

# 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

## January 2014

Technical Report No. 14-07

### INTRODUCTION:

This report provides a summary of biotoxin activity for the month of January, 2014. 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 between Los Angeles and Orange counties (Figure 1). The highest relative abundance was observed at Bolsa Chica.

The PSP toxin level remained high in mussels from Fish Harbor, but was lower than the

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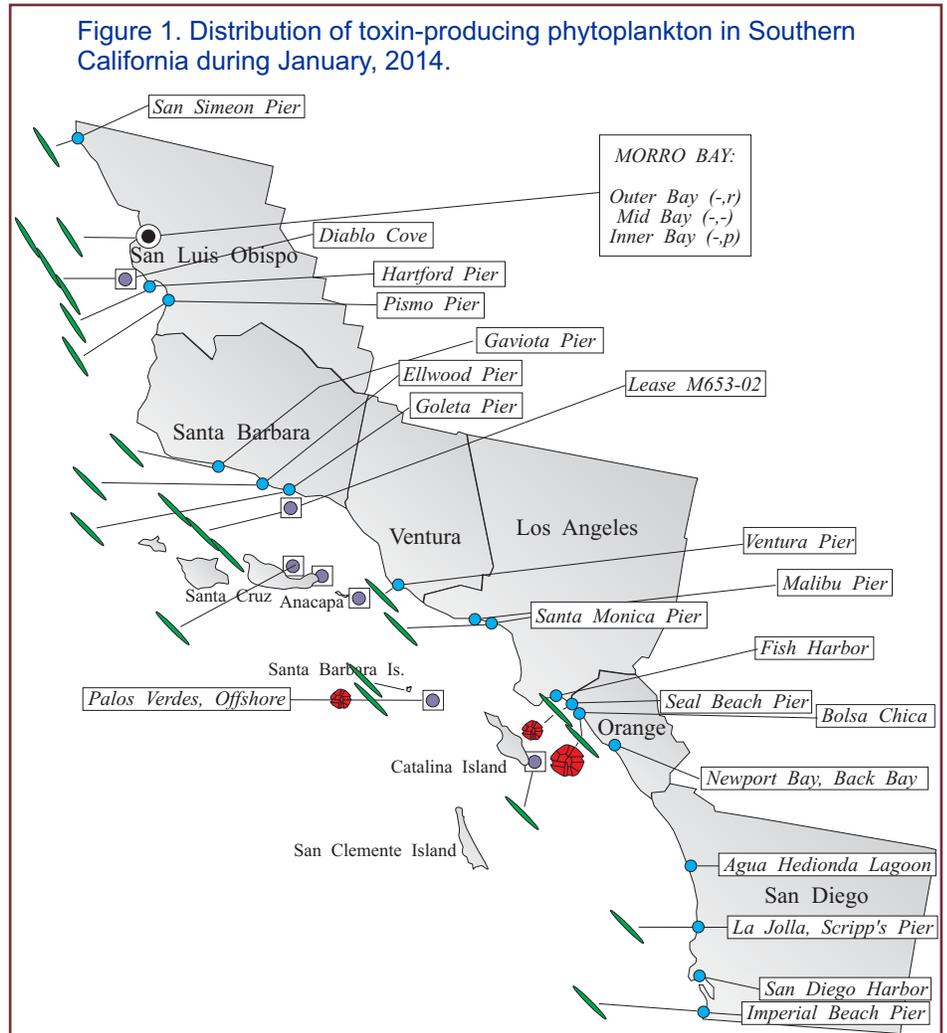
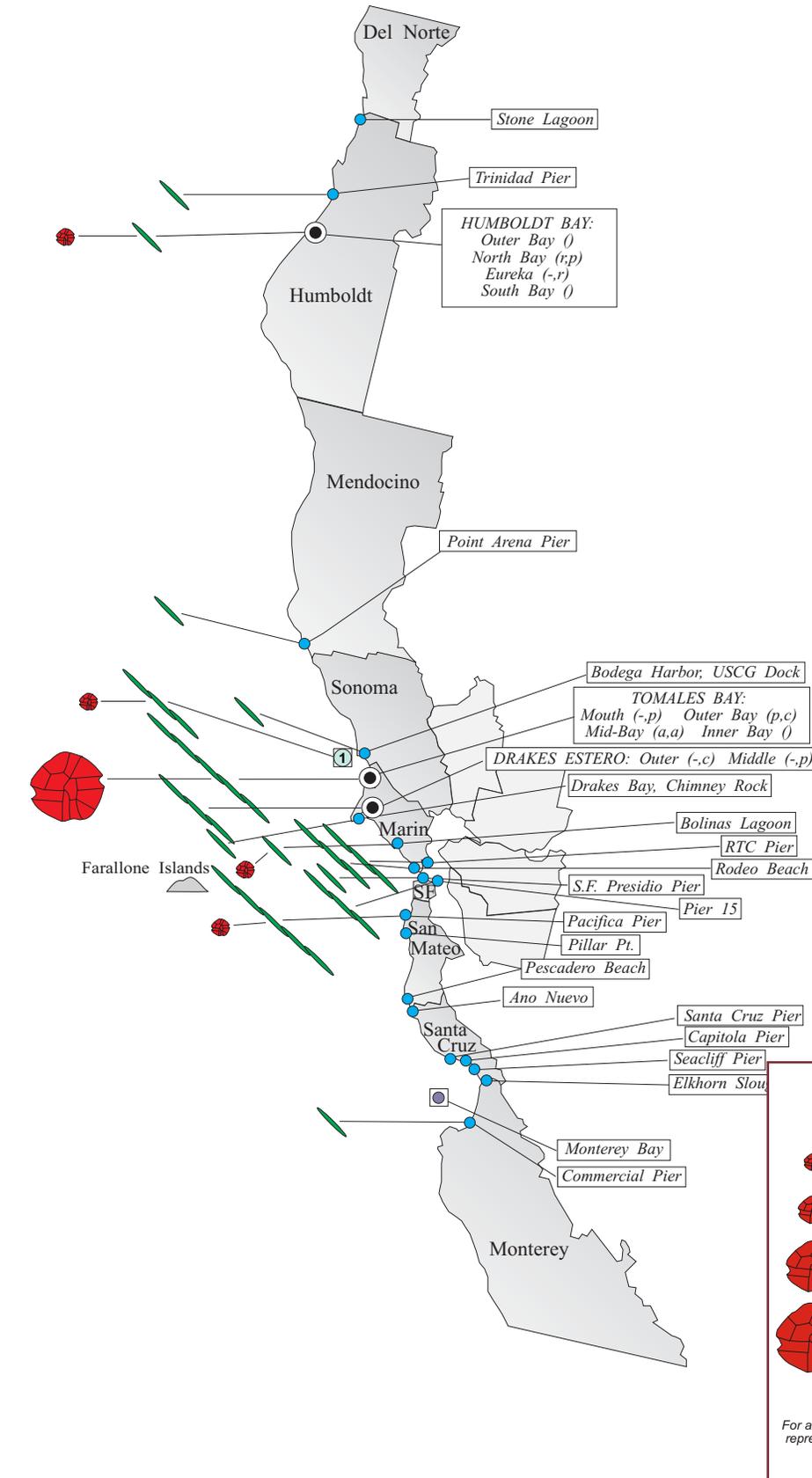


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during January, 2014.



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 concentrations detected in December (Figure 3). The toxin concentration continued declining and was below the detection limit by the end of the month. Low levels of PSP toxicity were also detected in mussels from Portuguese Bend and Bolsa Chica.

**Domoic Acid**

*Pseudo-nitzschia* was observed along the entire southern California coast (Figure 1). The relative abundance of this diatom declined at most sites compared to observations in December. The highest relative abundance of *Pseudo-nitzschia* was at Pismo Pier (January 29).

Domoic acid was not detected in bivalve shellfish (Figure 3). Rock crab viscera samples from nearshore Santa Barbara and several crab samples from offshore did not contain detectable levels of domoic acid. The latter is a significant change from past samples that contained varying levels of toxin, some well above the alert level.

**Non-Toxic Species**

The diatom *Chaetoceros* was ubiquitous along the coast. The dinoflagellate *Akashiwo sanguinea* was common offshore of Palos Verdes and at Bolsa Chica.

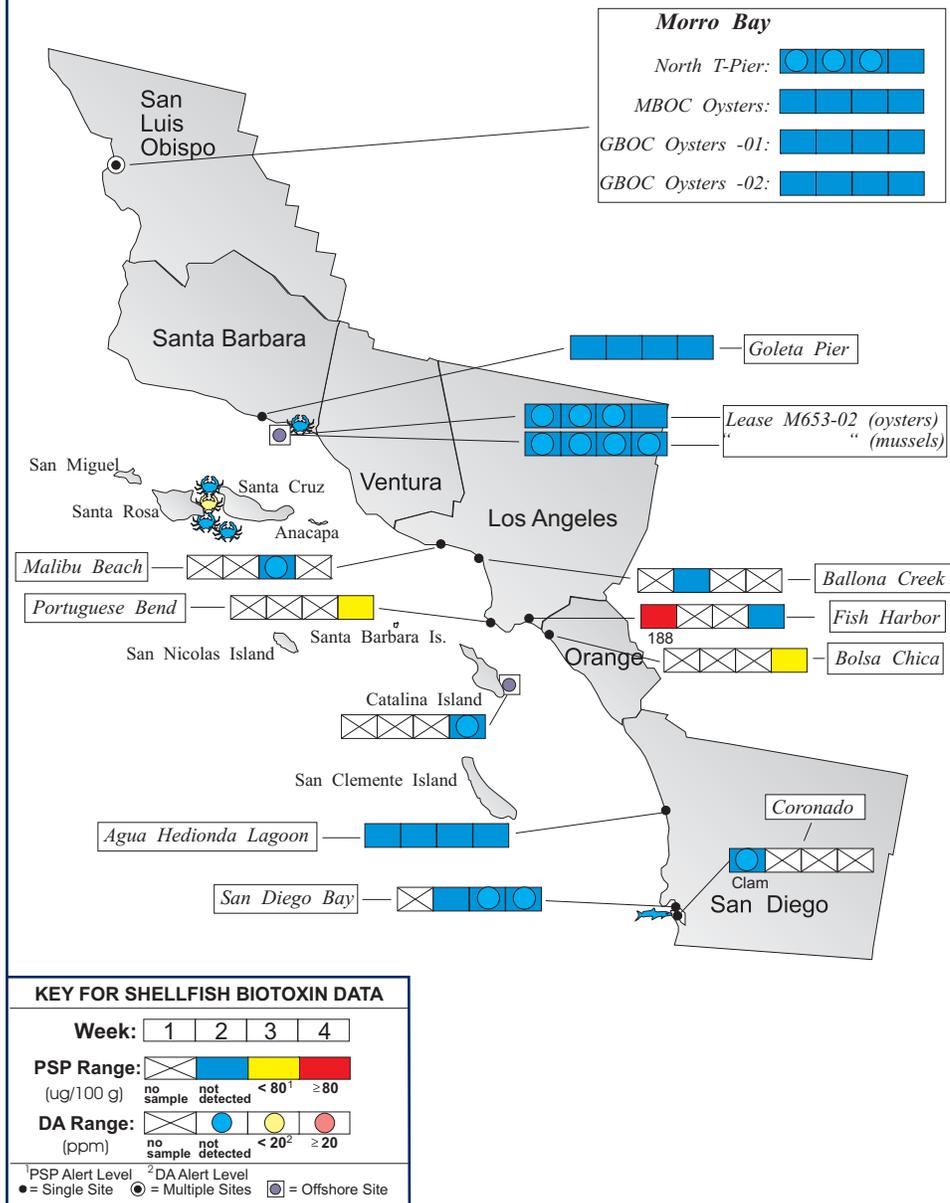
**Northern California Summary:**

**Paralytic Shellfish Poisoning**

*Alexandrium* was detected at several locations, with persistent high numbers inside Tomales Bay (Figure 2). The greatest number of cells of this dinoflagellate occurred

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Figure 3. Distribution of shellfish biotoxins in Southern California during January, 2014.



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in the mid and outer portion of Tomales Bay, with the highest relative abundance (15%) observed in the mid-bay region of northern Marshall.

The high levels of PSP toxins detected in December continued through the first half of January in the Marconi Cove region farther inside the bay (Figure 4). The toxin concentration declined below the alert level in mussels and oysters from this site by the second and third weeks of January, respectively. Low levels of PSP toxins were detected in a sample of littleneck clams collected near the mouth of Tomales Bay. Elsewhere, PSP toxin levels continued to increase in sentinel mussels from outer Drakes Estero during the first two weeks of the month, reaching 132 ug/100 g on January 9. Mussels from Point St. George in Del Norte County exceeded the alert level by the end of the month, and low toxin levels were detected at other sites in Humboldt and Del Norte counties.

**Domoic Acid**

*Pseudo-nitzschia* was observed at most sampling sites in January (Figure 2). The relative abundance of this diatom declined at most locations but remained high inside Tomales Bay and at Pacifica Pier, the latter having the highest observed relative abundance. Domoic acid was not detected in any shellfish samples analyzed during the month.

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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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**Non-Toxic Species**

Phytoplankton abundance was diminished in January. The diatom *Chaetoceros* was common at several sites from Humboldt to San Mateo and *Skeletonema* was common offshore of Bodega Head. The dinoflagellate *Prorocentrum micans* was common in Drakes Estero and Tomales Bay.



**QUARANTINES:** On January 24 the Department lifted the Health Advisory for all sport-harvested shellfish from Monterey Bay and Tomales Bay that was established due to elevated PSP levels. The December 20 Health Advisory remained in effect, warning consumers to avoid all sport-harvested shellfish from Los Angeles County, between Pt. Cabrillo and the Orange County line, due to high PSP levels in this area.

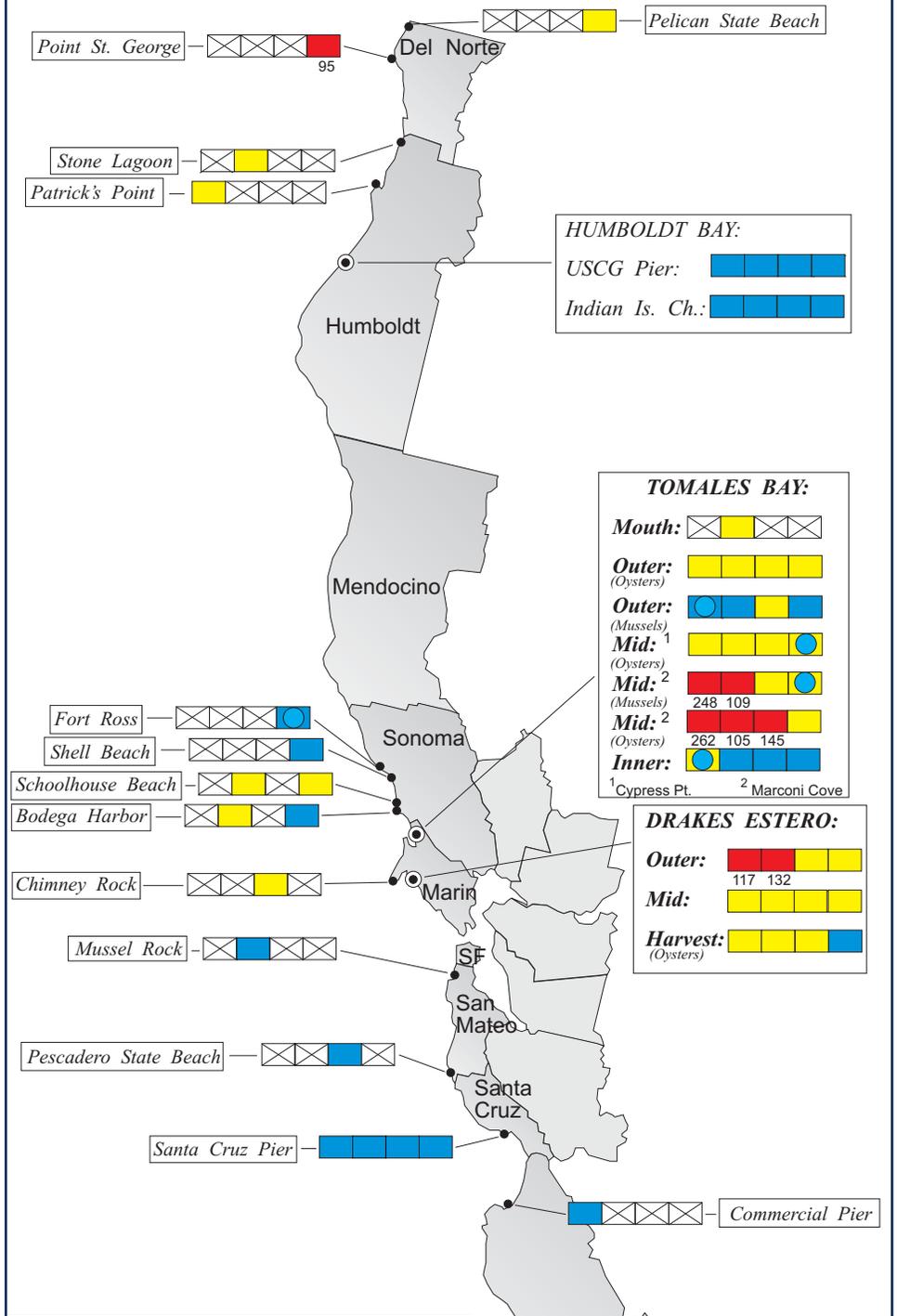
The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for northern Humboldt County. The quarantine on sport-harvested mussels was extended from the northern jetty at the entrance to Humboldt Bay to the Humboldt-Del Norte county line as a result of persistent high levels of the PSP toxins.

The September 14 health advisory for the northern Channel Islands remained in effect. The advisory warned consumers to avoid eating bivalve shellfish or the internal organs of crab, lobster, and small finfish like sardines and anchovies from the affected region due to persistent elevated levels of domoic acid in crab viscera samples.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can

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Figure 4. Distribution of shellfish biotoxins in Northern California during January, 2014.



**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. Program participants collecting phytoplankton samples during January, 2014.

| AGENCY                                       | # | AGENCY  | #  |
|--|---|---|----|
| <b>DEL NORTE COUNTY</b>                      |   |   |    |
| <b>HUMBOLDT COUNTY</b>                       |   |   |    |
|  |   | Coast Seafood Company                             | 5  |
| Yurok Tribe Environmental Group              | 1 | Humboldt State University Marine Lab              | 8  |
| <b>MENDOCINO COUNTY</b>                      |   |   |    |
|  |   | CDPH Volunteer ( <i>Marie DeSantis</i> )          | 2  |
| <b>SONOMA COUNTY</b>                         |   |   |    |
|  |   | Bodega Marine Lab & Farallone Institute           | 1  |
|  |   | CDPH Marine Biotoxin Program                      | 1  |
| <b>MARIN COUNTY</b>                          |   |   |    |
|  |   | Drakes Bay Oyster Company                         | 13 |
| CDPH Marine Biotoxin Program                 | 2 | CDPH Volunteers ( <i>Anderson, Clyde</i> )        | 7  |
| SFSU, Romberg Tiburon Center                 | 2 | Hog Island Oyster Company                         | 6  |
| Golden Gate National Recreation Area         | 1 |   |    |
| <b>SAN FRANCISCO COUNTY</b>                  |   |   |    |
|  |   | CDPH Volunteer ( <i>Eugenia McNaughton</i> )      | 1  |
|  |   | Exploratorium                                     | 3  |
| <b>SAN MATEO COUNTY</b>                      |   |   |    |
|  |   | The Marine Mammal Center ( <i>Stan Jensen</i> )   | 4  |
| San Mateo County Environmental Health Dept.  | 3 | U.C. Santa Cruz                                   | 2  |
| <b>SANTA CRUZ COUNTY</b>                     |   |   |    |
|  |   | U.C. Santa Cruz                                   | 4  |
|  |   | Santa Cruz Co. Environmental Health Dept.         | 3  |
| <b>MONTEREY COUNTY</b>                       |   |   |    |
|  |   | Friends of the Sea Otter ( <i>Janis Chaffin</i> ) | 1  |
| Marine Life Studies                          | 3 | Monterey Abalone Company                          | 3  |
| Marine Pollution Studies Laboratory          | 3 |   |    |
| <b>SAN LUIS OBISPO COUNTY</b>                |   |   |    |
|  |   | Friends of the Sea Otter ( <i>Kelly Cherry</i> )  | 9  |
| Morro Bay National Estuary Program           | 3 | Grassy Bar Oyster Company                         | 4  |
| Coastal Discovery Center, San Simeon         | 1 | Tenera Environmental                              | 3  |
| The Marine Mammal Center ( <i>Webb</i> )     | 1 |   |    |
| <b>SANTA BARBARA COUNTY</b>                  |   |   |    |
|  |   | CDPH Volunteer ( <i>Sylvia Short</i> )            | 5  |
| HABNet/CDPH Volunteers ( <i>Boyd Grant</i> ) | 4 | Island Packers/HABNet                             | 1  |
| National Park Service                        | 2 | Santa Barbara Mariculture Company                 | 4  |
|  |   | U.C. Santa Barbara                                | 4  |
| <b>VENTURA COUNTY</b>                        |   |   |    |
|  |   | CDPH Volunteer ( <i>Fred Burgess</i> )            | 3  |
| National Park Service                        | 1 |   |    |
| <b>LOS ANGELES COUNTY</b>                    |   |   |    |
|  |   | CDPH Volunteers ( <i>Kai Xu, Cal Parsons</i> )    | 4  |
| Los Angeles County Health Department, Burke  | 1 | Los Angeles County Sanitation District            | 2  |
| Southern California Marine Institute         | 1 | Catalina Island Marine Institute                  | 3  |
| <b>ORANGE COUNTY</b>                         |   |   |    |
|  |   | Amigos de Bolsa Chica                             | 6  |
| California Department of Fish and Wildlife   | 3 | CDPH Volunteer ( <i>Jennifer McCarthy</i> )       | 1  |
|  |   | Ocean Institute                                   | 1  |
| <b>SAN DIEGO COUNTY</b>                      |   |   |    |
|  |   | Carlsbad Aquafarms, Inc.                          | 1  |
| Scripps Institute of Oceanography            | 4 | Tijuana River National Estuary Research           | 4  |
| U.S. Navy Marine Mammal Program              | 3 |   |    |

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 can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be 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.

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 seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

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 (*Siliqua patula*) are an exception to



Table 2. CDPH program participants submitting shellfish samples during January, 2014.

| COUNTY          | AGENCY   | #  |
|-----------------|--|----|
| Del Norte       | California Department of Fish and Wildlife                   | 2  |
| Humboldt        | Coast Seafood Company  | 10 |
|                 | Yurok Tribe Environmental Program                            | 1  |
|                 | CDPH Volunteer ( <i>Brett Stacey</i> )                       | 1  |
| Mendocino       | None Submitted   |    |
| Sonoma          | CDPH Marine Biotoxin Program                                 | 4  |
|                 | CDPH Volunteer ( <i>James Sanders, John Morozumi</i> )       | 1  |
| Marin           | Cove Mussel Company  | 14 |
|                 | CDPH Volunteer ( <i>Carl Vogler</i> )                        | 4  |
|                 | Drakes Bay Oyster Company                                    | 28 |
|                 | Hog Island Oyster Company                                    | 9  |
|                 | Marin Oyster Company   | 6  |
|                 | Point Reyes Oyster Company                                   | 9  |
|                 | CDPH Marine Biotoxin Program                                 | 1  |
|                 | Tomales Bay Oyster Company                                   | 10 |
|                 | Starbird Mariculture   | 1  |
| San Francisco   | None Submitted   |    |
| San Mateo       | San Mateo County Environmental Health Department             | 1  |
|                 | CDPH Marine Biotoxin Program                                 | 1  |
| Santa Cruz      | U.C. Santa Cruz  | 4  |
| Monterey        | Monterey Abalone Company                                     | 1  |
| San Luis Obispo | Grassy Bar Oyster Co.  | 10 |
|                 | Morro Bay Oyster Company                                     | 6  |
| Santa Barbara   | Santa Barbara Mariculture Company                            | 8  |
|                 | Santa Barbara Seafood Station                                | 5  |
|                 | Ty Warner Sea Center   | 1  |
|                 | U.C. Santa Barbara   | 4  |
| Ventura         | None Submitted   |    |
| Los Angeles     | Los Angeles County Health Department, Burke Health Center    | 1  |
|                 | Los Angeles County Health Department, Torrance Health Center | 1  |
|                 | CDPH Volunteers ( <i>Cal Parsons, Vladimir Igoshin</i> )     | 2  |
|                 | Southern California Marine Institute                         | 2  |
| Orange          | Amigos de Bolsa Chica  | 1  |
| San Diego       | Carlsbad Aquafarms, Inc.                                     | 4  |
|                 | CDPH Volunteer ( <i>Steve Croke</i> )                        | 2  |
|                 | U.S. Navy Marine Mammal Program                              | 4  |

## PHYTOPLANKTON GALLERY



The diatom *Bacteriastrum* is sometimes common in samples from southern California.



Clusters of the diatom *Asterionella* are occasionally observed. The cells with elongated silica spines in the upper right are *Chaetoceros socialis*.



A more detailed view of a cluster of *Asterionella* cells.