

# M o n t h l y M a r i n e B i o t o x i n R e p o r t

June 2004 Technical Report No. 04-18

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June 2004. 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.

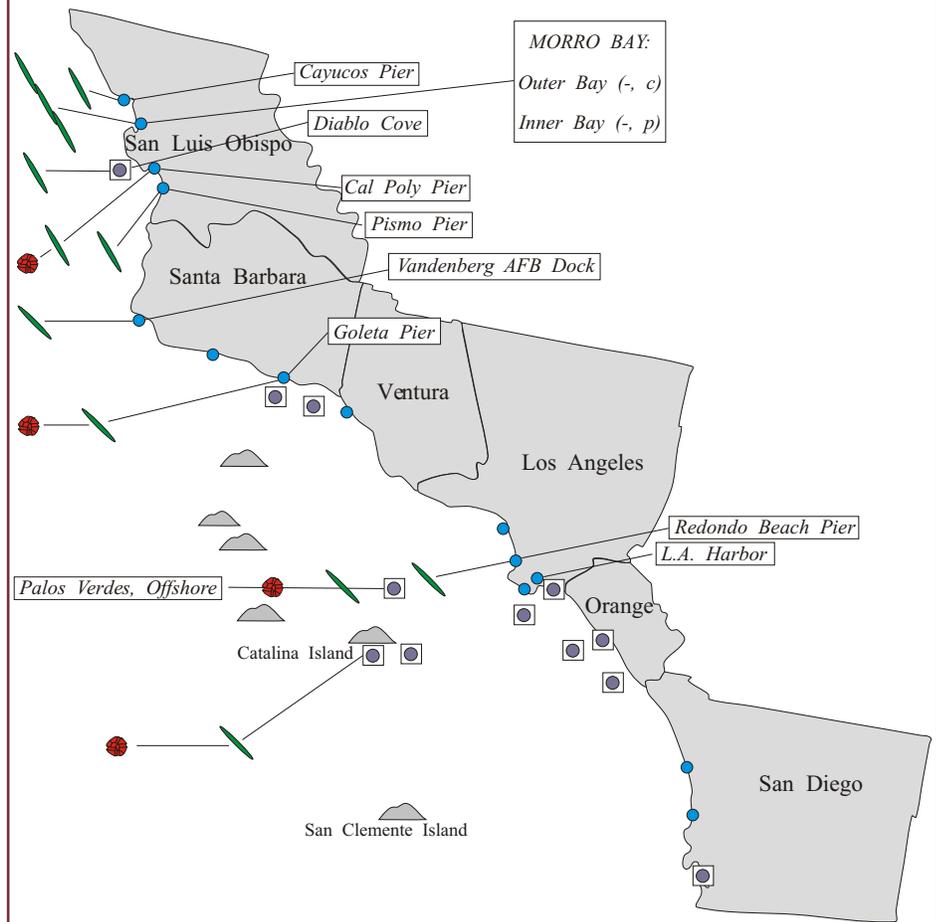
### Southern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* distribution increased slightly in June although cell numbers were very low (Figure 1). Small numbers of this

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during June, 2004.



### Relative Abundance of Known Toxin Producers

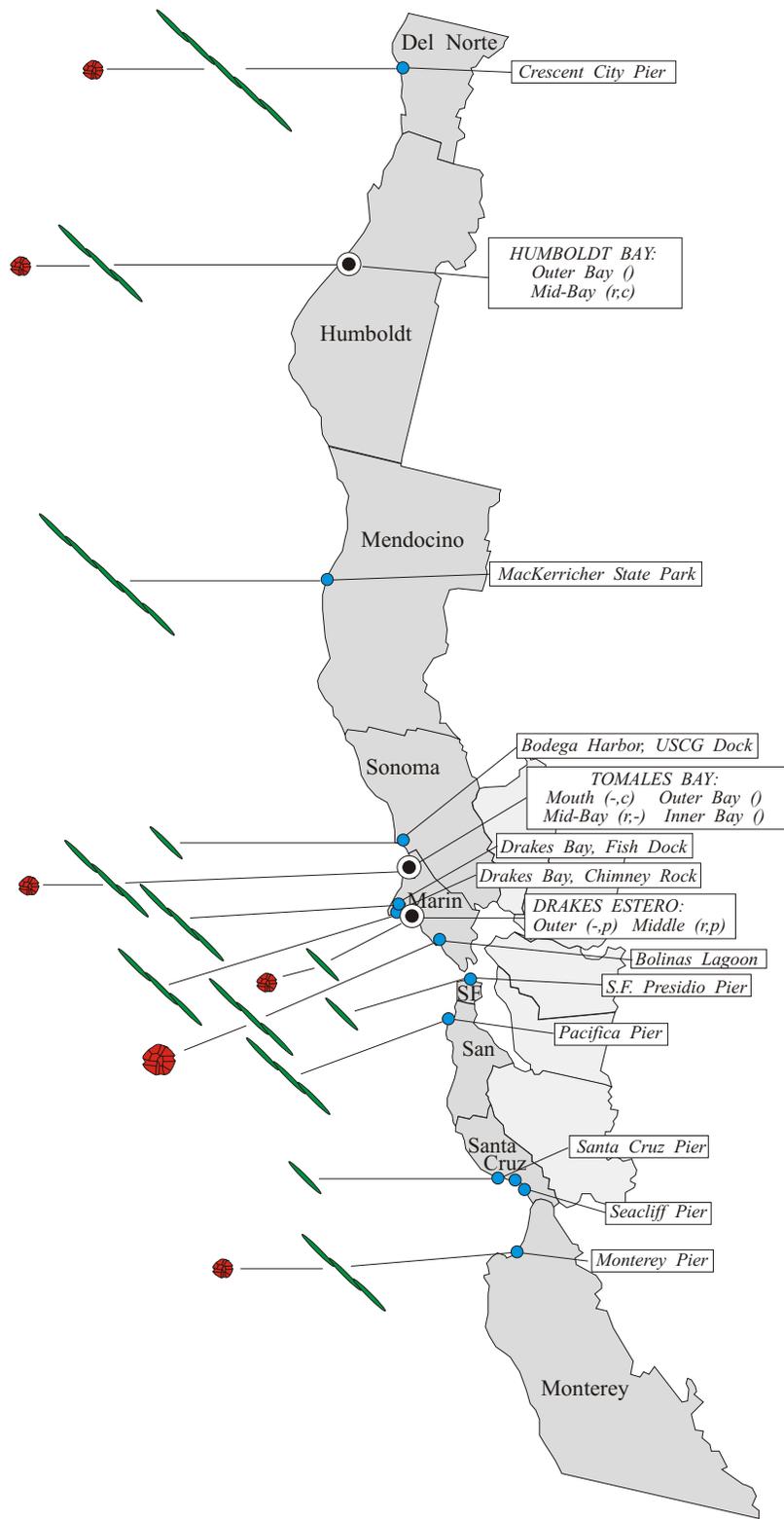
Alexandrium Species	Pseudo-nitzschia Species
 Rare (less than 1%)	 Present (less than 10%)
 Present (between 1% and 10%)	 Common (between 10% and 50%)
 Common (between 10% and 50%)	 Abundant (greater than 50%)
 Abundant (greater than 50%)	

#### 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, 2004.



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dinoflagellate species were observed at sites in San Luis Obispo and Santa Barbara counties. *Alexandrium* was also observed in samples collected offshore of the Palos Verdes peninsula (Los Angeles County) and Catalina Island. The higher numbers of *Alexandrium* observed in San Diego Bay in May were absent in June.

PSP toxins were detected in only one sample from the Southern California coast in June. Mussels collected on June 29 from Avila (San Luis Obispo County) were found to contain 79 ug of PSP toxins (Figure 3).

**Domoic Acid**

*Pseudo-nitzschia* distribution and relative abundance declined along the entire Southern California coast during June (Figure 1). The high relative abundances of *Pseudo-nitzschia* observed in May between San Luis Obispo and Los Angeles counties declined dramatically by the beginning of June.

Domoic acid was not detected in any shellfish sample collected along the Southern California coast in June.

**Non-toxic Species**

The San Luis Obispo coast was dominated by diatoms, in particular *Thalassiosira*. South

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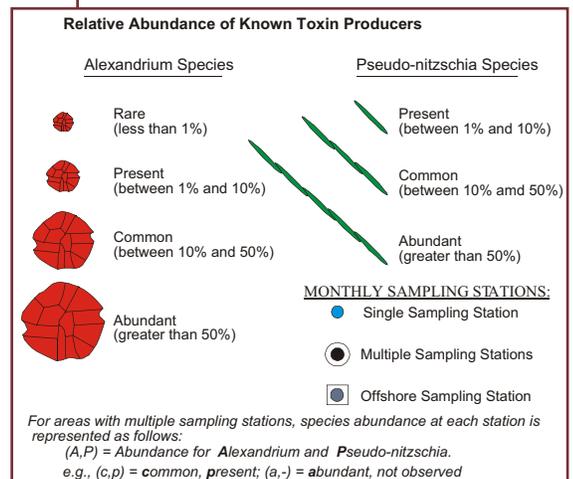
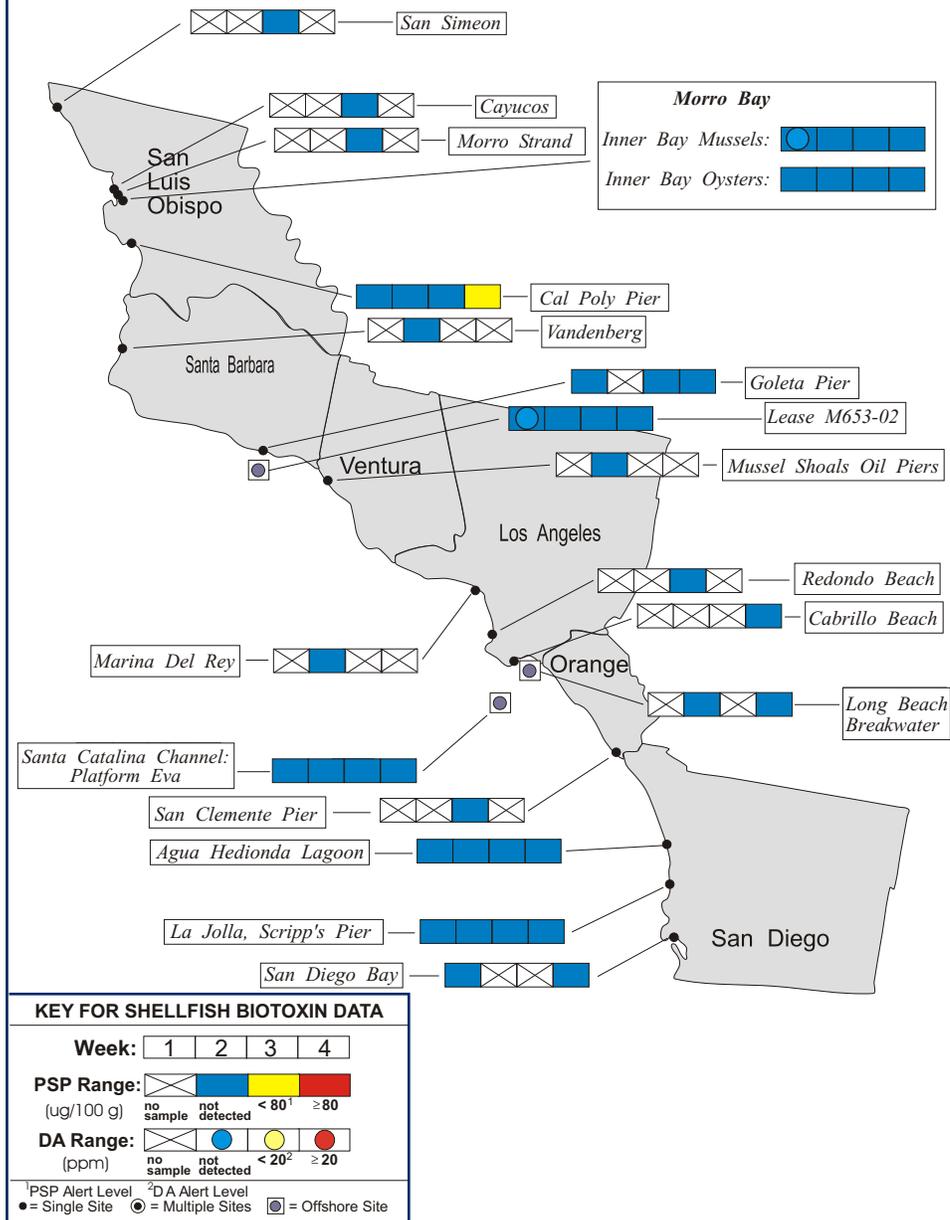


Figure 3. Distribution of shellfish biotoxins in Southern California during June, 2004.



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of Point Conception the coastal waters were dominated by an assemblage of dinoflagellates, including *Prorocentrum*, *Protoperidinium*, *Lingulodinium*, and *Ceratium*.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* distribution increased along the entire Northern California coastline in June (Figure 2). The greatest increase in relative abundance of this dinoflagellate was observed along the Marin coast towards the end of June.

The low levels of PSP toxins detected in sentinel mussels inside Humboldt Bay at the end of May continued throughout June (Figure 4). Low levels of these toxins were also detected at other sites along the northern Humboldt coast and farther south at sites in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey counties. Elevated levels of PSP toxins were detected in shellfish from sites in Marin (129 ug) and Santa Cruz (81 ug) during the last week in June.

**Domoic Acid**

*Pseudo-nitzschia* distribution and relative abundance were similar to

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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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observations in May, with increases at some locations and decreased numbers at others (Figure 2). The greatest relative abundances of this diatom were observed at Crescent City (Del Norte County) and, to a lesser extent, inside Humboldt Bay. These high densities decreased throughout the month.

The elevated level of domoic acid (33 ppm) detected in razor clams from Del Norte County in May continued to increase in June (Figure 4). Clams dug on June 5 contained toxin concentrations ranging from 43 ppm to 83 ppm. Razor clams collected from Clam Beach (Humboldt County) had very high concentrations of domoic acid, ranging from 120 ppm to 170 ppm. Several samples of cleaned (eviscerated) razor clams from this site were donated for testing. The resulting concentrations of domoic acid in the meat ranged from 130 ppm to 170 ppm. A razor clam sample collected from this site during the last week of June contained 78 ppm of domoic acid. The latter result was still well above the alert level of 20 ppm but indicative of a possible downward trend that was consistent with the phytoplankton observations for this region.

**Non-toxic Species**

The Northern California coastline was dominated by diatoms throughout June, with *Skeletonema* and *Coscinodiscus* the most abundant non-toxic species observed.



Figure 4. Distribution of shellfish biotoxins in Northern California during June, 2004.

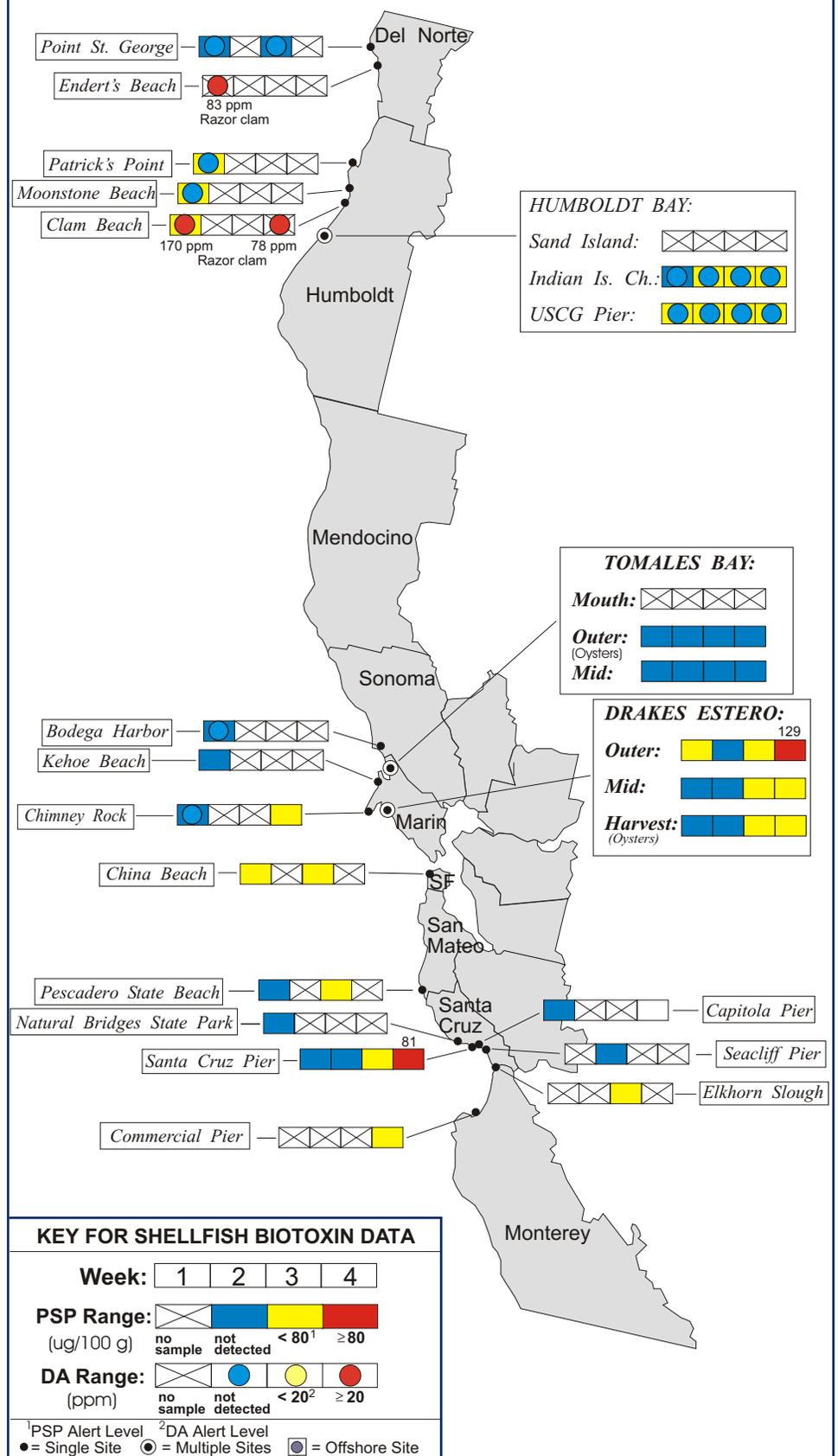


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during June, 2004.

COUNTY	AGENCY	# SAMPLES
<b>Del Norte</b>	Del Norte County Health Department	2
	Sea Grant Extension Program	3
<b>Humboldt</b>	Coast Seafood Company	10
	Humboldt County Environmental Health Department	2
	California Department of Fish and Game	7
<b>Mendocino</b>	None Submitted	
<b>Sonoma</b>	CDHS Marine Biotoxin Monitoring Program	1
<b>Marin</b>	Hog Island Oyster Company	4
	Johnson Oyster Company	29
	Marin Oyster Company	2
	Cove Mussel Company	5
	CDHS Marine Biotoxin Program Volunteer (Marjorie Siegal)	1
	CDHS Marine Biotoxin Monitoring Program	2
<b>San Francisco</b>	San Francisco County Health Department	2
<b>San Mateo</b>	San Mateo County Environmental Health Department	2
<b>Santa Cruz</b>	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	3
<b>Monterey</b>	CDHS Marine Biotoxin Program Volunteer (Art Seavey)	1
	California Department of Fish and Game	4
<b>San Luis Obispo</b>	Williams Shellfish Company	8
	U.C. Santa Barbara Marine Science Institute	5
	California Department of Fish and Game	4
<b>Santa Barbara</b>	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara Marine Science Institute	5
	Vanderberg Air Force Base	1
<b>Ventura</b>	Ventura County Environmental Health Department	1
<b>Los Angeles</b>	Los Angeles County Health Department	3
	Aquarium of the Pacific Long Beach	4
<b>Orange</b>	CDHS Marine Biotoxin Program Volunteer (Mike Femessey)	1
	Ecomar, Inc.	4
<b>San Diego</b>	Carlsbad Aquafarms, Inc.	5
	Scripps Institute of Oceanography	5
	U.S. Navy	2

### QUARANTINES:

On June 10 the State Health Director issued a health advisory for Humboldt and Del Norte counties, warning consumers to avoid eating sport-harvested shellfish from this area. This advisory was the result of dangerous levels of domoic acid in razor clams collected from this region.

The annual quarantine on the sport-harvesting of mussels went into effect on April 23, one week ahead of the normal May 1 start date. This action was taken as a result of elevated levels of domoic acid in Santa Cruz County and, subsequently, along the Santa Barbara coast.

The annual mussel quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. This quarantine does not affect the commercial shellfish growing areas in California. All commercial shellfish growers certified by the State of California are required to submit routine samples for biotoxin analysis, allowing us to closely monitor for the occurrence of any toxin. Harvesting closures are imposed if toxin levels reach the federal alert level.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera).

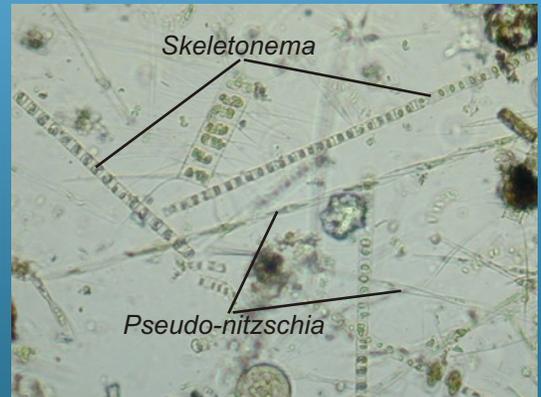
Contact the "Biotoxin Information Line" at 1-800-553-4133 or (510) 412-4643 for a current update on marine biotoxin activity.



Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during June, 2004.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
Mendocino	DHS Volunteer (Rouyaishyana)	1
Sonoma	DHS Marine Biotoxin Monitoring Program	1
Marin	CDHS Volunteers (Brent Anderson, Richard Plant, Marjorie Siegel, Mary Von Tölkendorf, Cal Strobel)	15
	Johnson Oyster Company	14
	DHS Marine Biotoxin Monitoring Program	1
Contra Costa	None Submitted	
San Francisco	CDHS Volunteer (Eugenia Mcnaughton)	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	Santa Cruz Environmental Health Department	3
Monterey	CDHS Volunteer (Jerry Norbn)	2
San Luis Obispo	CDHS Volunteers (Reree and Auburn Atkins, Richard Welch)	2
	Morro Bay National Estuary Program	5
	Tenera Environmental	1
	U.C. Santa Barbara Marine Science Institute	5
	Morro Bay Natural History Museum	2
Santa Barbara	U.C. Santa Barbara Marine Science Institute	6
	Santa Barbara Mariculture Company	3
	California Department of Parks and Recreation	2
	Vanderberg Air Force Base	2
	Santa Barbara Channekeeper	1
Santa Barbara	Santa Barbara City College	2
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Catalina Tall Ships Expeditions	2
	Catalina Island Marine Institute	2
	Aquarium of the Pacific, Long Beach	2
	Los Angeles County Sanitation District	5
	Los Angeles County Health Department	2
Orange	Orange County Sanitation District	4
	Ocean Institute	1
San Diego	San Diego County Environmental Health Department	2
	CDHS Volunteer (Paul Sims)	4
	Scripps Institute of Oceanography	5

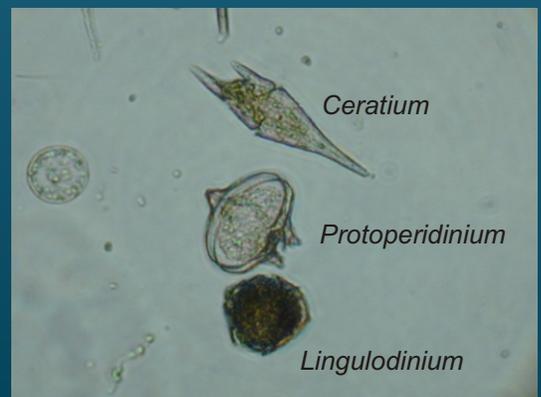
## PHYTOPLANKTON GALLERY



Diatoms dominated the north coast, with *Pseudo-nitzschia* and *Skeletonema* the most abundant during June.



The chain-forming diatom *Thalassiosira* was abundant along the San Luis Obispo coast.



Dinoflagellates dominated the coast south of Point Conception.