

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 2011

Technical Report No. 11-26

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of December, 2011. 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 only one southern California location in December (Figure 1). This dinoflagellate was rare in a December 5 sample from Scripps Pier. PSP toxins were not detected in any bivalve shellfish samples during December (Figure 3). As in November, a low concentration of these

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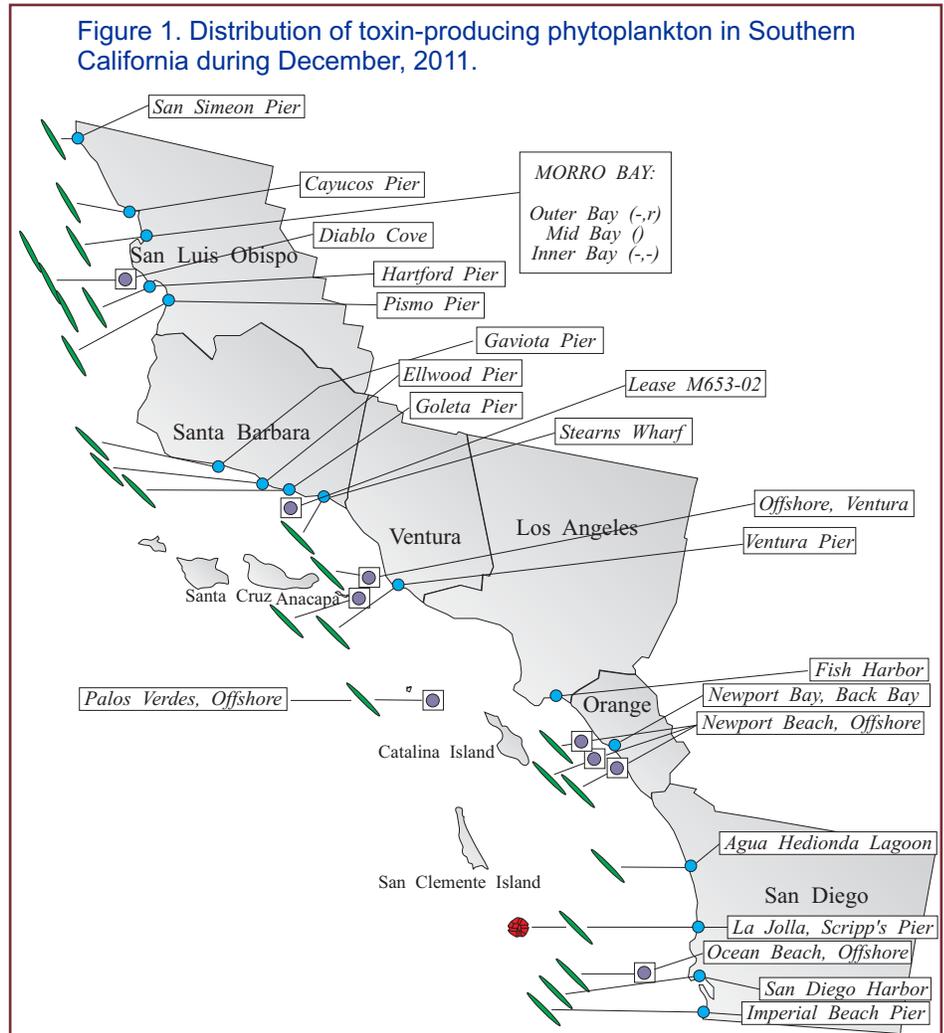
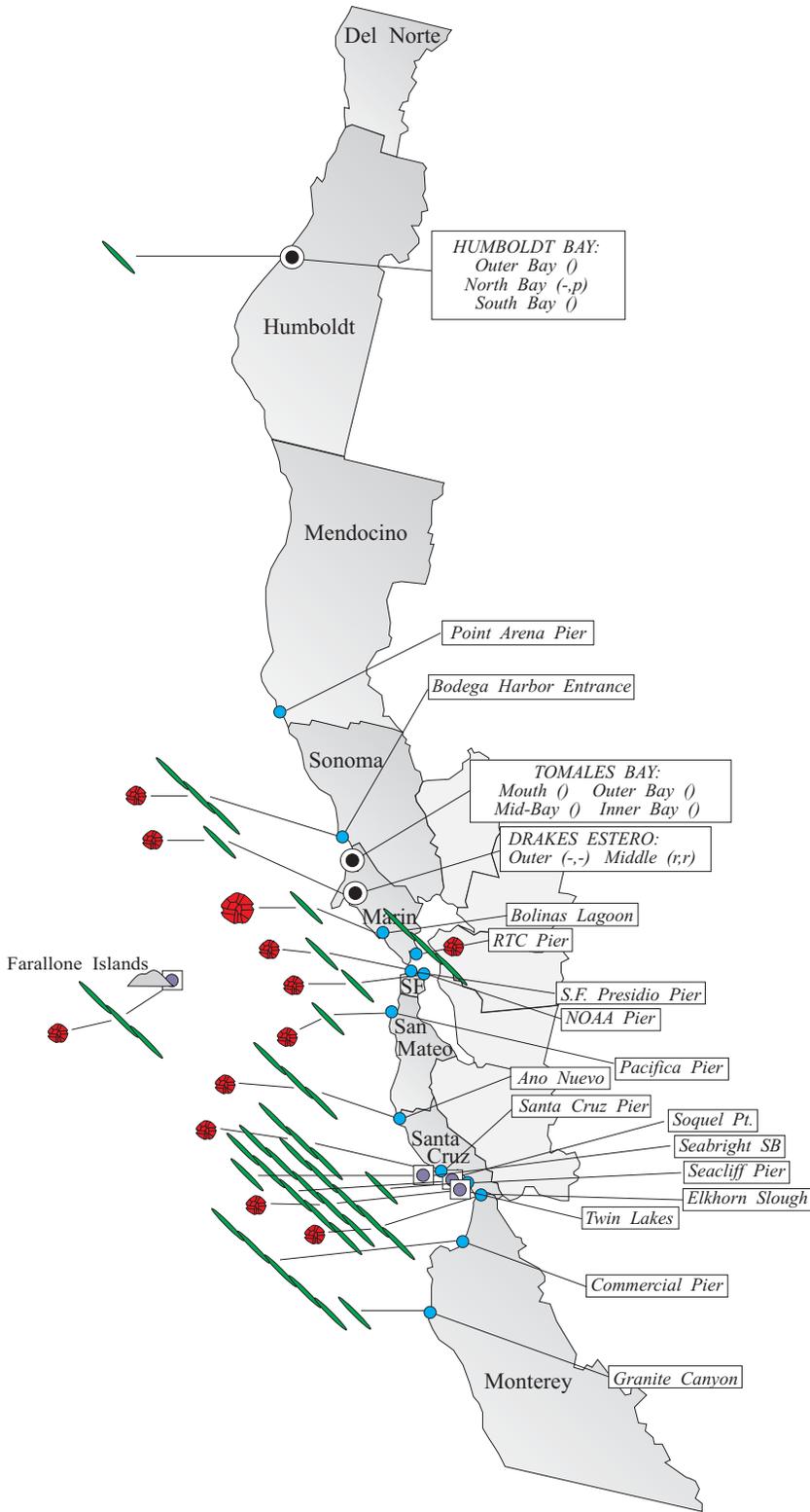


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during December, 2011.



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toxins was detected in a sample of lobster viscera from Ventura County (December 30).

Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast in December (Figure 1). There was a significant decrease in relative abundance at sites between San Luis Obispo and Santa Barbara compared to observations in November.

Domoic acid was not detected in any bivalve shellfish samples during December (Figure 3). A sample of lobster viscera from nearshore Ventura County did not contain a measurable level of domoic acid, whereas samples of lobster viscera from Santa Rosa Island contained varying levels of this toxin, ranging from nondetectable to 50 ppm.

Non-toxic Species

Diatoms were dominant between San Luis Obispo and Los Angeles counties, with *Chaetoceros* the most common genera. The diatoms *Skeletonema* and *Guinardia* were common offshore near Anacapa Island. The dinoflagellate *Akashiwo* was common to abundant at sites in Orange and San Diego counties.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at a number of

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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%)

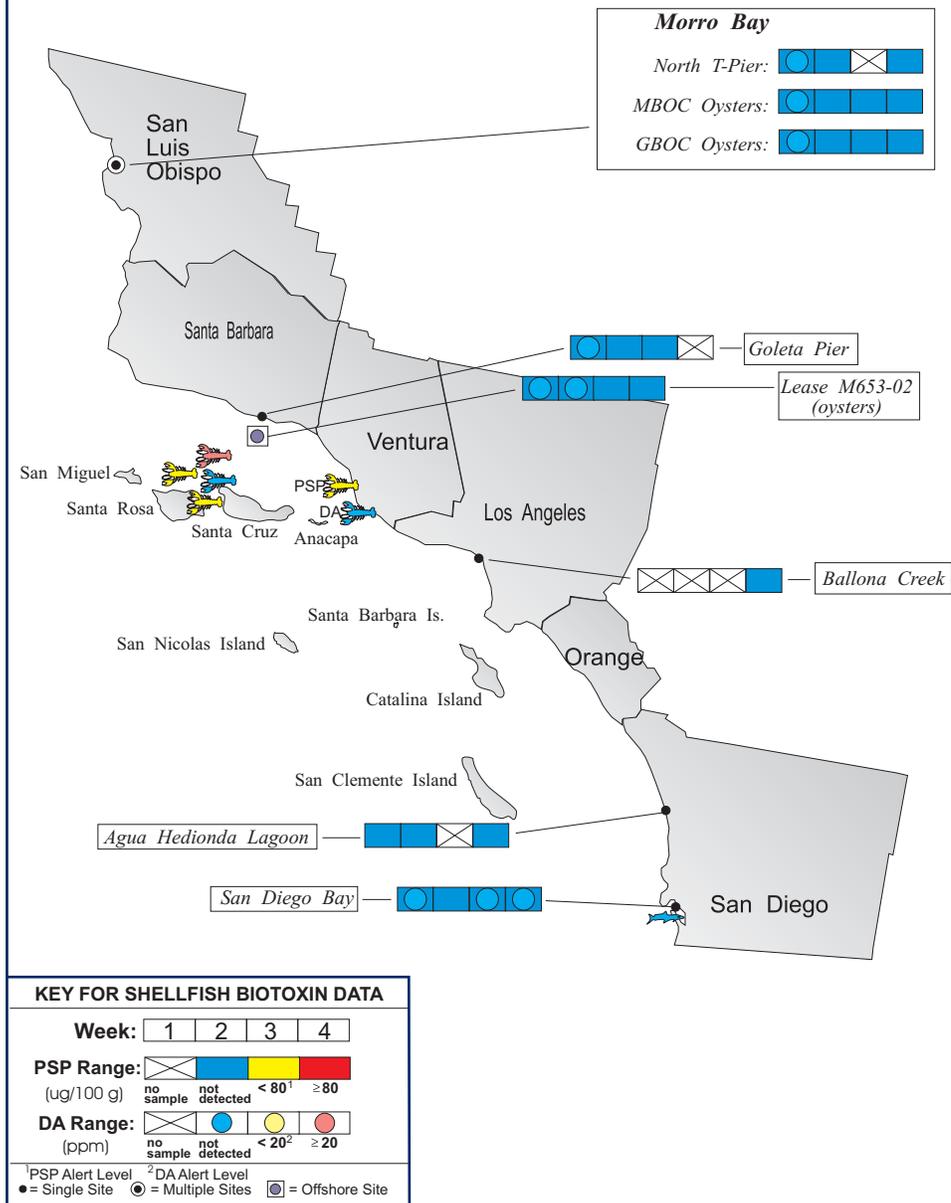
MONTHLY SAMPLING STATIONS:

- 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 December, 2011.



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locations between Monterey and Marin counties during December (Figure 2). There was a notable increase in the relative abundance of this toxin producer inside Bolinas Lagoon. *Alexandrium* was also observed inside San Francisco Bay at the Romberg Tiburon Center pier (Marin County).

PSP toxins were detected at several locations during December (Figure 4). Low levels of these toxins were detected throughout the month in sentinel mussels from Santa Cruz Pier. Low concentrations of PSP toxins were also detected at multiple sites in Drakes Estero, initially in the outer Estero sentinel mussel station and then farther inside the Estero in subsequent weeks. By the last week of December the toxin concentration had increased above the alert level in sentinel mussels in the outer Estero (108 ug/100 g) and mid-Estero (112 ug/100 g).

Domoic Acid

Pseudo-nitzschia was observed at most sites along the northern California coast during December (Figure 2). There was a decline in relative abundance at sites between Marin and San Mateo counties compared to observations in November. In contrast, the relative abundance appeared

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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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to increase at several sites inside Monterey Bay, although the cell mass was low. The highest relative abundance was observed in a sample from Bodega Harbor (December 1).

Low levels of domoic acid were detected in sentinel mussels from the Santa Cruz Pier during the second and fourth week of the month (Figure 4).

Non-toxic Species

Overall cell densities declined dramatically in December. The dinoflagellate *Akashiwo sanguinea* was common to abundant at sites between Marin and Santa Cruz counties.



QUARANTINES:

The October 16 health advisory remained in effect, warning consumers not to eat sport-harvested shellfish or the internal organs of crustaceans and small finfish from the Channel Islands.

The 2011 annual mussel quarantine ended at midnight on October 31. When in effect this quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored

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Figure 4. Distribution of shellfish biotoxins in Northern California during December, 2011.

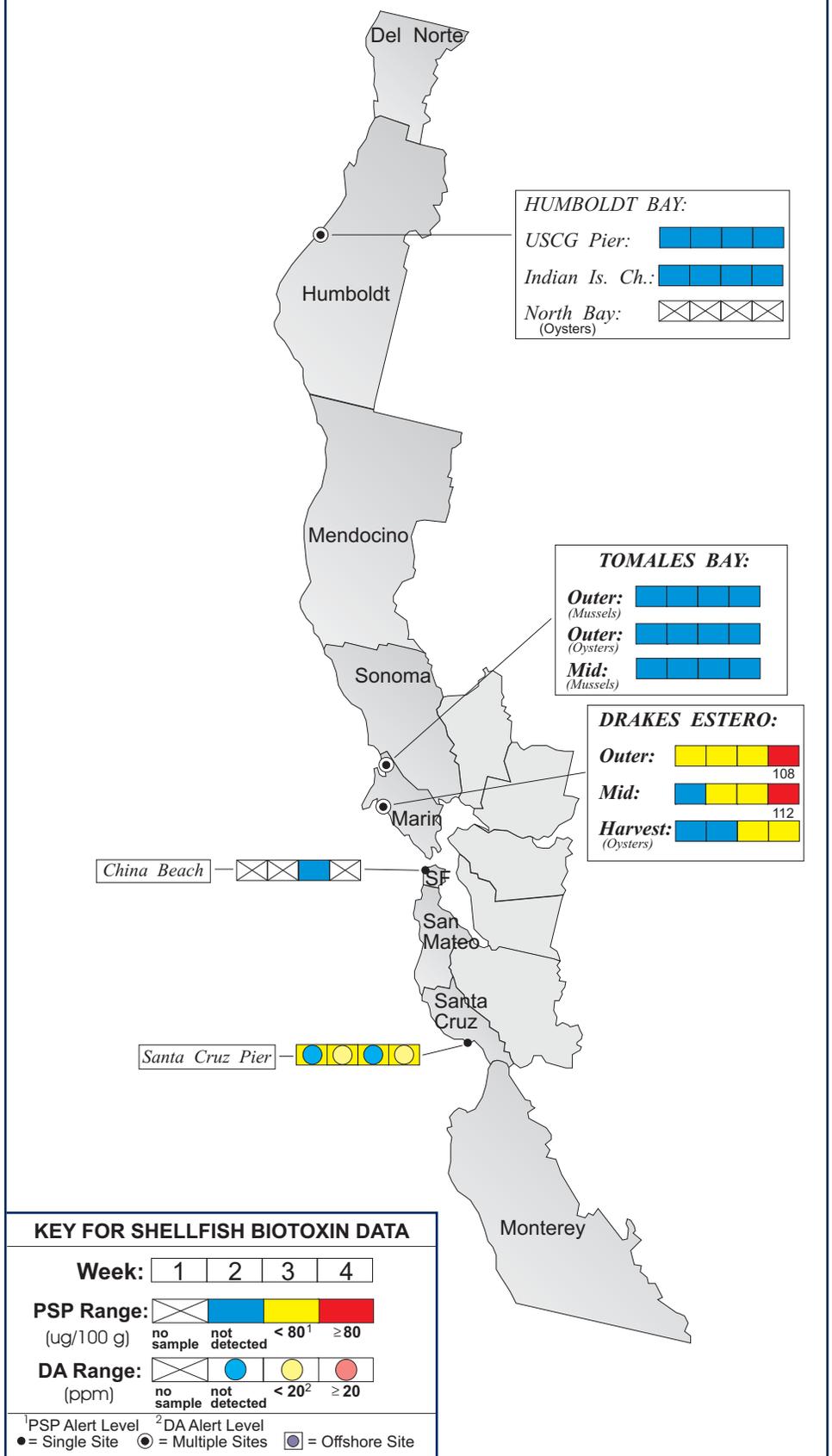


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during December, 2011.

COUNTY	AGENCY	#
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	5
	Marin Oyster Company	4
San Francisco	San Francisco Health Department	1
San Mateo	None Submitted	
Santa Cruz	U.C. Santa Cruz	5
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	6
	Morro Bay Oyster Company	5
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	3
	Sea Grant, U.C. Santa Barbara	6
Ventura	CDPH Volunteer (<i>Bill Weinerth</i>)	1
Los Angeles	Los Angeles County Health Department	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	3
	U.S. Navy Marine Mammal Program	5

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. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



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intensively throughout the year. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

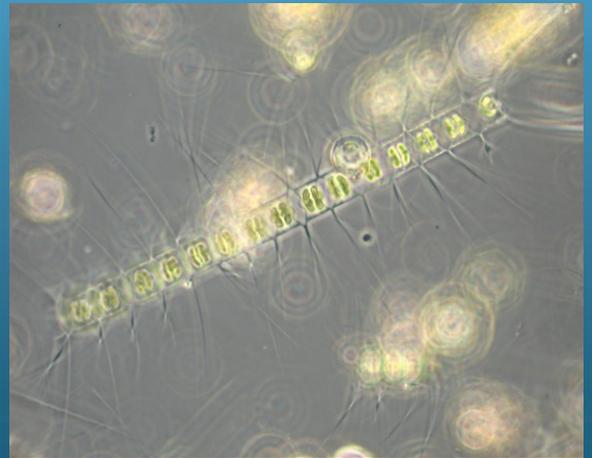
Consumers of Washington clams, also known as butter clams (*Saxidomus*

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

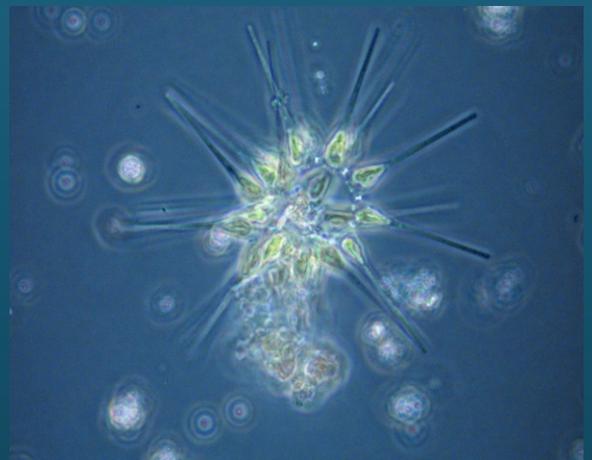
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during December, 2011.

COUNTY	AGENCY	#
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	4
	CDPH Volunteer (<i>Dustin Fredricey</i>)	2
Mendocino	CDPH Volunteer (<i>Marie de Santis</i>)	1
Sonoma	Willowside Middle School	1
Marin	Drakes Bay Oyster Company	15
	CDPH Volunteer (<i>Brent Anderson</i>)	2
	SFSU, Romberg Tiburon Center	5
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	1
	Exploratorium	3
	San Francisco Bay Whale Watching Company	1
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	4
	U.C. Santa Cruz	1
Santa Cruz	California Department of Parks and Recreation	3
	Santa Cruz County Environmental Health Department	2
	U.C. Santa Cruz	3
Monterey	Monterey Abalone Company	4
	Friends of the Sea Otter (<i>Janis Chaffin</i>)	2
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	4
	Grassy Bar Oyster Company	4
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	3
	Tenera Environmental	3
	The Marine Mammal Center (<i>P.J. Webb, Tim Lytsell</i>)	5
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	2
	Santa Barbara Mariculture Company	4
	National Park Service	1
	U.C. Santa Barbara	3
Ventura	CDPH Marine Biotoxin Program	2
	CDPH Volunteer (<i>Fred Burgess</i>)	2
	Channel Island National Marine Sanctuary	1
Los Angeles	National Park Service	3
	Los Angeles County Sanitation District	3
Orange	Southern California Marine Institute	1
	Orange County Sanitation District	3
San Diego	California Department of Fish and Game	2
	Carlsbad Aquafarms, Inc.	2
	Scripps Institute of Oceanography	4
Tijuana River National Estuary Research Reserve	San Diego Whale Watch	1
	Tijuana River National Estuary Research Reserve	2
	U.S. Navy Marine Mammal Program	2

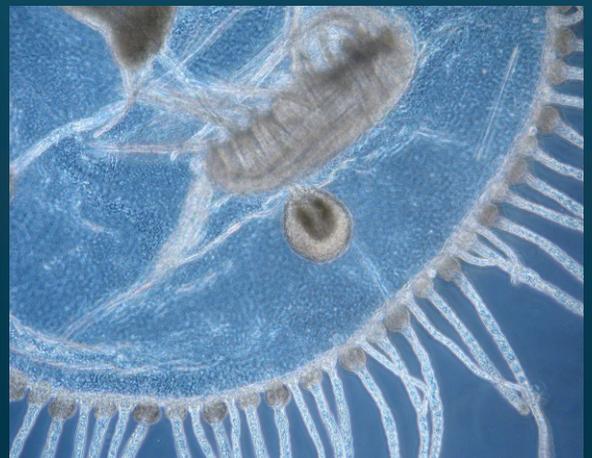
PHYTOPLANKTON GALLERY



A variety of species of the diatom *Chaetoceros* remained ubiquitous along the California coast.



The diatom *Asterionella* can occur in dense clusters of individual cells.



This hydrozoan medusa, possibly *Obelia*, appears to have devoured a copepod.