

Monthly Marine Biotoxin Report June 2009

Technical Report No. 09-21

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 2009. 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.

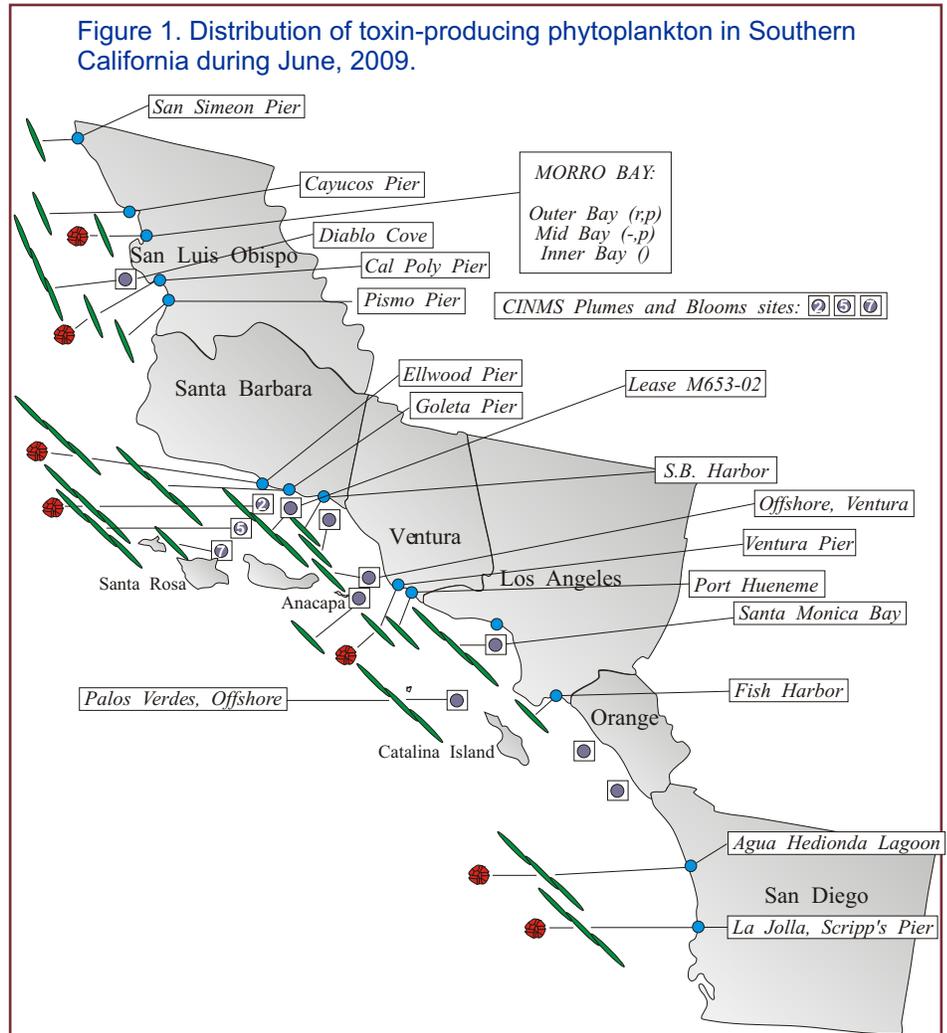
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All 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 in very low numbers along most of the southern California coast during June (Figure 1). These observations represent an increase in distribution compared to the previous month.

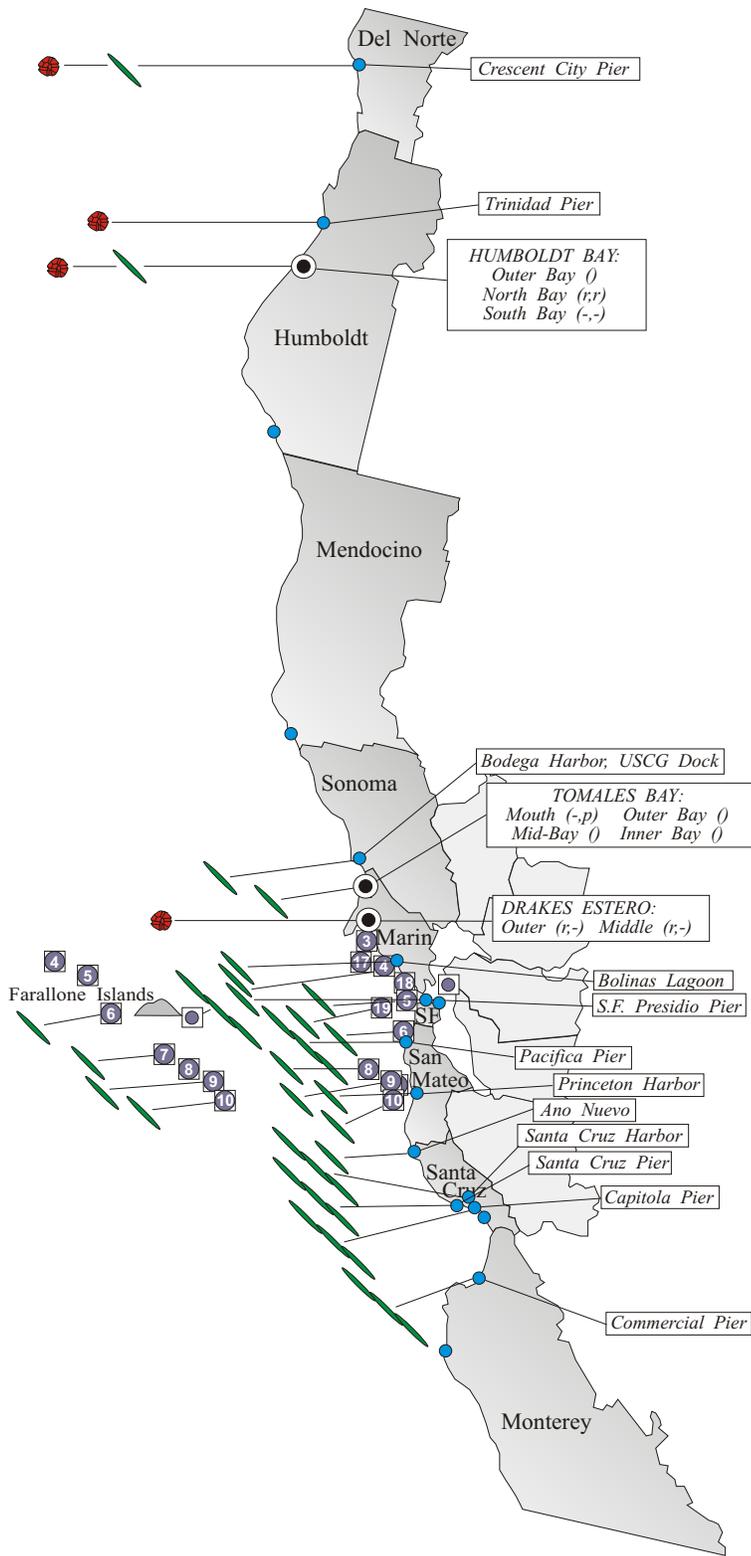
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Relative Abundance of Known Toxin Producers	
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
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 June, 2009.



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PSP toxins were not detected in any shellfish samples collected in June.

Domoic Acid

Pseudo-nitzschia was detected along the entire southern California coast during June (Figure 1). There was a general decline in the abundance of this diatom at most locations. The higher concentrations of *Pseudo-nitzschia* appeared to be mostly the nontoxic species in the delicatissima complex. Although *Pseudo-nitzschia* remained common at a number of sites, cell numbers were low relative to other nontoxic diatom species.

Domoic acid was detected in only one shellfish sample in June (Figure 3). Mussels collected by the Los Angeles County Health Department on June 10 from Portuguese Bend contained 4.5 ppm of domoic acid. This site had experienced a low level of this toxin at the beginning of the previous month.

Non-toxic Species

Diatoms continued to dominate the southern California coast between San Luis Obispo and Ventura counties. *Chaetoceros* remained abundant throughout this region, with *Skeletonema* and *Thalassiosira* common at some locations. The highest relative abundance for diatoms was

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Relative Abundance of Known Toxin Producers

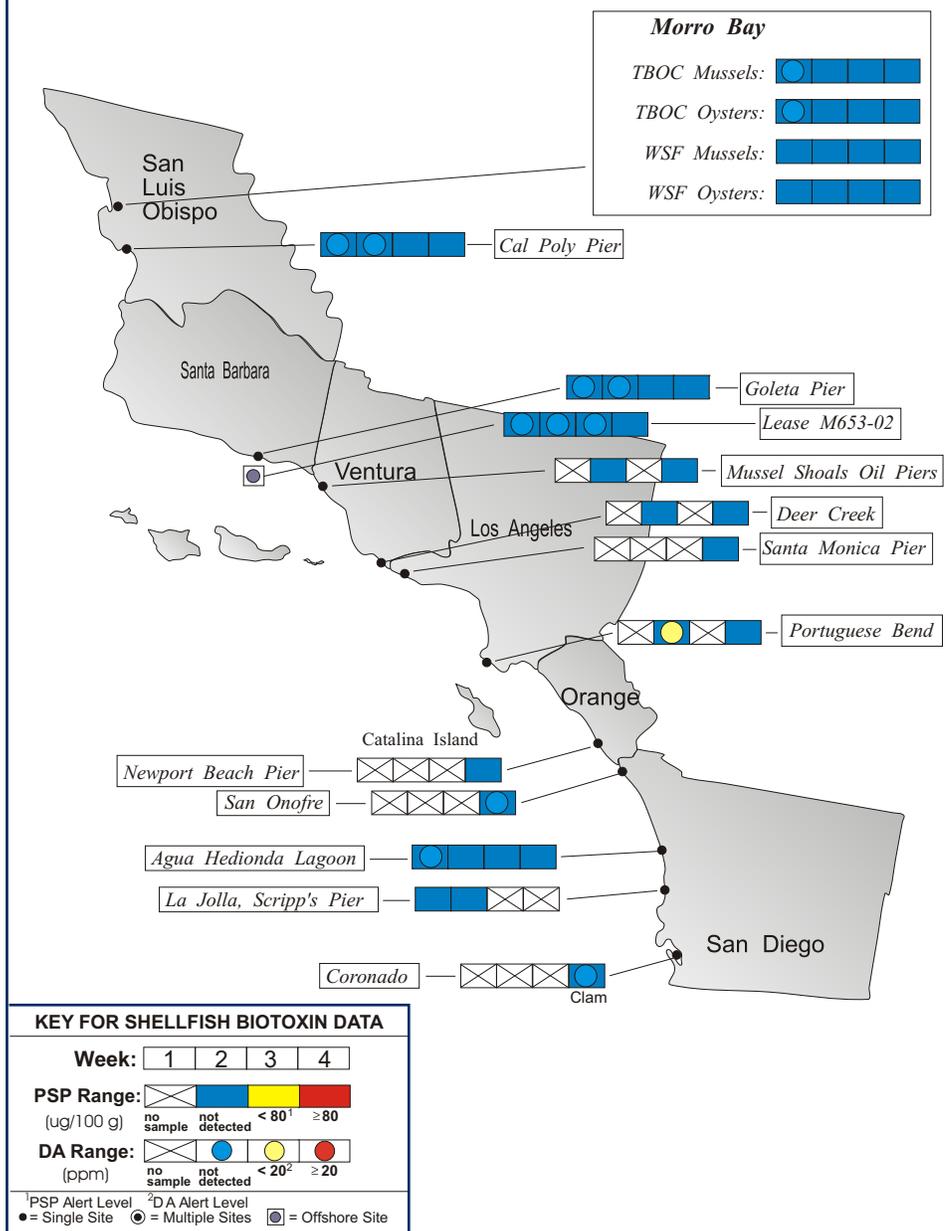
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (between 1% and 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 June, 2009.



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observed at the Cal Poly Pier on June 5 (San Luis Obispo County). Although diatoms remained common along the coast between Los Angeles and San Diego counties, there was a greater diversity and abundance of dinoflagellates. *Ceratium spp.* and *Prorocentrum spp.* were the most common dinoflagellates. The highest relative abundance of dinoflagellates was observed in a sample collected offshore of Palos Verdes on June 23.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at several sampling sites in June (Figure 2). Very low numbers of this dinoflagellate were observed in samples from Drakes Estero (June 2), Humboldt Bay (June 2), Trinidad Pier (June 9), and Crescent City (June 18). PSP toxins were not detected in any shellfish samples during the month.

Domoic Acid

Pseudo-nitzschia was observed at several sites in June (Figure 2). There was a decrease in *Pseudo-nitzschia* at sites in Monterey Bay compared to the previous month, although this diatom remained common. Low numbers of *Pseudo-*

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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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nitzschia were also observed in a series of near shore and offshore samples collected by the Gulf of the Farallones National Marine Sanctuary. The highest relative abundance of this diatom was observed at the Pacifica Pier.

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

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the northern California coast. *Chaetoceros* remained the most abundant genera observed. Other common genera observed at various locations were *Thalassiosira*, *Skeletonema*, *Thalassionema*, and *Bacteriastrium*.

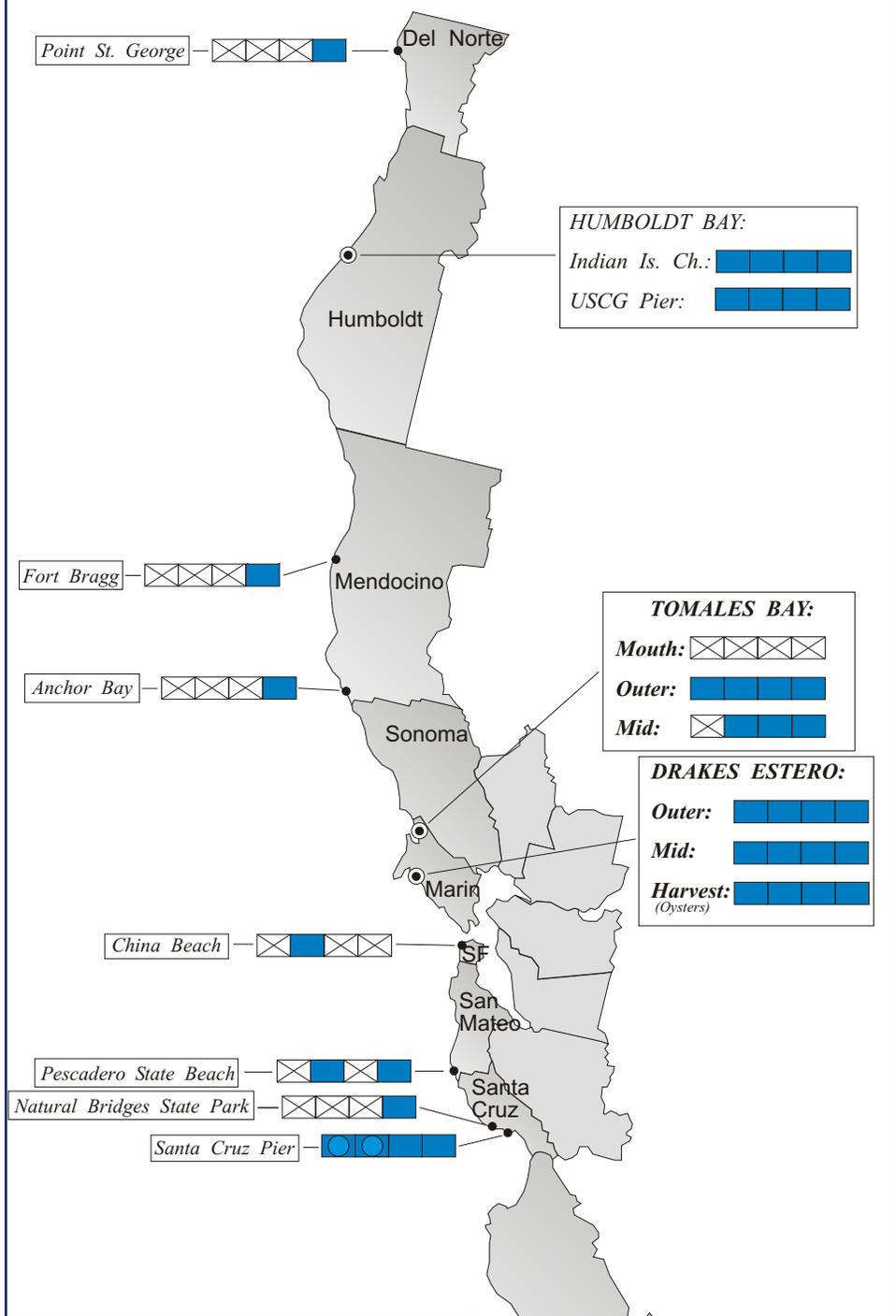


QUARANTINES:

The annual mussel quarantine went in effect on May 1. This quarantine 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, not just within the quarantine period. 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. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest

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Figure 4. Distribution of shellfish biotoxins in Northern California during June, 2009.



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 | 2 | 3 | 4

PSP Range: [Legend: white, blue, yellow, red] (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: [Legend: white, 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 June, 2009.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	12
	Humboldt County Environmental Health Department	1
Mendocino	CDPH Volunteer (Marie De Santis)	1
	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	4
	Marin Oyster Company	3
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	Santa Cruz County Environmental Health Department	1
	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Cal Poly	4
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	10
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	3
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	CDPH Volunteer (<i>Steve Crooke</i>)	3

this general guidance due to their ability to concentrate and retain domoic acid in the 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.



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

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during June, 2009.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	5
	Bureau of Land Management	1
	Humboldt State University	1
	Fortuna High School	1
Mendocino	CDPH Volunteer (Marie De Santis)	2
Sonoma	CDPH Volunteer (Cathleen Cannon)	1
Marin	CDPH Volunteers (Brent Anderson, Cal Strobel)	6
	Drakes Bay Oyster Company	10
	Cordell Banks National Marine Sanctuary	1
	Gulf of the Farallones National Marine Sanctuary	4
San Francisco	CDPH Volunteer (E. McNaughton)	2
	San Francisco Health Department	3
	Gulf of the Farallones National Marine Sanctuary	6
	CDPH Volunteer (Carol Keiper)	1
San Mateo	CDPH Volunteer (Kathleen Abadie)	1
	Gulf of the Farallones National Marine Sanctuary	10
	San Mateo County Environmental Health Dept.	2
	The Marine Mammal Center (Stan Jensen)	5
	U.C. Santa Cruz	4
Santa Cruz	Santa Cruz County Environmental Health Dept.	3
	U.C. Santa Cruz	3
	San Lorenzo Valley High School	1
Monterey	Monterey Abalone Company	5
	Marine Pollution Studies Laboratory	1
San Luis Obispo	CDPH Volunteer (Renee and Auburn Atkins)	1
	Cal Poly	10
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	2
	Tenera Environmental	3
	The Marine Mammal Center (Tim Lytsell, P.J. Webb)	9
	Tomales Bay Oyster Company	4
Santa Barbara	CDPH Volunteer (Sylvia Short)	5
	Channel Islands National Marine Sanctuary	4
	U.C. Santa Barbara	4
	National Park Service	1
	Santa Barbara Mariculture Company	4
	Santa Barbara Channel Keeper	1
Ventura	CDPH Volunteer (Fred Burgess)	3
	Channel Islands National Marine Sanctuary	2
	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	1
	Southern California Marine Institute	1
Orange	Orange County Health Care Agency	1
	Ocean Institute	2
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	5

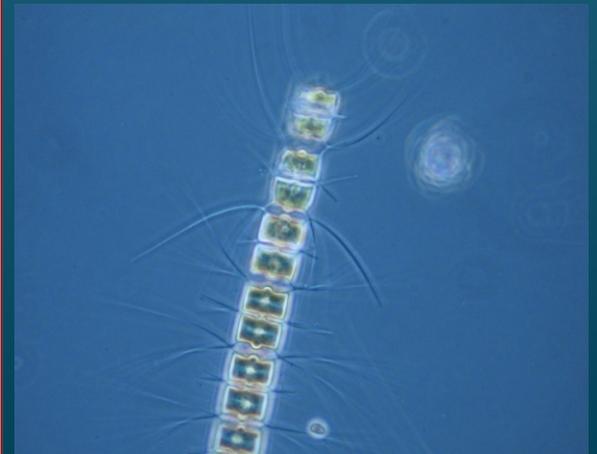
PHYTOPLANKTON GALLERY



The diatom *Licmophora* is often observed in low numbers in shallow, turbulent areas.



Diatoms remained common along much of the California coast in June.



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