

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

March 2010

Technical Report No. 10-05

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of March, 2010. 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.

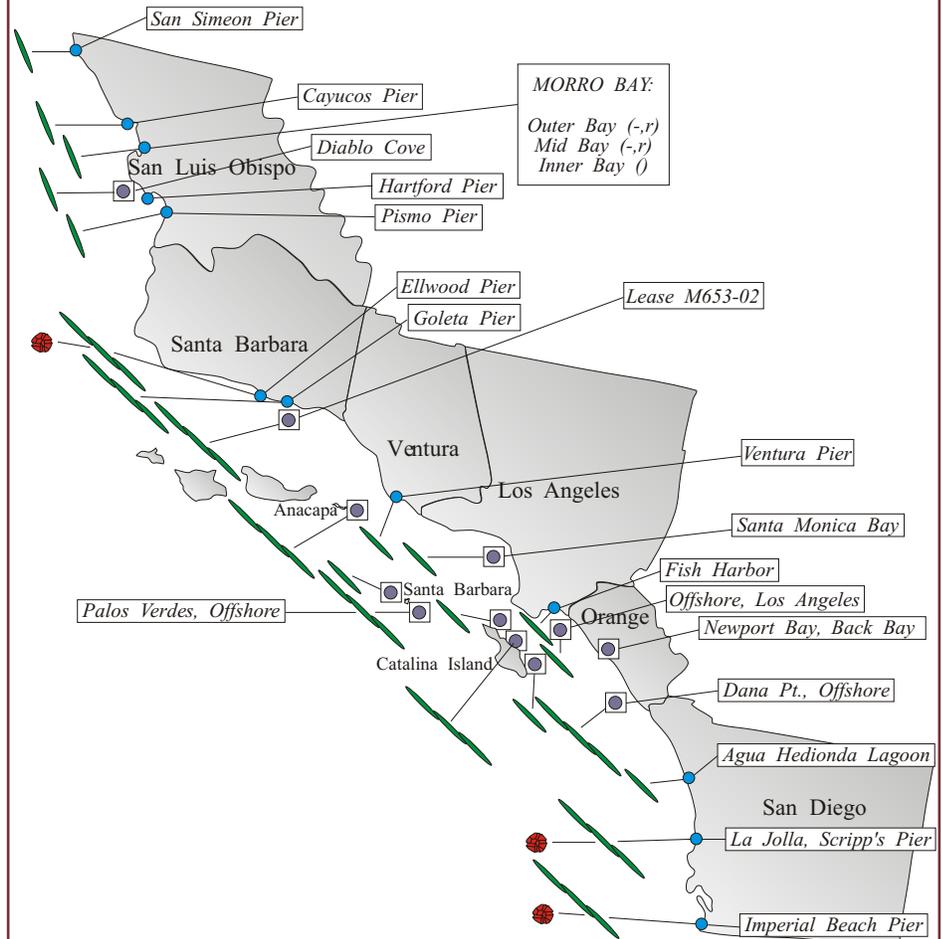
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at a few sampling locations during March (Figure 1). Low numbers of this dinoflagellate were detected at sites in Santa Barbara and San Diego counties, representing an increased presence

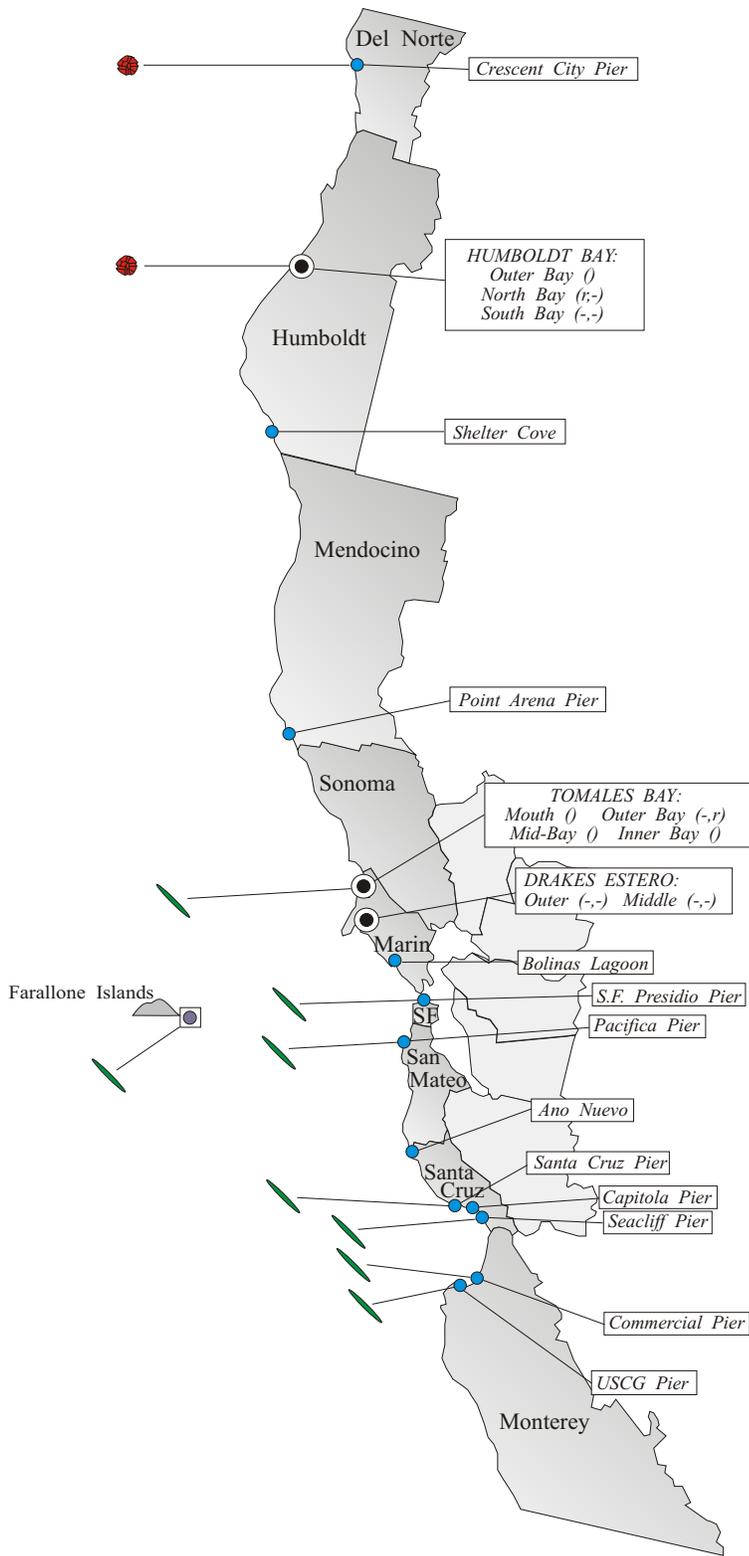
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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during March, 2010.



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 March, 2010.



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compared to observations in February. PSP toxins were not detected in any shellfish samples collected during the month (Figure 3).

Domoic Acid

Pseudo-nitzschia was detected along the entire southern California coast during March (Figure 1). This represents an increase in the distribution and relative abundance compared to observations in February. Cell numbers increased by mid-month at most Santa Barbara locations, offshore of Los Angeles, and at Catalina Island. By the last week of the month the cell numbers increased at nearshore sites in Ventura, Los Angeles, and San Diego counties. The highest relative abundances were observed at the aforementioned offshore sites and at Imperial Beach Pier (San Diego County). Domoic acid was not detected in any shellfish samples during the month.

Non-toxic Species

Phytoplankton diversity and abundance increased in March. Diatoms dominated the assemblage along the entire southern California coast. *Chaetoceros* was the dominant diatom, with several other species present in much lower relative abundances. Despite the predominance of diatoms, the dinoflagellate *Lingulodinium polyedrum* was

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Relative Abundance of Known Toxin Producers

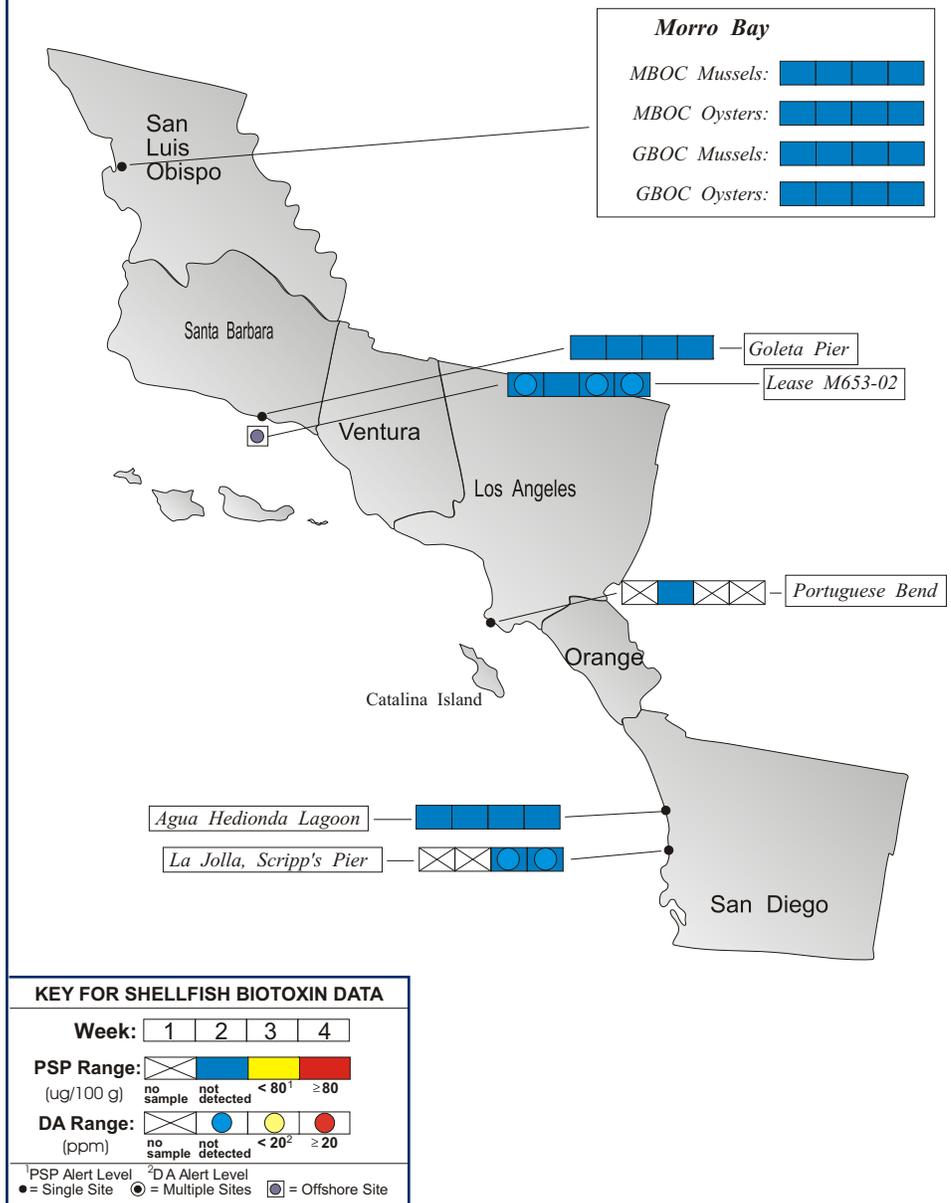
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (between 1% and 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 3. Distribution of shellfish biotoxins in Southern California during March, 2010.



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common in Santa Monica Bay and abundant at all San Diego sites.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at two sampling locations during March (Figure 2). Low numbers of *Alexandrium* were observed at Crescent City (Del Norte County) and inside Humboldt Bay during the last week of the month. A low concentration of PSP toxins was detected in sentinel mussels from Humboldt Bay during the last two weeks of March (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at most sampling locations between Marin and Monterey counties during March (Figure 2). Cell numbers were low at all of these locations.

Domoic acid was not detected in any shellfish samples collected in March.

Non-toxic Species

Winter conditions prevailed in March, with detritus dominating most samples. Diatoms accounted for the remainder of the sample contents, with *Chaetoceros* and *Thalassiosira* the most common species observed. The dinoflagellate *Prorocentrum*

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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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was common at Seacliff Pier (Santa Cruz County) by the last week of the month.



QUARANTINES:

There were no quarantines or health advisories in place in March.

The annual quarantine goes into effect each year on May 1 and applies specifically to the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the year. 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 throughout the year. All certified shellfish growers are required to submit at least weekly samples of 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 clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the

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Figure 4. Distribution of shellfish biotoxins in Northern California during March, 2010.

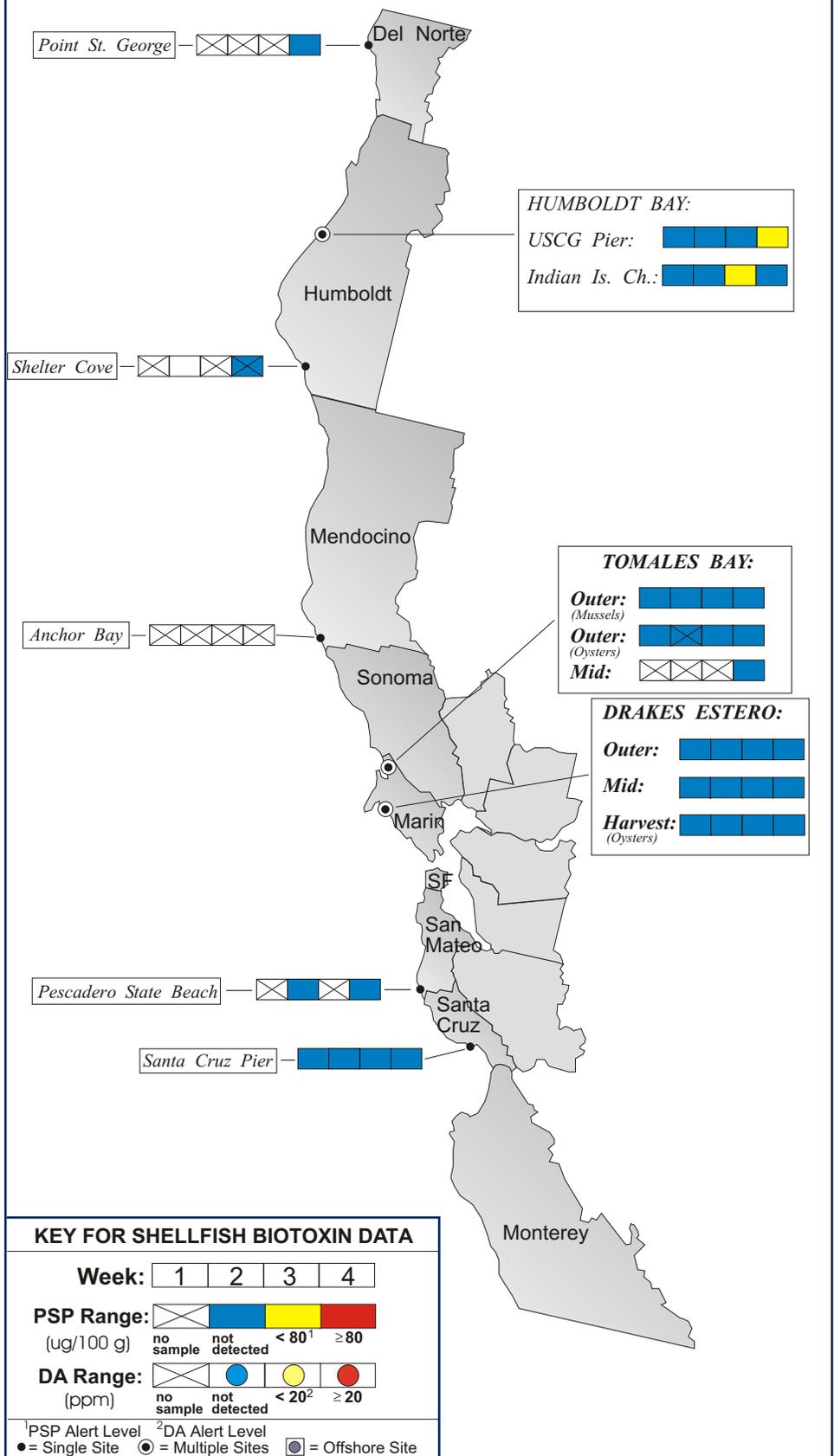


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during March, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	10
	CDPH Volunteer (Ann Danzer)	1
	CDPH Volunteer (<i>Marie De Santis</i>)	
Sonoma	None Submitted	
Marin	Cove Mussel Company	1
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	5
	Marin Oyster Company	4
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	8
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	Scripps Institute of Oceanography	2

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.

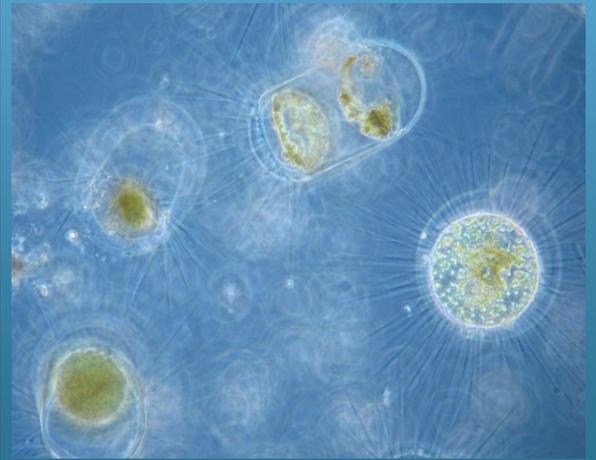
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, 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.



Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during March, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	5
	Bureau of Land Management	2
	Fortuna High School	1
Mendocino	CDPH Volunteer (<i>Marie De Santis</i>)	3
Sonoma	None Submitted	
Marin	CDPH Volunteer (<i>Brent Anderson</i>)	5
	Drakes Bay Oyster Company	11
	Hog Island Oyster Company	1
San Francisco	CDPH Volunteer (<i>E. McNaughton</i>)	4
	Gulf of the Farallones National Marine Sanctuary	1
San Mateo	San Mateo County Environmental Health Dept.	2
	The Marine Mammal Center (<i>Stan Jensen</i>)	4
Santa Cruz	U.C. Santa Cruz	1
	Santa Cruz County Environmental Health Dept.	3
	The Marine Mammal Center (<i>Nancy Scarborough</i>)	1
Monterey	U.C. Santa Cruz	5
	Friends of the Sea Otter (<i>Aya Obara</i>)	3
	Monterey Abalone Company	5
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	3
	Morro Bay Oyster Company	5
	Tenera Environmental	3
Santa Barbara	The Marine Mammal Center (<i>Tim Lytsell, P.J. Webb</i>)	6
	CDPH Volunteer (<i>Sylvia Short</i>)	5
	Santa Barbara Mariculture Company	4
Ventura	U.C. Santa Barbara	4
	CDPH Volunteer (<i>Fred Burgess</i>)	1
	Channel Islands National Marine Sanctuary	1
Los Angeles	National Park Service	1
	Los Angeles County Sanitation District	4
	Catalina Island Marine Institute	1
	City of Los Angeles Environmental Monitoring Div.	2
	Southern California Marine Institute	1
Orange	Guided Discoveries, Tole Mour	8
	California Department of Fish and Game	5
San Diego	Ocean Institute	1
	Avian Research Associates	4
	Carlsbad Aquafarms, Inc.	2
	Scripps Institute of Oceanography	5

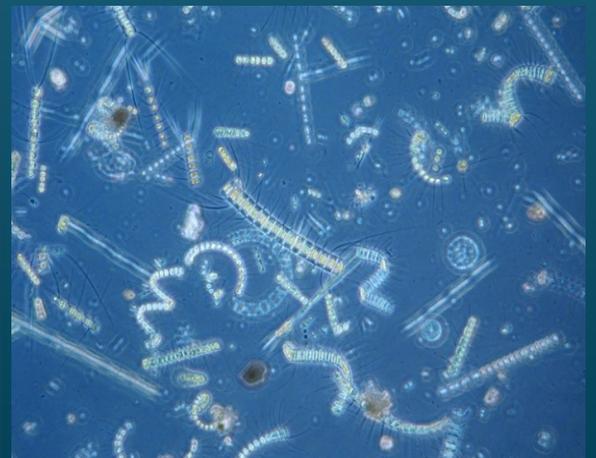
PHYTOPLANKTON GALLERY



The diatom *Corethron*, as seen in several different orientations.



The chained centric diatom *Thalassiosira* was common at a number of locations along the northern California coast..



The diatom *Chaetoceros* was common to abundant along the entire California coastline.