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

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

June 2006

Technical Report No. 06-17

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 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 Ventura counties during June (Figure 1). The distribution and relative

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

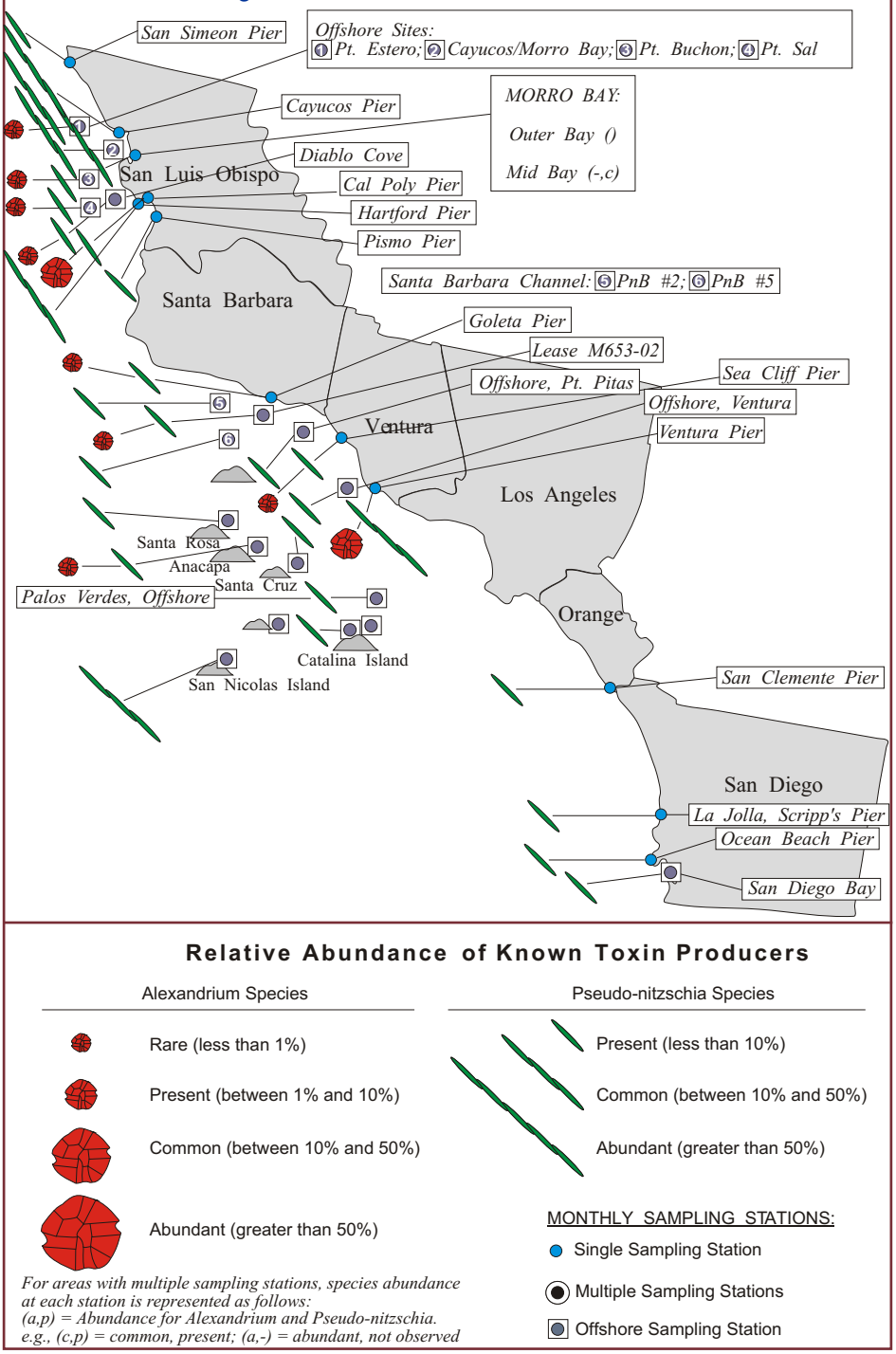
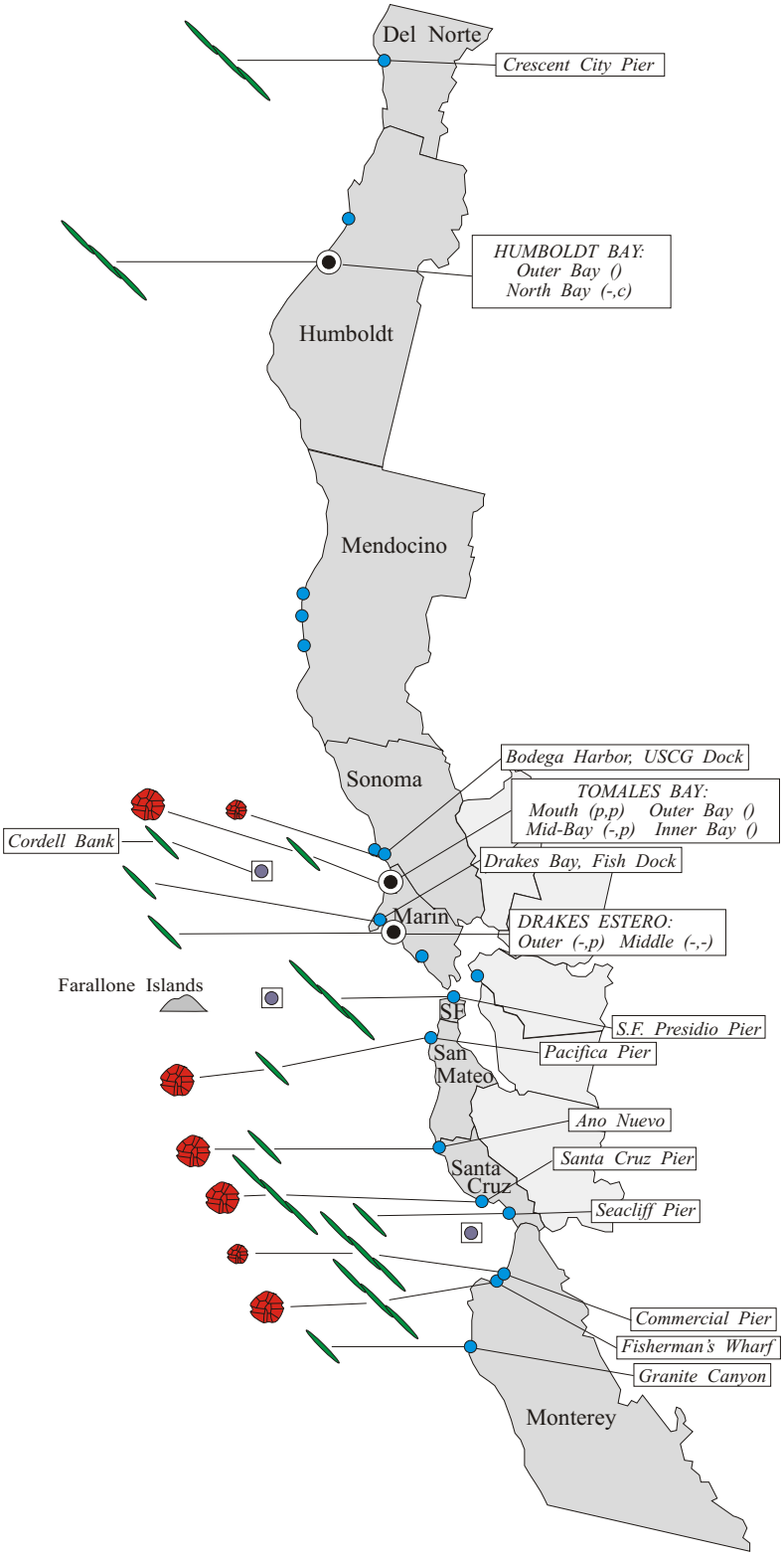


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during June, 2006.



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abundance of this dinoflagellate decreased in June compared to observations in May. The highest cell numbers were observed at the Cal Poly Pier in San Luis Obispo (June 27) and Ventura Pier (June 26). This marks the fourth 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 June.

Domoic Acid

Pseudo-nitzschia continued to be observed along the entire Southern California coast in June (Figure 1). The distribution was similar to observations in May but the relative abundance decreased significantly in most areas. The exception to this general trend was the offshore area of San Luis Obispo, where samples at a number of sites indicated increasing numbers of this diatom. The highest relative abundance was observed in a sample collected offshore of Diablo Cove (June 12). Domoic acid was not detected in any shellfish samples collected in June (Figure 3).

Non-toxic Species

Diatoms (*Chaetoceros*, *Thalassiosira*)

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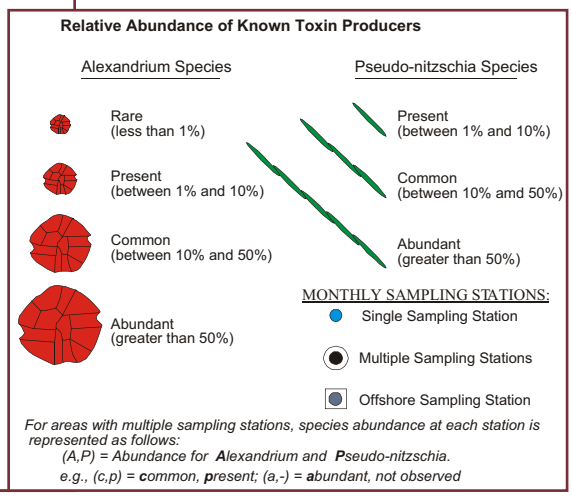
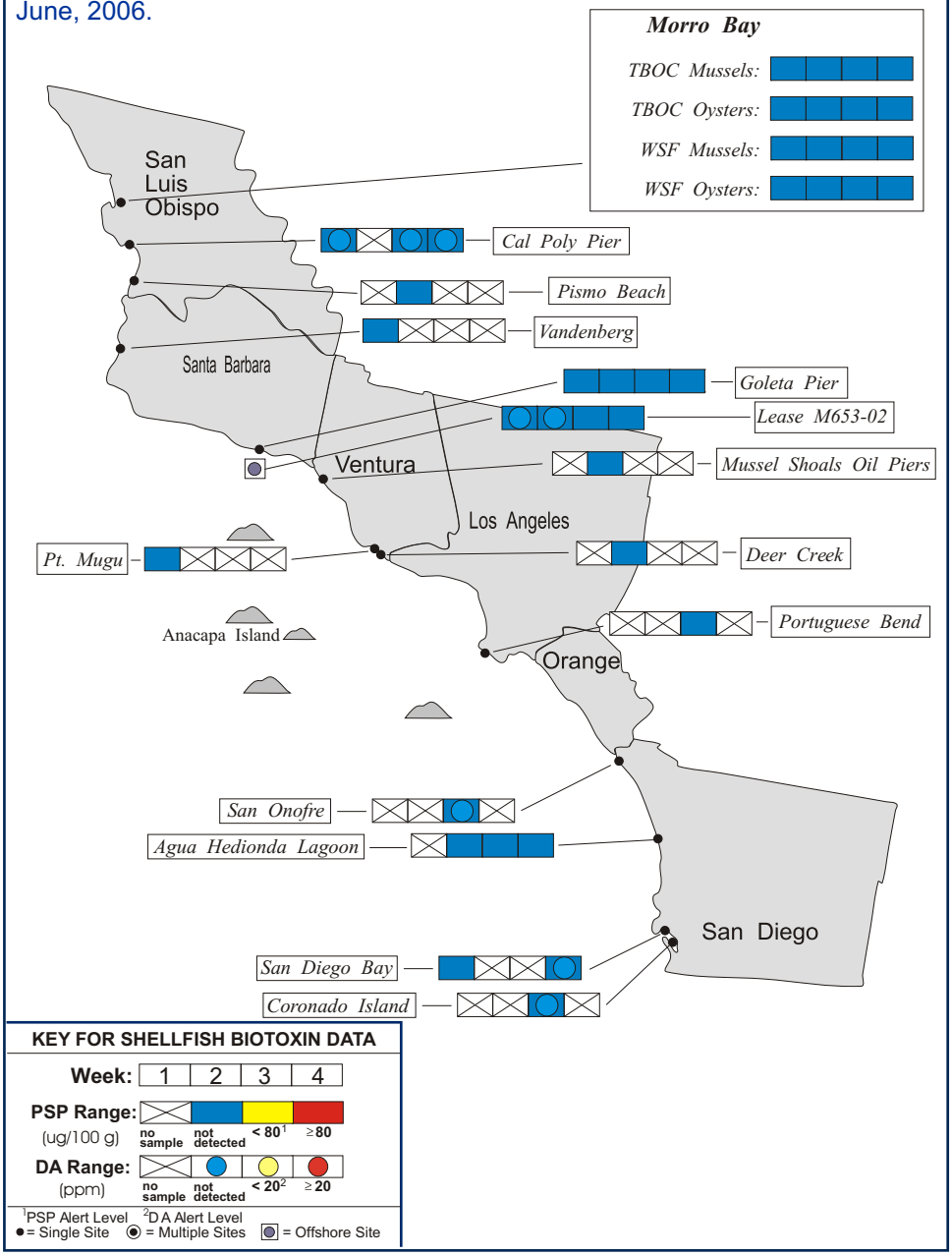


Figure 3. Distribution of shellfish biotoxins in Southern California during June, 2006.



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remained dominant along most of the Southern California coast through most of June. Later in the month dinoflagellates (*Ceratium*, *Gymnodinium*, *Prorocentrum*) became more common, particularly from Ventura through San Diego.

Northern California Summary:

Paralytic Shellfish Poisoning

The distribution of *Alexandrium* decreased somewhat in June compared to observations in May (Figure 2). The relative abundance appeared to increase slightly, however, particularly at sites between San Mateo and Monterey counties. The highest relative abundance of *Alexandrium* was observed at the entrance to Tomales Bay (June 27).

PSP toxins were detected in shellfish samples from Pescadero Beach in San Mateo County (June 15) and Santa Cruz Pier (June 14, 21, and 28).

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in May, however the relative abundance increased at several sites (Figure 2). This diatom was observed at sampling stations between Del Norte and Monterey counties. The highest relative

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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.

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(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

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abundances were observed in samples from the Santa Cruz Pier (June 21) and the entrance to Tomales Bay (June 27). Low concentrations of domoic acid were detected in sentinel mussels from the Santa Cruz Pier on June 21 and 28 (1.3 ppm and 7.1 ppm, respectively).

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the Northern California coast during June. *Skeletonema* and *Chaetoceros* were common to abundant at various locations. *Corethron* was abundant in an offshore sample from Cordell Banks and *Thalassiosira* was common at a number of locations in Marin and San Francisco. Despite the dominance of diatoms, there were occurrences of dinoflagellates at locations inside Monterey Bay. *Gymnodinium* was common at Seacliff Pier in Santa Cruz and abundant at the commercial pier in Monterey. *Prorocentrum* and *Protoperidinium* were also common at the latter site and at Fisherman's Wharf in Monterey.

QUARANTINES:

On March 24 a health advisory was issued for San Diego through San Luis Obispo counties. This advisory has been modified and currently only applies to Ventura County and the Channel Island region. This advisory warns the public to avoid harvesting and consuming the following seafoods: all sport-harvested bivalve shellfish, sardines and anchovies.

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

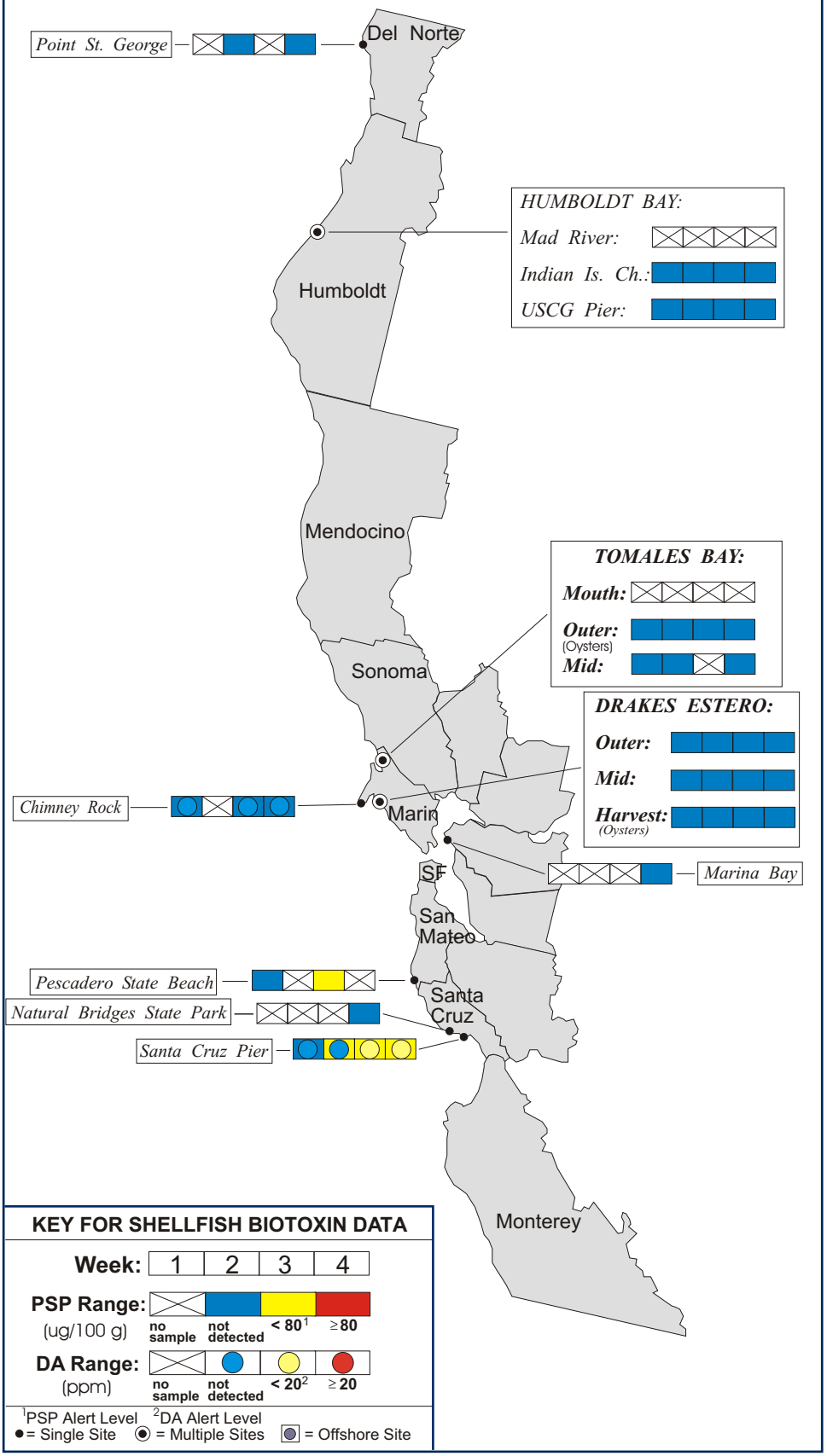

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during June, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
	CDHS Marine Biotoxin Monitoring Program	3
	Marin Oyster Company	1
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	10
	California Polytechnic State University	4
	Tomales Bay Oyster Company	10
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	2
	Pt. Mugu Naval Air Station	1
Los Angeles	Los Angeles County Health Department	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	2
	CDHS Volunteer (Steve Crooke)	2

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Consumers should also avoid the organs or viscera of lobster or crab taken from this region.

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 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.

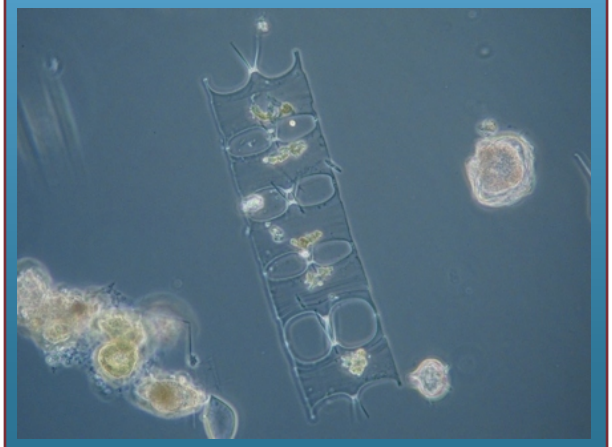
Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception 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. Sportharvesters 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.

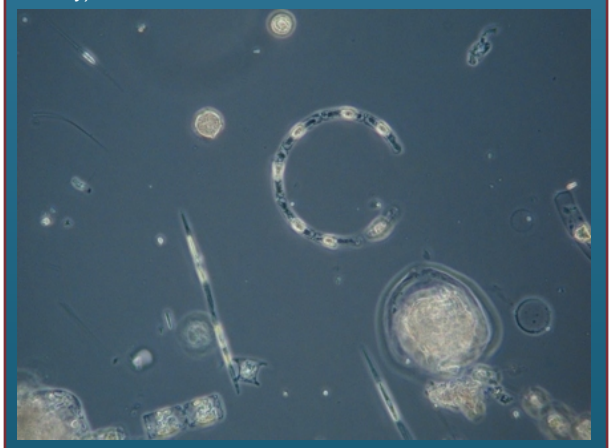
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during June, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	Cordell Banks National Marine Sanctuary	1
	CDHS Volunteer (Cathleen Cannon)	1
	Bodega Marine Laboratory	1
Marin	CDHS Volunteers (Brent Anderson, Marjorie Siegel, Mary Von Tolksdorf, Cal Strobel, Richard Plant)	10
	Drakes Bay Oyster Company	7
	CDHS Marine Biotoxin Monitoring Program	3
Contra Costa	CDHS Marine Biotoxin Monitoring Program	1
San Francisco	CDHS Volunteers (Eugenia McNaughton, Carol Keiper)	2
San Mateo	Marine Mammal Center Volunteer (Stan Jensen)	4
	U.C. Santa Cruz	3
Santa Cruz	U.C Santa Cruz	4
	Marine Mammal Center Volunteer (Nancy Scarborough)	3
Monterey	Marine Mammal Center Volunteers (Aubrey St. Marie, Marie Brayman)	4
	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	4
	CDHS Volunteer (Jerry Norton)	1
	CDHS Marine Biotoxin Monitoring Program	1
San Luis Obispo	Morro Bay National Estuary Program	2
	CDHS Volunteers (Renee and Auburn Atkins)	2
	California Polytechnic State University	4
	NOAA Coastal Discovery Center, San Simeon	2
	Tenera Environmental	3
	Marine Mammal Center Volunteers (Debby Davis, P.J. Webb, Teri Woodhouse)	10
Santa Barbara	Channel Islands National Marine Sartuary	3
	National Park Service	1
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	Vanderberg AFB	2
	Catalina Tall Ships Expeditions	1
Ventura	CDHS Volunteer (Fred Burgess)	4
	Channel Islands National Marine Sartuary	7
	Ventura County Environmental Health Department	1
	National Park Service	4
Los Angeles	Los Angeles County Sanitaton District	3
	Catalina Tall Ships Expeditions	5
	Pt. Mugu Naval Air Station	1
Orange	DHS Volunteer (Debbie Karimoto)	1
San Diego	Scripps Institute of Oceanography	4
	DHS Volunteer (Paul Sims, Claire Sims)	3

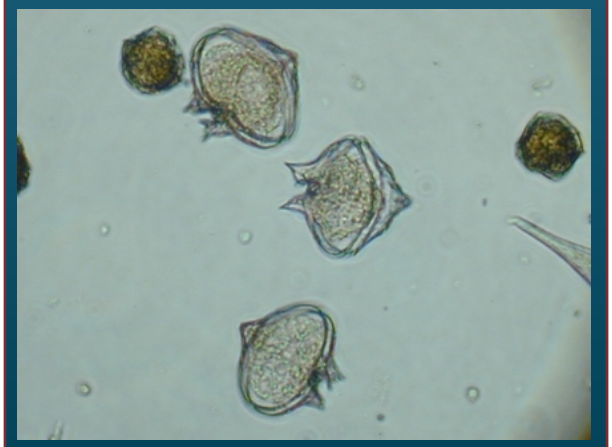
PHYTOPLANKTON GALLERY



The diatom Biddulphia was common in Drakes Bay (Marin County).



Different species of the diatom Rhizosolenia (including R. stolterfothii pictured here) were observed at Southern California sites.



Although diatoms were prevalent in June, several dinoflagellate species such as Protoperidinium were present in some locations.