

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

October 2004

Technical Report No. 04-24

INTRODUCTION:

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

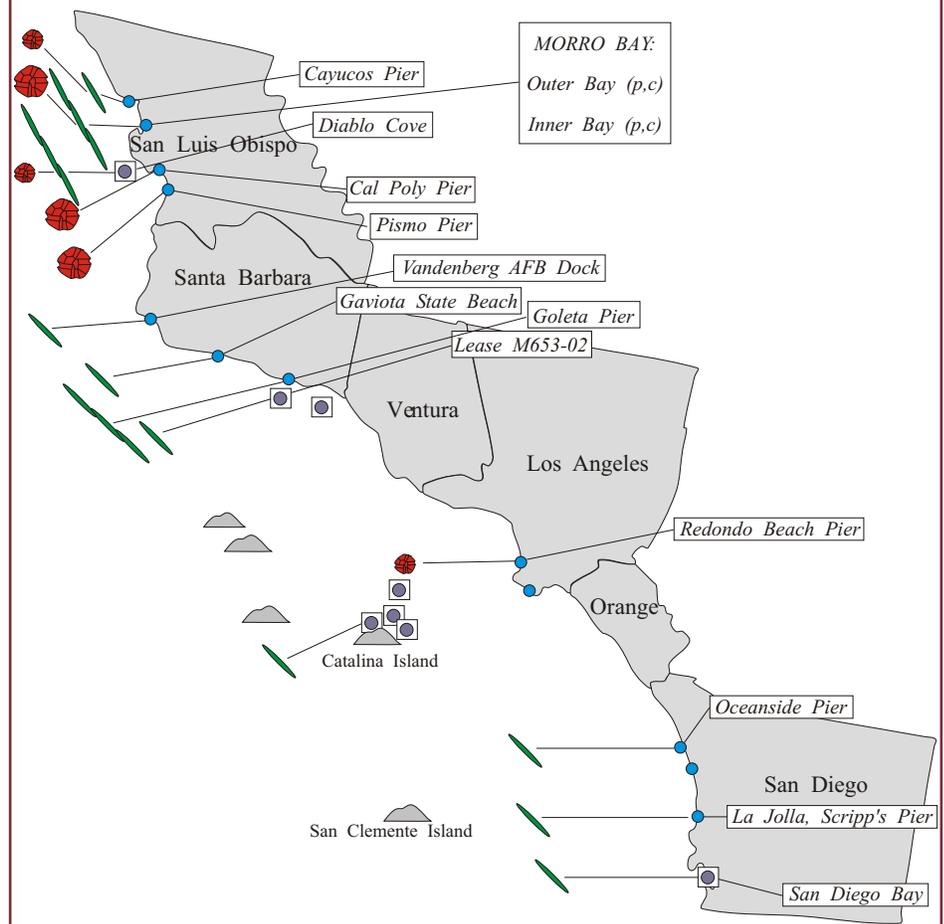
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium distribution and relative abundance increased along the San Luis Obispo coast in October (Figure 1). This

(Continued on Page 2)

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



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

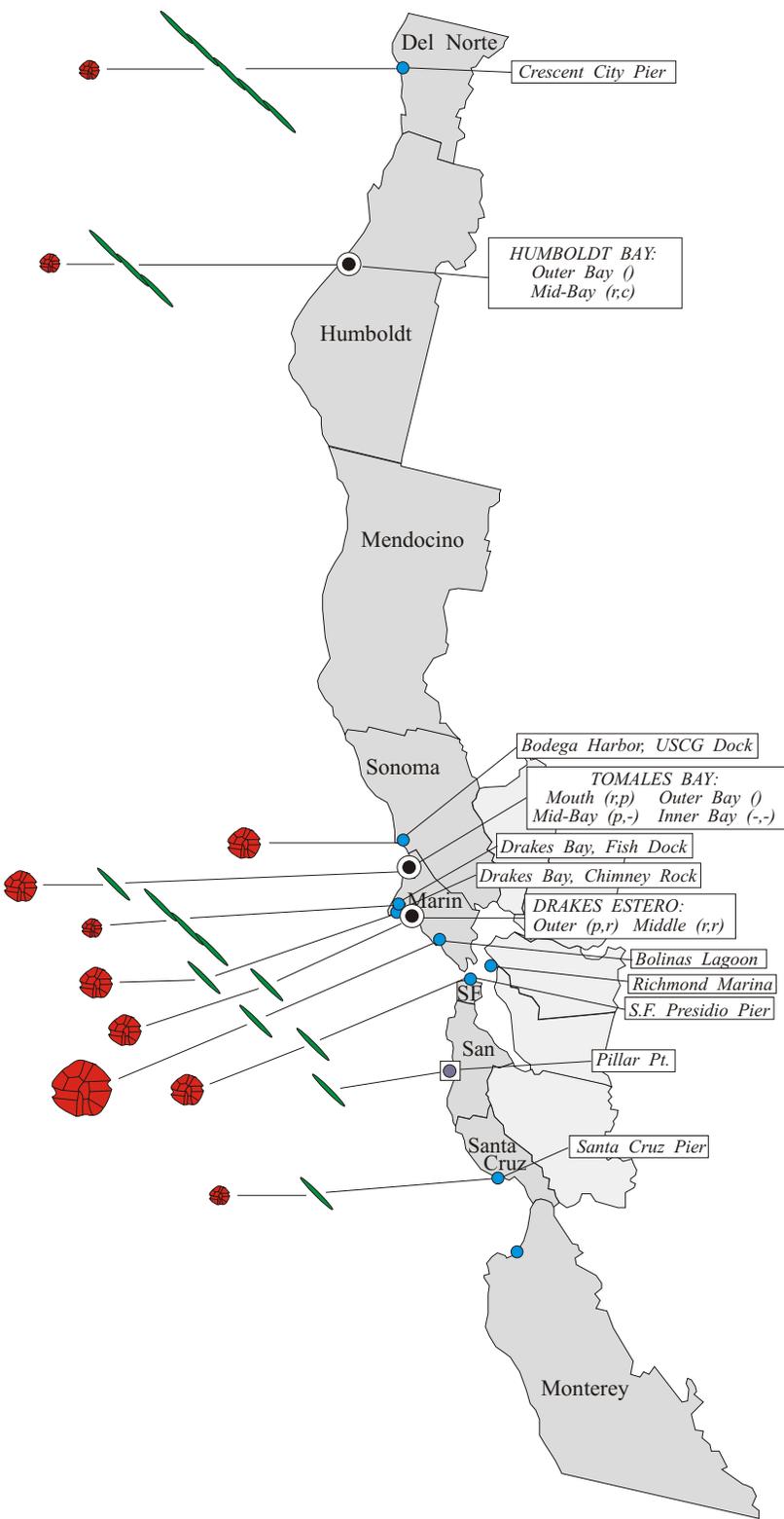
- Present (less than 10%)
- Common (between 10% and 50%)
- Abundant (greater than 50%)

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 October, 2004.



(Continued from Page 1)

dinoflagellate was common inside Morro Bay and farther south at Avila and Pismo. Cell densities were low however.

Low concentrations of PSP toxins continued to be detected inside Morro Bay and at Vandenberg (Figure 3). A low level of this toxin was also detected in mussels from Goleta Pier.

Domoic Acid

Pseudo-nitzschia was observed along the entire Southern California coast in October (Figure 1). The relative abundance was lower in most locations than observed in September. This diatom did increase in numbers along the San Luis Obispo coast however.

Non-toxic Species

The Southern California coast was dominated by a variety of dinoflagellates throughout October. *Cochlodinium* was abundant offshore of Diablo Canyon and farther south at Pismo Pier. *Prorocentrum micans* and *Gymnodinium sanguineum* were also abundant in this region.

Lingulodinium polyedrum was abundant along the coast from Santa Barbara through San Diego, along with a mix of other dinoflagellates (*Ceratium*, *Prorocentrum*, and *Protoperdinium*).

(Continued on Page 3)

Relative Abundance of Known Toxin Producers

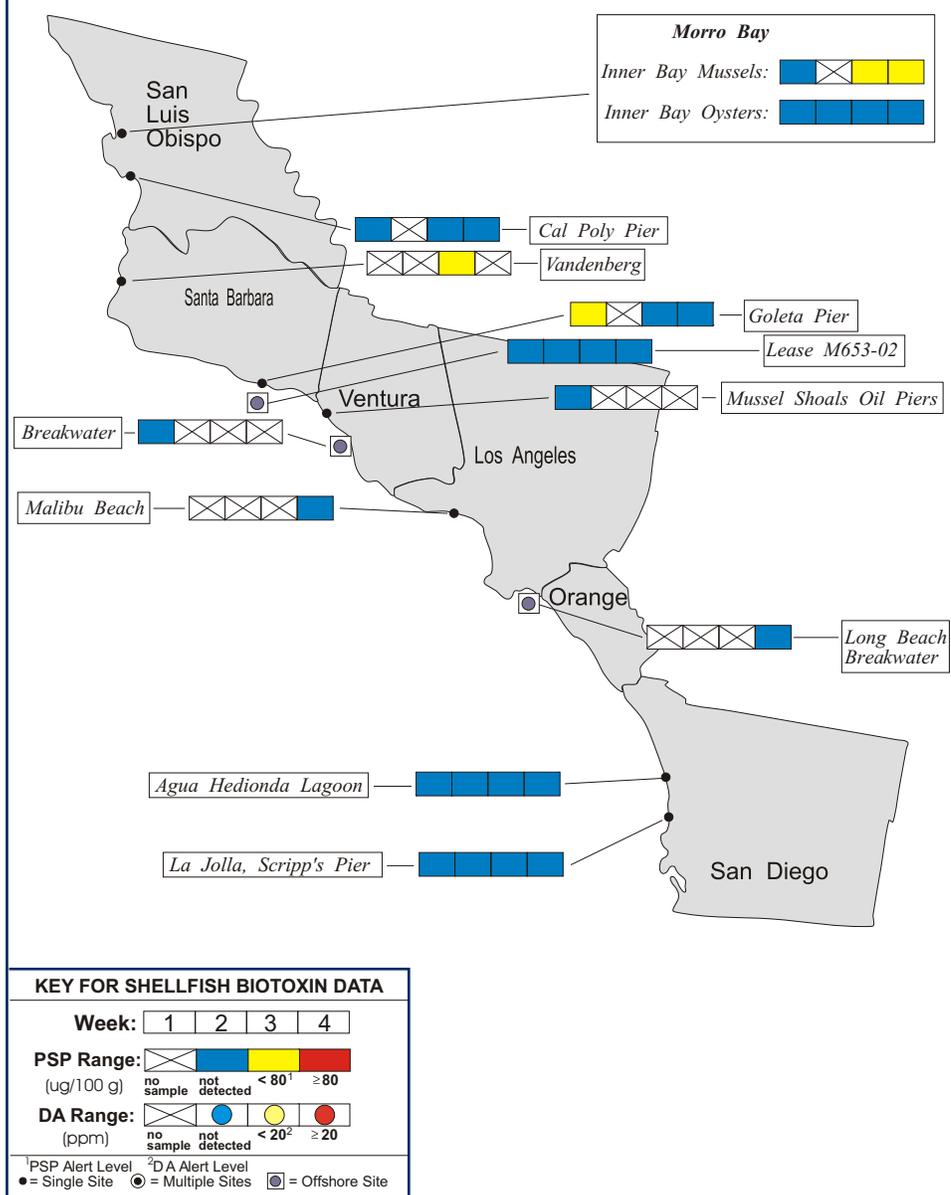
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (between 1% and 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 October, 2004.



(Continued from Page 2)

Bacteriastrium was abundant at sampling sites in Redondo Beach and Cabrillo (Los Angeles County).

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed along most of the Northern California coastline in October (Figure 2). There was a significant increase in the relative abundance of *Alexandrium* at several locations between Marin and Santa Cruz counties. The highest relative abundance of this dinoflagellate was observed in Bolinas Lagoon (Marin County). Cell densities were relatively low however.

PSP toxins were detected at several locations along the Northern California coast in October. The distribution of PSP toxicity in shellfish mirrored the distribution of *Alexandrium* (Figure 4). The low level of PSP toxins detected in Drakes Estero during the last week of September persisted through October. By the third week of the month the concentration of toxin had increased above the alert level, but declined to safe levels by the following week.

Domoic Acid

Pseudo-nitzschia was observed along most of the Northern California coast in October

(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)

(Figure 2). The relative abundance remained high in Crescent City (Del Norte County) throughout the month. Shellfish samples from Del Norte and Mendocino counties did not contain detectable levels of domoic acid.

Non-toxic Species

A mix of diatoms and dinoflagellates populated the coastal waters of Northern California in October. Common diatoms included *Skeletonema*, *Chaetoceros*, *Ditylum*, and *Melosira*. Dinoflagellates that were most common included *Gymnodinium sanguineum*, which was abundant at sites in Monterey and Santa Cruz, and *Cochlodinium*, *Prorocentrum*, and *Ceratium*.



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

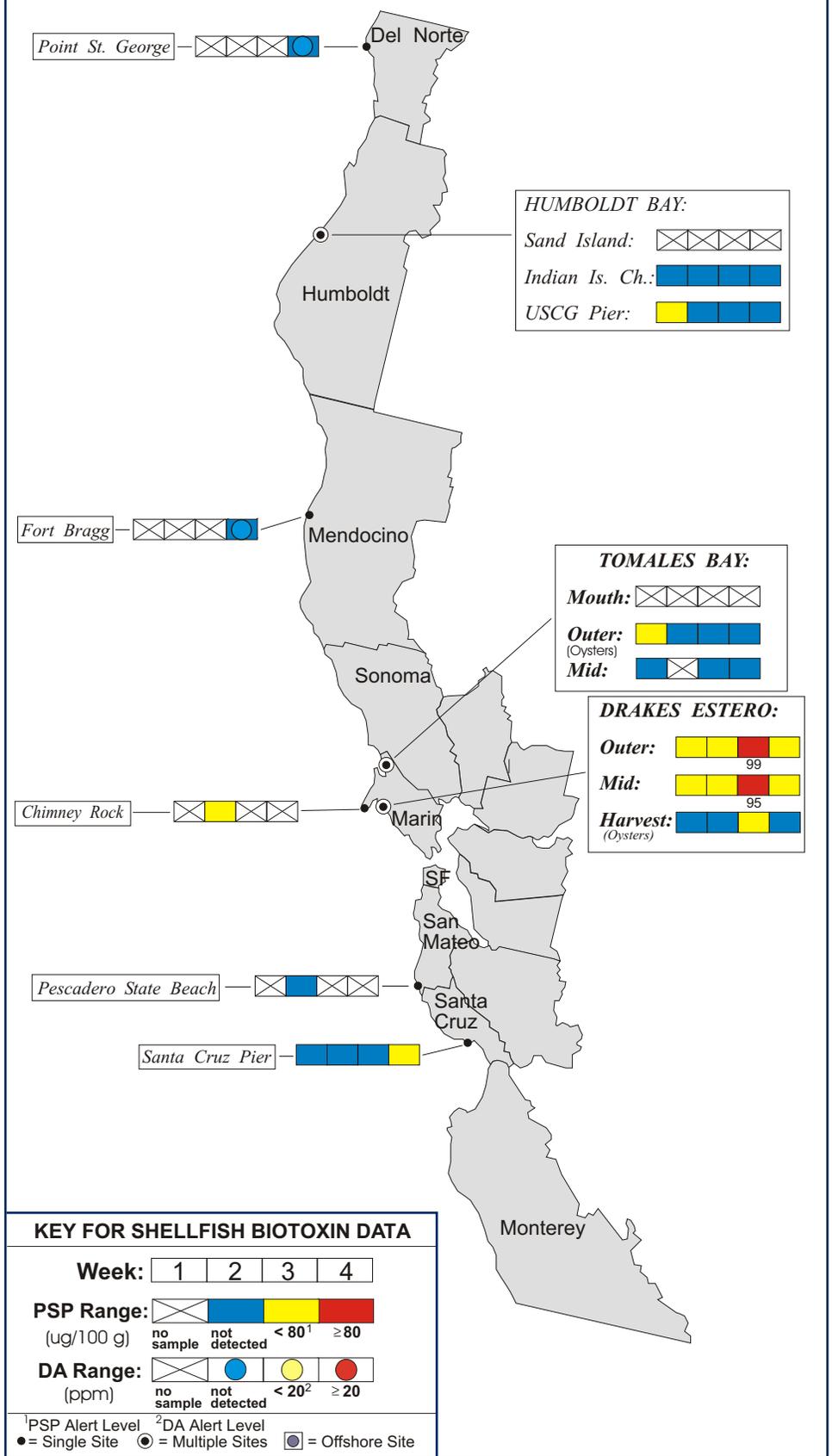


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during October, 2004.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	DHS Marine Biotoxin Monitoring Program	1
	Hog Island Oyster Company	4
	Johnson Oyster Company	26
	Marin Oyster Company	4
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	9
	U.C. Santa Barbara Marine Science Institute	3
Santa Barbara	Santa Barbara Mariculture Company	6
	U.C. Santa Barbara Marine Science Institute	3
	Vanderberg Air Force Base	1
Ventura	DHS Volunteer (Bill Weinerth)	2
Los Angeles	Los Angeles County Health Department	1
	Aquarium of the Pacific Long Beach	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	Scripps Institute of Oceanography	4

QUARANTINES:

The health advisory issued by the State Health Director on June 10 remained in effect. This advisory warned consumers to avoid eating sport-harvested shellfish from Humboldt and Del Norte counties and was the result of dangerous levels of domoic acid in razor clams collected from this region. The increase in relative abundance of *Pseudo-nitzschia* in September and October reinforced the continued need for the advisory.

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).

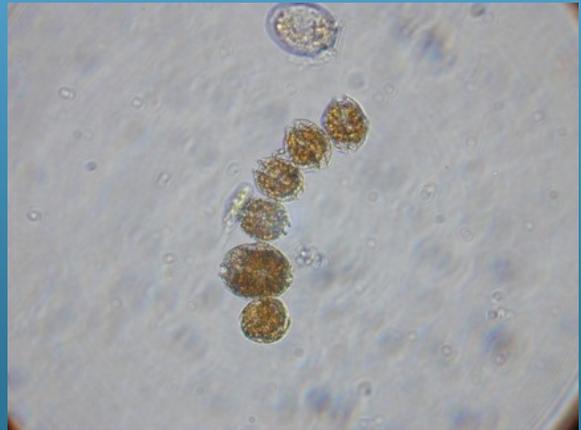
Contact the "Biotoxin Information Line" at 1-800-553-4133 or (510) 412-4643 for a current update on marine biotoxin activity.



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

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	DHS Volunteer (Cathleen Cannon)	1
Marin	CDHS Volunteers (Brent Anderson, Richard Plant, Marjorie Siegal, Mary Von Tölkendorf)	9
	DHS Marine Biotoxin Monitoring Program	3
	Johnson Oyster Company	8
Contra Costa	DHS Marine Biotoxin Monitoring Program	1
San Francisco	CDHS Volunteer (Eugenia McNaughton)	3
San Mateo	CDHS Volunteer (Sandy Emerson)	1
Santa Cruz	Santa Cruz Environmental Health Department	3
	U.C. Santa Cruz	2
Monterey	CDHS Volunteer (Jerry Norton)	1
San Luis Obispo	CDHS Volunteers (Renee and Auburn Atkins)	5
	Morro Bay National Estuary Program	6
	Tenera Environmental	2
	U.C. Santa Barbara Marine Science Institute	4
	Morro Bay Natural History Museum	2
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
	Santa Barbara Mariculture Company	3
	Vanderberg Air Force Base	2
	Santa Barbara Channel Keeper	1
	California Department of Parks and Recreation	1
Ventura	None Submitted	
Los Angeles	Guided Discoveries (CTSE)	4
	Catalina Island Marine Institute	4
	Los Angeles County Sanitation District	3
	CDHS Volunteer (Richard Weaver)	2
	Aquarium of the Pacific Long Beach	1
Orange	None Submitted	
San Diego	CDHS Volunteer (Paul Sims, Jeff Kermodé)	4
	Scripps Institute of Oceanography	4

PHYTOPLANKTON GALLERY



Alexandrium, the PSP toxin producer, was common in Bolinas Lagoon.



The dinoflagellate *Dinophysis caudata* was observed in samples from Redondo Beach.



Although dinoflagellates dominated much of the coast in October, the diatom *Melosira* was common along the Marin shoreline.