

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

March 2006

Technical Report No. 06-10

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of March, 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 along the entire Southern California coast during March (Figure 1). This dinoflagellate was observed at

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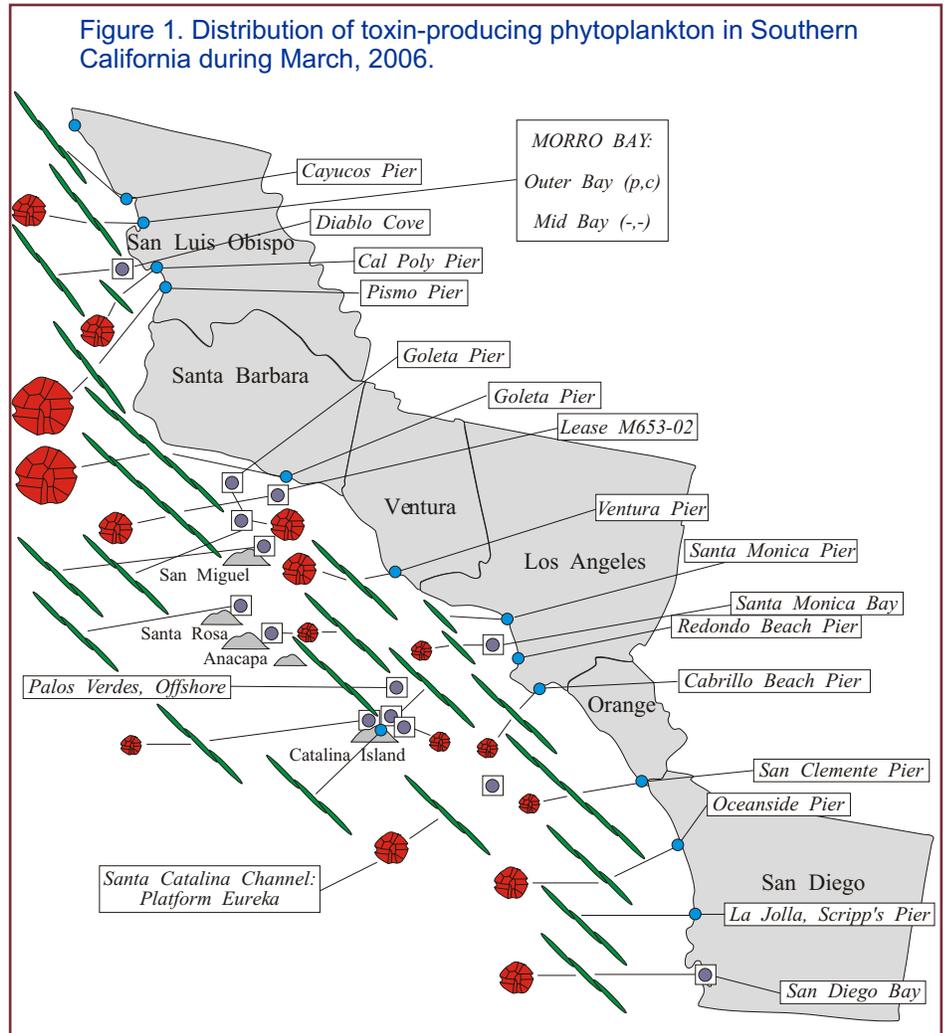


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during March, 2006.

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

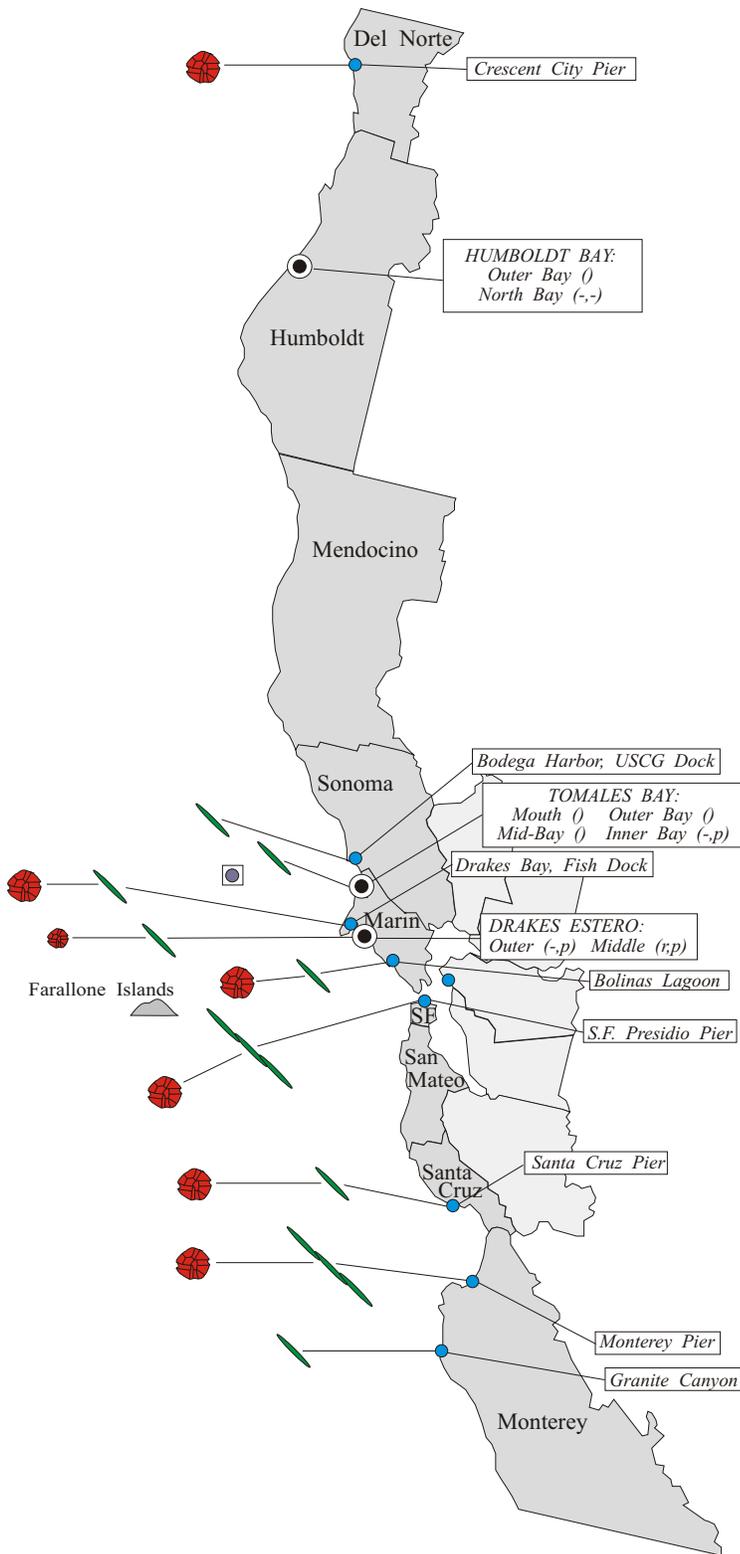
- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

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



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the beginning of the month at sites in San Luis Obispo and Santa Barbara. By mid month there were observations of *Alexandrium* near Catalina Island and inside San Diego Bay. By the last week of March *Alexandrium* was detected farther south as well, from Ventura through San Diego counties. The highest relative abundance was observed at Pismo Pier.

PSP toxins were detected along the entire Southern California coast (Figure 3). Low levels of PSP toxins were detected in the beginning of March at sites in San Luis Obispo County. By the third week of the month toxin concentrations had exceeded the alert level in San Luis Obispo and Santa Barbara counties, increasing through the end of the month. High concentrations of PSP toxins were detected in mussels from Redondo Beach by the last week of the month. In a rare occurrence, PSP toxins exceeded the alert level inside San Diego Bay on March 13 (112 ug).

Domoic Acid

Pseudo-nitzschia increased in distribution and relative abundance along the Southern California coast in March (Figure 1). This diatom was common along the coast of San Luis Obispo and Santa Barbara from the

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Relative Abundance of Known Toxin Producers

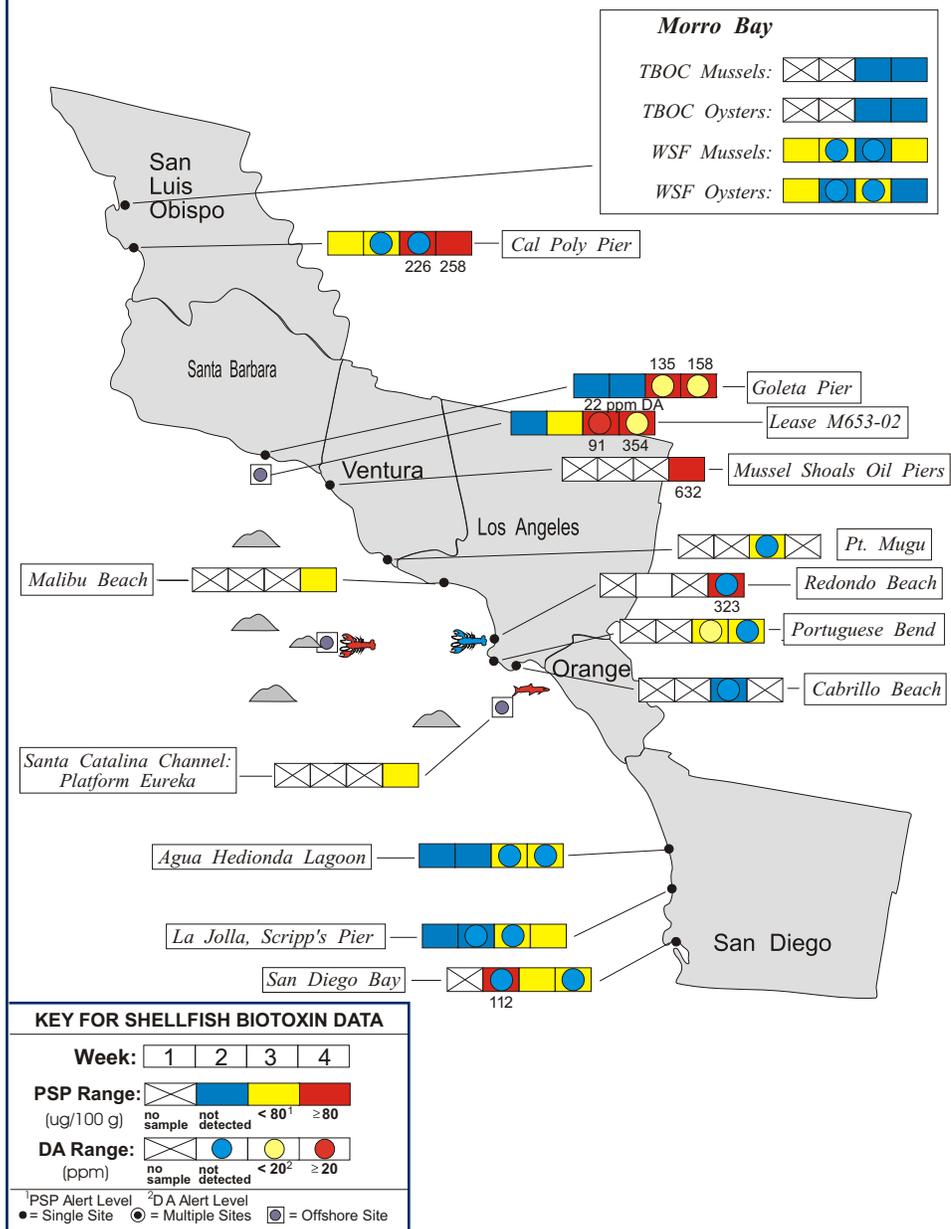
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (between 1% and 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 March, 2006.



(Continued from Page 2)

beginning of the month, and increased in relative abundance throughout the month. *Pseudo-nitzschia* was also common at a number of sites farther south, peaking in relative abundance by mid-month. The highest relative abundances, in decreasing order, were observed at the following locations: offshore of Palos Verdes (March 7), Oceanside (March 8), inside San Diego Bay (March 21), inside Morro Bay (March 30), offshore of Ventura (March 21), offshore of Santa Barbara (March 17), San Clemente Pier (March 15), and at Cabrillo Beach Pier (March 22).

Domoic acid was detected in shellfish samples by the third week of March (Figure 3). Alert levels of this toxin were detected in mussels from Santa Barbara, lobster viscera from the Channel Islands, and sardine viscera from the Los Angeles - Orange County region.

Non-toxic Species

The Southern California coast contained a mix of dinoflagellate and diatoms species, with the latter group more abundant in most areas. *Chaetoceros* was by far the dominant diatom genus along the coast. Common dinoflagellate species included *Prorocentrum* and, to a lesser extent,

(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)

Gymnodinium.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at numerous locations along the Northern California coast during March (Figure 2). The distribution and relative abundance of this dinoflagellate were similar to observations in February.

The elevated levels of the PSP toxins detected in Drakes Estero (Marin County) at the end of February continued through the first week of March. By the second week of the month toxin levels increased above the alert level in mussels from Santa Cruz Pier.

Domoic Acid

Low numbers of *Pseudo-nitzschia* were observed at several sampling stations between Marin and Santa Cruz counties in March (Figure 2).

Non-toxic Species

Continued winter storms produce more detritus than phytoplankton in March. Diatoms (*Chaetoceros*, *Skeletonema*, *Thalassiosira*) were common to abundant along the Northern California coast.

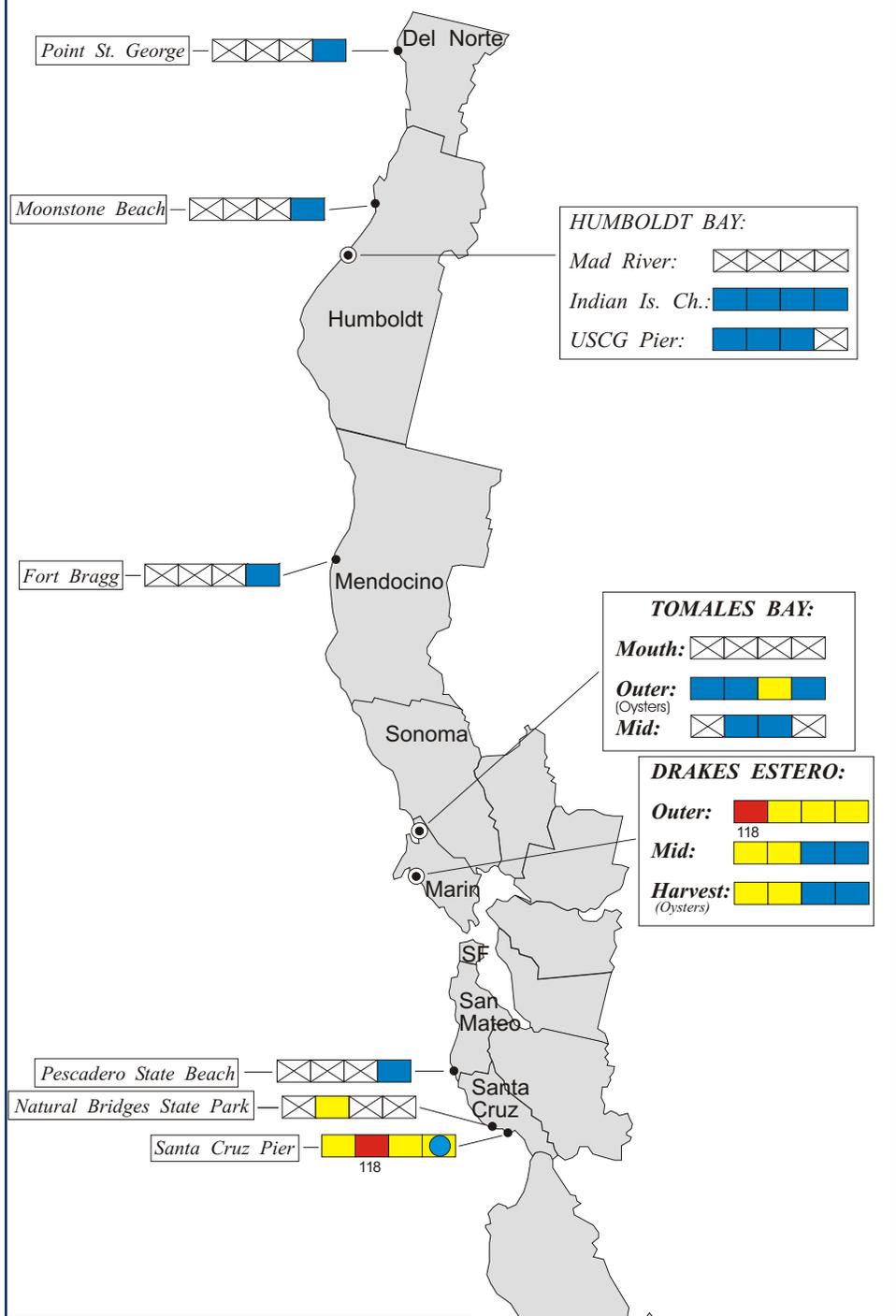


QUARANTINES:

On March 24 a health advisory was issued warning consumers not to eat sport-harvested species of bivalve shellfish, sardines and anchovies, or the viscera of sport-harvested or commercially sold lobster or crab taken

(Continued on Page 5)

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



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: (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 March, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	7
	Humboldt County Environmental Health Department	1
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	2
	Hog Island Oyster Company	5
	Drakes Bay Oyster Company	28
	Marin Oyster Company	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
	California Polytechnic State University	4
	Tomales Bay Oyster Company	4
Santa Barbara	Santa Barbara Mariculture Company	7
	U.C. Santa Barbara	4
Ventura	Naval Air Station, Pt. Mugu	1
	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	6
Orange	Aquarium of the Pacific, Long Beach	1
San Diego	Carlsbad Aquafarms, Inc.	5
	U.S. Navy Marine Mammal Program	3
	Scripps Institute of Oceanography	5

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from the coast of San Diego, Los Angeles, Orange, Ventura, Santa Barbara and San Luis Obispo counties.

The annual quarantine on the sport-harvesting of mussels was scheduled to go in 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. 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 March, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	DHS Volunteer (Cathleen Cannon)	1
Marin	DHS Volunteers (Brent Anderson, Mary Von Tolksdorf, Cal Strobel)	6
	Drakes Bay Oyster Company	10
Contra Costa	DHS Marine Biotoxin Monitoring Program	2
San Francisco	DHS Volunteer (Eugenia McNaughton)	2
	Gulf of the Farallones National Marine Sanctuary	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	DHS Volunteer (Jerry Norton)	1
	Monterey Abalone Company	2
	Marine Pollution Studies Laboratory	2
San Luis Obispo	Morro Bay National Estuary Program	3
	DHS Volunteers (Renee and Auburn Atkins)	2
	California Polytechnic State University	4
	Monterey Bay National Marine Sanctuary	1
	Tenera Environmental	2
Santa Barbara	U.C. Santa Barbara	5
	Santa Barbara Mariculture Company	3
	Channel Islands National Marine Sanctuary	4
	National Park Service	3
	The Marine Mammal Center	2
Ventura	DHS Volunteer (Fred Burgess)	3
	Channel Islands National Marine Sanctuary	2
	National Park Service	2
Los Angeles	Los Angeles County Sanitation District	4
	Catalina Island Marine Institute	1
	Catalina Tall Ships Expeditions	7
	Los Angeles County Health Department	8
Orange	Aquarium of the Pacific Long Beach	1
	DHS Volunteer (Debbie Karimoto, Jeff Kermode)	2
San Diego	Scripps Institute of Oceanography	4
	DHS Volunteer (Paul Sims, Jeff Kermode, Randy Dick)	9

PHYTOPLANKTON GALLERY



Despite continued winter storms, the diatom Chaetoceros was common along most of the California coast.



The PSP toxin-producing dinoflagellate Alexandrium was common along much of the Southern California coast.



Pseudo-nitzschia was abundant along much of the Southern California coast.