

# 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 2005

Technical Report No. 05-21

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of August 2005. 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.

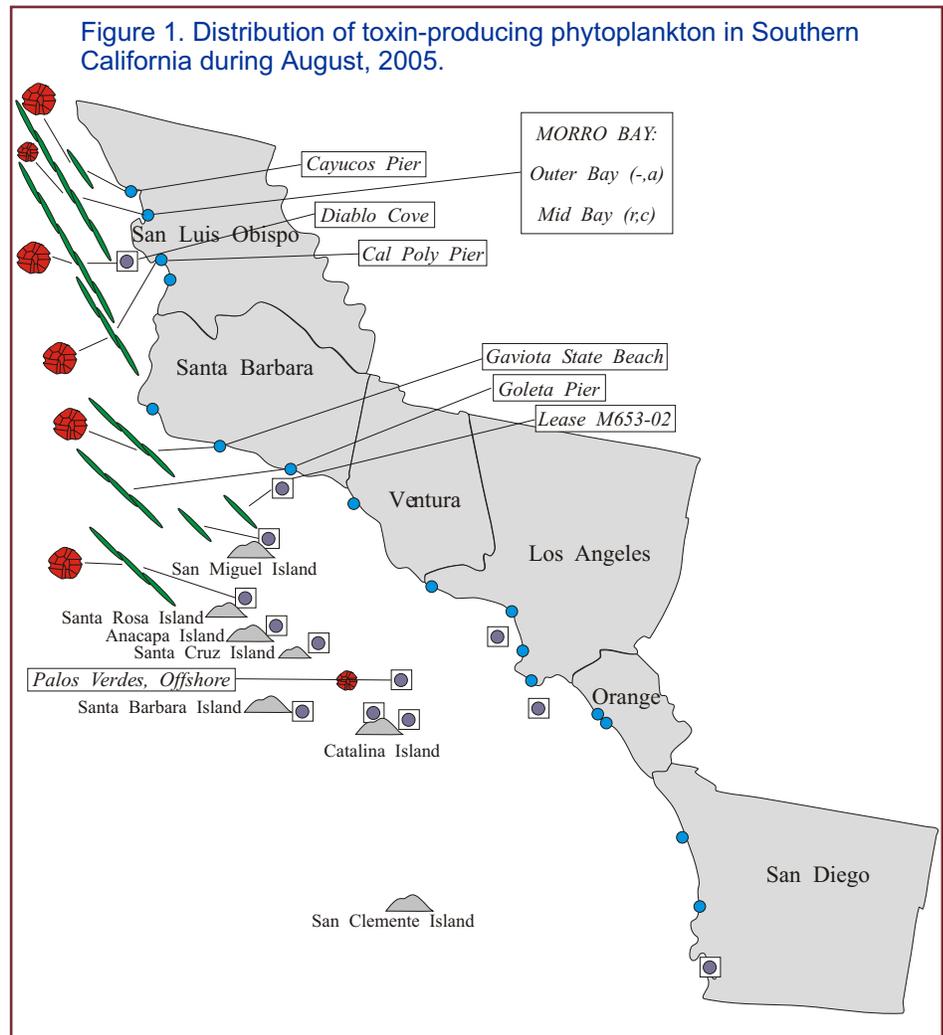
Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All 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 at several Southern California sites during August (Figure 1). The distribution of this toxin-

(Continued on Page 2)



### Relative Abundance of Known Toxin Producers

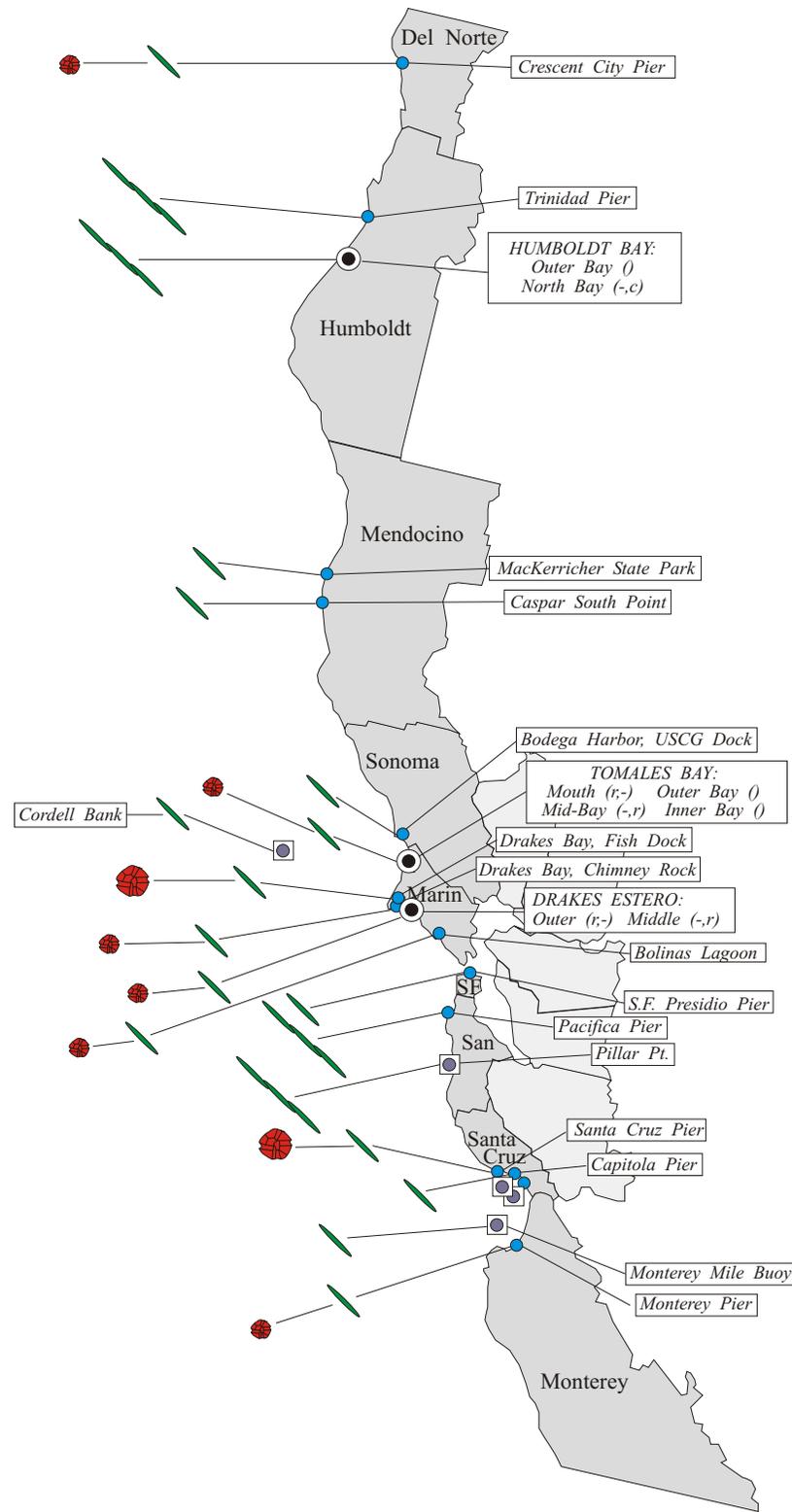
| Alexandrium Species          | Pseudo-nitzschia Species     |
|------------------------------|------------------------------|
| Rare (less than 1%)          | Present (less than 10%)      |
| Present (between 1% and 10%) | Common (between 10% and 50%) |
| Common (between 10% and 50%) | Abundant (greater 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 August, 2005.



(Continued from Page 1)

producing dinoflagellate was similar to observations in July, with relative abundances increasing in at some sites and decreasing at others. The highest concentrations of *Alexandrium* were observed at the beginning of the month offshore of Diablo Cove and later in the month at Cayucos (San Luis Obispo County). *Alexandrium* was also detected in low numbers at offshore sites near Santa Rosa Island and Palos Verdes.

Low concentrations of PSP toxins were detected throughout the month at sites in San Luis Obispo County (Figure 3). Low levels of these toxins also remained in scallops from offshore of Santa Barbara County.

**Domoic Acid**

*Pseudo-nitzschia* was observed at several sites along the coast between San Luis Obispo and Santa Barbara counties in August (Figure 1). The relative abundance of this diatom increased at the San Luis Obispo sites and decreased at most other locations. This diatom was also observed offshore in samples from San Miguel and Santa Rosa islands.

**Non-toxic Species**

Dinoflagellates were dominant along most of the Southern California coast throughout

(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%)

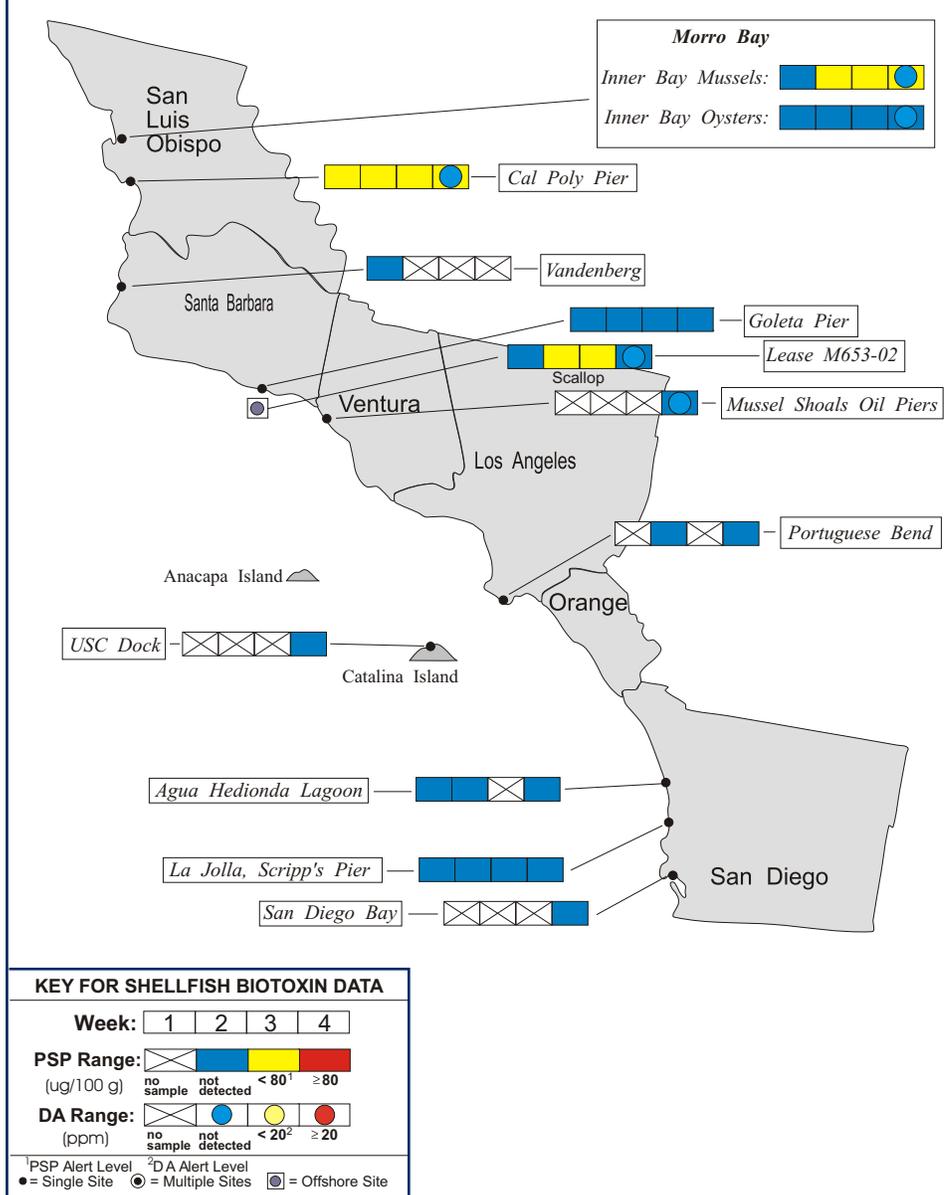
MONTHLY SAMPLING STATIONS:

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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, 2005.



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August. *Ceratium* was common at various locations between San Luis Obispo and San Diego, while *Cochlodinium* was abundant at Pismo Pier by mid-month. *Lingulodinium polyedrum* was also common along the entire Southern California coast, becoming increasingly dominant from Los Angeles through San Diego counties.

Despite the overall dominance of various dinoflagellate species, a variety of diatoms were also observed at some locations. *Chaetoceros* was abundant at San Miguel Island and common in samples from Santa Monica Bay and Scripps Pier.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* relative abundance decreased dramatically in August, although the distribution was similar to observations in July. The highest relative abundance of *Alexandrium* was detected by mid-August at the sentinel station in Drakes Bay. Lower numbers of this dinoflagellate were also observed at sites along the coast of Del Norte and Humboldt counties.

The high concentrations of PSP toxins detected in the Drakes Bay region during July decreased below the alert level by the

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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

(Continued from Page 3)

beginning of August (Figure 4). Low levels remained at sites in this region throughout the month. The elevated levels of PSP toxins detected in the Santa Cruz region of Monterey Bay in July decreased below the detection limit by August. Low levels of these toxins were detected along the San Mateo coast and at Natural Bridges (Santa Cruz County).

**Domoic Acid**

*Pseudo-nitzschia* was observed at most sampling stations along the Northern California coast in August (Figure 2). The relative abundance of *Pseudo-nitzschia* increased at sites in Humboldt and Del Norte counties. Low numbers of this diatom were observed in samples from two sites in Mendocino County. The relative abundance of *Pseudo-nitzschia* decreased at most sites between Sonoma and Monterey, although a slight increase was observed at Pillar Point (San Mateo County).

**Non-toxic Species**

Diatoms remained the dominant group at most stations. Common diatoms included *Chaetoceros* and *Ditylum*. The dinoflagellate *Gymnodinium* was abundant at Pacifica Pier, Santa Cruz Pier, and the Monterey commercial pier. This dinoflagellate was also common inside Tomales Bay and at various locations inside Monterey Bay.

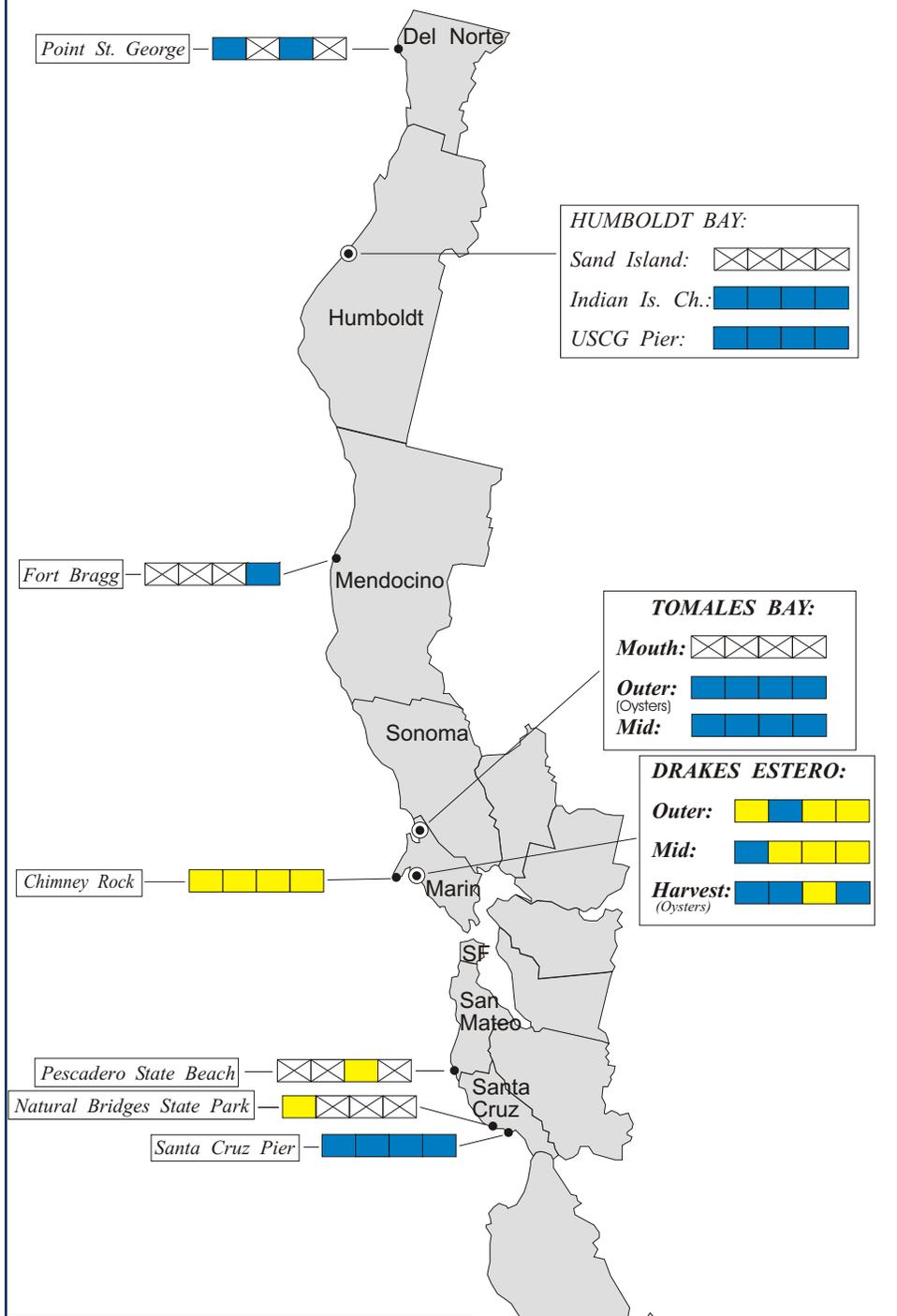


**QUARANTINES:**

The June 24 health advisory remained in effect, warning the public not to eat mussels or the viscera of sardines,

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during August, 2005.



**KEY FOR SHELLFISH BIOTOXIN DATA**

**Week:** 1 2 3 4

**PSP Range:** (ug/100 g) no sample not detected < 80<sup>1</sup> ≥ 80

**DA Range:** (ppm) no sample not detected < 20<sup>2</sup> ≥ 20

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level  
 ● = Single Site ○ = Multiple Sites ◐ = Offshore Site

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during August, 2005.

| COUNTY          | AGENCY  | # SAMPLES |
|-----------------|---|-----------|
| Del Norte       | Del Norte County Health Department                | 2         |
| Humboldt        | Coast Seafood Company                             | 10        |
| Mendocino       | None Submitted                                    |           |
| Sonoma          | None Submitted                                    |           |
| Marin           | Cove Mussel Company                               | 3         |
|                 | Hog Island Oyster Company                         | 4         |
|                 | Johnson Oyster Company                            | 20        |
|                 | Marin Oyster Company                              | 2         |
|                 | DHS Marine Biotoxin Monitoring Program            | 5         |
| San Francisco   | None Submitted                                    |           |
| San Mateo       | San Mateo County Environmental Health Department  | 1         |
| Santa Cruz      | U.C. Santa Cruz                                   | 4         |
|                 | Santa Cruz County Environmental Health Department | 1         |
| Monterey        | None Submitted                                    |           |
| San Luis Obispo | Williams Shellfish Company                        | 10        |
|                 | California Polytechnic State University           | 5         |
| Santa Barbara   | Santa Barbara Mariculture Company                 | 12        |
|                 | U.C. Santa Barbara                                | 5         |
|                 | Vanderberg AFB                                    | 1         |
| Ventura         | Ventura County Environmental Health Department    | 1         |
| Los Angeles     | Los Angeles County Health Department              | 2         |
|                 | Aquarium of the Pacific, Long Beach               | 1         |
| Orange          | None Submitted                                    |           |
| San Diego       | Carlsbad Aquafarms, Inc.                          | 3         |
|                 | U.S. Navy   | 1         |
|                 | Scripps Institution of Oceanography               | 4         |

(Continued from Page 4)

anchovies, lobster (also known as lobster "tomale"), and crab (sometimes called crab "butter") from Ventura County. This advisory was issued after dangerous levels of domoic acid were detected from this region.

The annual quarantine on the sport-harvesting of mussels went into effect on May 1 and will continue through October 31. 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.

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.



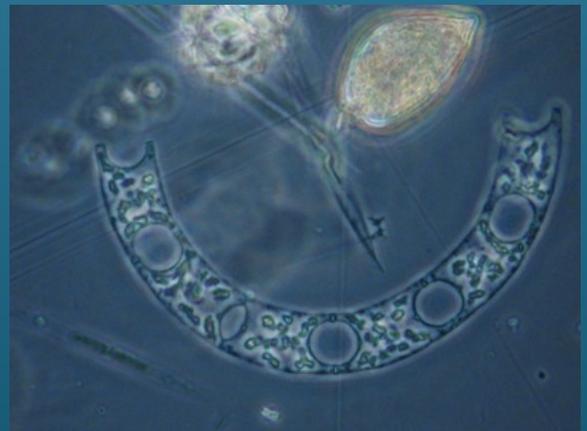
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during August, 2005.

| COUNTY                 | AGENCY   | # SAMPLES |
|------------------------|--|-----------|
| <b>Del Norte</b>       | Del Norte County Health Department   | 4         |
| <b>Humboldt</b>        | Coast Seafood Company  | 5         |
|                        | DHS Volunteer (Jacki Riley)  | 2         |
| <b>Mendocino</b>       | DHS Volunteer (Marc Margahas)  | 3         |
| <b>Sonoma</b>          | DHS Volunteer (Cathleen Cannon)  | 1         |
| <b>Marin</b>           | DHS Volunteers (Brent Anderson, Mary Von Tolksdorf, Marjorie Siegel, Richard Plant, Cal Strobel) | 14        |
|                        | DHS Marine Biotoxin Monitoring Program   | 4         |
|                        | Johnson Oyster Company   | 10        |
| <b>Contra Costa</b>    | None Submitted   |           |
| <b>San Francisco</b>   | DHS Volunteer (Eugenia McNaughton)   | 3         |
|                        | Gulf of the Farallones National Marine Sanctuary   | 1         |
| <b>San Mateo</b>       | San Mateo County Environmental Health Department   | 2         |
|                        | DHS Volunteer (Sandy Emerson)  | 1         |
| <b>Santa Cruz</b>      | U.C. Santa Cruz  | 6         |
|                        | Santa Cruz County Environmental Health Department  | 4         |
| <b>Monterey</b>        | DHS Volunteer (Jerry Norton)   | 1         |
|                        | Pacific Cetacean Group   | 1         |
| <b>San Luis Obispo</b> | DHS Volunteers (Renee and Auburn Atkins)   | 4         |
|                        | Morro Bay National Estuary Program   | 3         |
|                        | Cal Poly   | 4         |
|                        | Tomales Bay Oyster Company   | 1         |
|                        | Tenera Environmental   | 1         |
| <b>Santa Barbara</b>   | U.C. Santa Barbara   | 5         |
|                        | Santa Barbara Mariculture Company  | 5         |
|                        | California Department of Parks and Recreation  | 2         |
|                        | Catalina Tall Ships Expeditions  | 1         |
| <b>Ventura</b>         | Ventura County Environmental Health Department   | 1         |
|                        | Catalina Tall Ships Expeditions  | 1         |
| <b>Los Angeles</b>     | Aquarium of the Pacific Long Beach   | 1         |
|                        | City of Los Angeles Environmental Monitoring Division  | 3         |
|                        | Los Angeles County Sanitation District   | 3         |
|                        | University of Southern California  | 1         |
| <b>Orange</b>          | DHS Volunteer (Debbie Karimoto)  | 1         |
| <b>San Diego</b>       | Scripps Institute of Oceanography  | 4         |
|                        | DHS Volunteer (Paul Sims, Jeff Kermode)  | 4         |

## PHYTOPLANKTON GALLERY



*The diatom Ditylum was common at various locations along the Northern California coast.*



*The diatom Eucampia remained common at certain Northern California sampling stations in August.*



*Alexandrium was present at a variety of station in Northern and Southern California.*