

# Monthly Marine Biotoxin Report

September 2006

Technical Report No. 06-21

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of September, 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 San Diego counties during September (Figure 1). The distribution

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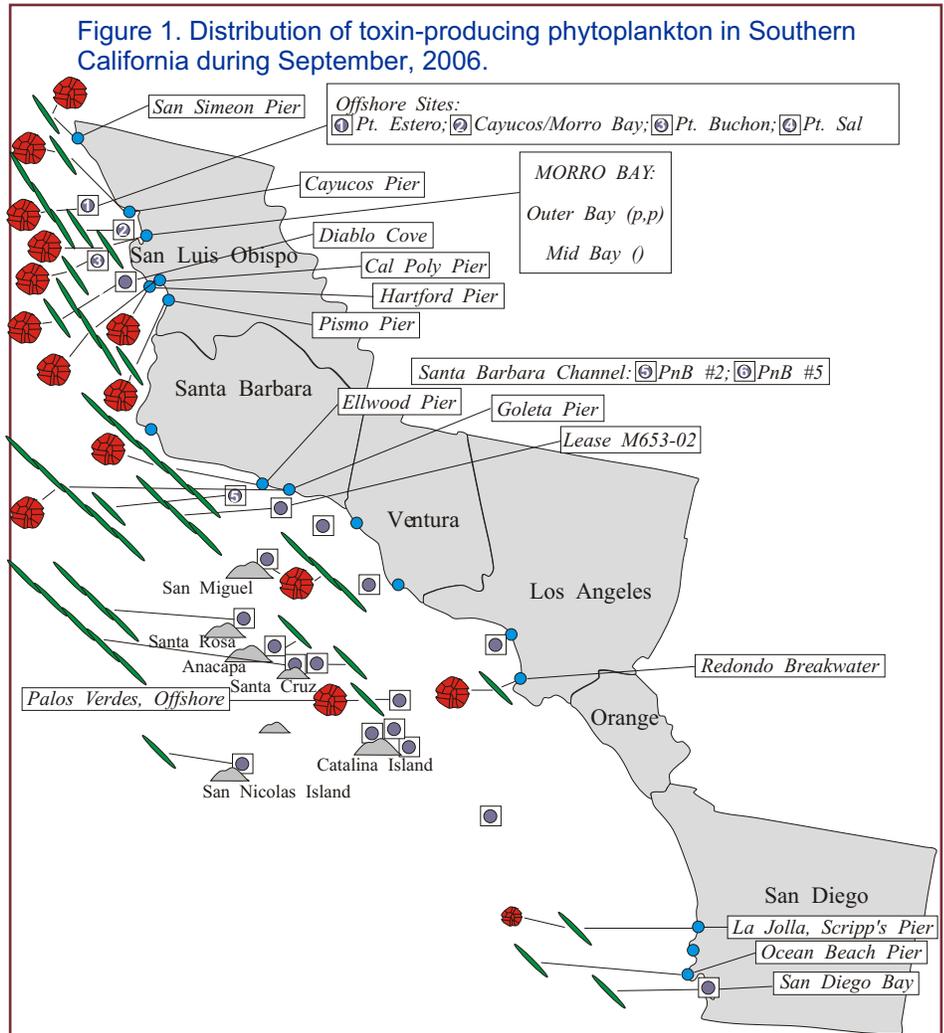
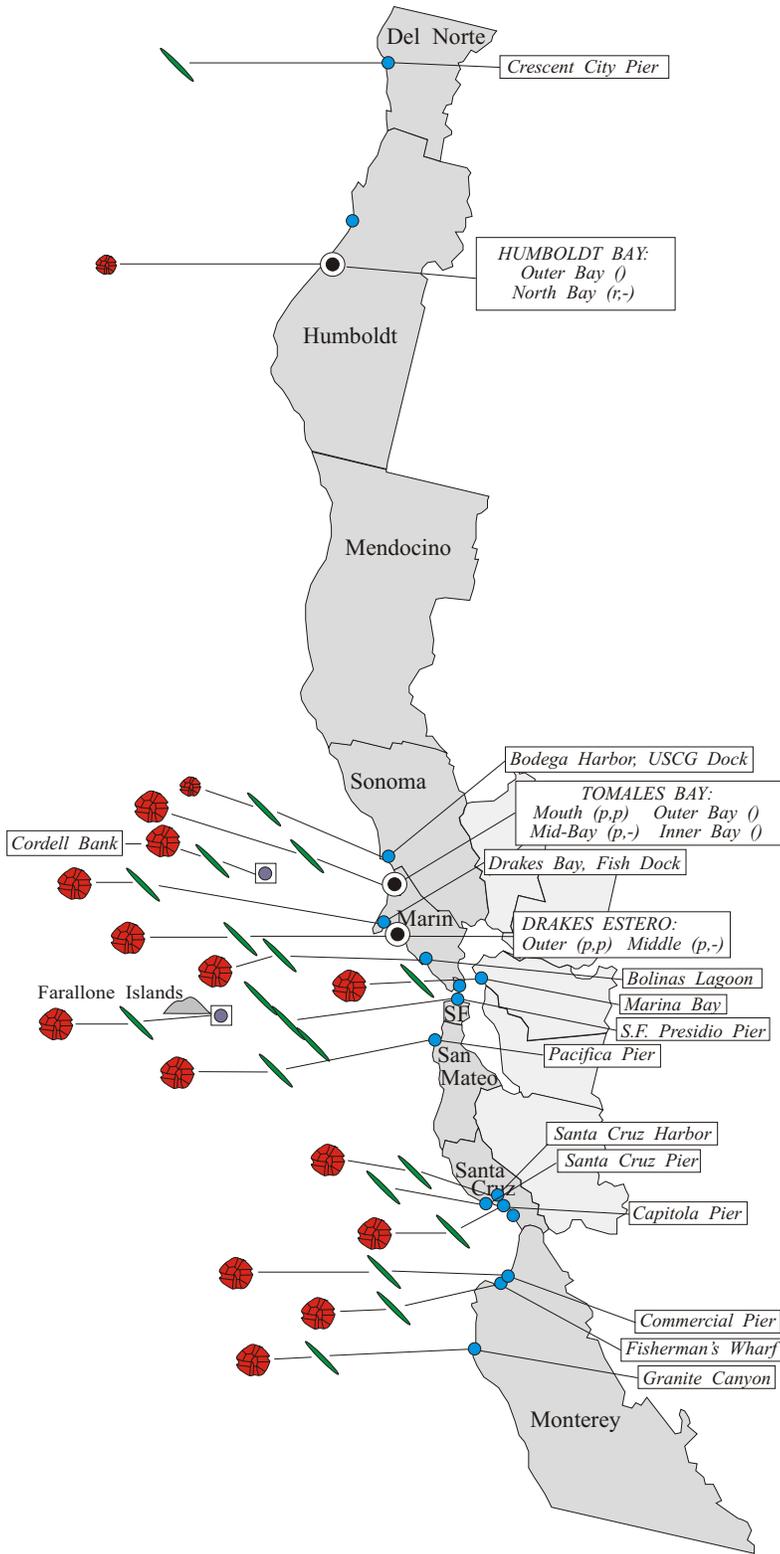


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during September, 2006.

Relative Abundance of Known Toxin Producers	
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%) Present (between 1% and 10%) Common (between 10% and 50%) Abundant (greater than 50%)	Present (less than 10%) Common (between 10% and 50%) Abundant (greater than 50%)
<b>MONTHLY SAMPLING STATIONS:</b>	
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 September, 2006.



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and relative abundance of this dinoflagellate were similar to observations in August, however *Alexandrium* was observed at more locations within this range. These increased observations were most notable at offshore sites along the San Luis Obispo coast. The highest cell numbers were observed at Pismo Beach Pier on September 27. This marks the seventh consecutive month that *Alexandrium* has been observed along a significant portion of the Southern California coast.

PSP toxins were detected by the second week of September in shellfish samples from San Luis Obispo County (Figure 3). By the third week toxic concentrations reached 164 ug/100 g shellfish tissue inside Morro Bay. High toxin levels were also detected in mussels from Vandenberg on September 26 (148 ug).

**Domoic Acid**

*Pseudo-nitzschia* continued to be observed along the entire Southern California coast in September (Figure 1). The distribution was similar to observations in August but the relative abundance decreased from Ventura through San Diego. Cell numbers also decreased at some sites in San Luis Obispo. Cell numbers were highest offshore near Santa Cruz Island. Domoic acid was not detected in any shellfish samples collected in

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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%)

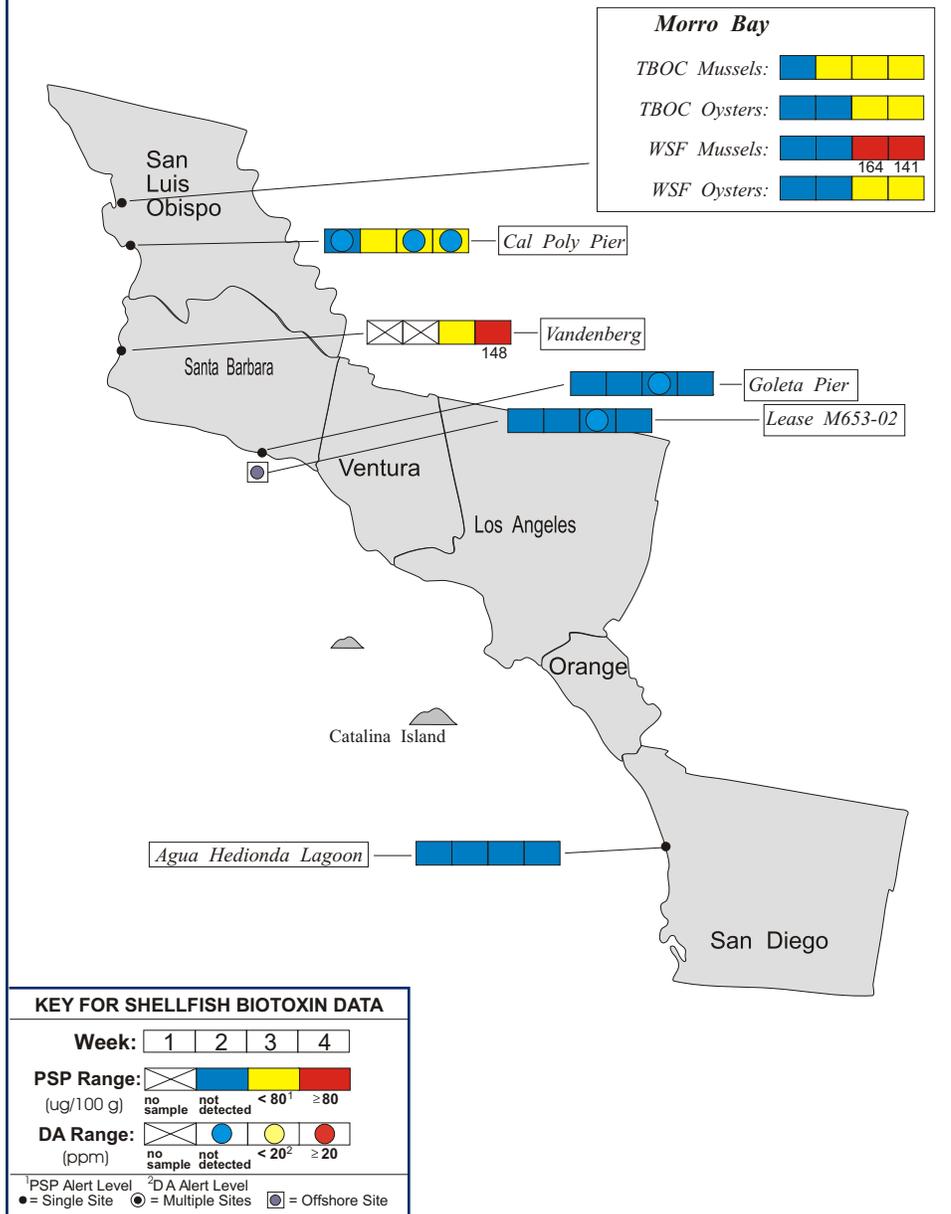
MONTHLY SAMPLING STATIONS:

- 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 September, 2006.



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September.

**Non-toxic Species**

The Southern California coast continued to be characterized by a mix of diatoms and dinoflagellates. *Chaetoceros* was ubiquitous, with a variety of other species occurring at different sites. Of the dinoflagellates, *Ceratium* remained the most common, with *Akashiwo sanguinea* (formerly *Gymnodinium sanguineum*) also present at numerous locations. Perhaps most noteworthy was the occurrence of *Cochlodinium*, a non-toxic but harmful red tide producer, at several sites in San Luis Obispo.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

The distribution and relative abundance of *Alexandrium* in September was similar to observations in August (Figure 2), however this dinoflagellate was observed at more sites within this range. The highest relative abundance of *Alexandrium* was observed in mid Tomales Bay (September 2).

Low levels of PSP toxins continued to be detected at several sites in Marin County, including outer Tomales Bay (Figure 4). There was a brief increase in toxicity above

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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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the alert level in sentinel mussels from Drakes Estero on September 12 (100 ug). Low concentrations of these toxins were also detected at two sites inside Humboldt Bay.

**Domoic Acid**

The distribution and relative abundance of *Pseudo-nitzschia* remained similar to observations in August (Figure 2). Low numbers of this diatom were observed at sampling stations between Humboldt and Monterey counties. The highest relative abundance observed was in a sample from the San Francisco Presidio Pier (September 3). Domoic acid was not detected in any shellfish samples collected in September.

**Non-toxic Species**

A mixture of diatoms and dinoflagellates were observed along the Northern California coast in September. *Chaetoceros* was common along most of the coast, as were the dinoflagellates *Ceratium* and *Akashiwo sanguinea*. *Cochlodinium*, a red tide-producing dinoflagellate, was common inside Monterey Bay along the Santa Cruz shoreline. Interestingly, this dinoflagellate was also observed farther northward than previously noted. *Cochlodinium* was common inside Bolinas Lagoon (September 25) and in the outer and mid-bay regions of Tomales Bay (September 29).

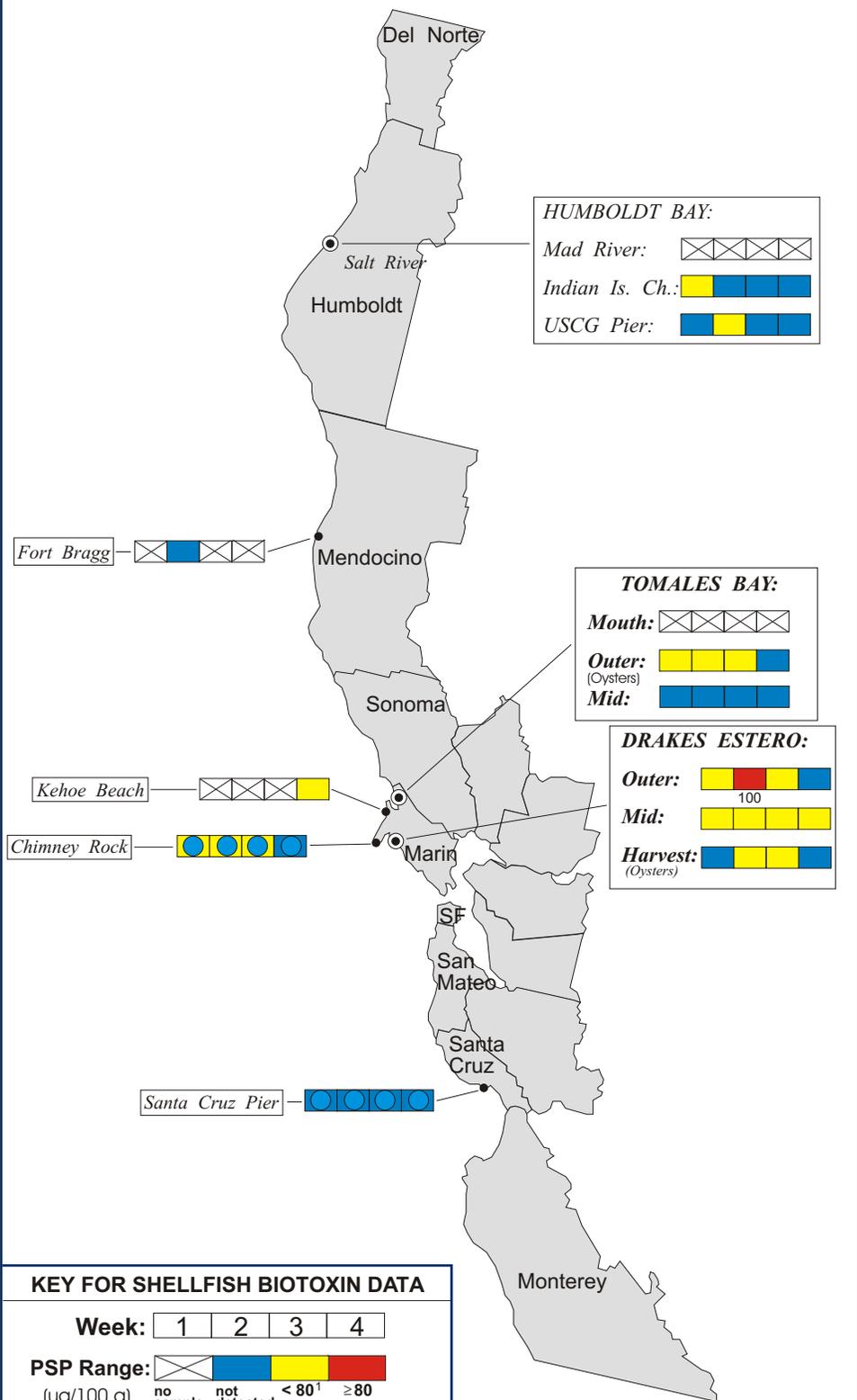


**QUARANTINES:**

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

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



**KEY FOR SHELLFISH BIOTOXIN DATA**

Week: 1 2 3 4

**PSP Range:** (ug/100 g)   
 no sample (white box) not detected (blue box) < 80<sup>1</sup> (yellow box) ≥ 80 (red box)

**DA Range:** (ppm)   
 no sample (white box) not detected (blue box) < 20<sup>2</sup> (yellow box) ≥ 20 (red box)

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level   
 ● = Single Site ○ = Multiple Sites ◐ = Offshore Site

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

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	8
	CDHS Marine Biotoxin Monitoring Program	1
	Marin Oyster Company	7
San Francisco	None Submitted	
San Mateo	None Submitted	
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	14
	California Polytechnic State University	4
	Tomales Bay Oyster Company	10
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	Vanderberg AFB	2
Ventura	None Submitted	
Los Angeles	None Submitted	
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	2

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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 September, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	CDHS Volunteer (Cathben Cannon)	1
	Cordell Bank National Marine Sanctuary	1
Marin	CDHS Volunteers (Brent Anderson, Mary Von Toksdorf, Marjorie Siegel, Cal Strobel, Richard Plant)	11
	Drakes Bay Oyster Company	12
	CDHS Marine Biotxin Monitoring Program	4
	Audubon California	2
Contra Costa	CDHS Marine Biotxin Monitoring Program	2
San Francisco	CDHS Volunteers (Eugenia McNaughbn, Carol Keiper)	3
San Mateo	Marine Mammal Center Volunteer (Stan Jensen)	4
	San Mateo County Environmental Health Department	1
Santa Cruz	U.C Santa Cruz	4
	Marine Mammal Center Volunteers (Nancy Scarborough, Marie Braymar)	5
Monterey	Marine Mammal Center Volunteer (Aubrey St Marie)	3
	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	2
	CDHS Volunteer (Jerry Norton)	1
San Luis Obispo	Morro Bay National Estuary Program	3
	CDHS Volunteers (Renee and Auburn Atkins)	3
	California Polytechnic State University	4
	NOAA Coastal Discovery Center San Simeon	4
	Terera Environmental	3
	Marine Mammal Center Volunteers (Debby Davis, P.J. Webb, Teri Woodhouse, Tim Lytsel)	10
	Tombles Bay Oyster Company	2
	CDHS Marine Biotxin Monitoring Program	1
Santa Barbara	Channel Islands National Marine Sanctuary	1
	National Park Service	3
	Santa Barbara Mariculture Company	4
	Marine Mammal Center (Tracey Goldstein)	4
	Tom More (Guided Discoveries)	1
	U.C. Santa Barbara	4
	Vandenberg AFB	1
	CDHS Volunteer (Sylvia Short)	3
Ventura	CDHS Volunteer (Fred Burgess)	3
	Channel Islands National Marine Sanctuary	2
	National Park Service	2
	Pt. Mugu NAS	1
Los Angeles	Los Angeles County Sanitation District	4
	Los Angeles County Health Department	2
	CDHS Volunteer (Richard Weaver)	4
	City of Los Angeles Environmental Monitoring Division	2
	Catalina Island Marine Institute	2
	Tom More (Guided Discoveries)	13
Orange	Tom More (Guided Discoveries)	1
San Diego	Scripps Institute of Oceanography	4
	DHS Volunteer (Paul Sims, Claire Sims)	3
	Avian Research Associates	1

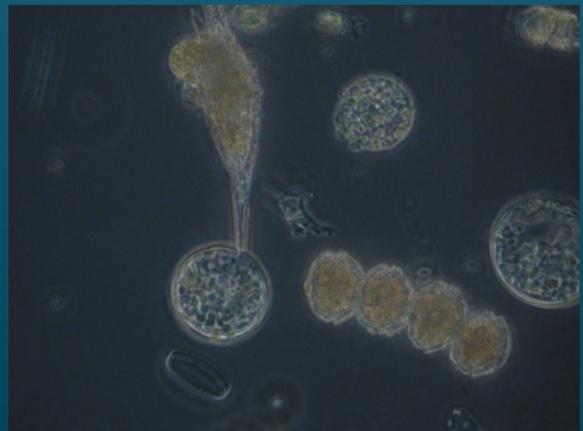
## PHYTOPLANKTON GALLERY



*The diatom Chaetoceros remained common along most of the California coast.*



*The athecate dinoflagellate Cochlodinium has been linked with mass mortalities of shellfish and other sessile invertebrates along the California coast.*



*The chain-forming dinoflagellate Alexandrium remained present at a number of sites in September.*