

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

July 2009

Technical Report No. 09-22

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of July, 2009. 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.

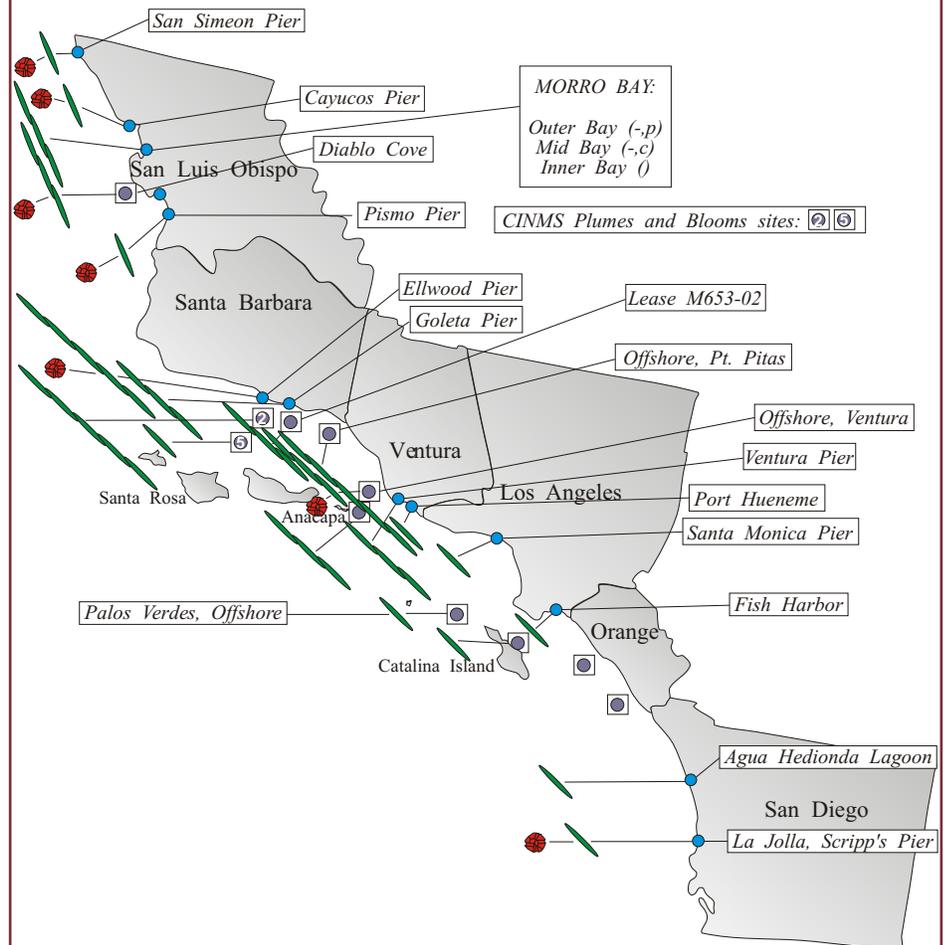
Southern California Summary:

Paralytic Shellfish Poisoning

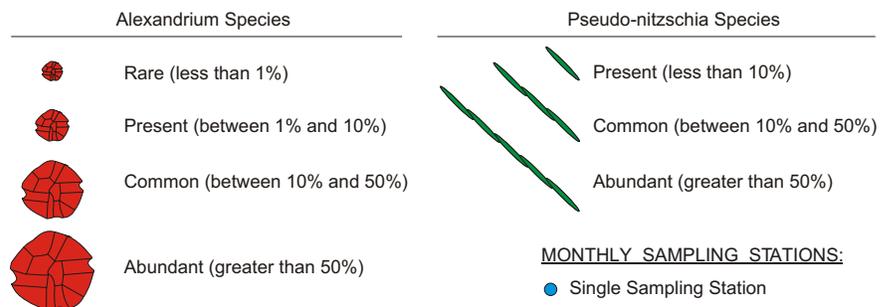
Alexandrium was observed along most of the southern California coast during July (Figure 1). The distribution and relative abundance of this dinoflagellate were equivalent to observations in June. PSP toxins were not

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during July, 2009.



Relative Abundance of Known Toxin Producers

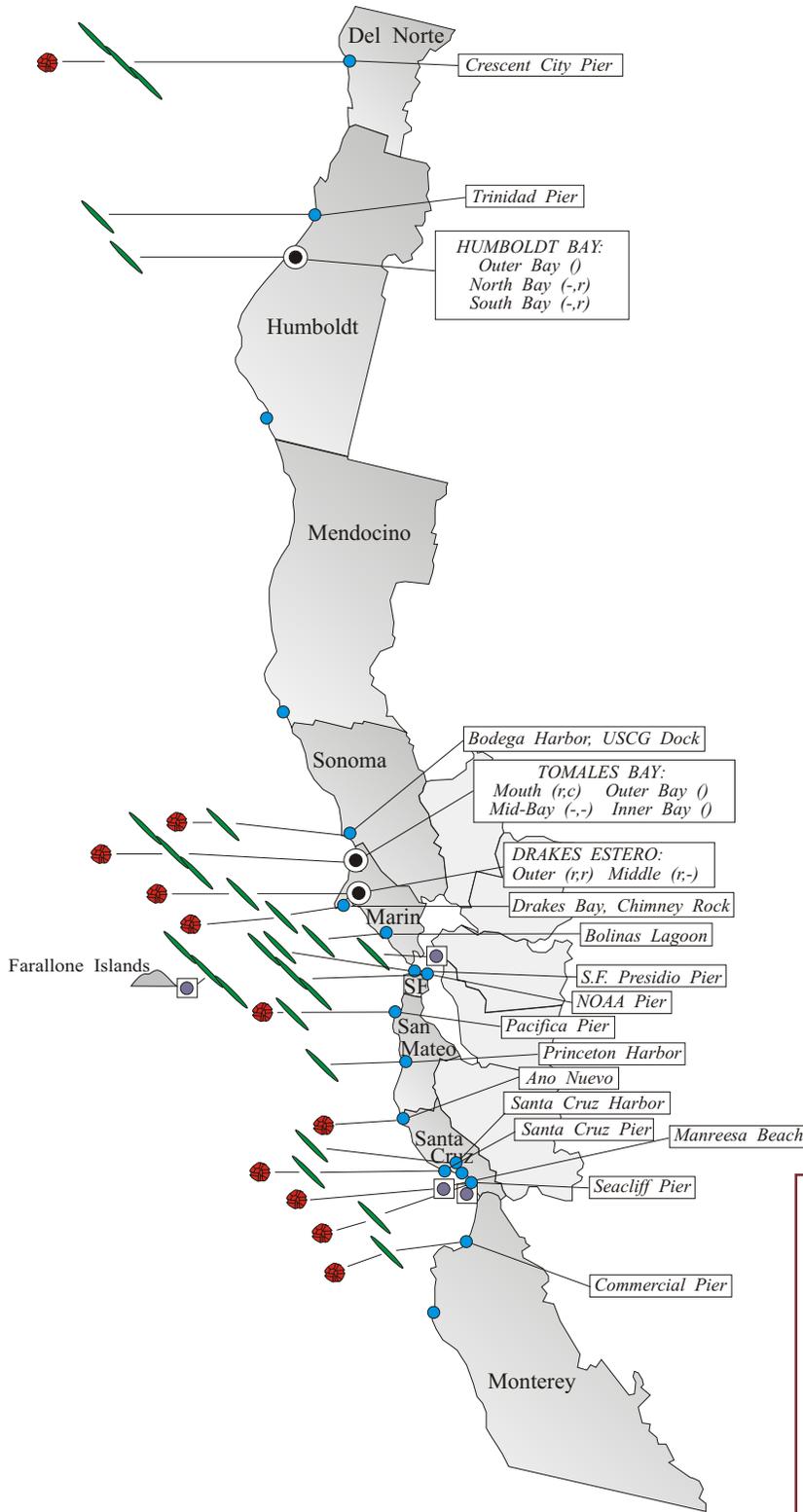


MONTHLY SAMPLING STATIONS:

-  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 July, 2009.



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detected in any shellfish samples collected in July.

Domoic Acid

Pseudo-nitzschia was detected along the entire southern California coast during July (Figure 1). There was an increase in the abundance of this diatom at sites in Santa Barbara and Ventura counties, while farther south the numbers declined. As noted in June, there was a proportionally higher number of the nontoxic *Pseudo-nitzschia* species in the delicatissima complex; however there appeared to be an increase in the relative abundance of the toxic species in the seriata class during July. These distinctions should be considered tentative given the difficulty in identifying species of this diatom with light microscopy. Cell densities were relatively low at most sites, with the highest relative abundances observed in Morro Bay and offshore of Diablo Cove (San Luis Obispo County).

Domoic acid was not detected in any shellfish samples collected in July (Figure 3).

Non-toxic Species

Diatoms remained dominant along much of the southern California coast, particularly between San Luis Obispo and Ventura counties. *Chaetoceros* was abundant

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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%)

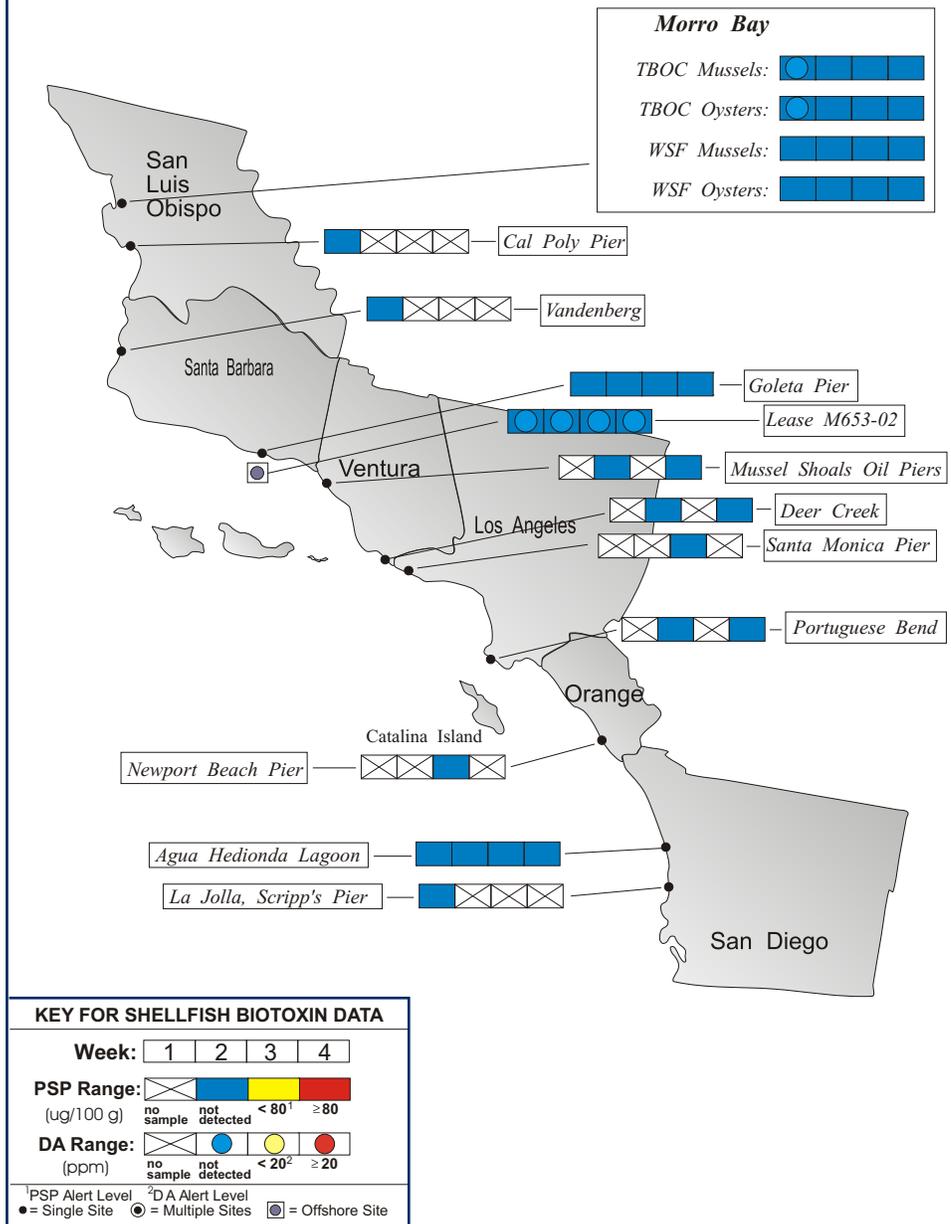
MONTHLY SAMPLING STATIONS:

- 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 July, 2009.



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throughout this region. The highest relative abundance for diatoms was observed at several sites in San Luis Obispo County: offshore of Diablo Cove (July 14), inside Morro Bay (July 22), and at the San Simeon Pier (July 24). Dinoflagellates increased in numbers at sites in Santa Barbara and Ventura and were dominant between Los Angeles and San Diego counties. *Ceratium spp.* and *Prorocentrum spp.* were the most common dinoflagellates observed.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at many sampling sites in July (Figure 2). The distribution of this dinoflagellate increased noticeably compared to observations in June, occurring at most sites between Bodega Bay and Monterey Bay.

PSP toxins were detected in shellfish samples from Marin County sites for the first time in 2009. Low levels of these toxins were detected at Kehoe Beach (35 ug/100 g) on July 8, then inside Drakes Estero during the last two weeks of the month.

Domoic Acid

Pseudo-nitzschia was observed at several sites in July (Figure 2). There was a

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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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continued decrease in *Pseudo-nitzschia* at sites in Monterey Bay compared to previous months. *Pseudo-nitzschia* remained common at sites in Del Norte, Marin, and San Francisco counties and was mostly comprised of the toxic species in the seriata complex. The highest relative abundances of this diatom were observed offshore near the Farallon Islands.

Domoic acid was not detected in any shellfish samples collected in July.

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the northern California coast. *Chaetoceros* remained the most abundant genera observed. Other common genera observed at various locations were *Thalassiosira*, *Thalassionema*, *Corethron*, and *Coscinodiscus*.

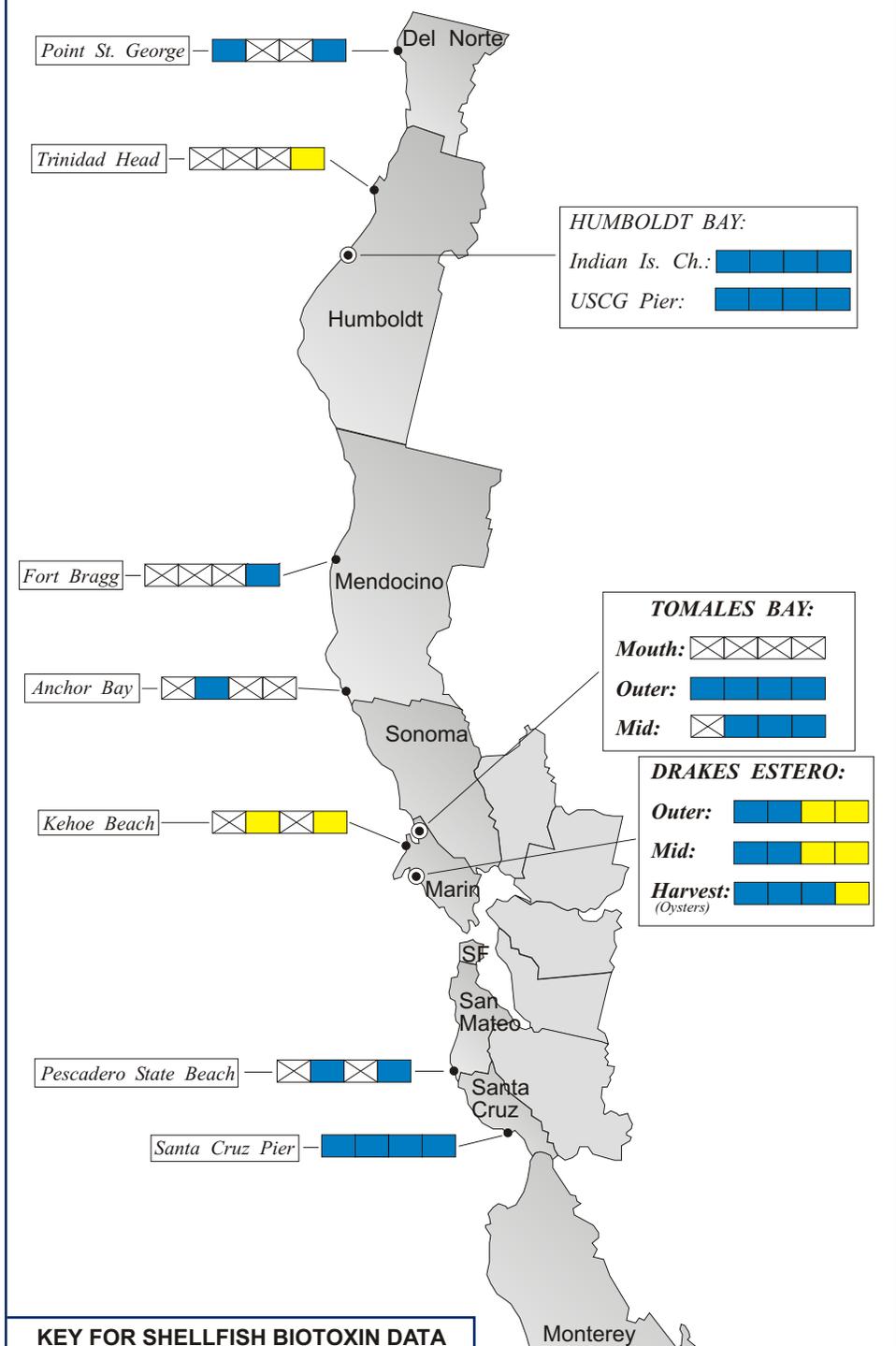


QUARANTINES:

The annual mussel quarantine went in effect on May 1. This quarantine applies specifically to the sport-harvesting of mussels along 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

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Figure 4. Distribution of shellfish biotoxins in Northern California during July, 2009.



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: (ppm) no sample not detected < 20² ≥ 20

¹PSP Alert Level ²DA Alert Level
 ● = Single Site ● = Multiple Sites ◐ = Offshore Site

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during July, 2009.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
Mendocino	CDPH Volunteer (<i>Marie De Santis</i>)	1
	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	25
	Hog Island Oyster Company	5
	Marin Oyster Company	3
	CDPH Marine Biotoxin Monitoring Program	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	5
Monterey	None Submitted	
San Luis Obispo	Cal Poly	1
	Tomales Bay Oyster Company	10
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	5
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	4
Los Angeles	Los Angeles County Health Department	3
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1

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.

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.



restrictions or closures are implemented as needed to protect the public's health.

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 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

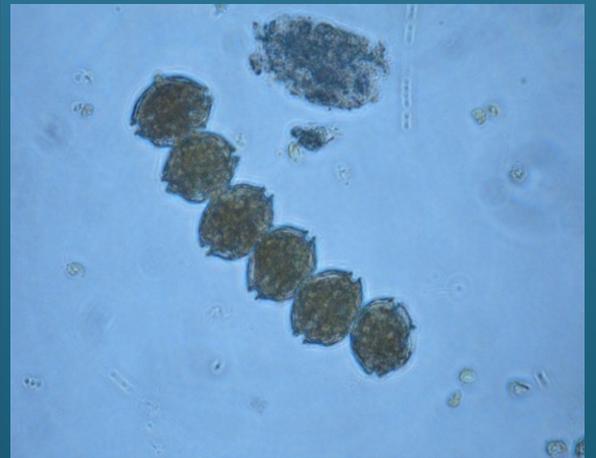
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during July, 2009.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
	Bureau of Land Management	2
	Humboldt State University	1
	Fortuna High School	2
Mendocino	CDPH Volunteer (<i>Marie De Santis</i>)	3
Sonoma	CDPH Volunteer (<i>Cathleen Cannon</i>)	1
Marin	CDPH Volunteers (<i>Brent Anderson, Cal Strobel</i>)	5
	Drakes Bay Oyster Company	8
	CDPH Marine Biotoxin Program	2
San Francisco	CDPH Volunteer (<i>E. McNaughton</i>)	1
	San Francisco Health Department	4
	CDPH Marine Biotoxin Program	1
	CDPH Volunteer (<i>Carol Keiper</i>)	2
San Mateo	CDPH Volunteer (<i>Kathleen Abadie</i>)	2
	San Mateo County Environmental Health Dept.	2
	The Marine Mammal Center (<i>Stan Jensen</i>)	4
	U.C. Santa Cruz	3
Santa Cruz	Santa Cruz County Environmental Health Dept.	3
	U.C. Santa Cruz	4
	San Lorenzo Valley High School	2
	California Department of Parks and Recreation	3
	The Marine Mammal Center (<i>Nancy Scarborough</i>)	1
Monterey	Monterey Abalone Company	4
	CDPH Volunteer (<i>Jerry Norton</i>)	1
	Marine Pollution Studies Laboratory	1
San Luis Obispo	Cal Poly	1
	Monterey Bay National Marine Sanctuary	5
	Morro Bay National Estuary Program	2
	Tenera Environmental	2
	The Marine Mammal Center (<i>Tim Lytsell, P.J. Webb</i>)	12
	Tomales Bay Oyster Company	4
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	4
	Channel Islands National Marine Sanctuary	5
	U.C. Santa Barbara	5
	National Park Service	1
	Santa Barbara Mariculture Company	5
Ventura	CDPH Volunteer (<i>Fred Burgess</i>)	3
	Channel Islands National Marine Sanctuary	2
	Ventura County Environmental Health Department	1
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	3
	Los Angeles County Health Department	1
	Southern California Marine Institute	1
	Guided Discoveries, Tole Mour	1
Orange	Orange County Health Care Agency	1
	Ocean Institute	1
San Diego	Carlsbad Aquafarms, Inc.	3
	Scripps Institute of Oceanography	4

PHYTOPLANKTON GALLERY



A rarely observed bloom of the diatom *Corethron* was detected in a sample near the Farallon Islands.



The PSP toxin-producer, *Alexandrium*, became more prevalent at central and northern California sampling sites.



The diatom *Stephanopyxis* was observed at a number of sites along the coast in July.