CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

February 2011

Technical Report No. 11-12

INTRODUCTION:

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

Low numbers of *Alexandrium* were detected at sites in Santa Barbara, Los Angeles, Orange, and San Diego counties (Figure 1).

PSP toxins were not detected in any shellfish samples collected in February (Figure 3).

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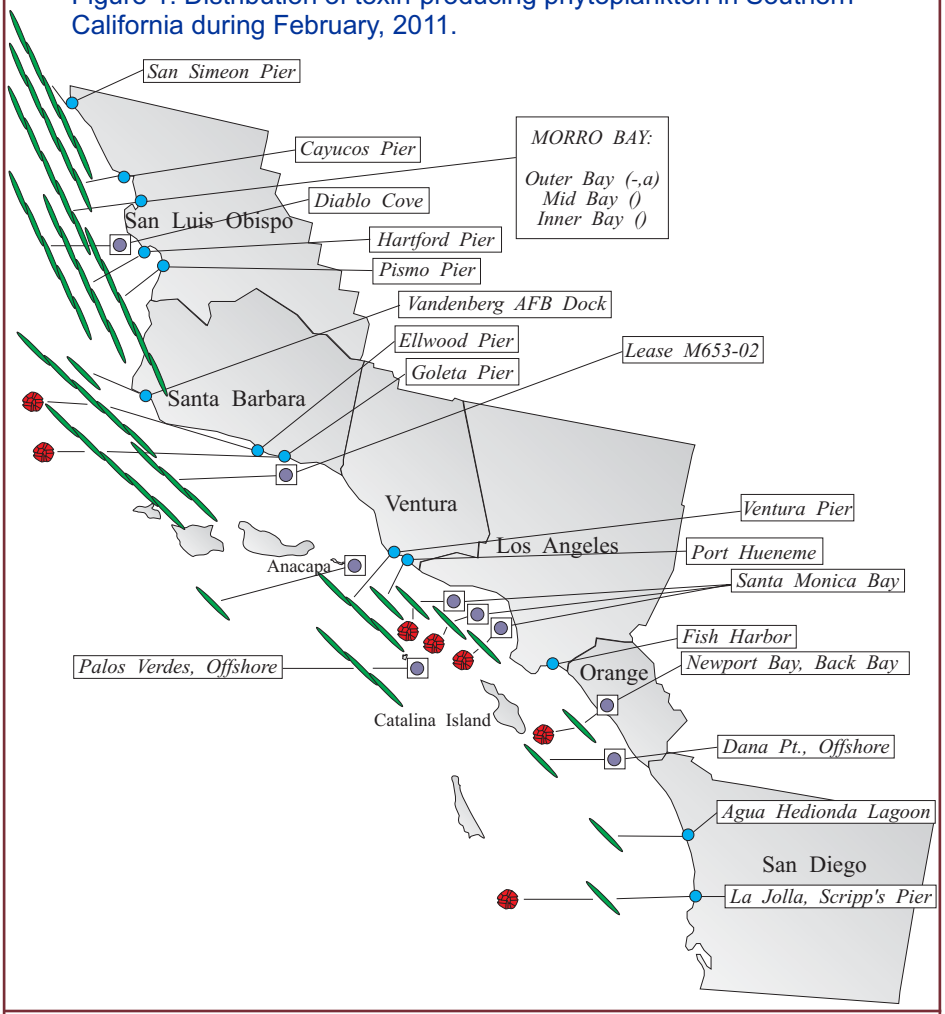
Figure 1. Distribution of toxin-producing phytoplankton in Southern California during February, 2011.



Relative Abundance of Known Toxin Producers

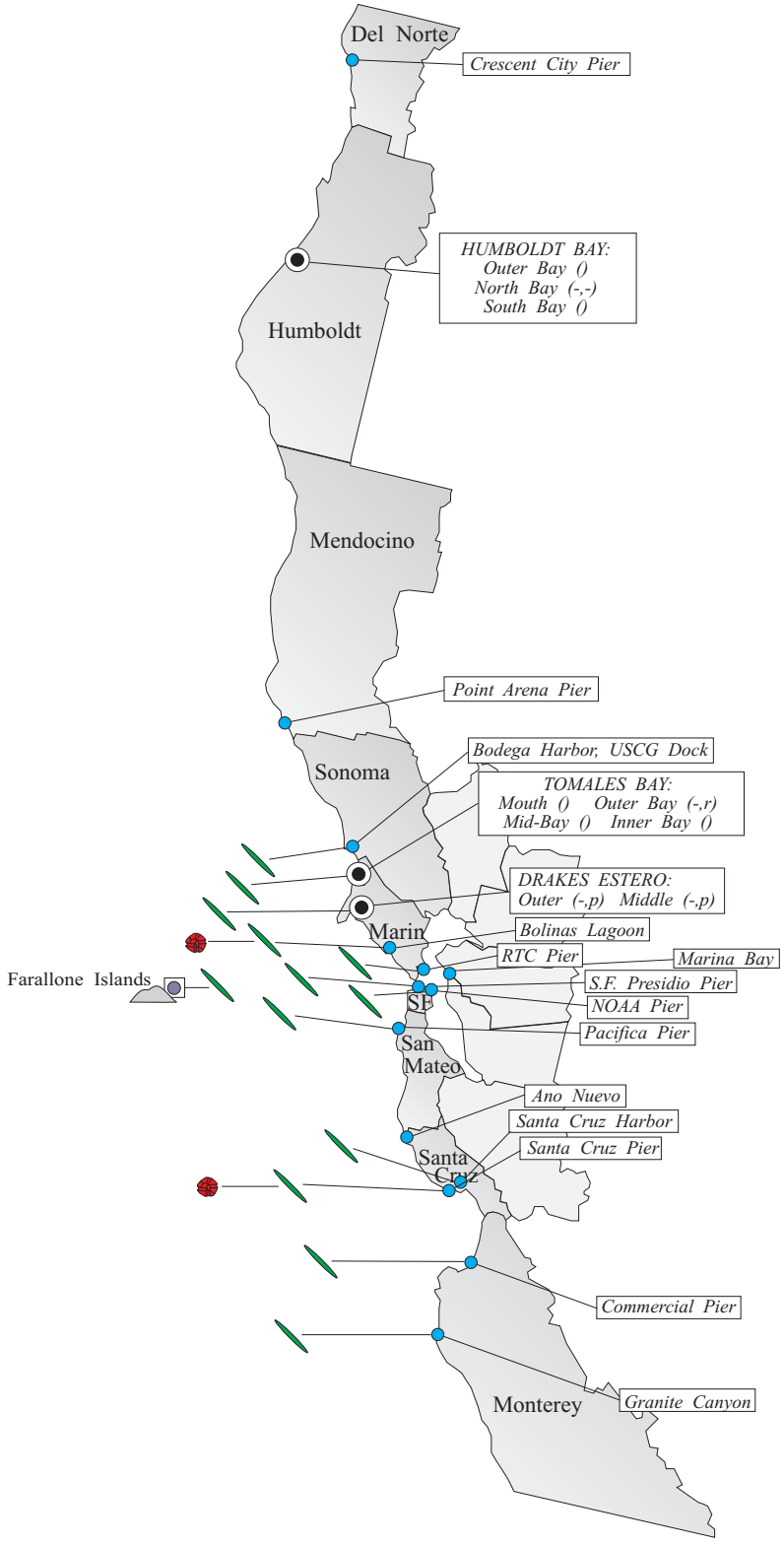
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

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

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

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



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Domoic Acid

Pseudo-nitzschia was observed at a number of sites along the entire southern California coast during February (Figure 1). The relative abundance of *Pseudo-nitzschia* increased significantly at most sites in San Luis Obispo and Santa Barbara counties compared to observations in January. The highest relative abundances of this diatom were observed at the Morro Bay North T-Pier (February 19), offshore of Diablo Cove (February 11), San Simeon Pier (February 11), and Pismo Pier (February 7).

The concentration of domoic acid remained high in samples of lobster viscera from offshore near Anacapa (51 ppm) and Santa Cruz (239 ppm) islands. Low levels of domoic acid were detected inside Morro Bay by the second week of the month, persisting through the end of February (Figure 3). Levels of this toxin reached 19 ppm by February 21 at one site in the bay. The low levels of domoic acid detected at an aquaculture lease offshore of Santa Barbara in late January declined below the detection limit for the first two weeks of February. The toxin level then began increasing by the third week of the month, reaching 25 ppm in mussels by February 23.

Non-toxic Species

The diatom *Chaetoceros* was common at

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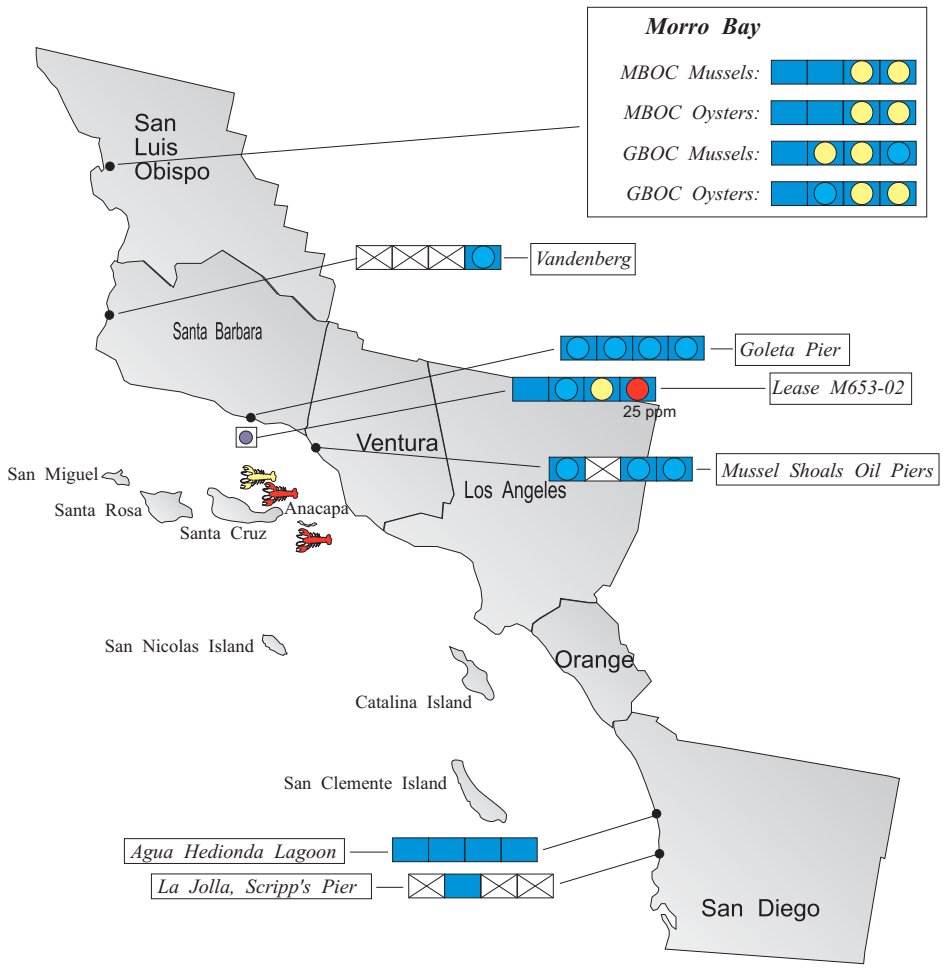
Figure 3. Distribution of shellfish biotoxins in Southern California during February, 2011.



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several sites in Santa Barbara, Ventura, Orange, and San Diego counties. Dinoflagellates were more common along the Los Angeles coast, particularly *Lingulodinium* and *Prorocentrum*.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at only two northern California sampling sites in February (Figure 2). Very low numbers of this dinoflagellate were observed in Bolinas Lagoon (February 7) and at the Santa Cruz Pier (February 16). PSP toxins were not detected in any shellfish samples analyzed in February (Figure 4).

Domoic Acid

Low numbers of *Pseudo-nitzschia* were present at sites between Sonoma and Monterey counties (Figure 2). The relative abundance and distribution were similar to observations in January. Domoic acid was not detected in any shellfish samples analyzed during the month.

Non-toxic Species

Northern California phytoplankton samples continued to contain a large percentage of detritus during February. Diatoms were most numeroous at a number of sites along the coast and included *Chaetoceros* 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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Skeletonema as the most common species. The dinoflagellate *Ceratium divaricatum* was common inside Bolinas Lagoon and *Prorocentrum* was common inside Tomales Bay and at the Santa Cruz Pier inside Monterey Bay.

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. Elevated levels of domoic acid were first detected in the viscera of lobster in this region and subsequently in rock crab viscera.

The 2010 annual mussel quarantine ended at midnight on October 31, with the exception of the health advisory issued for the Channel Islands. 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 intensively throughout the year. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin

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

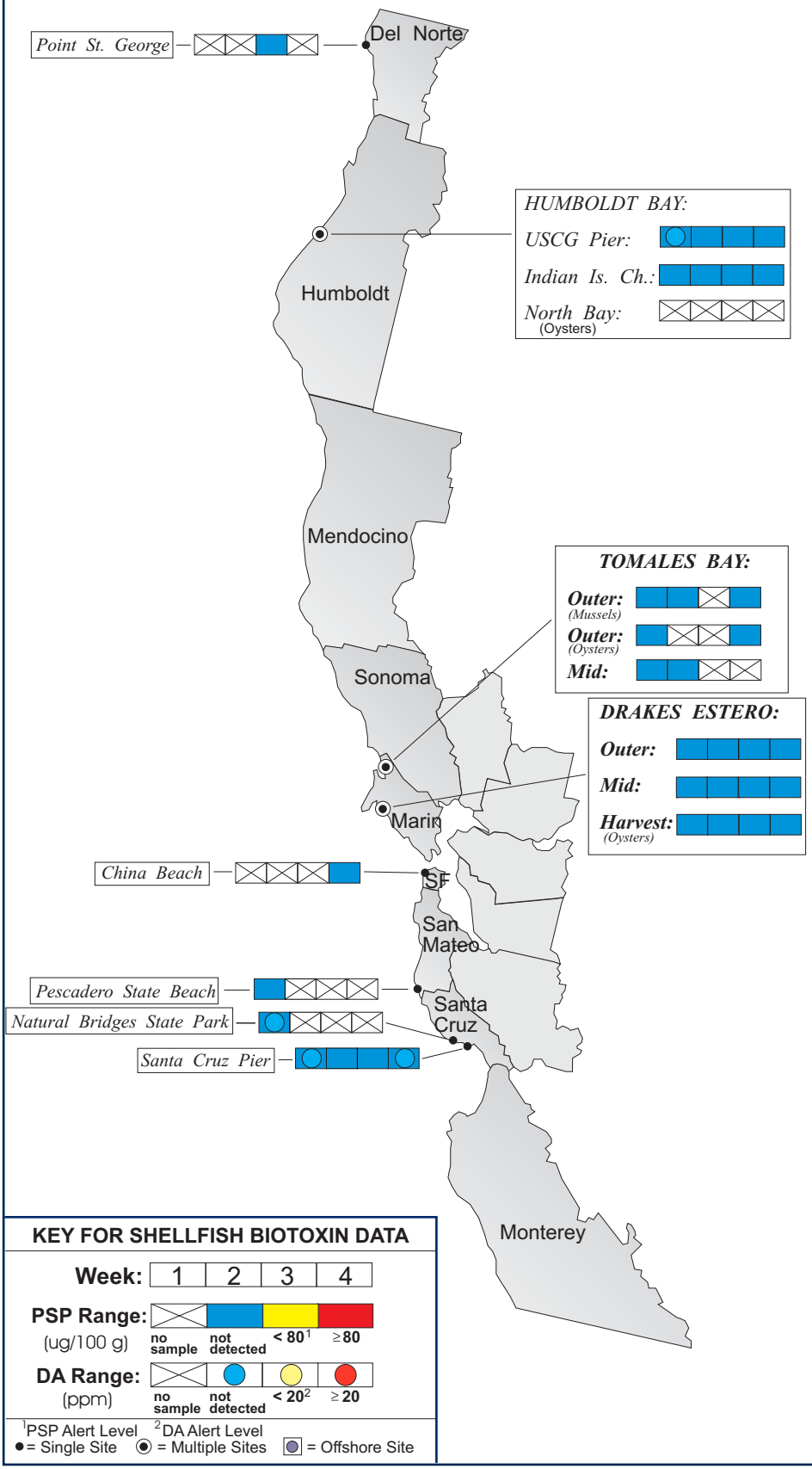

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during February, 2011.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	7
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	2
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	3
	Marin Oyster Company	2
San Francisco	San Francisco Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	8
	Morro Bay Oyster Company	8
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	CDPH Volunteer (*Bill Weinerth*)	1
Ventura	CDPH Volunteer (*Bill Weinerth*)	1
	Coastal Marine Biolabs	3
Los Angeles	None Submitted	
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1

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

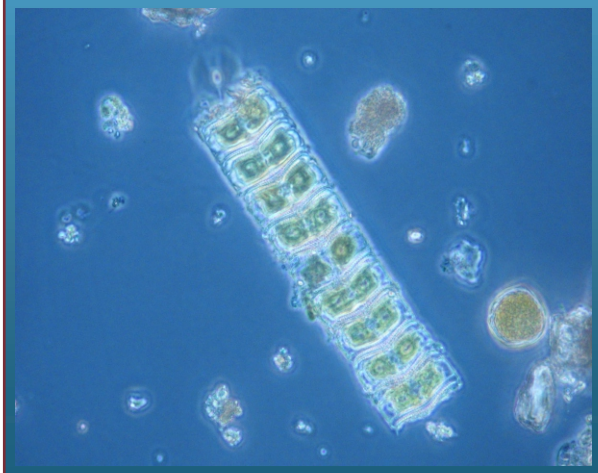
Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, 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.

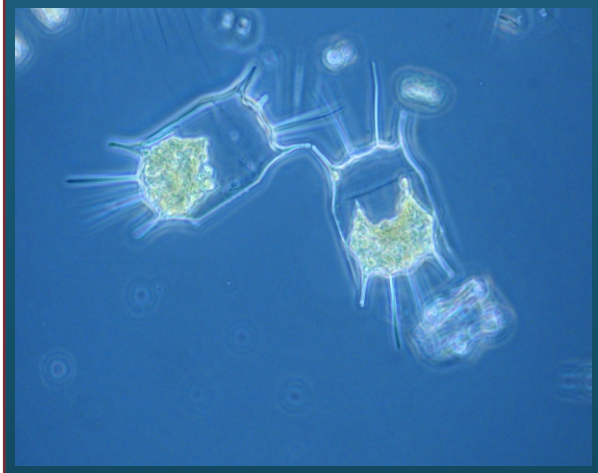
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during February, 2011.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
Mendocino	CDPH Volunteer (*Marie De Santis*)	1
Sonoma	CDPH Volunteer (*Cathleen Cannon*)	1
Marin	Drakes Bay Oyster Company	12
	CDPH Volunteer (*Brent Anderson, Marjorie Siegel*)	4
	Hog Island Oyster Company	1
	SFSU, Romberg Tiburon Center	3
San Francisco	CDPH Volunteer (*Eugenia McNaughton*)	4
	Exploratorium	3
	Gulf of the Farallones National Marine Sanctuary	1
	San Francisco Health Department	3
San Mateo	San Mateo County Environmental Health Department	1
	The Marine Mammal Center (*Stan Jensen*)	2
	U.C. Santa Cruz	2
Santa Cruz	U.C. Santa Cruz	4
	San Lorenzo Valley High School	2
Monterey	Monterey Abalone Company	3
	Marine Pollution Studies Laboratory	4
San Luis Obispo	Friends of the Sea Otter (*Kelly Cherry*)	4
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	2
	Tenera Environmental	5
	The Marine Mammal Center (*Tim Lytsel, P.J. Webb*)	5
Santa Barbara	CDPH Volunteer (*Sylvia Short*)	4
	Santa Barbara Mariculture Company	5
	Vandenberg AFB	2
	U.C. Santa Barbara	4
Ventura	CDPH Volunteer (*Fred Burgess*)	4
	Coastal Marine Biolabs	1
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	2
	City of Los Angeles Environmental Monitoring Division	3
Orange	California Department of Fish and Game	5
San Diego	Carlsbad Aquafarms, Inc.	3
	Scripps Institute of Oceanography	4

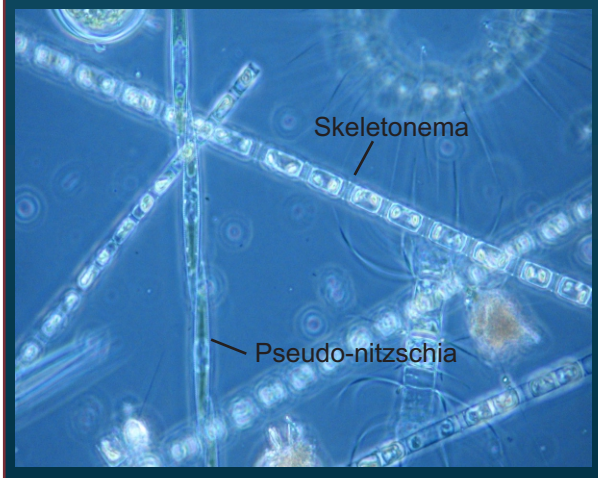
PHYTOPLANKTON GALLERY



A chain-forming diatom (Achnanthes cf) that is occasionally observed in low numbers.



The diatom Odontella is another species that is occasionally present in low numbers in our samples..



Skeletonema, a chain-forming diatom, was common at a number of locations along the California coast..