

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 February 2008

Technical Report No. 08-12

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of February, 2008. 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.

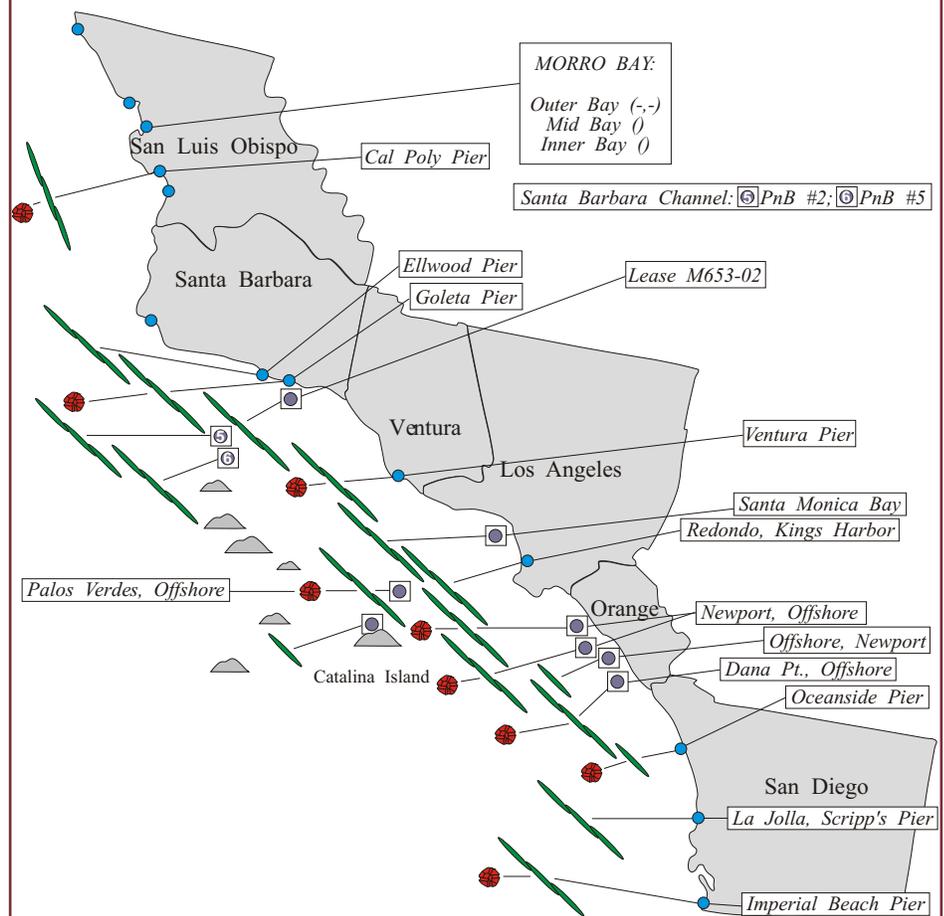
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sampling stations between San Luis Obispo and San Diego counties during February (Figure 1). The distribution was similar to observations in January, with the frequency of occurrence

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during February, 2008.



Relative Abundance of Known Toxin Producers

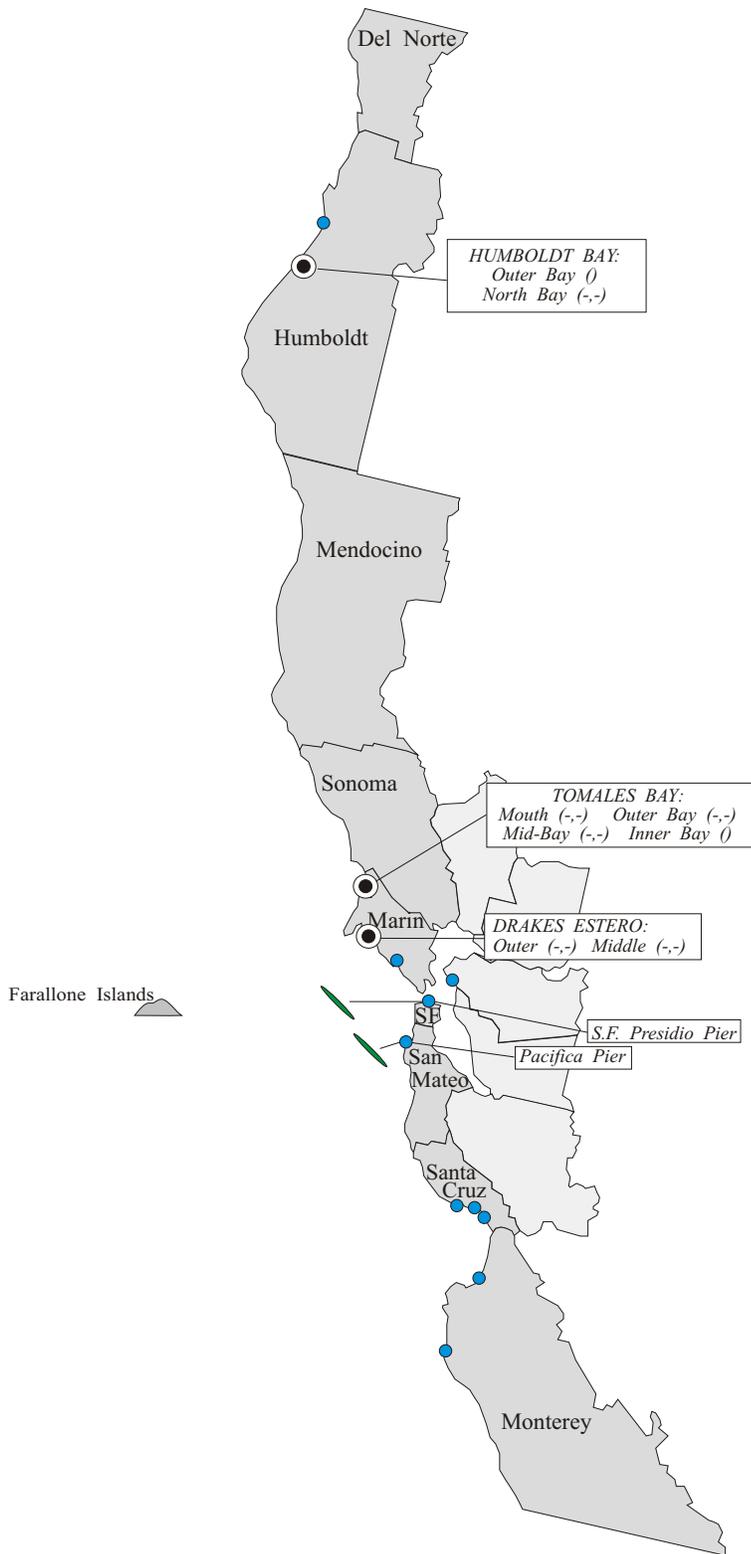
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 February, 2008.



(Continued from Page 1)

much greater in February. The relative abundance of this dinoflagellate also increased in February compared to observations in the previous month.

Low concentrations of PSP toxins were detected in mussels from sites in Santa Barbara almost every week of the month (Figure 3). PSP toxicity was also detected at low levels in mussels from Agua Hedionda Lagoon in northern San Diego County. There was a similar occurrence in 2006, with low levels of these toxins being detected from mid-March through the beginning of April in this lagoon. Prior to 2006 it had been six years since the last positive result in shellfish from this lagoon. Historically there have been periodic, brief occurrences of low PSP toxin concentrations dating back to 1988.

Domoic Acid

Pseudo-nitzschia was detected at sites along each Southern California coastal County during February (Figure 1). The distribution of this diatom was similar to observations in January but the relative abundance increased significantly. *Pseudo-nitzschia* constituted 10% to 20% of the phytoplankton species composition along each County. Although the percent composition of this diatom increased in February, the overall cell mass was low. The highest relative

(Continued on Page 3)

Relative Abundance of Known Toxin Producers

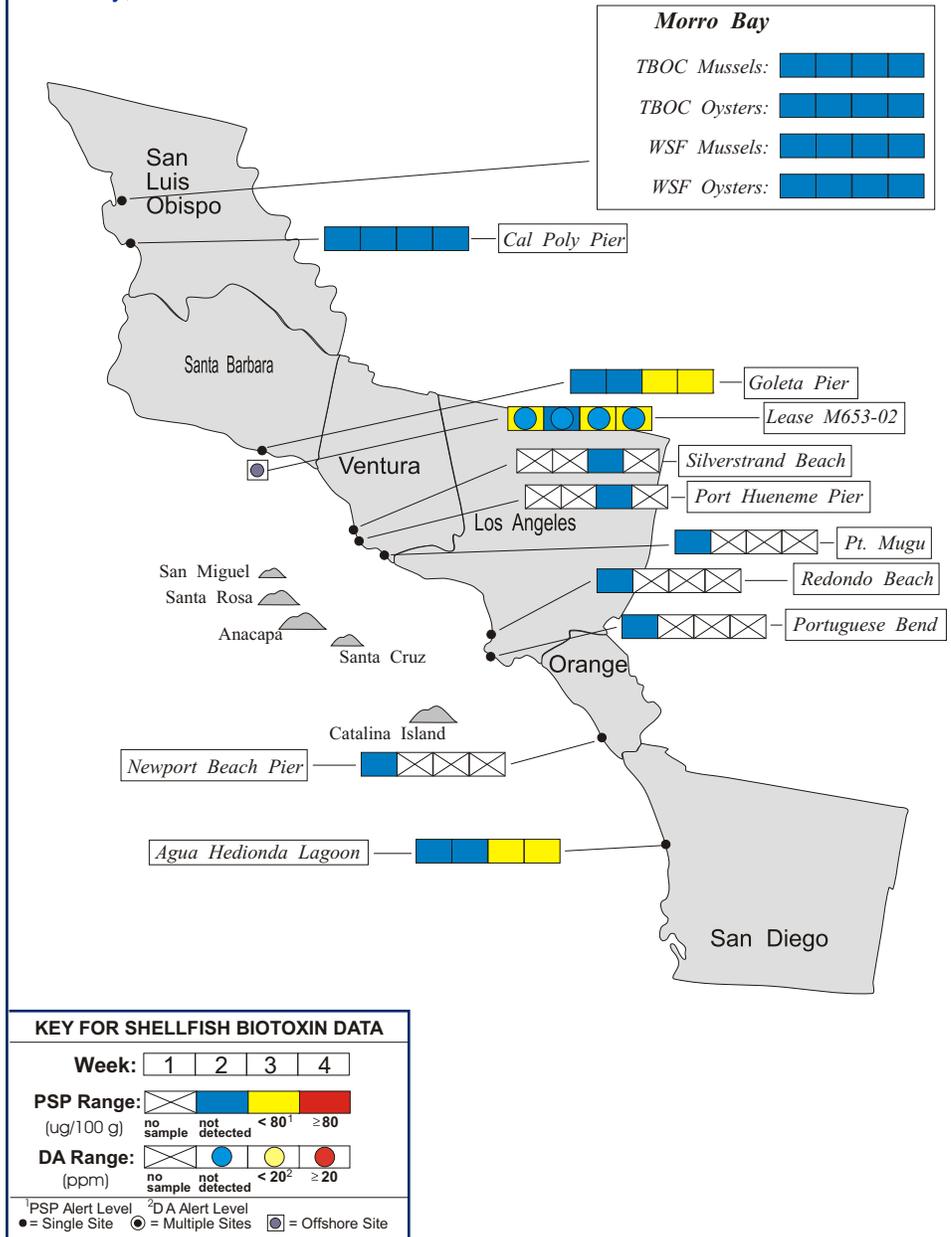
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (between 1% and 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 February, 2008.



(Continued from Page 2)

abundance of *Pseudo-nitzschia* was observed in a sample from Santa Monica Bay on February 6.

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

Non-toxic Species

Of the phytoplankton present amidst the detritus and sediment typical of winter conditions, diatoms were dominant between San Luis Obispo and Los Angeles counties. *Chaetoceros*, *Thalassiosira* and *Skeletonema* were the most common genera observed. Orange County sites contained a mix of these diatoms and several dinoflagellates that also dominated the San Diego coast. The latter included *Lingulodinium* and *Prorocentrum*, with *Akashiwo* also common at some sites.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any sampling sites in Northern California during February (Figure 2). PSP toxicity was not detected in any shellfish samples from this region during the month (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed in very low

(Continued on Page 4)

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

(Continued from Page 3)

numbers at only two sites: The Presidio Pier in San Francisco Bay near the Golden Gate and at Pacifica Pier in San Mateo County (Figure 2). The distribution and relative abundance of this diatom was reduced from observations in January. Domoic acid was not detected in any shellfish samples analyzed in February.

Non-toxic Species

The frequent winter storms contributed detritus and sediment and very few phytoplankton during February. Interestingly there was a bloom of centric diatoms inside Tomales Bay by the second week of the month. A very unusual species of the dinoflagellate *Dinophysis* was also identified in a sample collected near the mouth of Tomales Bay. A special thanks to Amelia La Barbera, INIA, Cumana, Venezuela for the tentative identification of this species as *D. schuetti* (see photo on Page 6) and to Sherwood Hall of the U.S. Food and Drug Administration for facilitating the discussion.



QUARANTINES:

The annual mussel quarantine was rescinded on schedule at midnight, October 31, 2007. 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

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during February, 2008.

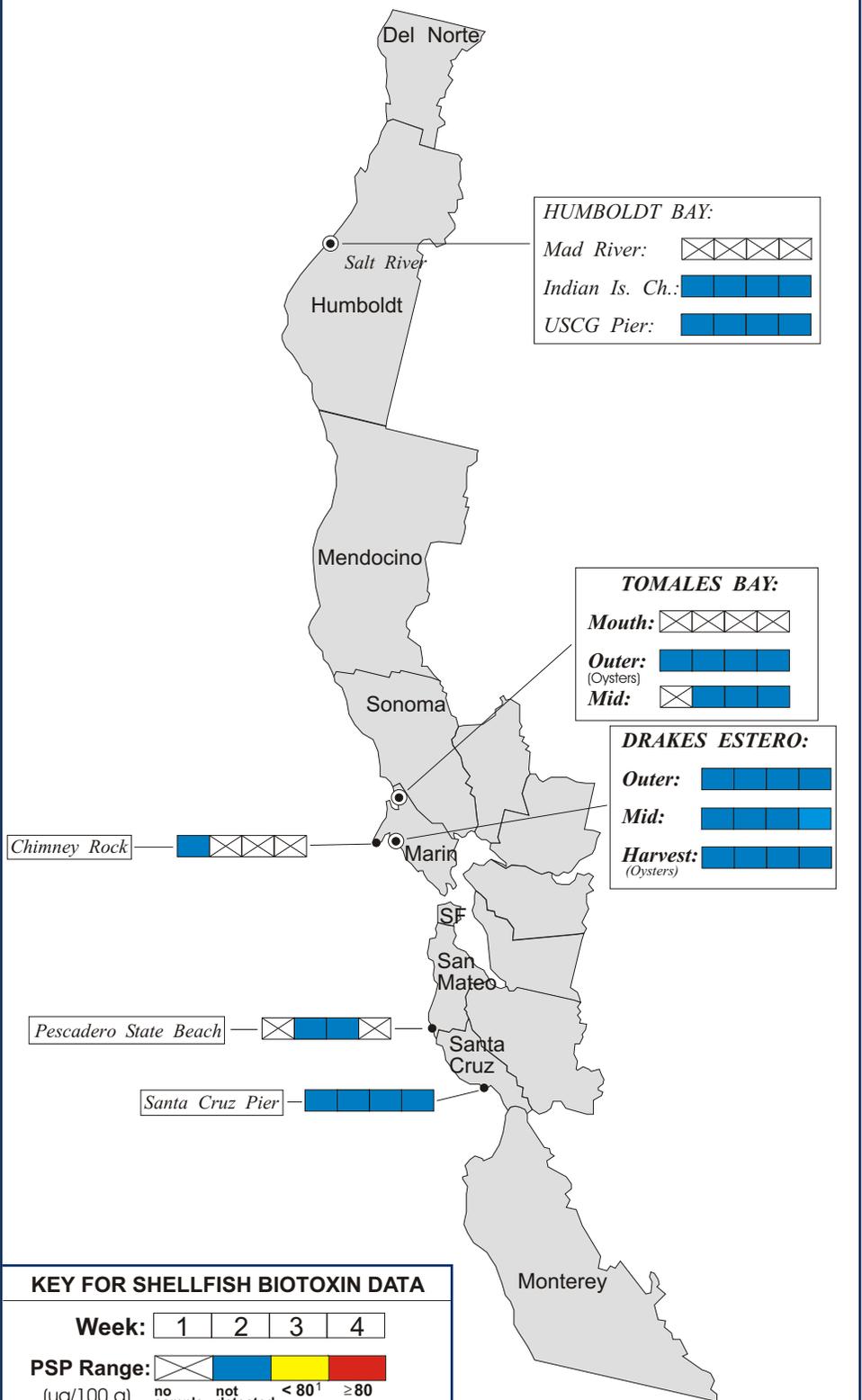


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during February, 2008.

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

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.



(Continued from Page 4)

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 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

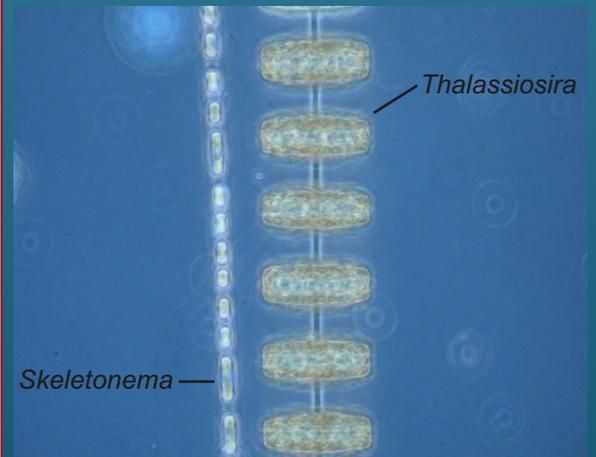
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during February, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	2
	California Department of Fish and Game	1
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	CDPH Volunteers (<i>Brent Anderson, Cal Strobel</i>)	2
	Drakes Bay Oyster Company	4
	Hog Island Oyster Company	2
Contra Costa	CDPH Marine Biotoxin Program	1
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	1
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	2
	San Mateo County Environmental Health Dept.	1
Santa Cruz	U.C. Santa Cruz	3
Monterey	Monterey Abalone Company	1
	Marine Pollution Studies Laboratory	1
San Luis Obispo	CDPH Volunteer (<i>Renee and Auburn Atkins</i>)	1
	Cal Poly	10
	Monterey Bay National Marine Sanctuary	1
	Morro Bay National Estuary Program	1
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	2
	Channel Islands National Marine Sanctuary	2
	Santa Barbara Mariculture Company	2
Ventura	U.C. Santa Barbara	2
	CDPH Volunteer (<i>Fred Burgess</i>)	2
Los Angeles	Los Angeles County Sanitation District	2
	City of Los Angeles Environmental Monitoring Div.	3
	Catalina Island Marine Institute	1
Orange	Orange County Health Care Agency	1
	Orange County Sanitation District	4
	Ocean Institute	2
San Diego	Avian Research Associates	3
	Scripps Institute of Oceanography	2

PHYTOPLANKTON GALLERY



A very unusual species of *Dinophysis*, possibly *D. schuetti*, was observed in a sample from Tomales Bay.



The diatoms *Thalassiosira* and *Skeletonema* were common along parts of the Southern California coast.



The dinoflagellate *Lingulodinium*, often responsible for red tides, increased in number in samples from Orange and San Diego counties.