

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 December 2007

Technical Report No. 07-27

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of December, 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 during December

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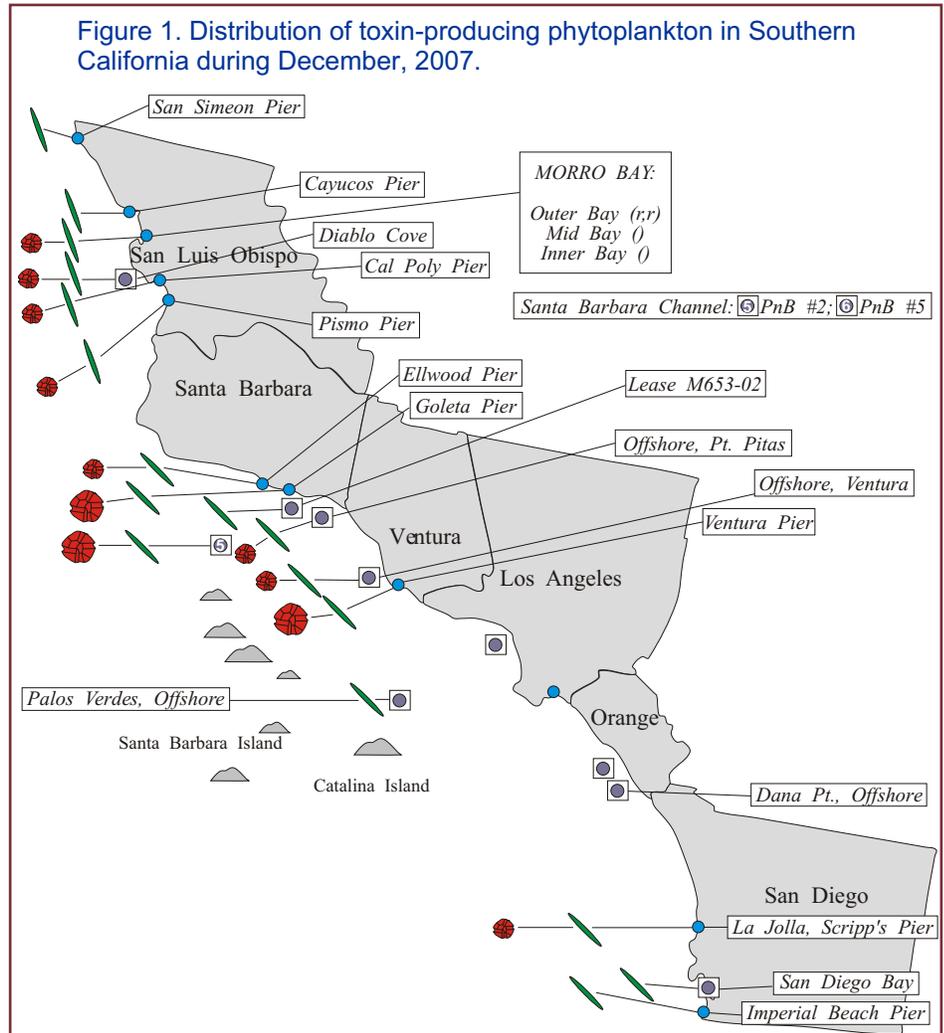


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during December, 2007.

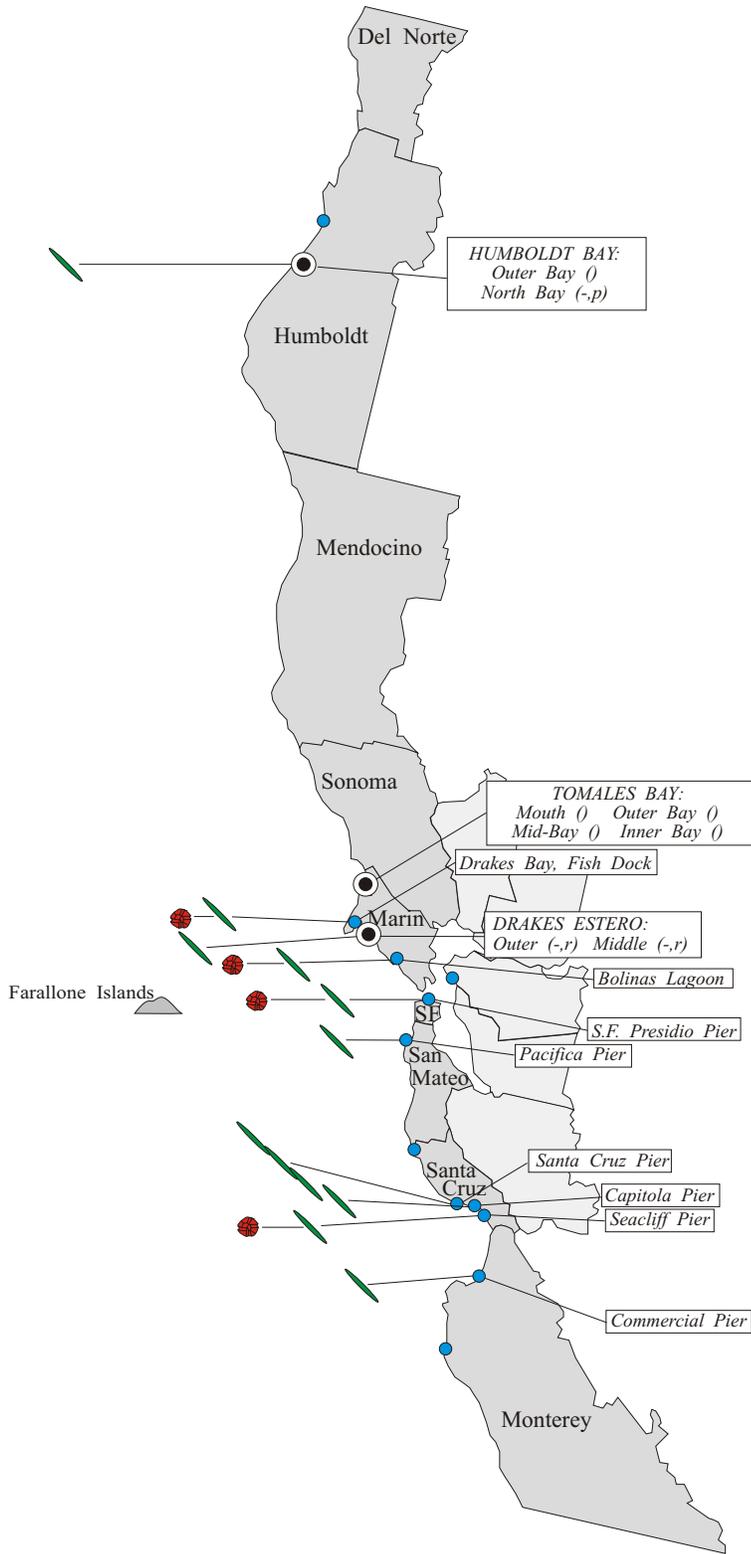
Relative Abundance of Known Toxin Producers	
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

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 December, 2007.



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(Figure 1). This distribution was similar to observations in November, however the relative abundance increased slightly at several sites during the first half of the month. The highest relative abundances were observed at the Goleta Pier (Santa Barbara) on December 5.

Low concentrations of PSP toxins were detected the first week of December at several sites in San Luis Obispo and Santa Barbara counties. These low toxin levels persisted through the second or third week of the month. The highest PSP toxin concentration detected was 71 ug/100g in a mussel sample from offshore of Santa Barbara (December 13). Low levels of PSP toxins were also detected in the viscera of lobster collected offshore of Ventura and in scallop viscera collected near Santa Cruz Island.

Domoic Acid

Pseudo-nitzschia was detected along the entire Southern California coast in December (Figure 1). The relative abundance of this diatom continued to decrease at all sites throughout this range.

Domoic acid was not detected in any samples analyzed in December.

Non-toxic Species

Dinoflagellates continued to dominate the

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Relative Abundance of Known Toxin Producers

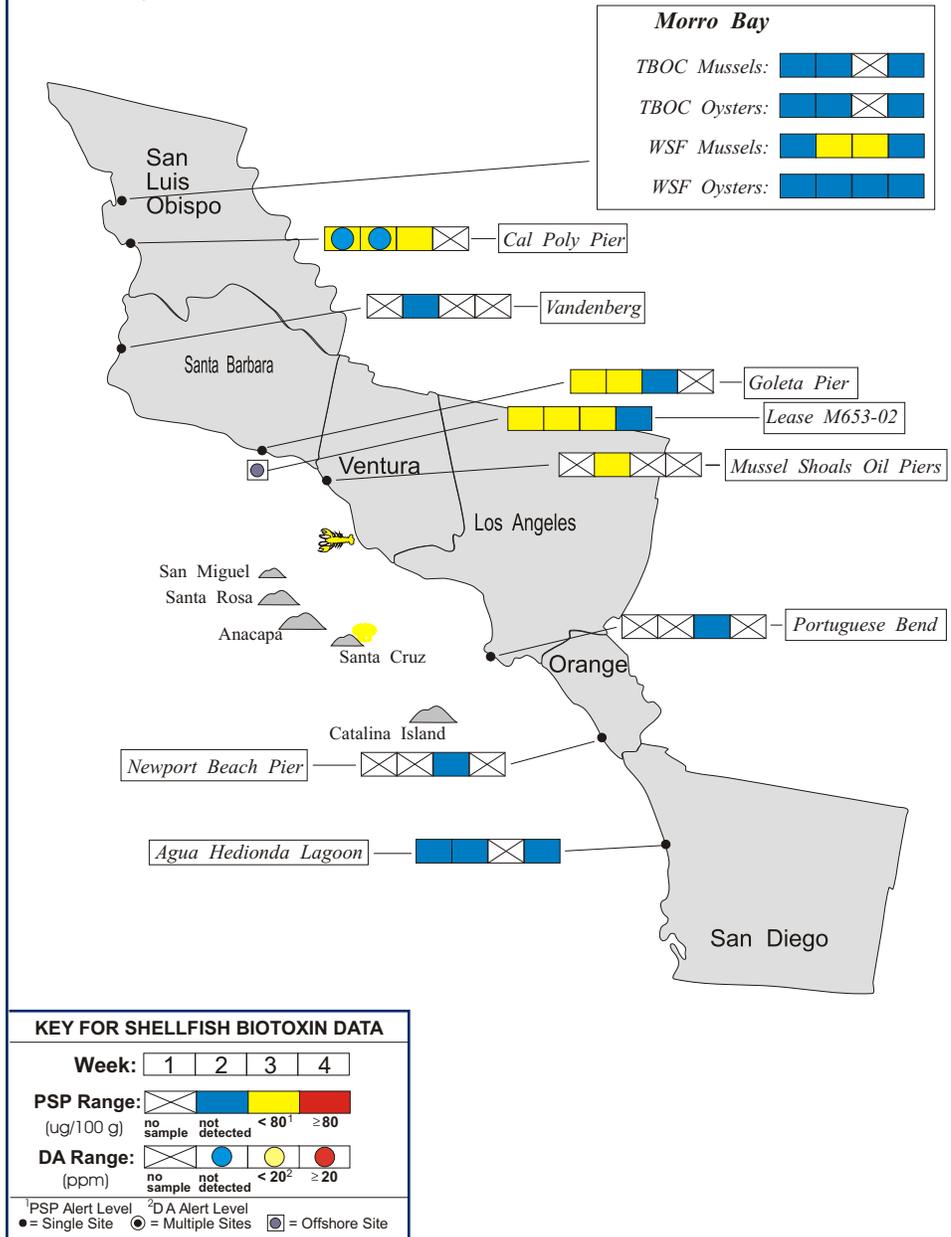
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (between 1% and 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 December, 2007.



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phytoplankton assemblage in December. The dinoflagellates *Prorocentrum* and *Akashiwo* were common along the Southern California coast between San Luis Obispo and Los Angeles counties. *Lingulodinium* was common to abundant between Los Angeles and San Diego counties. The highest relative abundance of *Lingulodinium* were observed offshore of Palos Verdes in mid-December.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at several sites between Marin and Santa Cruz counties in December (Figure 2). The distribution was slightly reduced from observations in November and the relative abundance was quite similar to the previous month.

Very low levels of PSP toxins were detected during the third week of December in mussels from Drakes Estero (Marin County) and Pescadero Beach (San Mateo County). (Figure 4).

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in November and the relative abundance remained very low at most sites (Figure 2). An exception to this pattern was a brief increase observed at

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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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Santa Cruz Pier during the first week of the month. Domoic acid was not detected in any shellfish samples analyzed in December.

Non-toxic Species

Dinoflagellates continued to dominate the phytoplankton assemblage along the Northern California coast in December. *Ceratium* and *Akashiwo* were the most common genera, with the latter continuing to be abundant in Monterey Bay where visible red tides were still being reported. The diatoms *Chaetoceros* and *Thalassionema* were also common at many sites along the coast during the latter half of the month.



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.

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

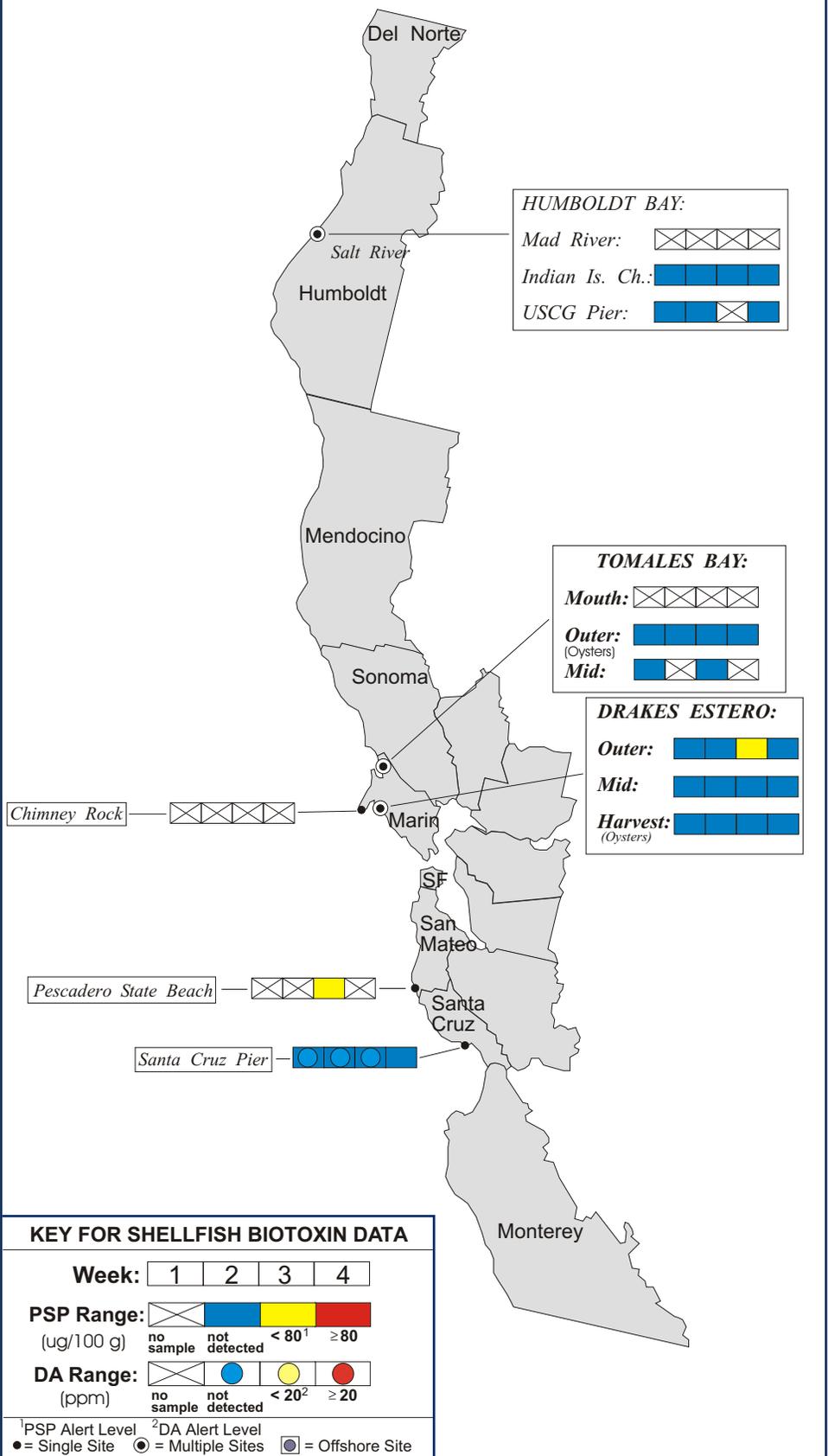


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during December, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	7
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	2
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Cal Poly	3
	Tomales Bay Oyster Company	6
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	13
	U.C. Santa Barbara	3
Ventura	Ventura County Environmental Health Dept.	1
	CDPH Volunteer (<i>Bill Weinerth</i>)	2
Los Angeles	Los Angeles County Health Department	1
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	3

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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 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 December, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
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 <i>(Brent Anderson, Mary Von Tolksdorf)</i>	5
	Drakes Bay Oyster Company	8
	Contra Costa	CDPH Marine Biotxin Monitoring Program
San Francisco	CDPH Volunteer <i>(Eugenia McNaughton)</i>	3
San Mateo	San Mateo County Environmental Health Dept.	1
	The Marine Mammal Center <i>(Stan Jensen)</i>	2
Santa Cruz	Santa Cruz County Environmental Health Dept.	3
	The Marine Mammal Center <i>(Nancy Scarborough)</i>	1
	U.C. Santa Cruz	3
Monterey	Marine Pollution Studies Laboratory	3
	Monterey Abalone Company	3
San Luis Obispo	CDPH Volunteer <i>(Renee and Auburn Atkins)</i>	2
	Cal Poly	8
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	2
	Tenera Environmental	2
Santa Barbara	The Marine Mammal Center <i>(P.J. Webb)</i>	2
	CDPH Volunteer <i>(Sylvia Short)</i>	3
	Channel Islands National Marine Sanctuary	1
	Santa Barbara Mariculture Company	5
Ventura	U.C. Santa Barbara	4
	CDPH Volunteers <i>(Fred Burgess, Dennis Carlson)</i>	3
Los Angeles	Los Angeles County Sanitation District	4
Orange	Orange County Health Care Agency	1
	Ocean Institute	1
San Diego	Avian Research Associates	2
	CDPH Volunteer <i>(Paul Sims)</i>	2
	Scripps Institute of Oceanography	5

PHYTOPLANKTON GALLERY



Diatoms were present in small numbers at several sites in December.



The pennate diatom Pleurosigma is often seen in low numbers, particularly when ocean conditions are rough.



A common member of the zooplankton community, this cyclopoid copepod is occasionally observed in our samples.