

Monthly Marine Biotoxin Report

May 2007

Technical Report No. 07-19

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of May, 2007. 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 number of sampling stations between San Luis Obispo and Orange counties during May (Figure 1).

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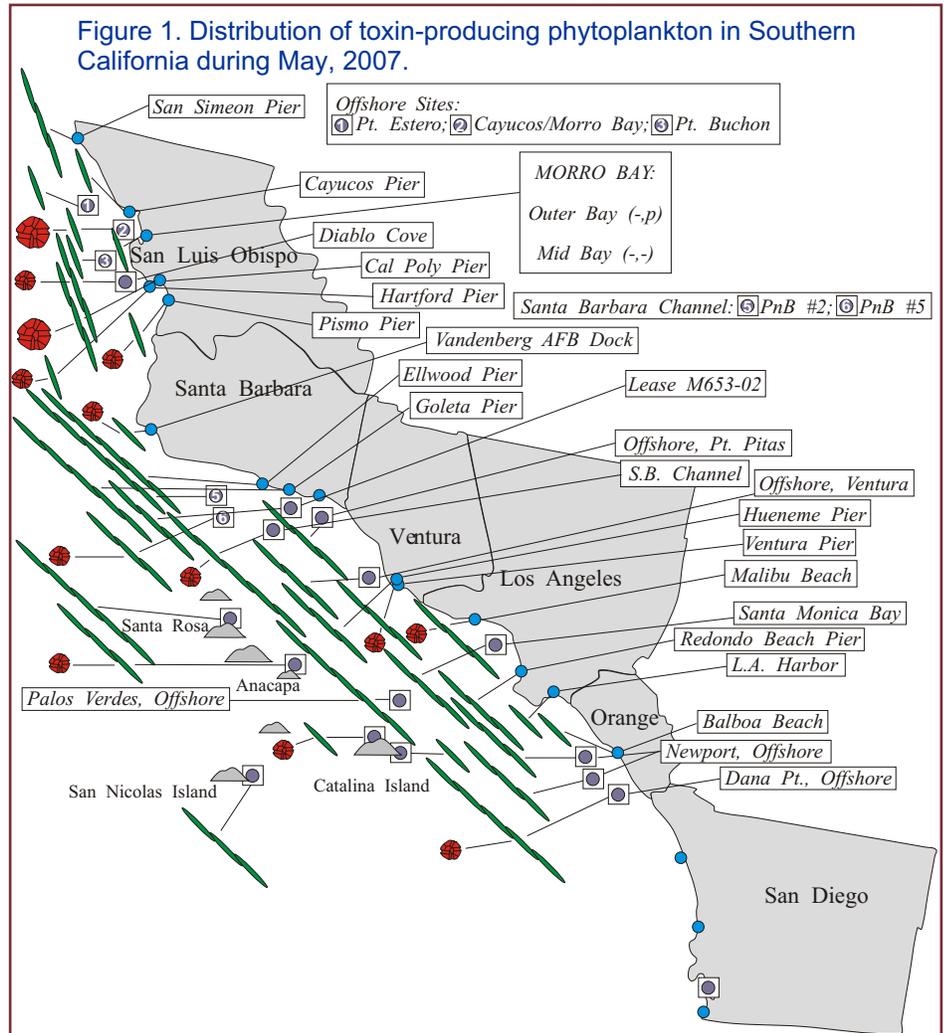
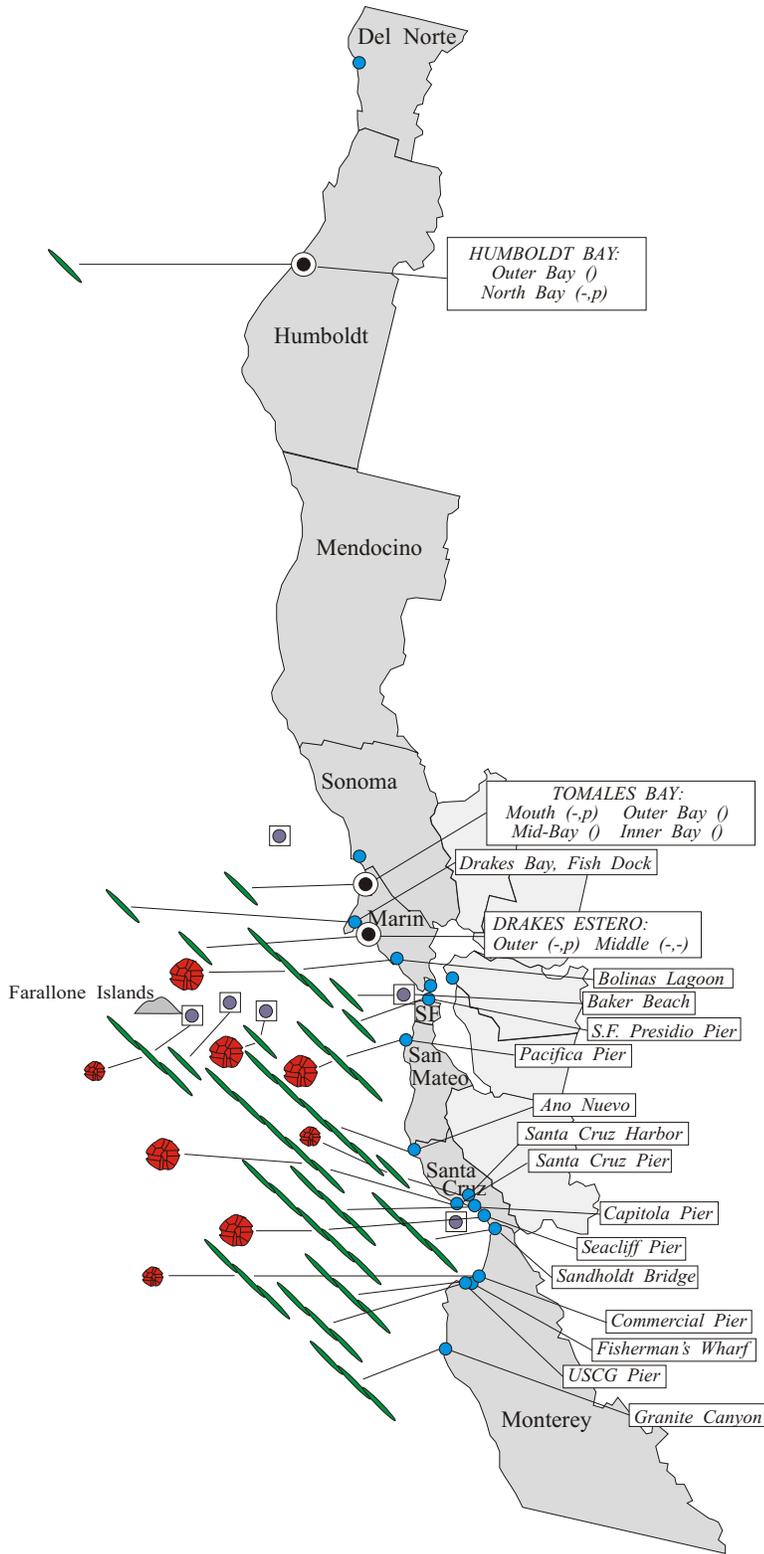


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during May, 2007.

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%)	
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 May, 2007.



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The frequency of *Alexandrium* observations increased compared to the previous month, with increased sightings between Ventura and Orange counties during May. The relative abundance was slightly increased at some sites in San Luis Obispo County. *Alexandrium* continued to be observed at offshore sites, including the Santa Barbara Channel, Anacapa Island, and Catalina Island.

Low levels of the PSP toxins were detected in sentinel mussels from Avila (San Luis Obispo County) during the latter half of the month (Figure 3). These toxins were also detected at low concentrations in mussel samples from an aquaculture lease just offshore of Santa Barbara by the last week of May.

Domoic Acid

Pseudo-nitzschia continued to be observed in very high numbers along much of the Southern California coast in May (Figure 1). The relative abundance of this diatom decreased throughout the month at sites between San Luis Obispo and Ventura counties. In contrast, the relative abundance of this diatom increased offshore near San Nicolas Island at the beginning of May, then at sites in Los Angeles and Orange counties by mid-month, decreasing again by the end of the month. The highest relative

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Relative Abundance of Known Toxin Producers

Alexandrium Species

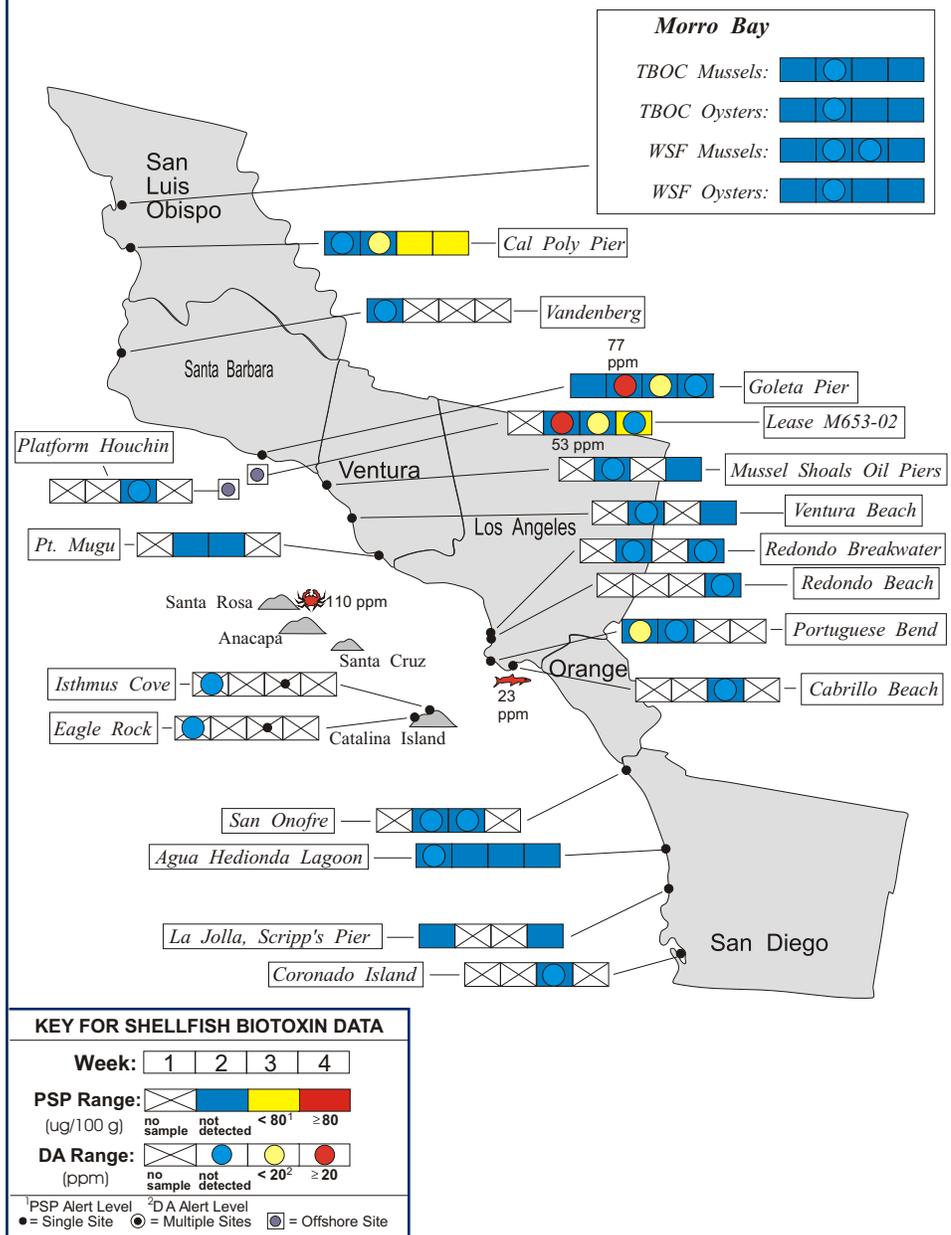
- Rare (less than 1%)
- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

Pseudo-nitzschia Species

- Present (between 1% and 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

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 May, 2007.



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abundances of *Pseudo-nitzschia* were observed offshore near San Nicolas Island (May 2), offshore of the Palos Verdes peninsula (May 23), and at Port Hueneme Pier (May 8).

Domoic acid concentrations in mussels remained at elevated levels at sites in Santa Barbara through mid-May (Figure 3), then declined rapidly to nondetectable levels by the end of the month. Elevated levels of this toxin were also detected in samples of rock crab from the Channel Islands and in samples of sardines landed in Los Angeles that were collected by the Department's Food and Drug Branch.

Non-toxic Species

Diatoms were common along the Southern California coast and included such species as *Chaetoceros*, *Thalassiosira*, and *Leptocylindrus*. Several species of the dinoflagellate *Ceratium* were also common to abundant along the coast between Los Angeles and San Diego counties.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sites between Marin and Monterey counties in May (Figure 2). The relative abundance of

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, 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 program 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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this dinoflagellate increased slightly at several sites in this range. The highest relative abundance was observed in samples collected offshore of San Francisco. PSP toxins were detected in sentinel mussels from the Santa Cruz Pier during the last week of May (Figure 4). Shellfish from all other locations in Northern California did not contain detectable levels of these toxins.

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in April, however the relative abundance increased between Ano Nuevo (San Mateo County) and Monterey County (Figure 2). Low levels of domoic acid were detected in sentinel mussels from Santa Cruz Pier during the first two weeks of May (13 ppm on May 9) and at Natural Bridges (6 ppm on May 9). A very low level of domoic acid was also detected in a razor clam sample from Clam Beach in Humboldt County (1.6 ppm on May 18).

Non-toxic Species

The diatoms *Chaetoceros*, *Skeletonema*, and *Thalassiosira* continued to dominate the Northern California coast in May.

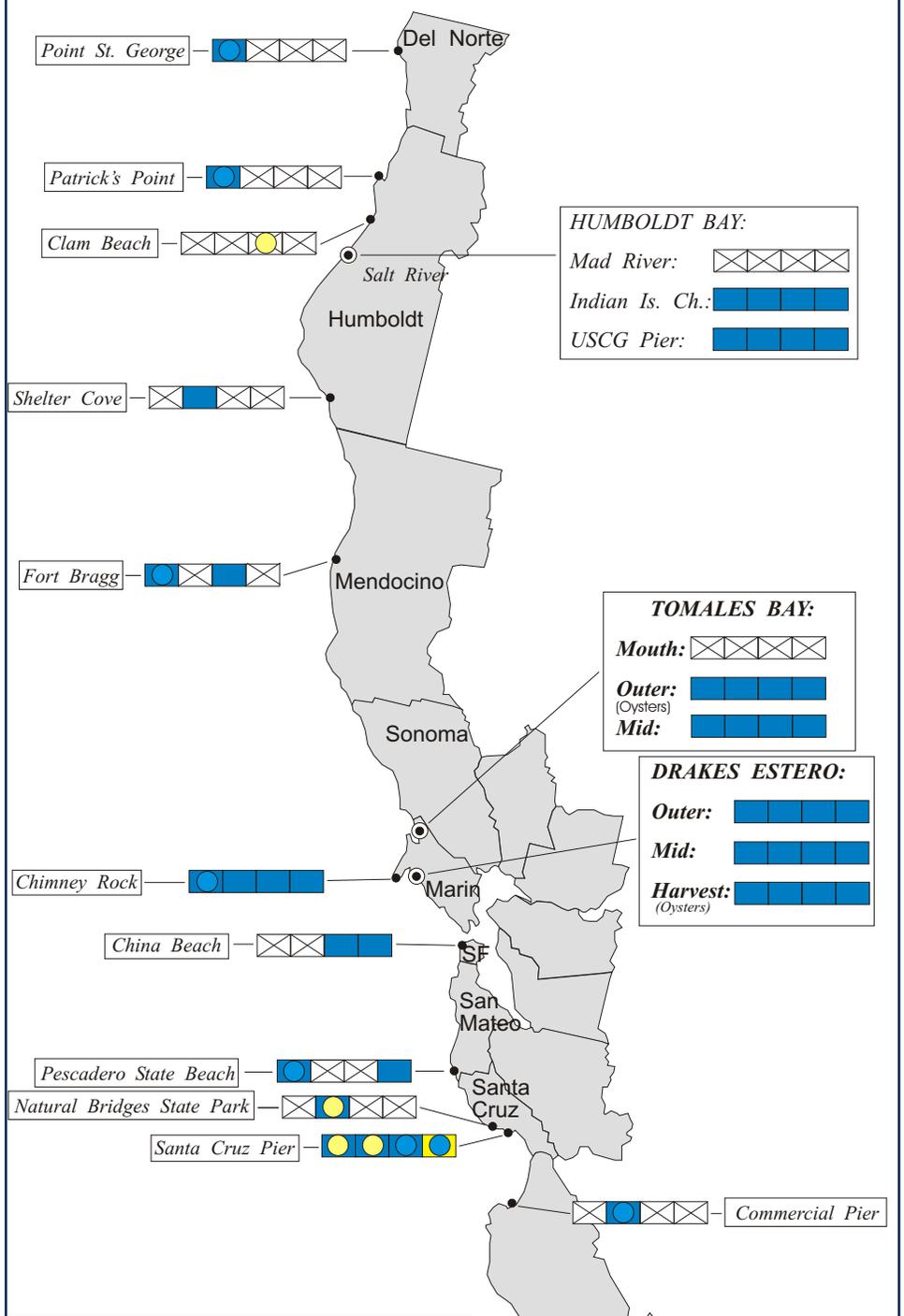


QUARANTINES:

The annual mussel quarantine was initiated early, on April 20, due to the widespread increase in domoic acid levels along the coast. The annual quarantine, which normally goes into effect on May 1 of each year, applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and

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Figure 4. Distribution of shellfish biotoxins in Northern California during May, 2007.



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 May, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	10
	Humboldt State Marine Lab	1
	Humboldt County Environmental Health Department	2
Mendocino	Mendocino County Environmental Health Department	2
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	4
	CDHS Marine Biotoxin Monitoring Program	6
	Marin Oyster Company	3
San Francisco	San Francisco County Health Department	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	Monterey Abalone Company	1
San Luis Obispo	Cal Poly	8
	Tomales Bay Oyster Company	10
	Williams Shellfish Farms	10
Santa Barbara	Central Coast Shellfish Company	1
	Santa Barbara Mariculture Company	14
	U.C. Santa Barbara	5
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	4
	Pt. Mugu NAS	2
Los Angeles	Los Angeles County Health Department	4
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1
	CDHS Volunteer (Steve Crooke)	2

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biotoxin monitoring is maintained throughout the quarantine period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. 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.

On April 27 the State Public Health Officer warned the public to avoid eating sport-harvested species of bivalve shellfish, sardines and anchovies, or the organs or viscera of sport-harvested or commercially sold lobster or crab taken from the coast between San Luis Obispo and Orange counties. This advisory was the result of the Department's monitoring efforts, which detected elevated levels of domoic acid in a variety of seafood species.

Consumers of Washington clams, also known as butter clams, 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 are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

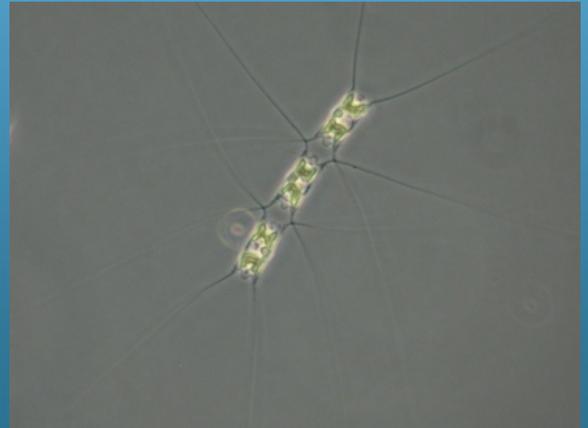
Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



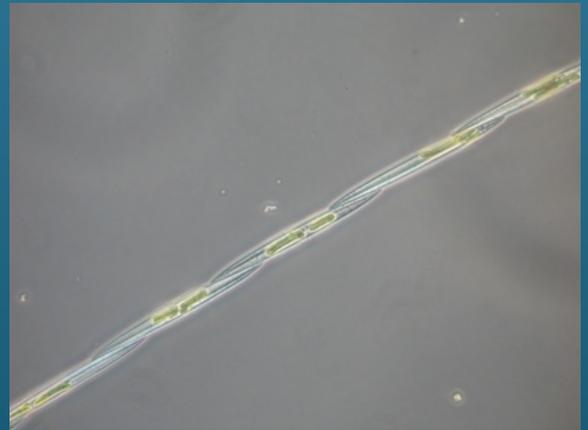
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during May, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	5
Mendocino	None Submitted	
Sonoma	Cordell Banks National Marine Sanctuary	1
Marin	Audubon California	4
	CDHS Volunteers (Brent Anderson, Cal Strobel, Marjorie Siegel)	6
	Drakes Bay Oyster Company	9
	CDHS Marine Biotoxin Monitoring Program	4
Contra Costa	CDHS Marine Biotoxin Monitoring Program	2
San Francisco	CDHS Volunteers (Eugenia McNaughton, Carol Keiper)	5
	Gulf of the Farallones National Marine Sanctuary	22
San Mateo	California Department of Parks and Recreation	1
	San Mateo County Environmental Health	1
Santa Cruz	The Marine Mammal Center (Stan Jensen)	5
	U.C. Santa Cruz	4
	The Marine Mammal Center (Nancy Scarborough, Marie Brayman)	4
Monterey	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Dept.	3
	California Department of Parks and Recreation	3
San Luis Obispo	Monterey Abalone Company	4
	CDHS Volunteer (Jerry Norton)	1
	Marine Pollution Studies Laboratory	3
	The Marine Mammal Center (Aubrey St. Marie)	2
	CDHS Volunteer (Renee and Auburn Atkins)	3
Santa Barbara	Cal Poly	12
	Monterey Bay National Marine Sanctuary	2
	Morro Bay National Estuary Program	3
	Tenera Environmental	4
	The Marine Mammal Center (Debbie Davis, Tim Lytsell)	6
	Tomales Bay Oyster Company	2
	National Park Service	3
Ventura	CDHS Volunteer (Sylvia Short)	9
	Channel Islands National Marine Sanctuary	2
	Santa Barbara Channel Keeper	4
	Santa Barbara Mariculture Company	3
	U.C. Santa Barbara	7
	Vandenberg AFB	2
	CDHS Volunteers (Fred Burgess, Dennis Carlson)	5
Los Angeles	National Park Service	1
	Ventura County Environmental Health Department	1
	Santa Barbara Channel Keeper	1
Orange	City of L. A. Environmental Monitoring Division	3
	Los Angeles County Sanitation District	6
	Guided Discoveries, Tole Mour	11
	Southern California Marine Institute	2
	Los Angeles County Health Department	2
San Diego	U.S. Navy	1
	CDHS Volunteer (Debbie Karimoto)	2
	Ocean Institute	3
San Diego	Orange County Sanitation District	2
	Avian Research Associates	4
	CDHS Volunteers (Paul Sims, Jeff Kermod)	5
	Scripps Institute of Oceanography	5

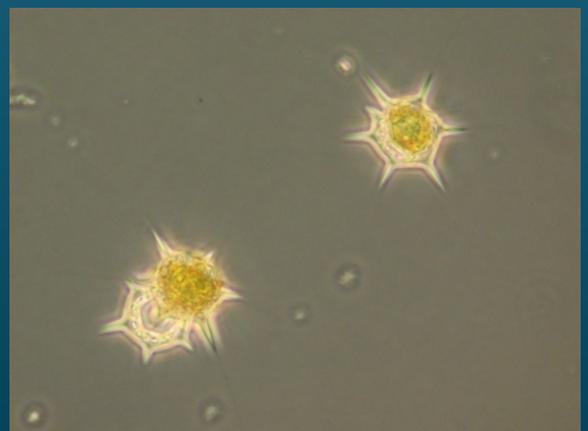
PHYTOPLANKTON GALLERY



Several species of the diatom Chaetoceros were common along the California coast.



Pseudo-nitzschia was common to abundant along much of the Southern California coast.



Silicoflagellates, such as these cells observed inside Humboldt Bay, are relatively rare along the coast.