

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

March 2008

Technical Report No. 08-15

INTRODUCTION:

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

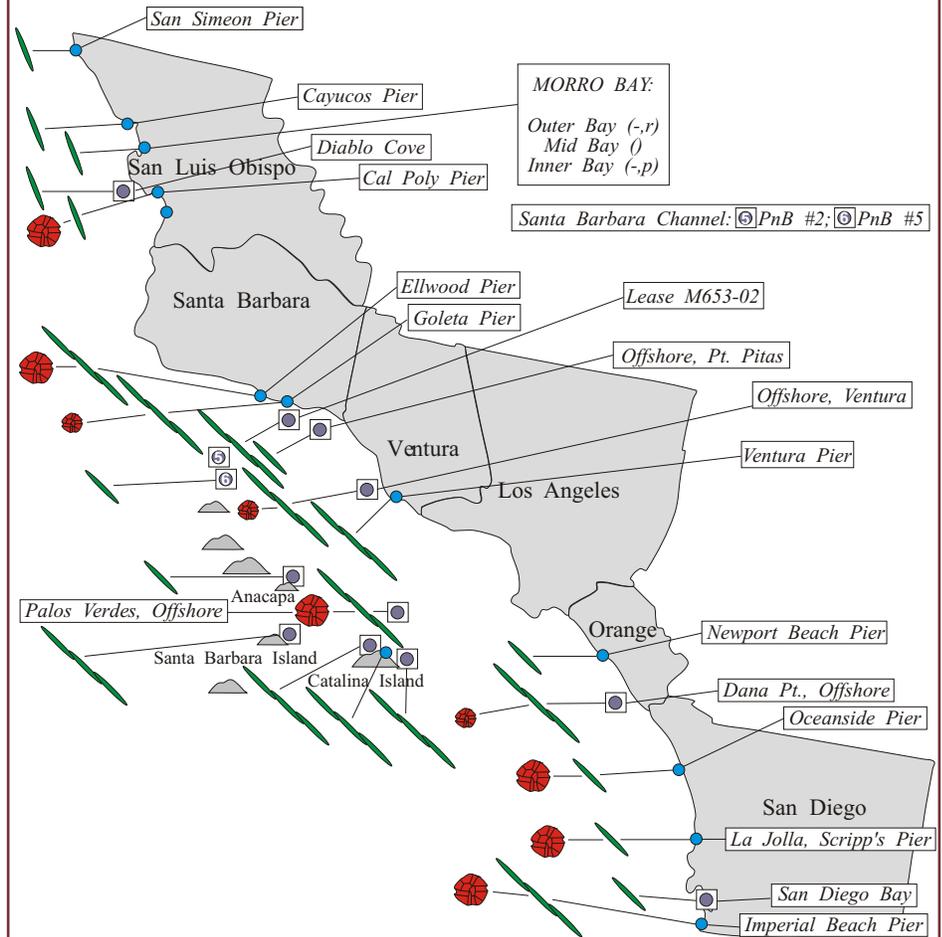
Southern California Summary:

Paralytic Shellfish Poisoning

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

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



Relative Abundance of Known Toxin Producers

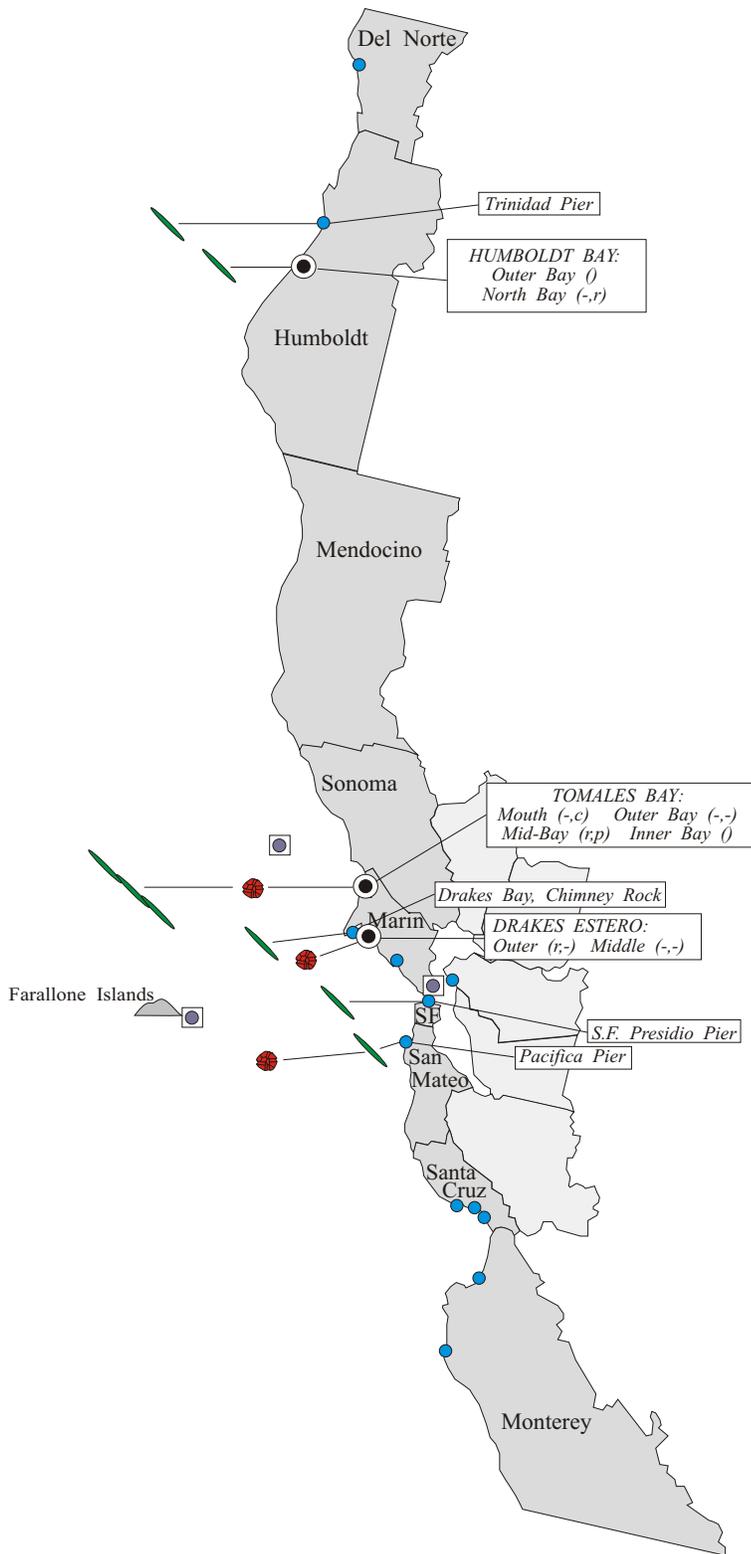
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

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 March, 2008.



(Continued from Page 1)

and relative abundance increasing in March. The relative abundance of this dinoflagellate was highest offshore of Palos Verdes (Los Angeles County).

Low concentrations of PSP toxins were detected in mussels at a number of sites between Santa Barbara and San Diego counties throughout the month (Figure 3). The low levels of PSP toxicity detected in mussels from Agua Hedionda Lagoon during the latter half of February continued to increase in March, reaching 72 ug by March 25 and exceeding the alert level by the 31st (114 ug). This is the first known occurrence of PSP toxin concentrations exceeding the alert level inside this lagoon. The mussel sample from Portuguese Bend also approached the alert level, reaching 74 ug by March 27.

Domoic Acid

Pseudo-nitzschia was detected at numerous sites between San Luis Obispo and San Diego counties during March (Figure 1). The distribution of this diatom was similar to observations in February but the relative abundance decreased slightly at sites in San Luis Obispo and San Diego counties. Although *Pseudo-nitzschia* was common at a number of locations, the overall cell mass was low. In addition, there appeared to be a mix of both toxic and nontoxic species

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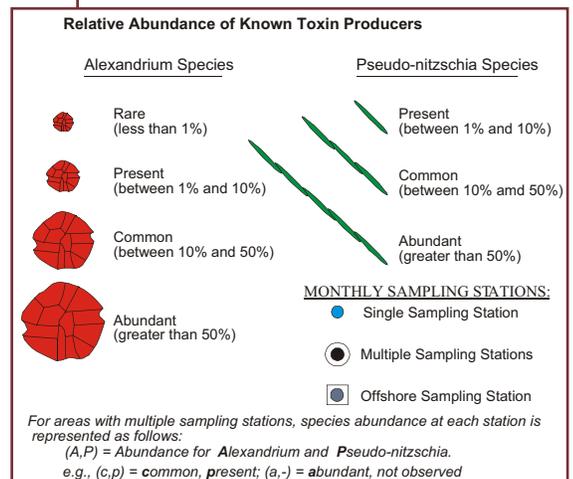
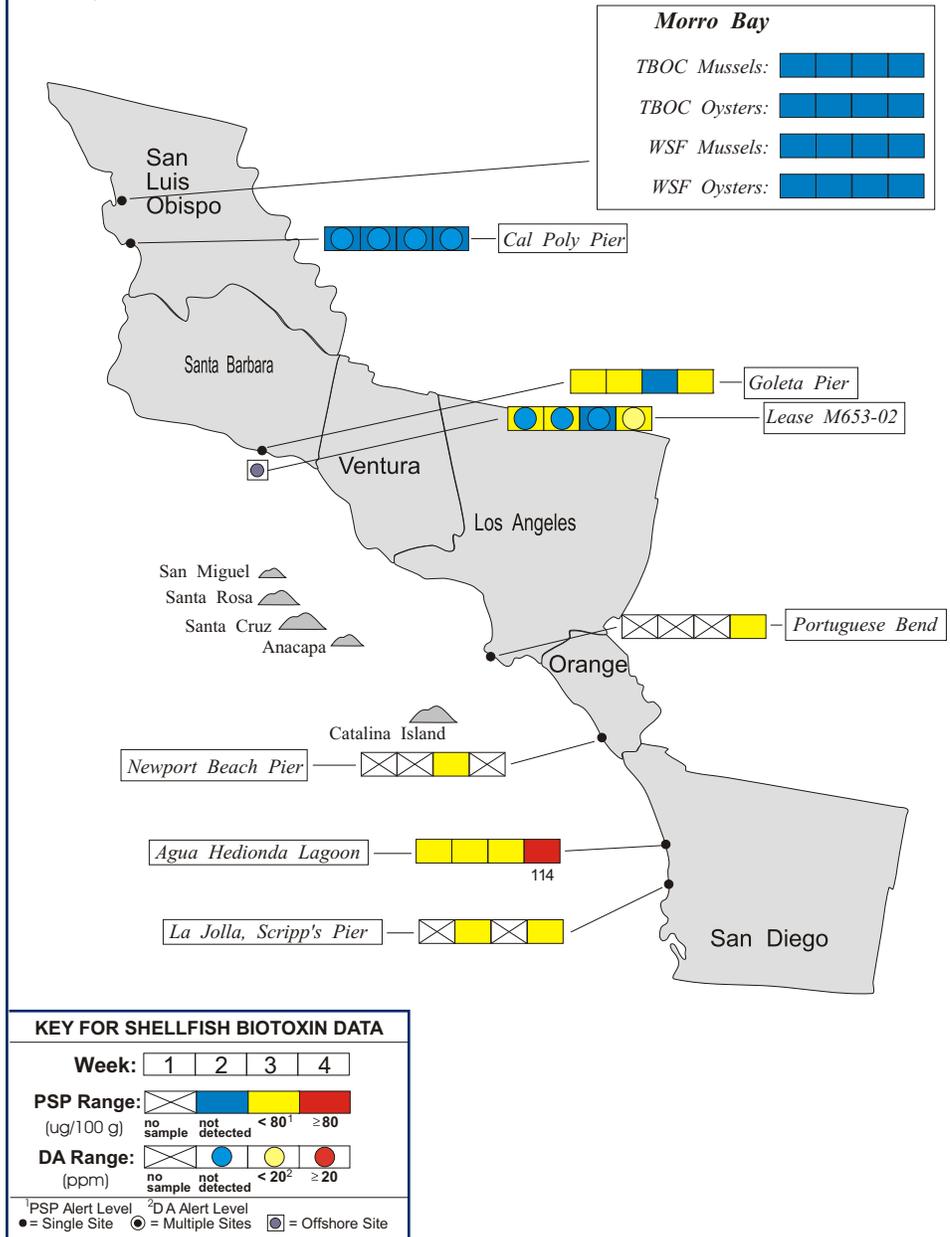


Figure 3. Distribution of shellfish biotoxins in Southern California during March, 2008.



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present.

A low level of domoic acid (2 ppm) was detected in a shellfish sample from offshore of Santa Barbara on March 26.

Non-toxic Species

March represented a transition from winter to spring conditions along the southern California coast. Species diversity and biomass increased throughout the month. Diatoms were dominant between San Luis Obispo and Los Angeles counties, with *Chaetoceros* and *Eucampia* the most common genera observed. Sites along the Orange and San Diego coast contained mostly dinoflagellates, including *Lingulodinium* and *Prorocentrum*.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed in very low numbers at two sites in Marin and one site in San Mateo County during March (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 numbers at a few sites along the northern

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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

(Continued from Page 3)

California coast in March (Figure 2). The distribution and relative abundance of this diatom was slightly increased from observations in February. Domoic acid was not detected in any shellfish samples analyzed in March.

Non-toxic Species

The phytoplankton assemblage was sparse through most of March as winter conditions prevailed along the northern California coast. By the end of the month there was a noticeable increase in the diversity and biomass of phytoplankton species, with diatoms dominating the assemblage. *Chaetoceros* and *Thalassiosira* were the most common genera observed.



QUARANTINES:

The annual mussel quarantine is scheduled to go into effect on May 1, barring a sudden increase in toxin levels prior to that time. The annual quarantine 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

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

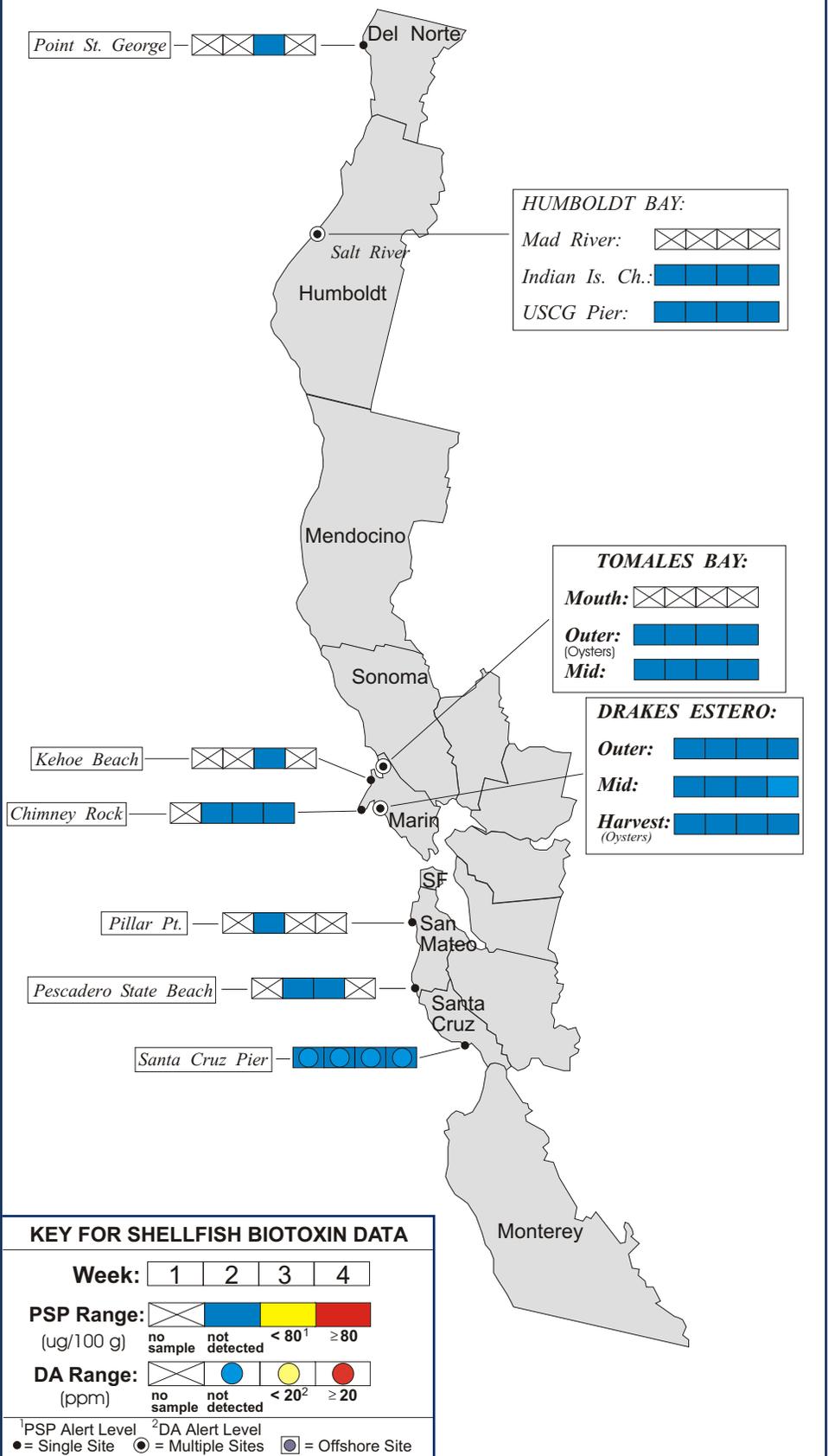


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during March, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	5
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
	Marin Oyster Company	4
	CDPH Marine Biotoxin Monitoring Program	7
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	2
	CDPH Volunteer (Kirk Lombard)	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Cal Poly	4
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	10
Santa Barbara	Santa Barbara Mariculture Company	9
	U.C. Santa Barbara	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	1
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	11
	Scripps Institute of Oceanography	2

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)

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.

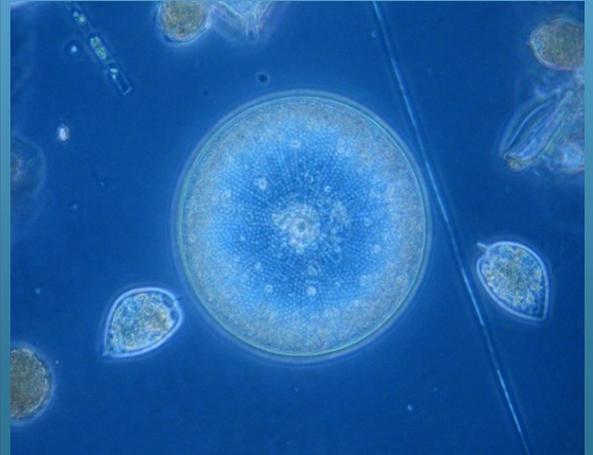
Consumers of Washington clams, also

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

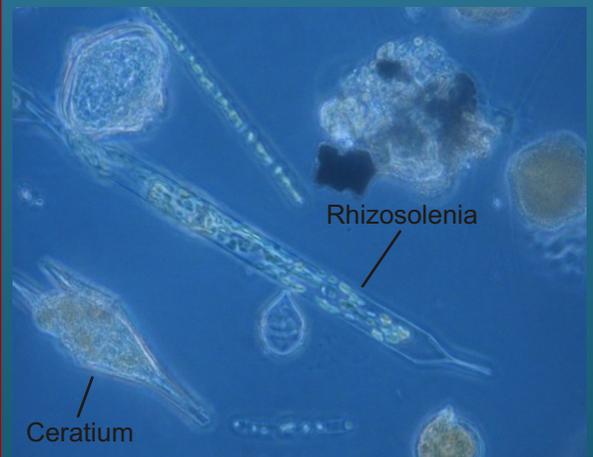
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during March, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
	California Department of Fish and Game	1
	Humboldt State University	1
	None Submitted	
Sonoma	Cordell Banks National Marine Sanctuary	1
Marin	CDPH Volunteers (<i>B. Anderson, C. Strobel, R. Plant</i>)	10
	Drakes Bay Oyster Company	6
	Hog Island Oyster Company	1
	CDPH Marine Biotoxin Program	3
Contra Costa	None Submitted	1
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	3
	Oikonos	2
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	3
	San Mateo County Environmental Health Dept.	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Dept.	3
	The Marine Mammal Center (<i>Nancy Scarborough</i>)	1
Monterey	Monterey Abalone Company	5
	Marine Pollution Studies Laboratory	2
San Luis Obispo	CDPH Volunteer (<i>Renee and Auburn Atkins</i>)	1
	Cal Poly	10
	The Marine Mammal Center (<i>Tim Lytsell</i>)	5
	Monterey Bay National Marine Sanctuary	2
	Morro Bay National Estuary Program	2
Santa Barbara	Tenera Environmental	3
	CDPH Volunteer (<i>Sylvia Short</i>)	4
	Channel Islands National Marine Sanctuary	3
	National Park Service	1
	Santa Barbara Mariculture Company	6
Ventura	U.C. Santa Barbara	4
	CDPH Volunteer (<i>Fred Burgess</i>)	3
Los Angeles	Channel Islands National Marine Sanctuary	4
	City of Los Angeles Environmental Monitoring Div.	3
	Catalina Island Marine Institute	2
Orange	Guided Discoveries, Tole Mour	9
	Orange County Health Care Agency	1
San Diego	Ocean Institute	2
	Avian Research Associates	7
	Scripps Institute of Oceanography	5
	CDPH Volunteer (<i>Paul Sims</i>)	1

PHYTOPLANKTON GALLERY



Centric diatoms were observed at a number of locations in March.



Diatoms and dinoflagellates began increasing in numbers through March.



The diatom *Corethron* began appearing in low numbers at several sites in March.