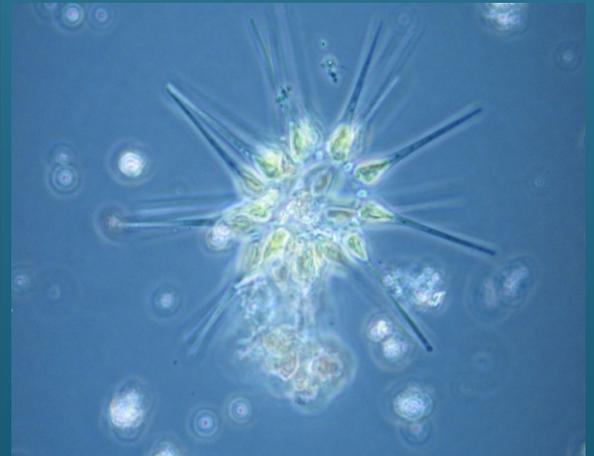
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during December, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	3
	California Department of Fish and Game	1
	Humboldt State University	1
Mendocino	California Department of Fish and Game	2
Sonoma	CDPH Marine Biotoxin Program	1
Marin	CDPH Volunteers (<i>Brent Anderson, Cal Strobel</i>)	3
	Drakes Bay Oyster Company	6
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	2
	San Francisco Health Department	2
San Mateo	CDPH Volunteer (<i>Kathleen Abadie</i>)	4
	San Mateo County Environmental Health Dept.	1
	The Marine Mammal Center (<i>Stan Jensen</i>)	3
Santa Cruz	San Lorenzo Valley High School	1
	Santa Cruz County Environmental Health Dept.	2
	U.C. Santa Cruz	3
Monterey	Monterey Abalone Company	2
	Marine Pollution Studies Laboratory	3
San Luis Obispo	CDPH Volunteer (<i>Renee and Auburn Atkins</i>)	1
	Cal Poly	8
	Monterey Bay National Marine Sanctuary	1
	Morro Bay National Estuary Program	1
	Tenera Environmental	2
Santa Barbara	The Marine Mammal Center (<i>Tim Lytsell, P.J. Webb</i>)	7
	Tomales Bay Oyster Company	2
	CDPH Volunteer (<i>Sylvia Short</i>)	4
	Channel Islands National Marine Sanctuary	4
	Santa Barbara Mariculture Company	4
Ventura	National Park Service	1
	U.C. Santa Barbara	3
	CDPH Volunteer (<i>Fred Burgess</i>)	2
Los Angeles	Channel Islands National Marine Sanctuary	1
	Los Angeles County Sanitation District	2
Orange	Southern California Marine Institute	1
	Ocean Institute	1
San Diego	Scripps Institute of Oceanography	3

PHYTOPLANKTON GALLERY



Diatoms and dinoflagellates were both observed along of the California coast, including the large species of *Coscinodiscus* in this photograph.



A cluster of the diatom *Asterionella*.



The diatom *Chaetoceros socialis* occurs as short chains linked together, usually forming a large sphere.