

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

August 2003

Technical Report No. 03-19

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of August 2003. 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.

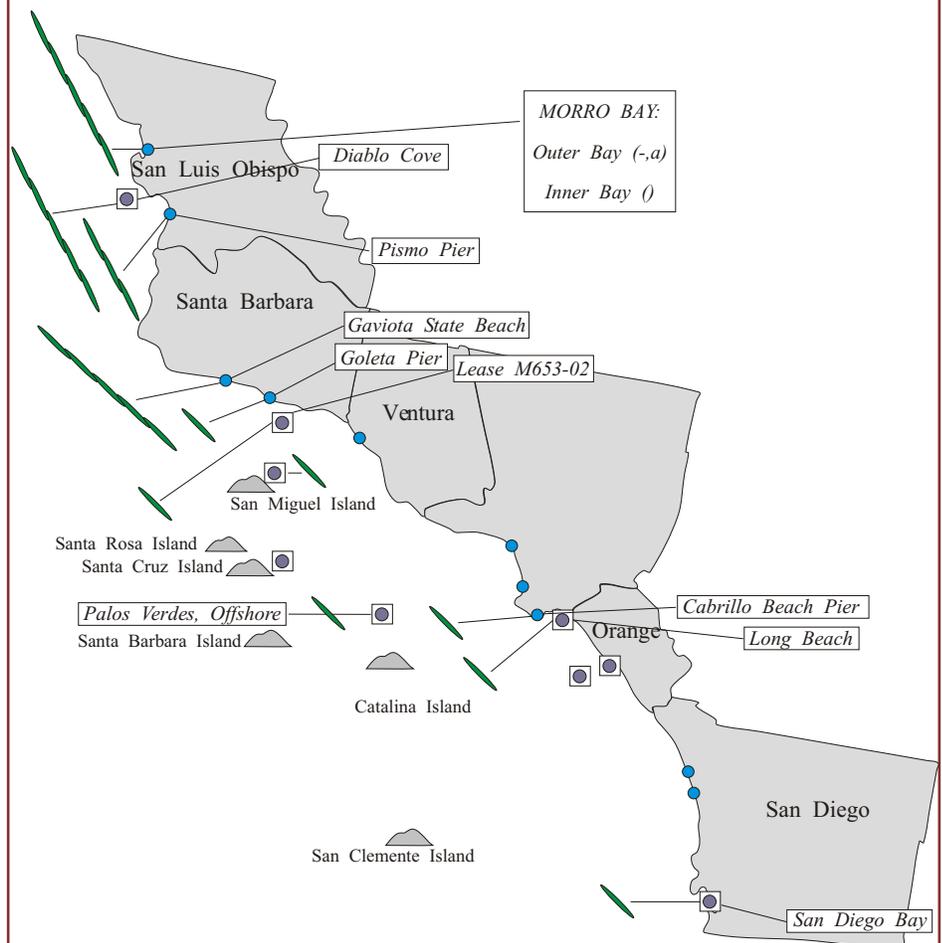
Southern California Summary:

Paralytic Shellfish Poisoning:

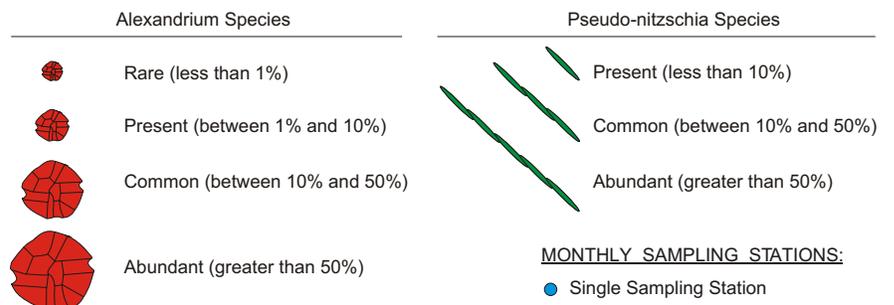
Alexandrium was not observed at any of the Southern California sites during August (Figure 1). PSP toxicity was not detected in

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during August, 2003.



Relative Abundance of Known Toxin Producers



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 August, 2003.

(Continued from Page 1)

any shellfish samples collected at sites along the Southern California coast throughout the month.

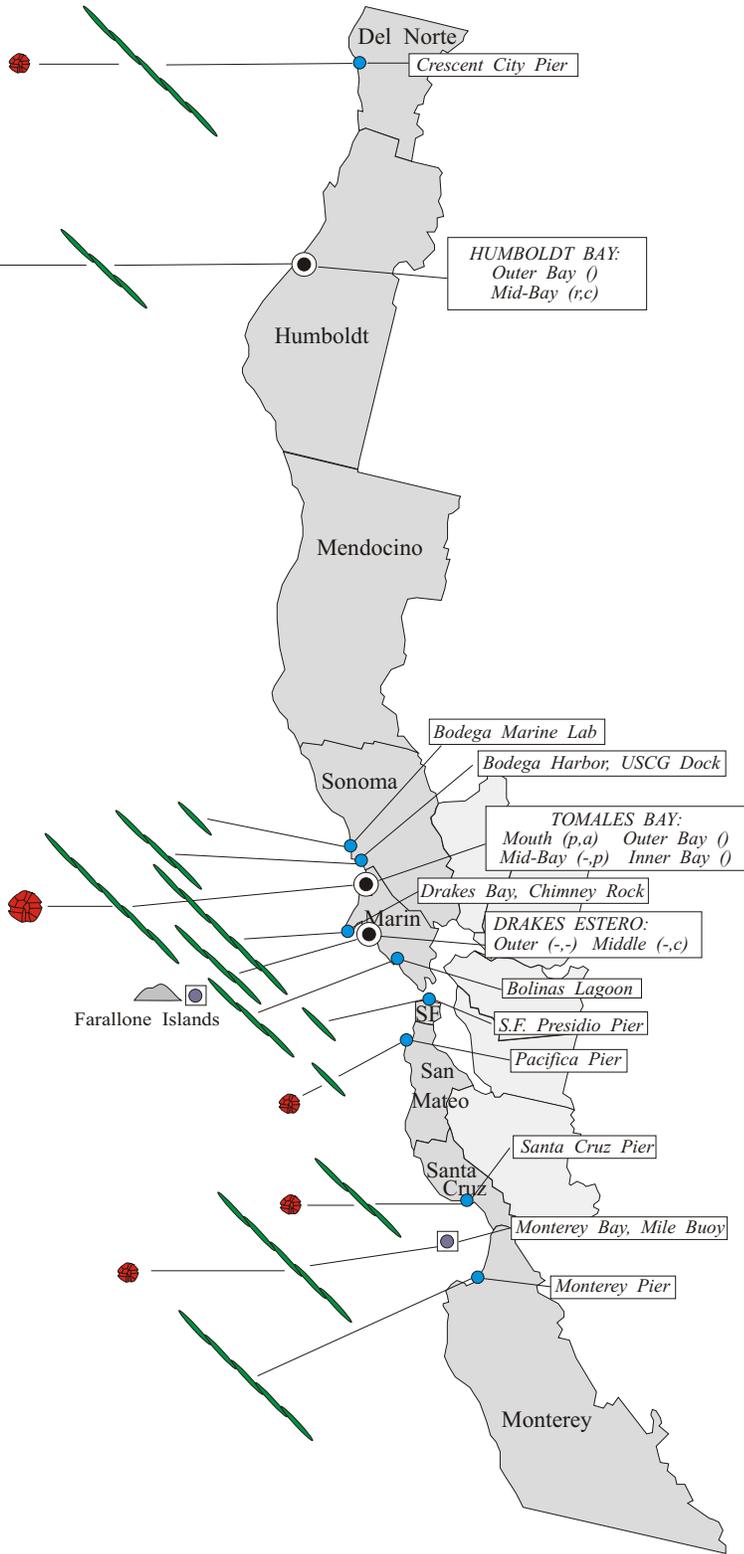
Domoic Acid:

The distribution and relative abundance of *Pseudo-nitzschia* remained similar to July's observations along most of the Southern California coast during August (Figure 1). High relative abundances of this toxin producing diatom continued to be observed along the San Luis Obispo coast at sites inside Morro Bay and offshore of Diablo Cove. The elevated numbers of *Pseudo-nitzschia* observed in July at several locations near the Channel Islands appeared to dissipate by August. There was also a notable increase of this diatom at Gaviota Pier (Santa Barbara County) by August 23.

Nontoxic Events:

Of the various nontoxic phytoplankton present in August, diatoms continued to be common along the San Luis Obispo coast. *Chaetoceros* and *Bacteriastrum* were most common in this region. Dinoflagellates began to dominate the assemblage from Santa Barbara through San Diego counties. *Ceratium*, *Prorocentrum* and

(Continued on Page 3)



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%)

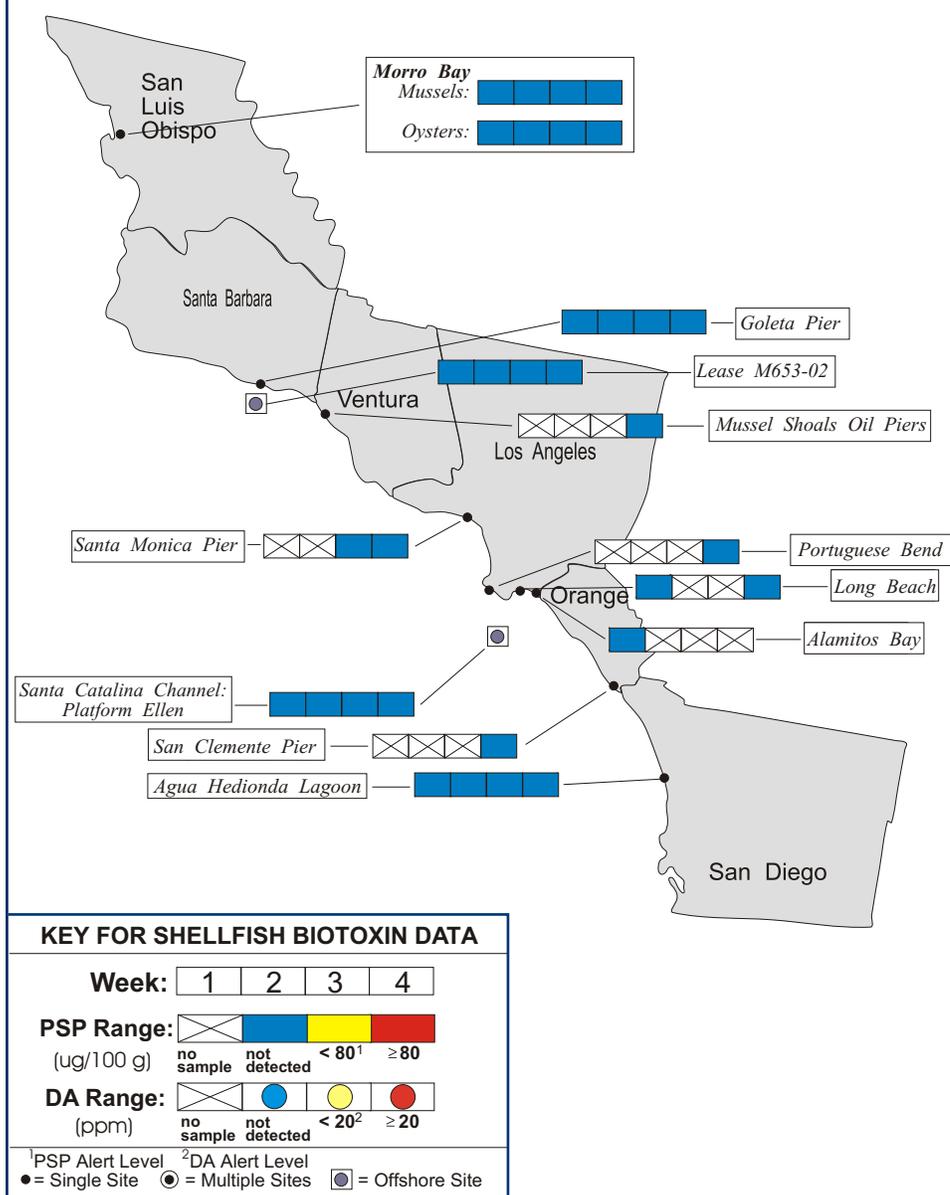
MONTHLY SAMPLING STATIONS:

- 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 August, 2003.



(Continued from Page 2)

Protoperdinium were common along the Santa Barbara coast in August, with *Lingulodinium polyedrum* increasing by the end of the month. *Ceratium furca* was common along the Los Angeles and San Diego coast, with *Lingulodinium polyedrum* becoming the most abundant dinoflagellate by the end of the month.

Northern California Summary:

Paralytic Shellfish Poisoning:

The small numbers of *Alexandrium* that were first observed in July continued to be detected in August (Figure 2). Low relative abundances of this dinoflagellate were detected at several locations between Del Norte and Monterey counties. *Alexandrium* was observed in Monterey Bay on August 8 in samples collected jointly by the Monterey Bay Aquarium Research Institute and U.C. Santa Cruz. By August 13 *Alexandrium* was present at the Santa Cruz Pier. The highest relative abundance of *Alexandrium* was observed at Lawson's Landing, just inside Tomales Bay, on August 18.

The low concentration of PSP toxins

(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)

detected in sentinel mussels from Humboldt Bay in July persisted throughout August. Low levels of these toxins were also detected near Trinidad (Humboldt County) and Fort Bragg (Mendocino County) by the second week of August (Figure 4). Low levels of PSP toxins were also detected at several Marin County sites, and at the Santa Cruz Pier, throughout the remainder of the month. By the last week in August the toxin concentrations increased above the federal alert level near Trinidad (81 ug on August 27) and Fort Bragg (120 ug on August 28).

Domoic Acid:

Pseudo-nitzschia was present along the entire Northern California coastline during August (Figure 2). The relative abundance and distribution of this diatom remained approximately the same as July's observations for sites in Humboldt and Del Norte counties. There was an increase in the relative abundance of *Pseudo-nitzschia* at sites in Sonoma, Marin, and Monterey counties. Despite this increase the cell mass was low in most areas and the relative abundance did not exceed 60 percent at the Marin locations where cell mass was slightly higher.

Nontoxic Events:

Diatoms continued to dominate the assemblage of phytoplankton species in samples collected by our volunteer network throughout August. *Chaetoceros* was common along the Northern California coast, with *Nitzschia*, *Coscinodiscus*, *Melosira*, and *Ditylum* also common at some sites.

Figure 4. Distribution of shellfish biotoxins in Northern California during August, 2003.

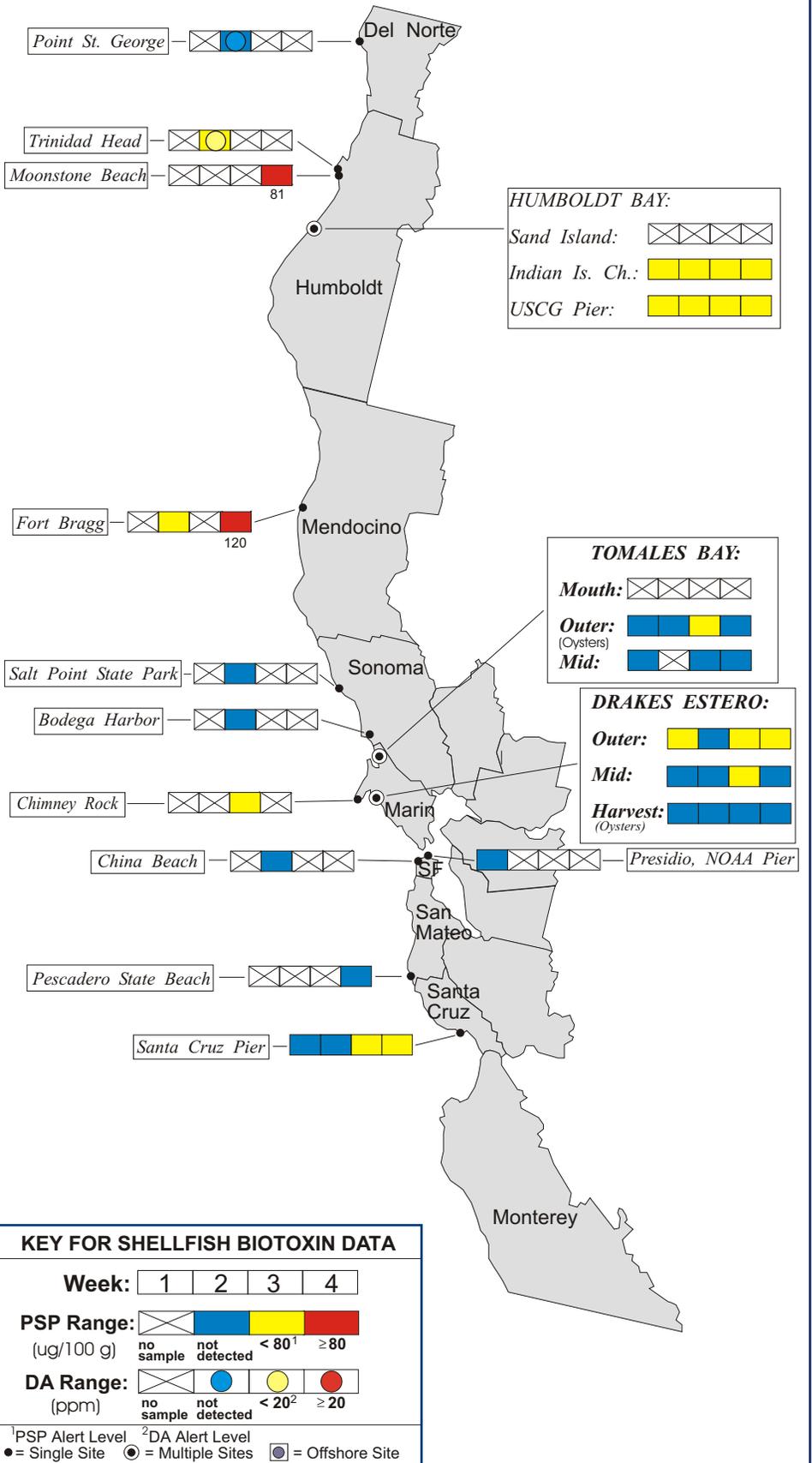


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during August, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	10
	Humboldt County Environmental Health Department	2
	Mendocino County Environmental Health Department	2
Mendocino	Mendocino County Environmental Health Department	2
Sonoma	Sonoma County Environmental Health Department	2
Marin	Cove Mussel Company	3
	Hog Island Oyster Company	4
	Johnson Oyster Company	16
	Marin Oyster Company	3
	CDHS Marine Biotoxin Program	2
San Francisco	San Francisco County Health Department	2
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	8
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
	Santa Barbara Mariculture Company	4
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	3
	Aquarium of the Pacific Long Beach	4
Orange	Ecomar, Inc.	4
	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4

QUARANTINES:

The annual quarantine on the sport-harvesting of mussels went into effect on May 1st and will continue through October 31st. This annual 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). Only the white meat of clams and scallops should be prepared for human consumption.

We recommend that persons engaged in the sport-harvesting of any bivalve shellfish (e.g., mussels, clams, scallops) contact the Department's "Shellfish Information Line" at 1-800-553-4133 or (510) 412-4643 for a current update on marine biotoxin activity.



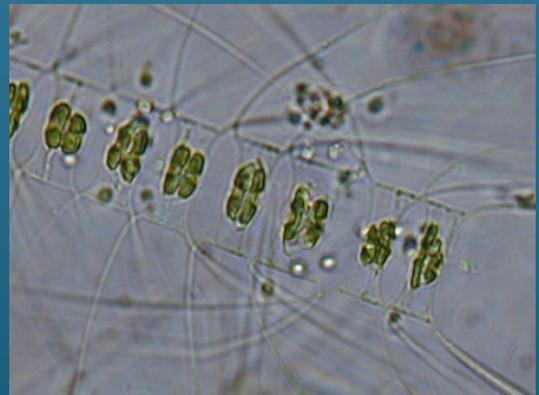
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during August, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	Bodega Marine Laboratory	1
	CDHS Volunteer (Cathleen Camon)	1
Marin	CDHS Volunteers (Brett Anderson, Cal Strobel, Richard Plant)	9
	Johnson Oyster Company	6
	CDHS Marine Biotxin Program	3
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugeria McNaughton)	2
	Gulf of the Farallones Marine Sanctuary	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	8
Monterey	CDHS Volunteer (Jerry Norbn)	3
San Luis Obispo	CDHS Volunteers (Rene and Auburn Atkins)	4
	Morro Bay National Estuary Program	4
	Tenera Environmental	2
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
	California Department of Parks and Recreation	3
	Santa Barbara Mariculture Company	4
	Catalina Tall Ships Expedition	1
Ventura	Catalina Tall Ships Expedition	1
Los Angeles	Los Angeles County Sanitation District	5
	Los Angeles County Health Department	2
	Los Angeles Regional Water Quality Control Board	1
	Aquarium of the Pacific Long Beach	5
Orange	Orange County Sanitation District	4
San Diego	San Diego County Environmental Health Department	1
	CDHS Volunteer (Paul Sims, Randy Dick)	6

PHYTOPLANKTON GALLERY



Pseudo-nitzschia was abundant at several locations along the California coast during August.



The diatom *Chaetoceros* remained common along the Northern California coast.



Dinoflagellates gradually replaced diatoms along most of the Southern California coast by August, with *Ceratium* one of several common genera present.