CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

October 2007

Technical Report No. 07-25

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of October, 2007. 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 stations between San Luis Obispo and Ventura counties, as well as near Catalina

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during October, 2007.

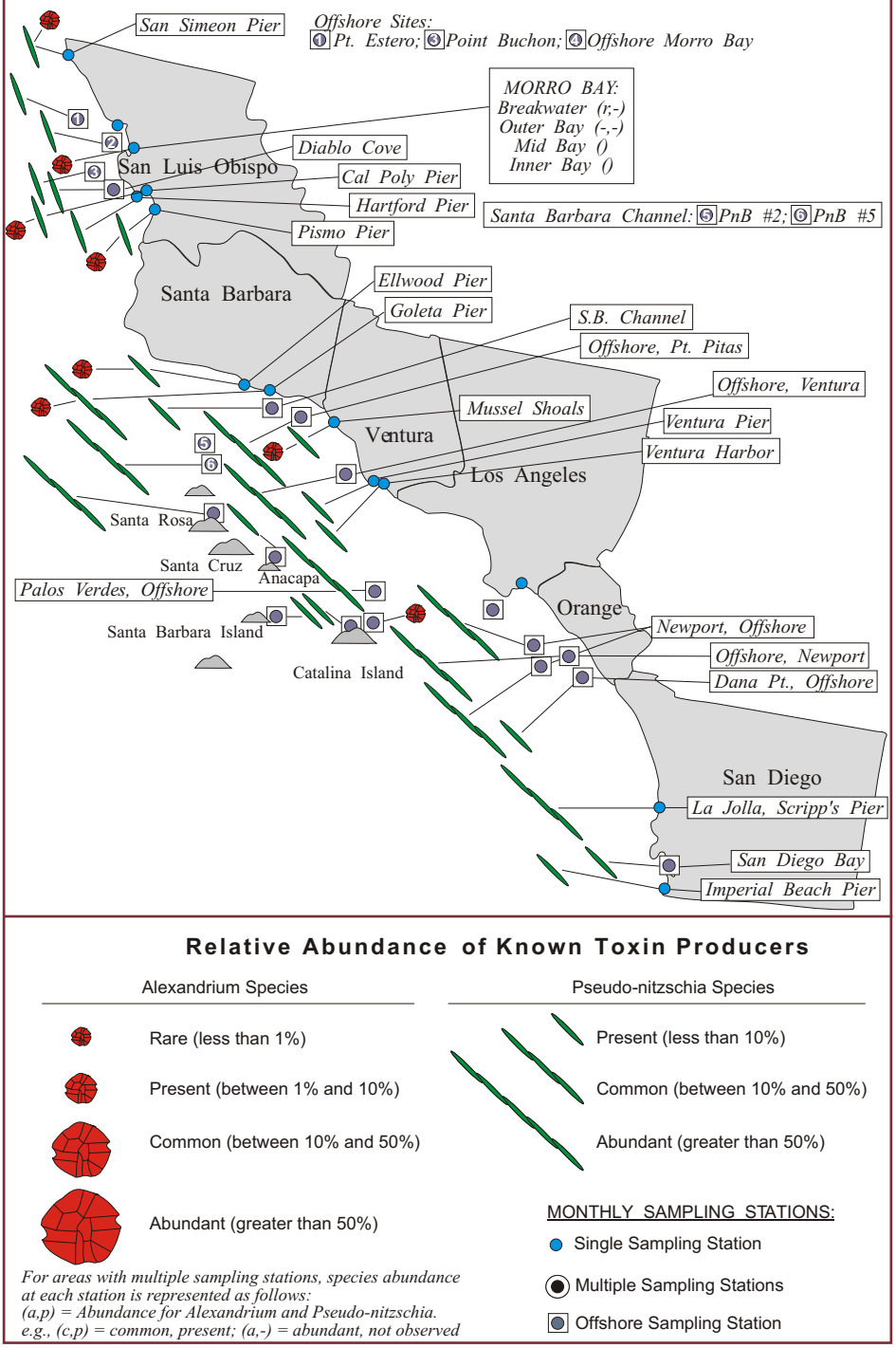
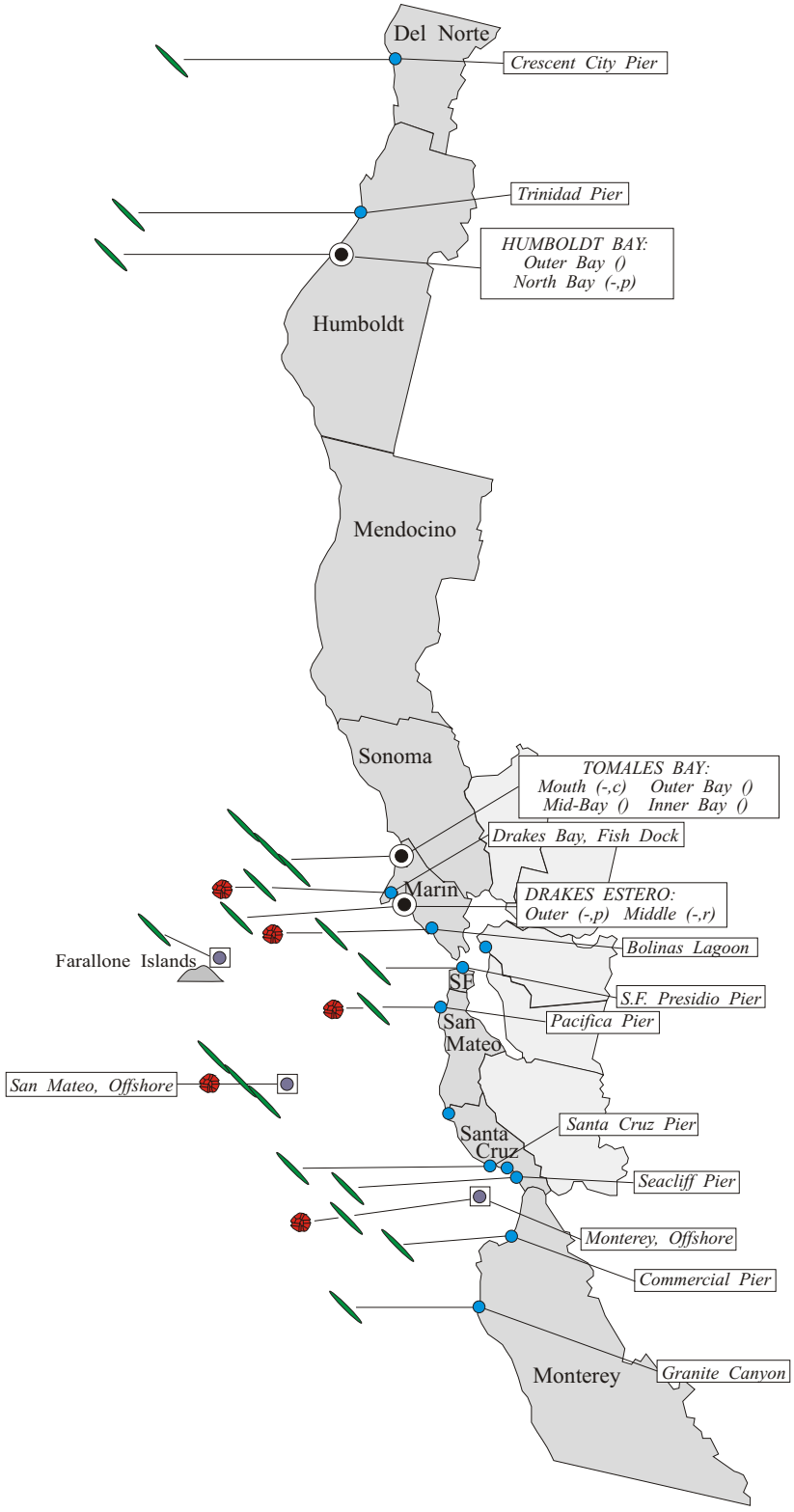


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during October, 2007.



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Island, during October (Figure 1). This distribution represents an increase for this dinoflagellate compared to observations in September. Overall the numbers of cells observed were quite low.

PSP toxicity was not detected in any shellfish sample from Southern California sampling stations during October.

Domoic Acid

Pseudo-nitzschia was detected along the entire Southern California coast in October (Figure 1). There was a noticeable increase in the relative abundance of this diatom offshore of Los Angeles and Orange counties. This diatom increased in abundance quickly offshore of Palos Verdes, with the percent composition increasing from 1% (October 11) to 15% (October 16) in just five days. The cell mass increased dramatically as well. By October 30 *Pseudo-nitzschia* had declined to 1% at this site. A similar pattern was observed for this diatom offshore of Newport Harbor, although cell numbers were lower than those observed offshore of Palos Verdes.

Low levels of domoic acid were detected in shellfish samples from an aquaculture lease located less than one mile offshore of Santa Barbara (Figure 3).

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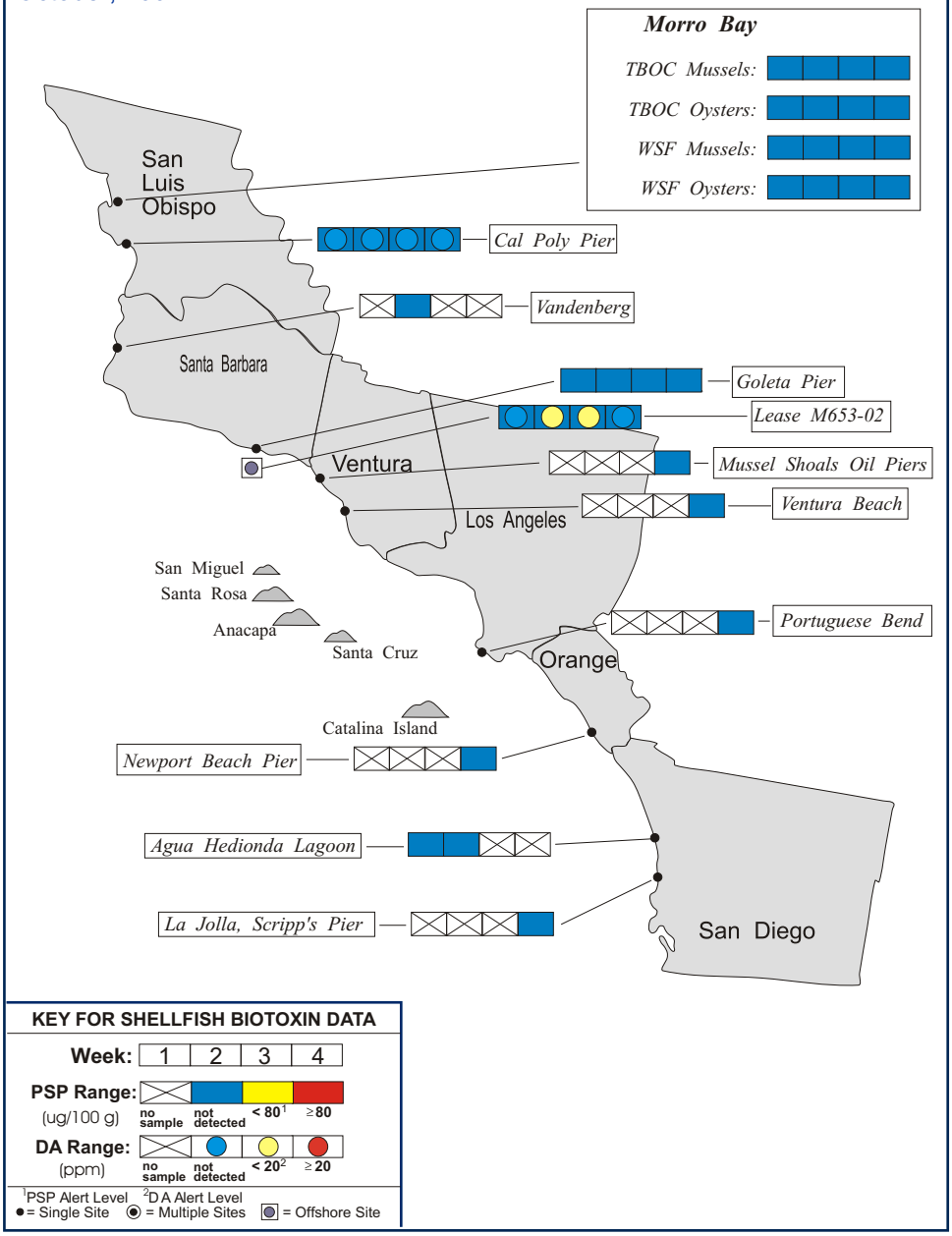
Figure 3. Distribution of shellfish biotoxins in Southern California during October, 2007.



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Non-toxic Species

A diverse mix of dinoflagellates and diatoms characterized the phytoplankton assemblage in October. The dinoflagellates *Ceratium* and *Akashiwo* were common along much of the Southern California coast. *Cochlodinium* was common at Avila and Pismo (San Luis Obispo County). *Thalassionema*, *Chaetoceros and Leptocylindrus* were common diatoms.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at several sites between Marin and Monterey counties in October (Figure 2). This distribution was similar to that observed in September and the relative abundance was slightly lower.

Low levels of PSP toxins continued to be detected in sentinel mussels from Drakes Bay and Drakes Estero during the first two weeks of October (Figure 4). These toxins were not detectable at any monitoring site by the end of the month.

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in September, although the relative abundance appeared to decrease at some sites (Figure 2).

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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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Domoic acid was not detected in any shellfish samples analyzed in October.

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along most of the Northern California coast. *Chaetoceros*, *Skeletonema* and *Rhizosolenia* were the most common genera observed. Dinoflagellates were common inside Monterey Bay and included *Akashiwo*, *Prorocentrum*, and *Cochlodinium*. The latter dinoflagellate was also common farther north at Pacifica Pier and inside Bolinas Lagoon.

QUARANTINES:

The annual mussel quarantine was rescinded on schedule at midnight, October 31. The annual quarantine, which normally goes into effect on May 1 of each year, applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the year, not just within the quarantine period. This allows the detection of unexpected increases in biotoxin activity outside of the routine quarantine period. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively. 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.

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

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Figure 4. Distribution of shellfish biotoxins in Northern California during October, 2007.

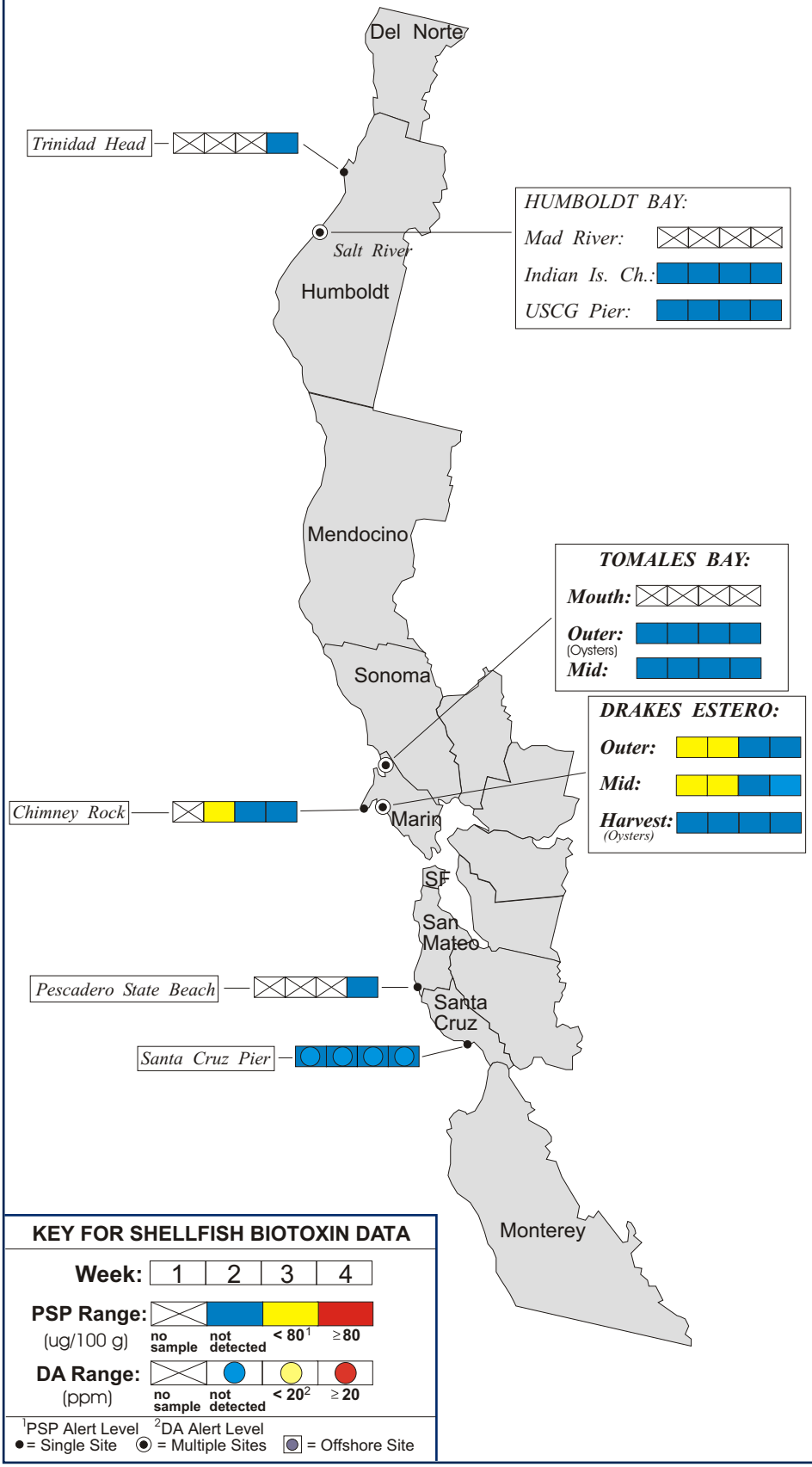

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during October, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	9
	Humboldt County Environmental Health Department	1
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	5
	CDPH Marine Biotoxin Monitoring Program	6
	Marin Oyster Company	1
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Dept.	1
Monterey	None Submitted	
San Luis Obispo	Cal Poly	5
	Tomales Bay Oyster Company	10
	Williams Shellfish Farms	10
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	5
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	1
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	2
	Scripps Institute of Oceanography	1

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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 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. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies.

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.

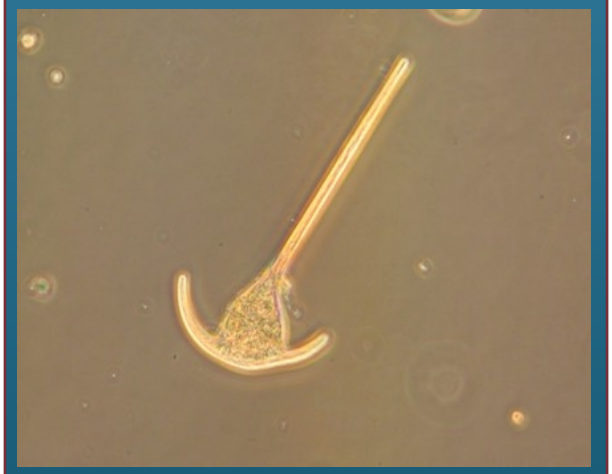
Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, 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. 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 October, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	4
	California Department of Fish and Game	1
	Humboldt State University	1
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	CDPH Volunteers (*Brent Anderson, Cal Strobel,*	8
	Marjorie Siegel, Mary Von Tolksdorf)	
	CDPH Marine Biotoxin Monitoring Program	3
	Drakes Bay Oyster Company	8
Contra Costa	CDPH Marine Biotoxin Monitoring Program	1
San Francisco	CDPH Volunteer (*Eugenia McNaughton*)	4
	Gulf of the Farallones National Marine Sanctuary	1
San Mateo	San Mateo County Environmental Health Dept.	1
	The Marine Mammal Center (*Stan Jensen*)	4
	U.C. Santa Cruz	1
Santa Cruz	The Marine Mammal Center (*Nancy Scarborough*)	2
	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Dept.	3
Monterey	Marine Life Studies	3
	Marine Pollution Studies Laboratory	3
	Monterey Abalone Company	4
San Luis Obispo	CDPH Volunteer (*Renee and Auburn Atkins*)	2
	Cal Poly	13
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	2
	Tenera Environmental	3
	The Marine Mammal Center (Tim Lytsell, P.J. Webb)	10
Santa Barbara	CDPH Volunteer (*Sylvia Short, Dennis Carlson*)	7
	Channel Islands National Marine Sanctuary	2
	National Park Service	1
	Santa Barbara Channel Keeper	1
	U.C. Santa Barbara	5
Ventura	CDPH Volunteers (Fred Burgess, Dennis Carlson)	6
	Ventura County Environmental Health Department	1
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	5
	Guided Discoveries, Tole Mour	6
Orange	Orange County Health Care Agency	1
	Ocean Institute	1
	Orange County Sanitation District	3
San Diego	Avian Research Associates	3
	CDPH Volunteer (*Paul Sims*)	1
	Scripps Institute of Oceanography	4

PHYTOPLANKTON GALLERY



The dinoflagellate Ceratium is a common and diverse genera along the coast. Pictured above are C. divaricatum and C. fusus (top), C. tripos (middle), and C. azoricum (bottom).