

# 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

May 2010

Technical Report No. 10-08

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of May, 2010. 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.

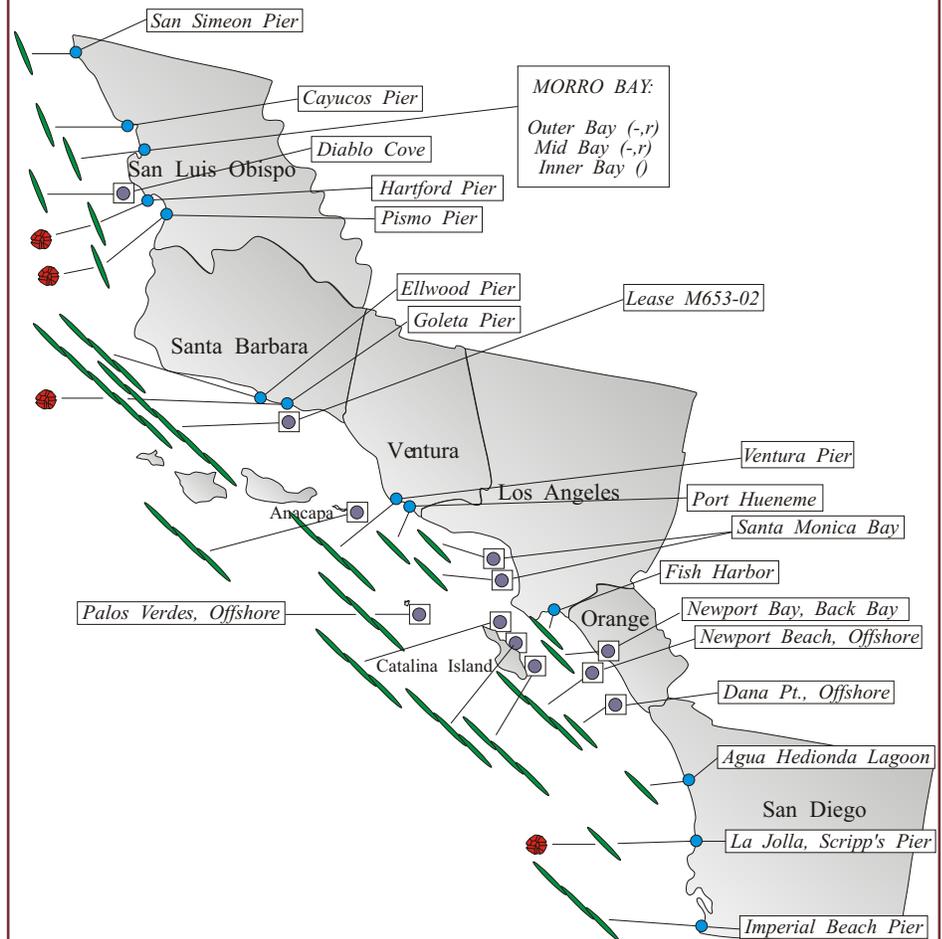
### Southern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* was observed at several sampling locations during May (Figure 1). Low numbers of this dinoflagellate were detected at sites in San Luis Obispo, Santa Barbara, and San Diego counties. PSP toxins were not

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during May, 2010.



### Relative Abundance of Known Toxin Producers

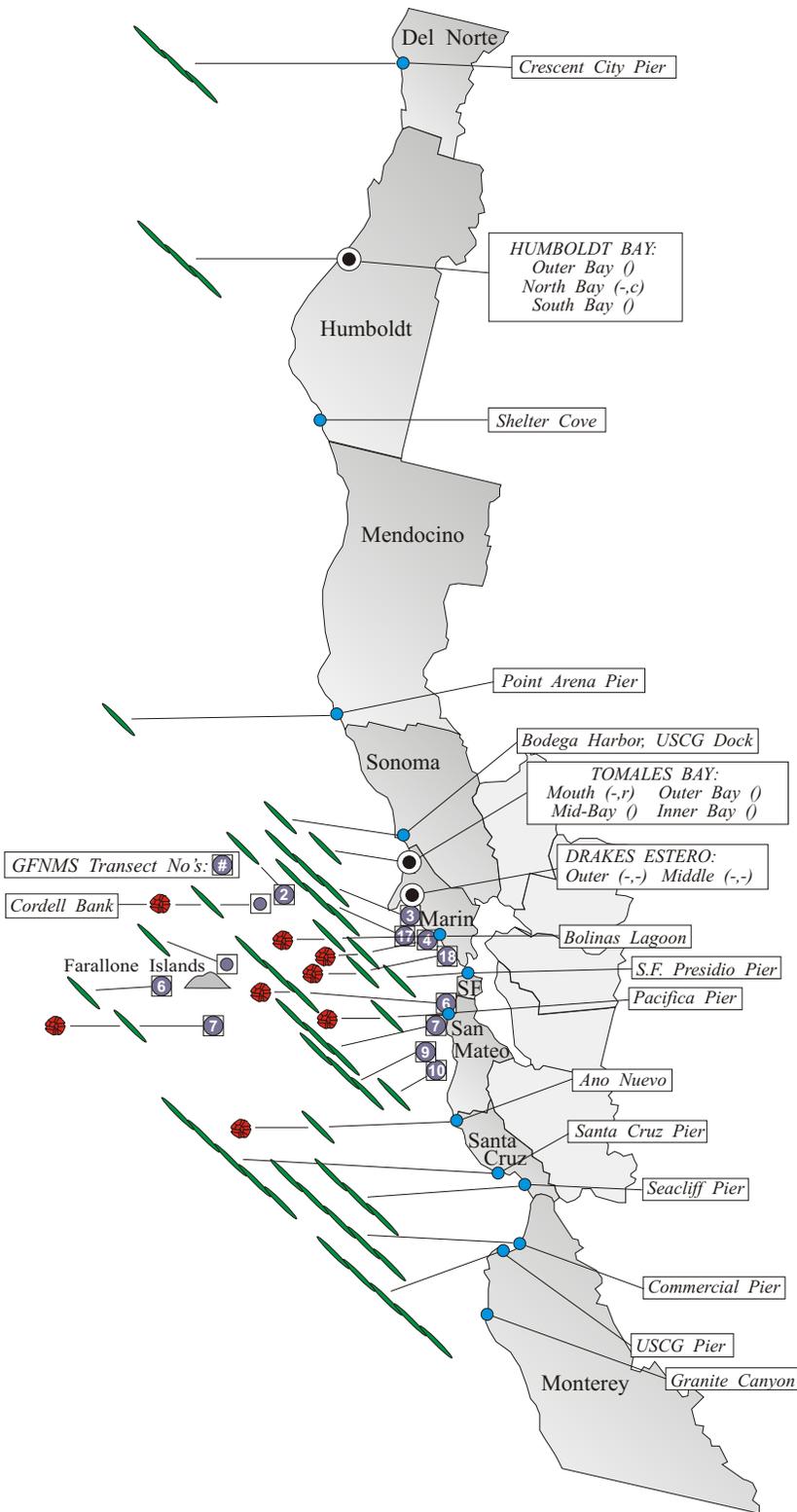
| Alexandrium Species |                              | Pseudo-nitzschia Species |                              |
|---------------------|------------------------------|--------------------------|------------------------------|
|                     | Rare (less than 1%)          |                          | 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 May, 2010.



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detected in any shellfish samples collected during the month (Figure 3).

**Domoic Acid**

*Pseudo-nitzschia* was detected along the entire southern California coast during May (Figure 1). The relative abundance and distribution of this diatom in May was similar to observations in April, with a continued increase in cell numbers along the Santa Barbara coast. The highest relative abundances of *Pseudo-nitzschia* were observed offshore of Palos Verdes (Los Angeles County) and at Goleta Pier (Santa Barbara County).

A low concentration of domoic acid was detected in shellfish samples from offshore of Santa Barbara by the third week of the month (Figure 3). By the following week the toxin levels had increased well above the federal alert level of 20 ppm, reaching 40 ppm on May 25. A low concentration of domoic acid was also detected in mussels from nearby Goleta Pier during the last week of May.

**Non-toxic Species**

Diatoms continued to dominate the phytoplankton assemblage along most of the southern California coast. *Chaetoceros* was the dominant diatom, with several other species (e.g., *Lauderia*, *Skeletonema*,

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**Relative Abundance of Known Toxin Producers**

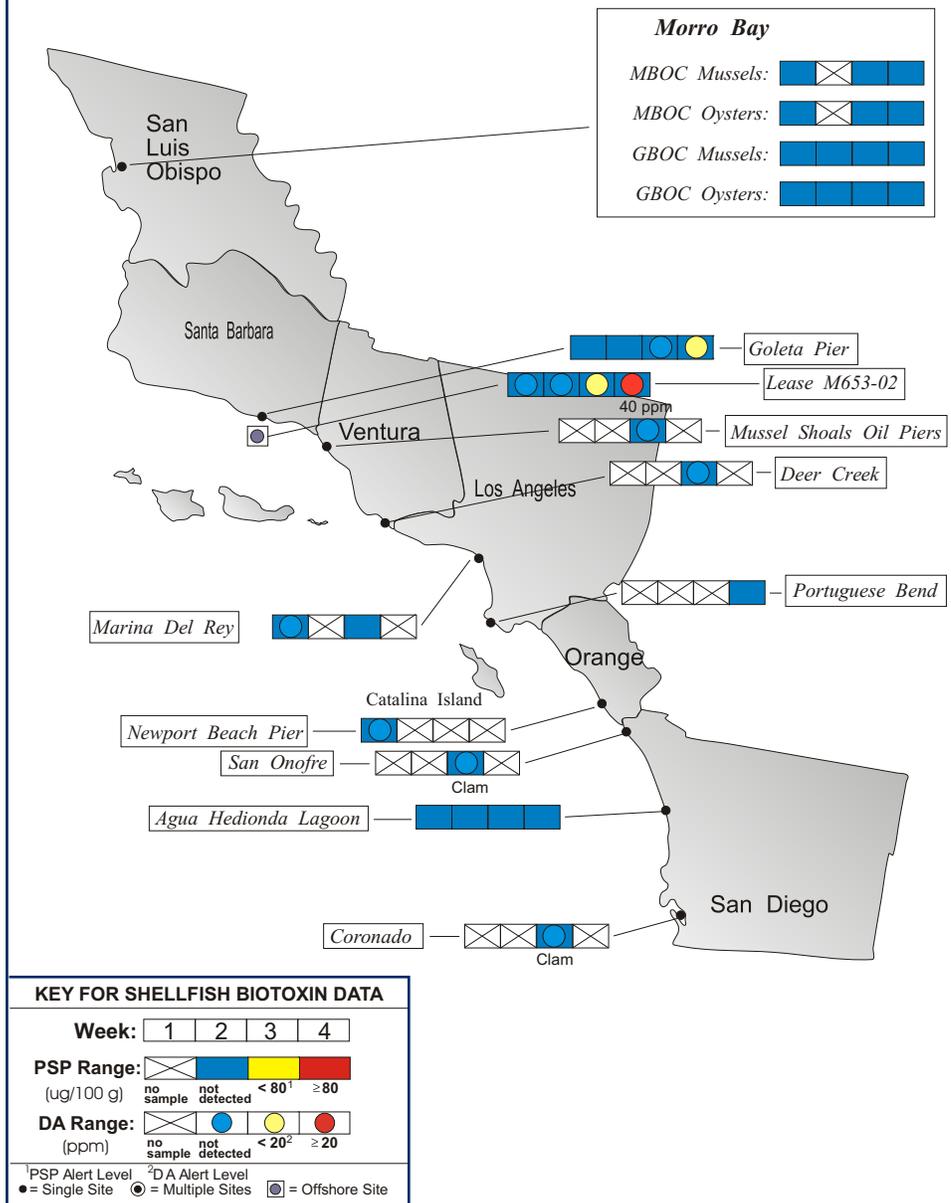
| Alexandrium Species |                              | Pseudo-nitzschia Species |                              |
|---------------------|------------------------------|--------------------------|------------------------------|
|                     | Rare (less than 1%)          |                          | 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 May, 2010.



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*Thalassiosira*) abundant at specific sites. Dinoflagellates (*Lingulodinium polyedrum*, *Prorocentrum*) were common along the San Diego coast and increased in abundance offshore of Los Angeles during the latter half of the month.

**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* was observed at an increased number of sampling locations during May (Figure 2). Low numbers of *Alexandrium* were observed at several sites between Marin and San Mateo counties, including offshore sites sampled by the Gulf of the Farallones National Marine Sanctuary. Low concentrations of PSP toxins were detected in sentinel mussels from Humboldt Bay and farther upcoast at Trinidad Head (Figure 4).

**Domoic Acid**

*Pseudo-nitzschia* was observed at most sampling locations along the northern California coast during May (Figure 2). The relative abundance of this diatom increased at sites between Marin and Monterey counties. The highest relative abundances were observed at Santa Cruz Pier (May 19) and the USCG Pier in Monterey (May 17).

Low levels of domoic acid were detected in sentinel mussels from the Santa Cruz Pier

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, 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 effort 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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 during the last two weeks of May.

**Non-toxic Species**

Diatoms were dominant along the northern California coast during May, with *Chaetoceros* the dominant genus. The highest relative abundances were observed in samples from Crescent City (*Skeletonema*) and offshore of San Francisco and San Mateo (*Chaetoceros*).



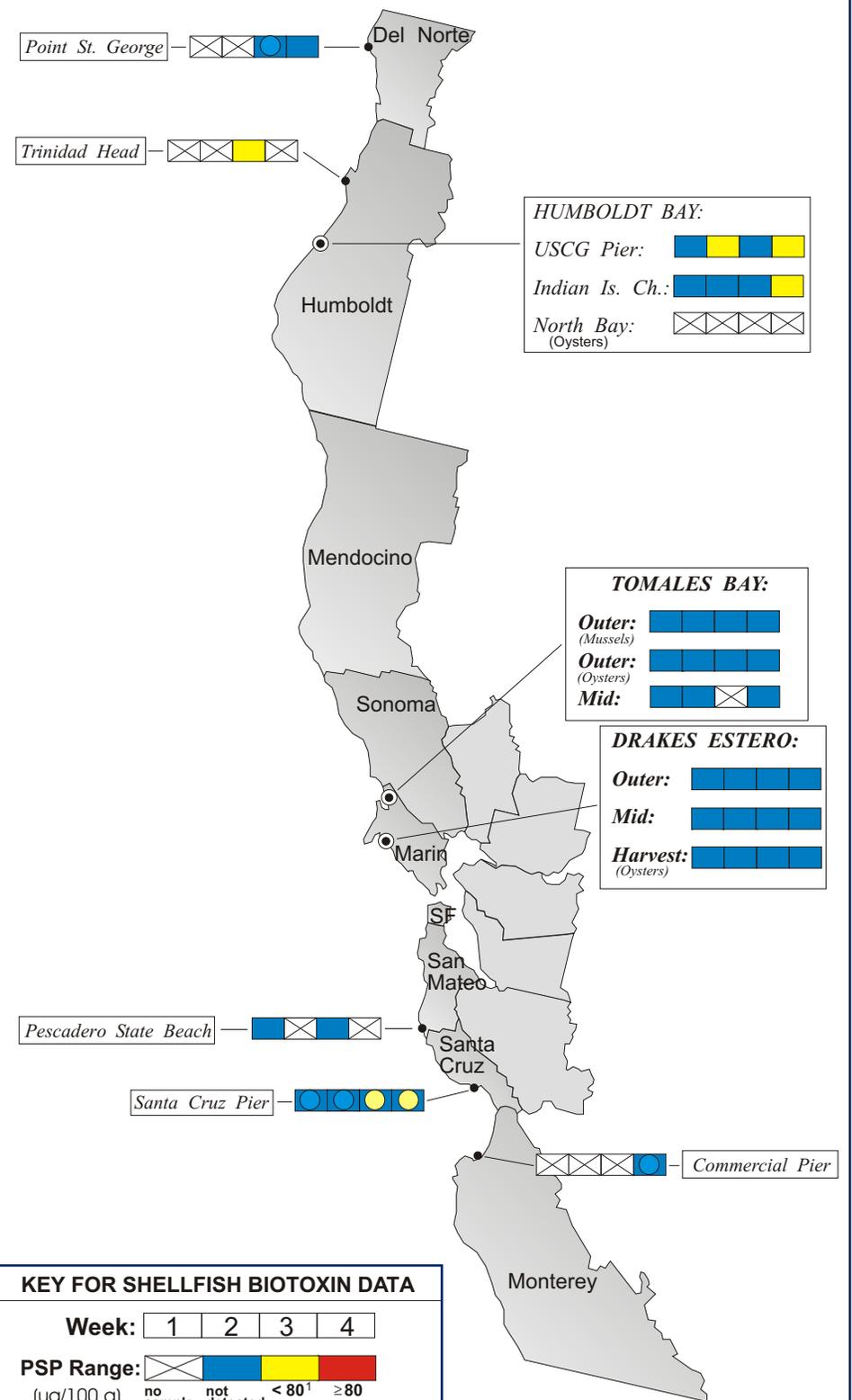
**QUARANTINES:**

The annual mussel quarantine went into effect on May 1. This quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. 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. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), 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

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Figure 4. Distribution of shellfish biotoxins in Northern California during May, 2010.



<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 May, 2010.

| COUNTY          | AGENCY   | # SAMPLES |
|-----------------|--|-----------|
| Del Norte       | Del Norte County Health Department               | 2         |
| Humboldt        | Coast Seafood Company                            | 8         |
|                 | Humboldt County Environmental Health Department  | 1         |
|                 | None Submitted                                   |           |
| Mendocino       | None Submitted                                   |           |
| Sonoma          | None Submitted                                   |           |
| Marin           | Cove Mussel Company                              | 3         |
|                 | Drakes Bay Oyster Company                        | 17        |
|                 | Hog Island Oyster Company                        | 4         |
|                 | Marin Oyster Company                             | 4         |
| San Francisco   | None Submitted                                   |           |
| San Mateo       | San Mateo County Environmental Health Department | 2         |
| Santa Cruz      | U.C. Santa Cruz                                  | 4         |
| Monterey        | Monterey Abalone Company                         | 1         |
| San Luis Obispo | Grassy Bar Oyster Co.                            | 10        |
|                 | Morro Bay Oyster Company                         | 8         |
| Santa Barbara   | Santa Barbara Mariculture Company                | 8         |
|                 | U.C. Santa Barbara                               | 4         |
| Ventura         | Ventura County Environmental Health Department   | 2         |
| Los Angeles     | Los Angeles County Health Department             | 3         |
| Orange          | Orange County Health Care Agency                 | 1         |
| San Diego       | Carlsbad Aquafarms, Inc.                         | 4         |
|                 | CDPH Volunteer ( <i>Steve Crooke</i> )           | 2         |

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. 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.



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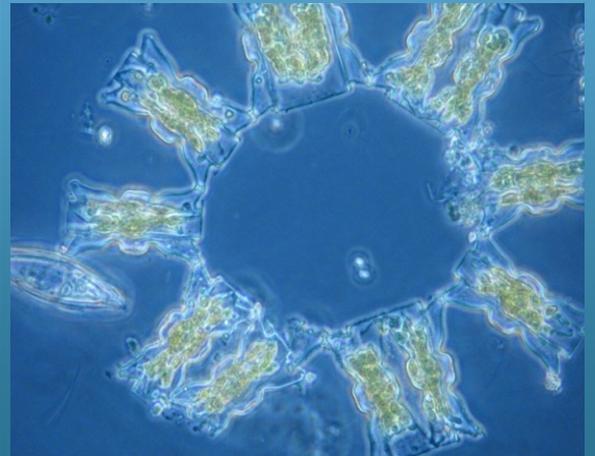
remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

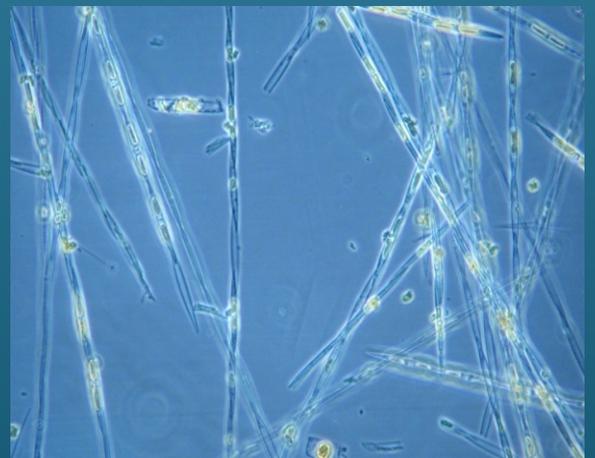
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during May, 2010.

| COUNTY          | AGENCY   | # SAMPLES |
|-----------------|--|-----------|
| Del Norte       | Del Norte County Health Department                         | 4         |
| Humboldt        | Coast Seafood Company                                      | 4         |
|                 | Bureau of Land Management                                  | 1         |
| Mendocino       | CDPH Volunteer ( <i>Marie De Santis</i> )                  | 3         |
| Sonoma          | CDPH Volunteer ( <i>Cathleen Cannon</i> )                  | 1         |
| Marin           | CDPH Volunteer ( <i>Brent Anderson, Cal Strobel</i> )      | 5         |
|                 | Cordell Bank National Marine Sanctuary                     | 1         |
|                 | Drakes Bay Oyster Company                                  | 12        |
|                 | Gulf of the Farallones National Marine Sanctuary           | 6         |
| San Francisco   | CDPH Volunteer ( <i>E. McNaughton, C. Keiper</i> )         | 3         |
|                 | Gulf of the Farallones National Marine Sanctuary           | 4         |
| San Mateo       | San Mateo County Environmental Health Dept.                | 2         |
|                 | Gulf of the Farallones National Marine Sanctuary           | 4         |
|                 | The Marine Mammal Center ( <i>Stan Jensen</i> )            | 4         |
| Santa Cruz      | U.C. Santa Cruz  | 2         |
|                 | The Marine Mammal Center ( <i>Nancy Scarborough</i> )      | 1         |
| Monterey        | U.C. Santa Cruz  | 4         |
|                 | CDPH Volunteer ( <i>Jerry Norton</i> )                     | 2         |
|                 | Friends of the Sea Otter ( <i>Aya Obara</i> )              | 3         |
|                 | Monterey Abalone Company                                   | 2         |
|                 | Marine Pollution Studies Laboratory                        | 1         |
| San Luis Obispo | Friends of the Sea Otter ( <i>Kelly Cherry</i> )           | 5         |
|                 | Morro Bay National Estuary Program                         | 1         |
|                 | Monterey Bay National Marine Sanctuary                     | 4         |
|                 | Morro Bay Oyster Company                                   | 4         |
|                 | Tenera Environmental                                       | 3         |
| Santa Barbara   | The Marine Mammal Center ( <i>Tim Lytsell, P.J. Webb</i> ) | 5         |
|                 | CDPH Volunteer ( <i>Sylvia Short</i> )                     | 3         |
|                 | Santa Barbara Mariculture Company                          | 4         |
| Ventura         | U.C. Santa Barbara   | 4         |
|                 | CDPH Volunteer ( <i>Fred Burgess</i> )                     | 4         |
|                 | Channel Islands National Marine Sanctuary                  | 2         |
| Los Angeles     | Ventura County Environmental Health Department             | 1         |
|                 | City of Los Angeles Environmental Monitoring Div.          | 3         |
|                 | Los Angeles County Sanitation District                     | 3         |
|                 | Southern California Marine Institute                       | 1         |
| Orange          | Guided Discoveries, Tole Mour                              | 13        |
|                 | California Department of Fish and Game                     | 6         |
|                 | Ocean Institute  | 1         |
| San Diego       | Orange County Health Care Agency                           | 1         |
|                 | Avian Research Associates                                  | 2         |
|                 | Carlsbad Aquafarms, Inc.                                   | 1         |
|                 | Scripps Institute of Oceanography                          | 5         |

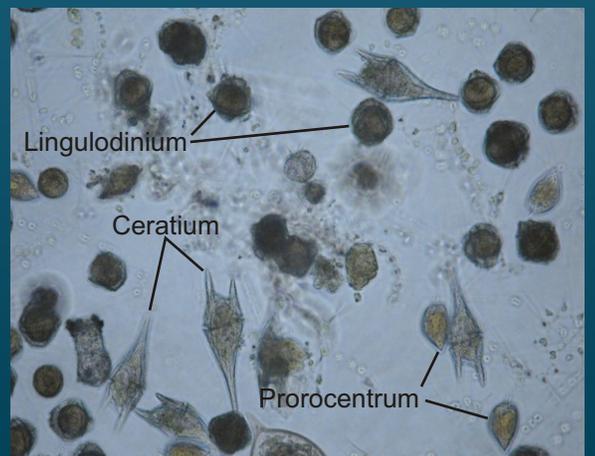
## PHYTOPLANKTON GALLERY



An unusual circular chain of the diatom *Odontella*.



*Pseudo-nitzschia* was common to abundant at a number of sites in May.



Despite the predominance of diatoms in May, there were areas where dinoflagellates were common.