

M o n i t o r i n g M a r i n e B i o t o x i n R e p o r t

August 2006

Technical Report No. 06-20

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of August, 2006. 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 sites between San Luis Obispo and Los Angeles counties during August (Figure 1). The distribution of

(Continued on Page 2)

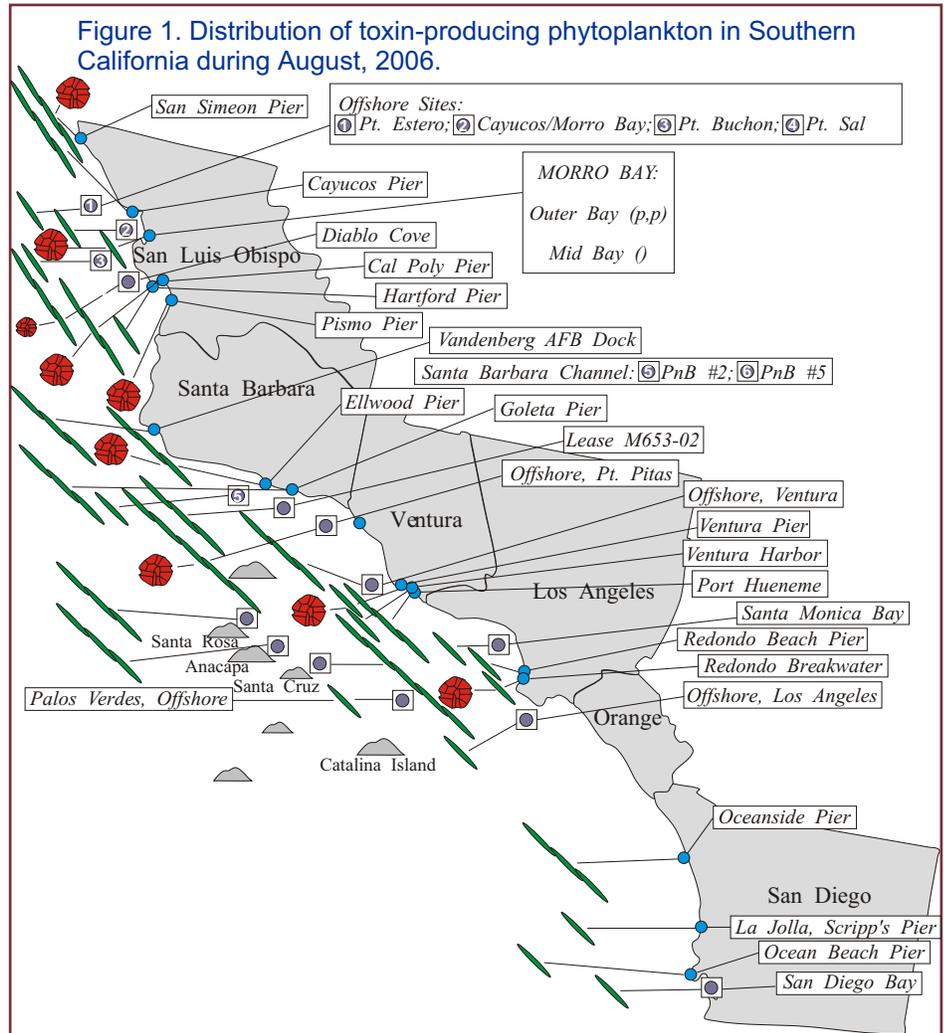


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during August, 2006.

Relative Abundance of Known Toxin Producers

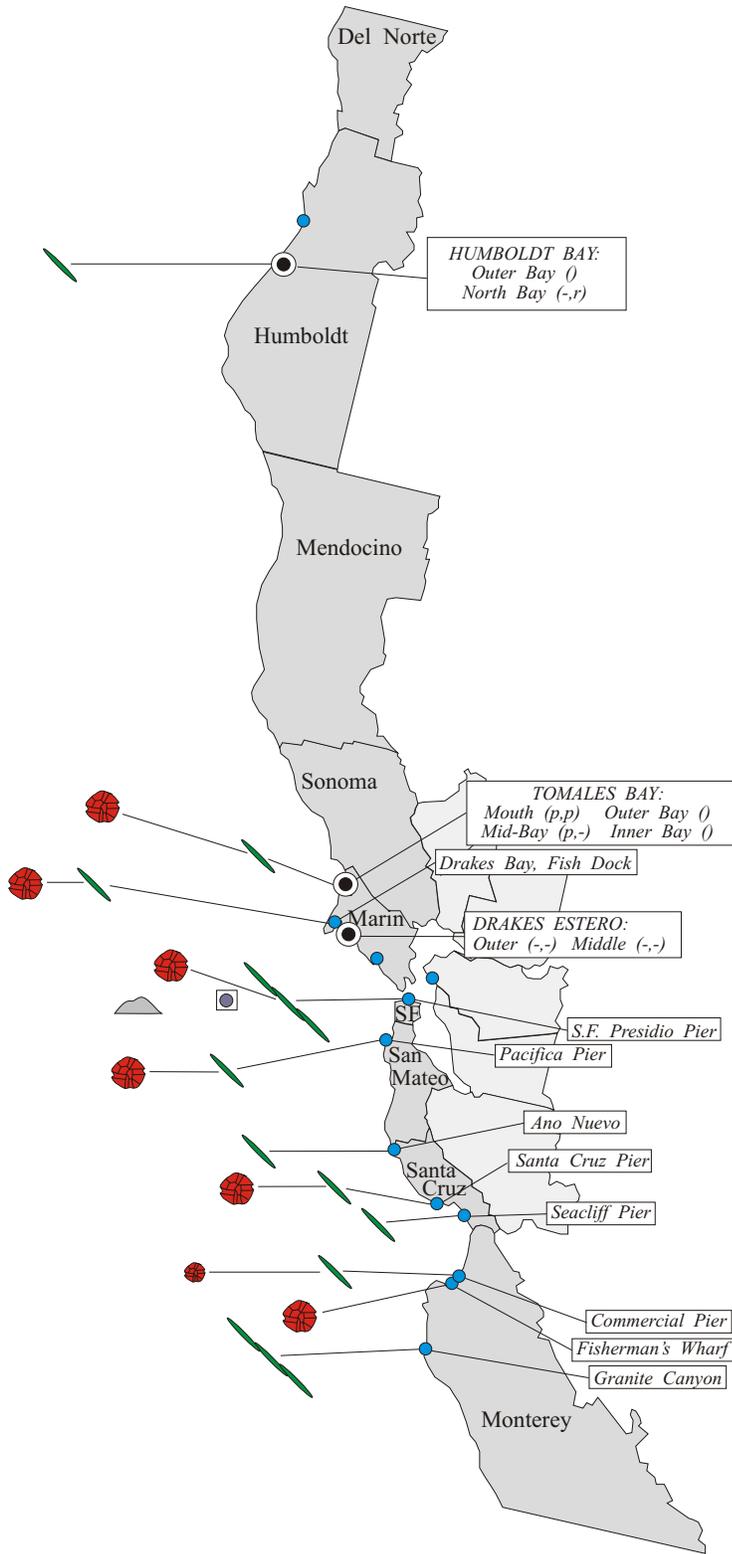
Alexandrium Species	Pseudo-nitzschia Species
 Rare (less than 1%)	 Present (less than 10%)
 Present (between 1% and 10%)	 Common (between 10% and 50%)
 Common (between 10% and 50%)	 Abundant (greater than 50%)
 Abundant (greater than 50%)	

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 August, 2006.



(Continued from Page 1)

this dinoflagellate expanded southward compared to observations in July, but decreased at offshore locations. The relative abundance was similar to the previous month, with a slight decrease at Avila (San Luis Obispo County). The highest cell numbers were observed at Pismo Beach Pier on August 21. This marks the sixth consecutive month that *Alexandrium* has been observed along a significant portion of the Southern California coast. PSP toxins were not detected in any shellfish samples from Southern California during August.

Domoic Acid

Pseudo-nitzschia continued to be observed along the entire Southern California coast in August (Figure 1). The distribution was similar to observations in July but the relative abundance increased several areas. Cell numbers increased at sampling sites offshore near the Channel Islands, most notably near Santa Cruz Island, as well as offshore of Pt. Pitas (Ventura County). Cell numbers decreased in southern San Diego County. With the exception of the two locations mentioned above, this diatom was not a dominant species in the phytoplankton assemblage. Domoic acid was not detected in any shellfish samples collected in August.

(Continued on Page 3)

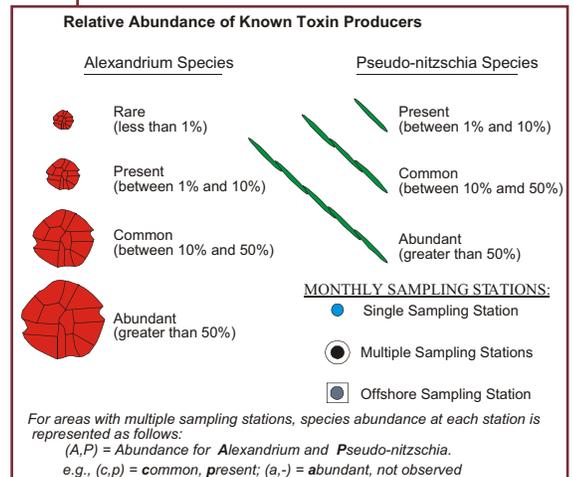
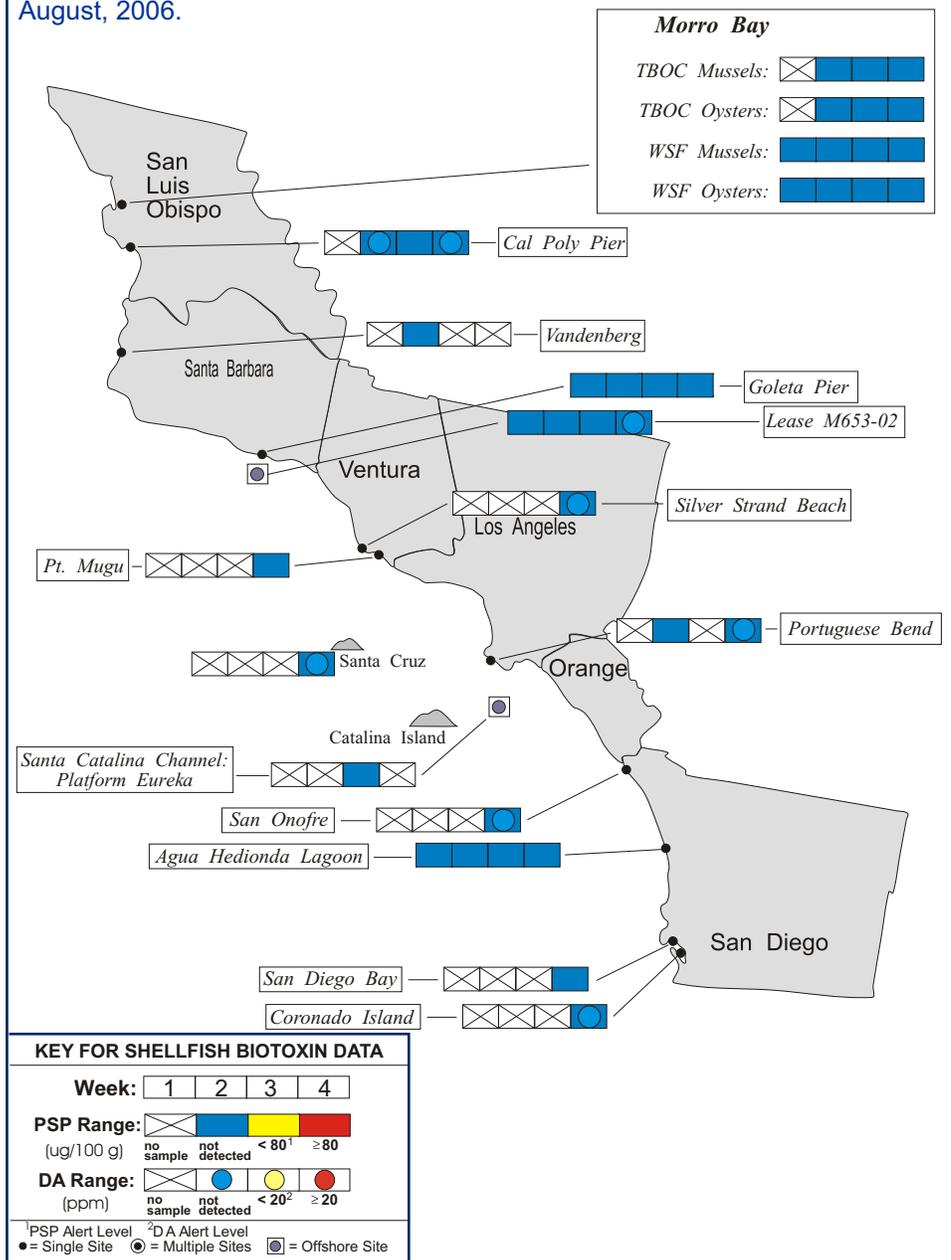


Figure 3. Distribution of shellfish biotoxins in Southern California during August, 2006.



(Continued from Page 2)

Non-toxic Species

The Southern California coast continued to be characterized by a mix of diatoms (*Chaetoceros*, *Thalassiosira*) and dinoflagellates (*Ceratium*, *Prorocentrum*). *Ceratium* was common to abundant along much of the coast and *Akashiwo sanguinea* (formerly *Gymnodinium sanguineum*) was abundant at several locations. The diatoms *Rhizosolenia* and *Bacteriastrium* were abundant offshore near the Channel Islands (Santa Cruz and Anacapa islands, respectively).

Northern California Summary:

Paralytic Shellfish Poisoning

The distribution of *Alexandrium* in August was similar to observations in July (Figure 2), however this dinoflagellate was observed at fewer sites within this range. The relative abundance decreased at several locations. The highest relative abundances of *Alexandrium* were observed at the San Francisco Presidio Pier (August 6).

The elevated levels of PSP toxins detected in sentinel mussel samples from Santa Cruz Pier in July continued through the first week of August (Figure 4). PSP toxin concentrations reached 324 ug by August 2.

(Continued on Page 4)

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

(Continued from Page 3)

Low concentrations of these toxins were detected in mussels from sampling sites between Humboldt and Santa Cruz counties, an increase in activity compared to results in July.

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in July, however the relative abundance decreased dramatically at most locations (Figure 2). This diatom was observed at sampling stations between Humboldt and Monterey counties. The greatest decreases in relative abundance were observed at sampling sites within Monterey Bay. The highest relative abundance observed was in a sample from the San Francisco Presidio Pier (August 14). Domoic acid was not detected in any shellfish samples collected in August.

Non-toxic Species

A mixture of diatoms and dinoflagellates were observed along the Northern California coast in August. The diatom *Skeletonema* was common along most of the coast, while *Rhizosolenia* was abundant offshore of San Francisco. The dinoflagellate *Akashiwo sanguinea* was abundant at several locations within Monterey Bay. *Ceratium*, *Prorocentrum* and *Protoperidinium* were also common at some sites.

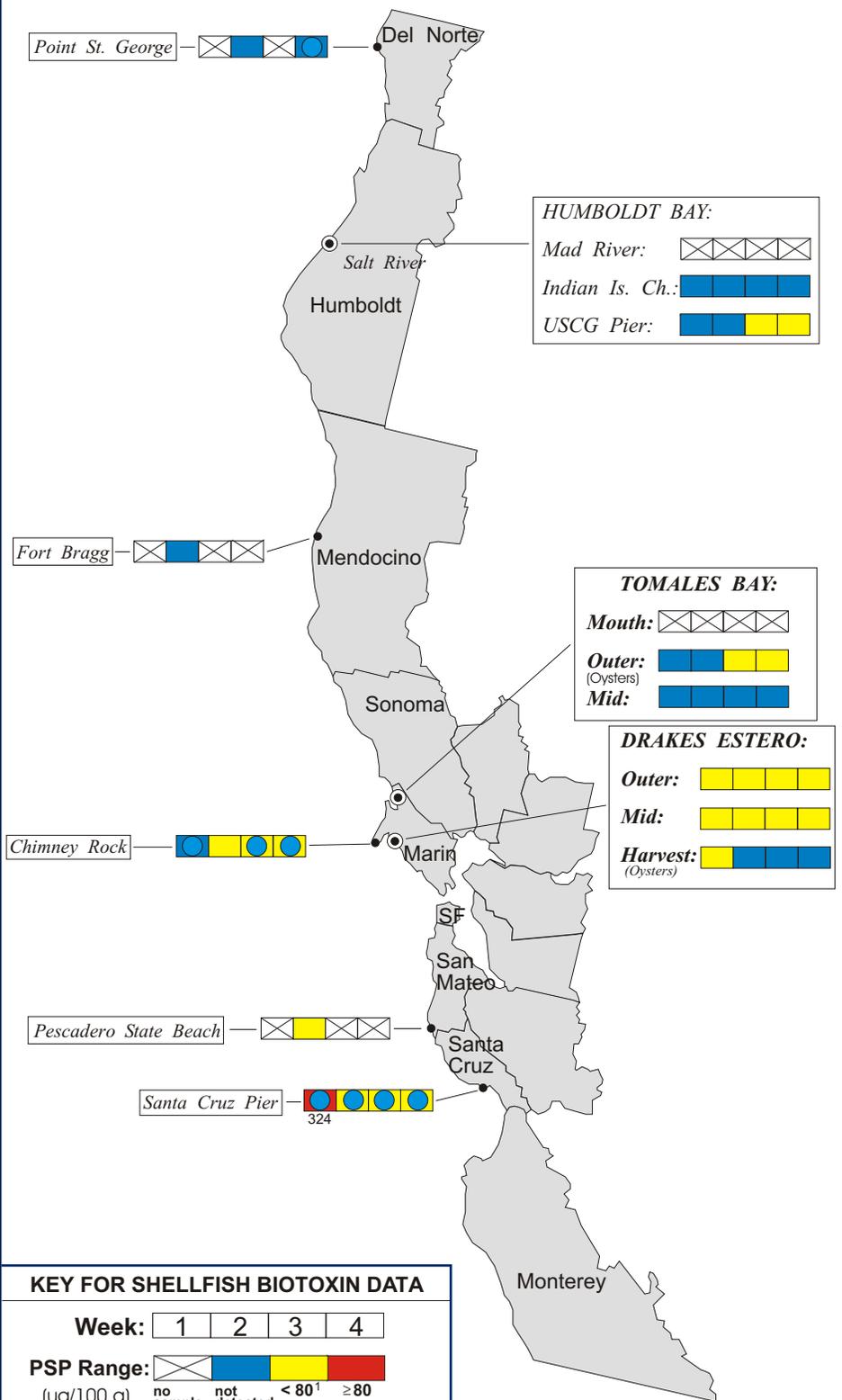


QUARANTINES:

The annual quarantine on the sport-harvesting of mussels went into effect on May 1. The annual mussel quarantine applies only to sport-harvested mussels

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during August, 2006.



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: [X][Blue][Yellow][Red]
 (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: [X][Blue][Yellow][Red]
 (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 August, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	12
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	5
	Drakes Bay Oyster Company	22
	Hog Island Oyster Company	4
	CDHS Marine Biotoxin Monitoring Program	4
	Marin Oyster Company	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	5
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	10
	California Polytechnic State University	4
	Tomales Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	4
	Vanderberg AFB	1
Ventura	Ventura County Environmental Health Department	1
	Naval Air Station, Pt. Mugu	1
Los Angeles	Los Angeles County Health Department	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	U.S. Navy Marine Mammal Program	1
	CDHS Volunteer (Steve Crooke)	2

(Continued from Page 4)

along the entire California coastline, including all bays and estuaries. Routine biotoxin monitoring is maintained throughout this 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.

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.

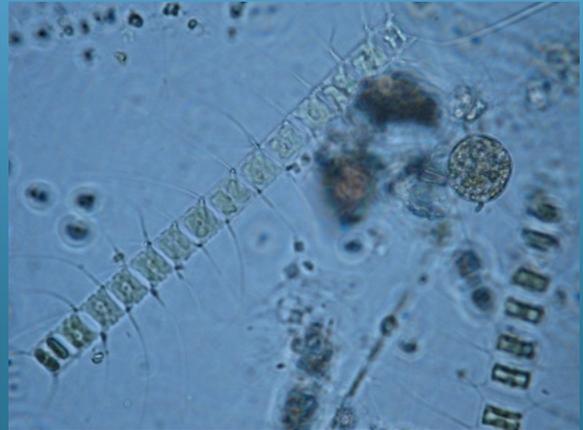
Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during August, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	5
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	CDHS Volunteers (Brert Anderson, Mary Von Tolksdorf, Cal Strobel, Richard Plant)	7
	Drakes Bay Oyster Company	8
	CDHS Marine Biotxin Monitoring Program	5
Contra Costa	CDHS Marine Biotxin Monitoring Program	1
San Francisco	CDHS Volunteers (Eugenia McNaughton, Carol Keiper)	5
San Mateo	Marine Mammal Center Volunteer (Stan Jensen)	4
	San Mateo County Environmental Health Department	2
	U.C. Santa Cruz	2
Santa Cruz	U.C. Santa Cruz	5
	Marine Mammal Center Volunteer (Nancy Scarborough)	3
Monterey	Marine Mammal Center Volunteer (Aubrey St. Marie)	3
	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	3
	CDHS Volunteer (Jerry Norton)	1
San Luis Obispo	Morro Bay National Estuary Program	2
	CDHS Volunteers (Reree and Auburn Atkins)	2
	California Polytechnic State University	4
	NOAA Coastal Discovery Center, San Simeon	4
	Tenera Environmental	4
Santa Barbara	Marine Mammal Center Volunteers (Debby Davis, P.J. Webb, Teri Woodhouse, Marie Brayman)	7
	Channel Islands National Marine Sanctuary	2
	National Park Service	3
	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	5
	Vanderberg AFB	2
Ventura	CDHS Volunteer (Sylvia Short)	1
	CDHS Volunteer (Fred Bugess)	4
	Channel Islands National Marine Sanctuary	8
	Ventura County Environmental Health Department	1
Los Angeles	National Park Service	3
	Los Angeles County Sanitation District	5
	CDHS Volunteer (Richard Weaver)	1
Orange	City of Los Angeles Environmental Monitoring Division	2
	None Submitted	
San Diego	Scripps Institute of Oceanography	4
	DHS Volunteer (Paul Sims, Claire Sims, Jeff Kermode)	8

PHYTOPLANKTON GALLERY



The diatom Chaetoceros continued to be common along most of the California coast in August.



The diatom Rhizosolenia was common at several sites along the entire California coastline.



Alexandrium remained present at a number of sites and Ceratium was common along much of the coastline in August.