

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

October 2012

Technical Report No. 12-23

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of October, 2012. 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 not observed at any southern California sampling station (Figure 1). PSP toxins were not detected in any shellfish samples collected in October (Figure 3).

Domoic Acid

(Continued on Page 2)

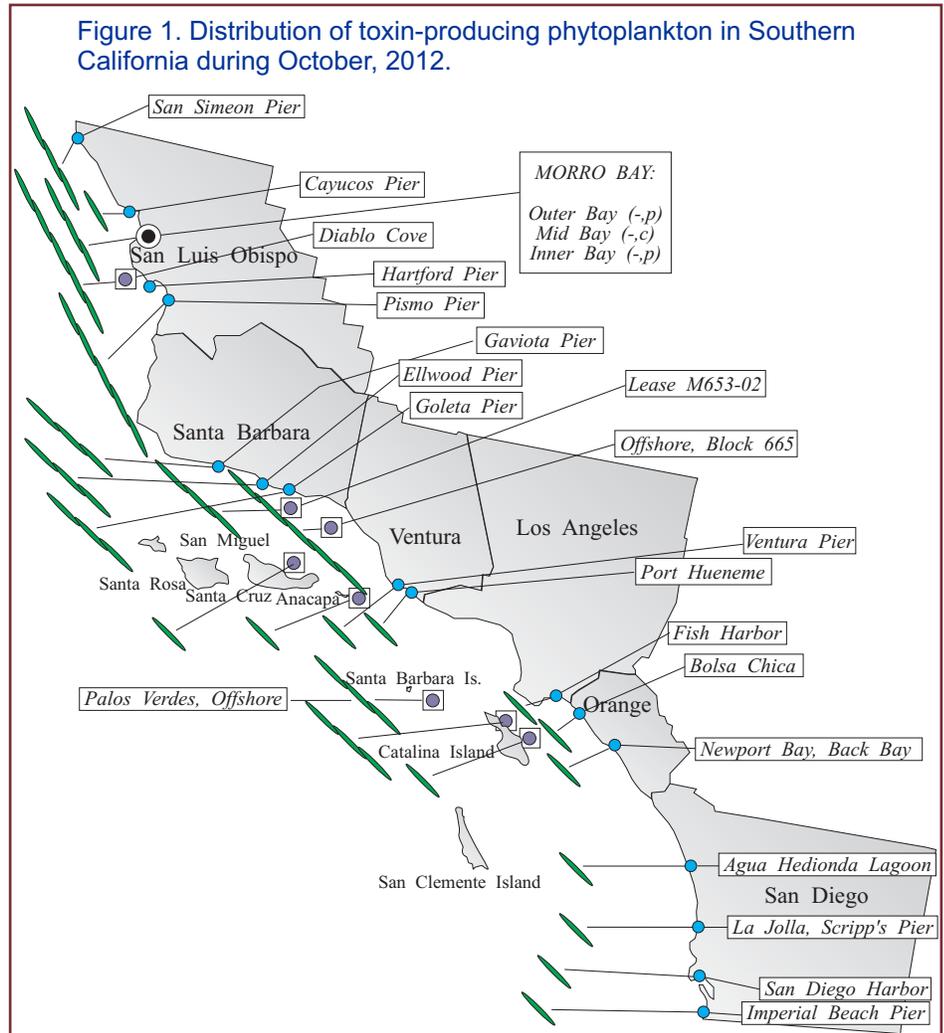


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during October, 2012.

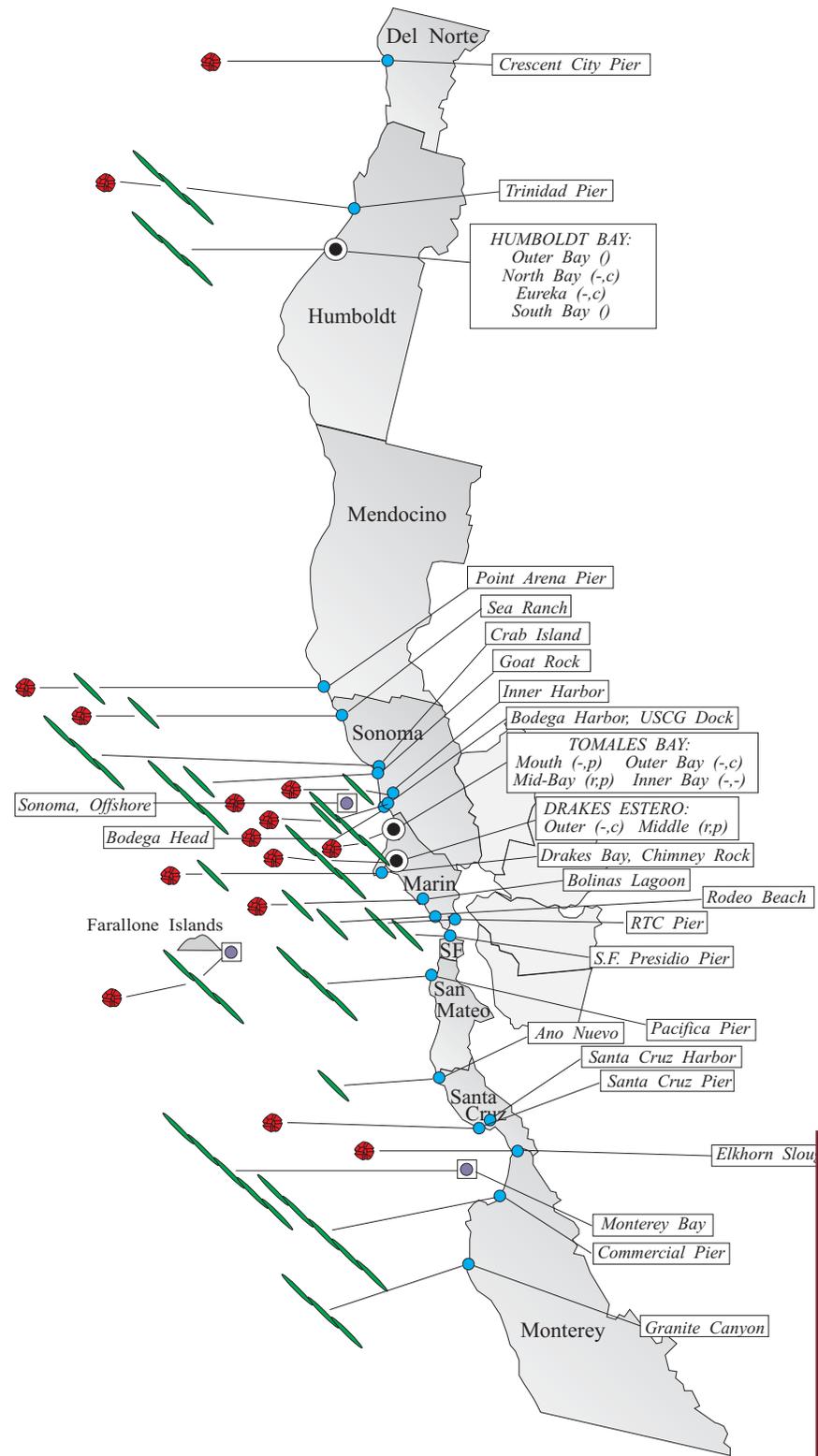
Relative Abundance of Known Toxin Producers	
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

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 October, 2012.



(Continued from Page 1)

Pseudo-nitzschia was observed along the entire southern California coast (Figure 1). This diatom remained common to abundant at sites along the San Luis Obispo and Santa Barbara coast. The cell mass increased towards the end of the month at several locations. The highest relative abundance of *Pseudo-nitzschia* was observed offshore of Santa Barbara and Ventura counties (DFG trawl block 665, October 31).

A low level of domoic acid was detected in Morro Bay during the last week of the month (Figure 3). Samples of lobster viscera from west of Santa Rosa Island contained low levels of domoic acid, ranging from nondetectable to 15 ppm. Lobster viscera samples from San Nicolas Island did not contain a detectable amount of this toxin.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed along most of the northern California coast (Figure 2). This represented an increase in distribution compared to observations in September and included the observation of this toxin producer as far offshore as the Farallone Islands. The relative abundance of this dinoflagellate was low at all locations.

PSP toxicity was detected at the beginning of the month in Tomales Bay and Bodega Harbor (Figure 4). These toxins were (Continued on Page 3)

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%)

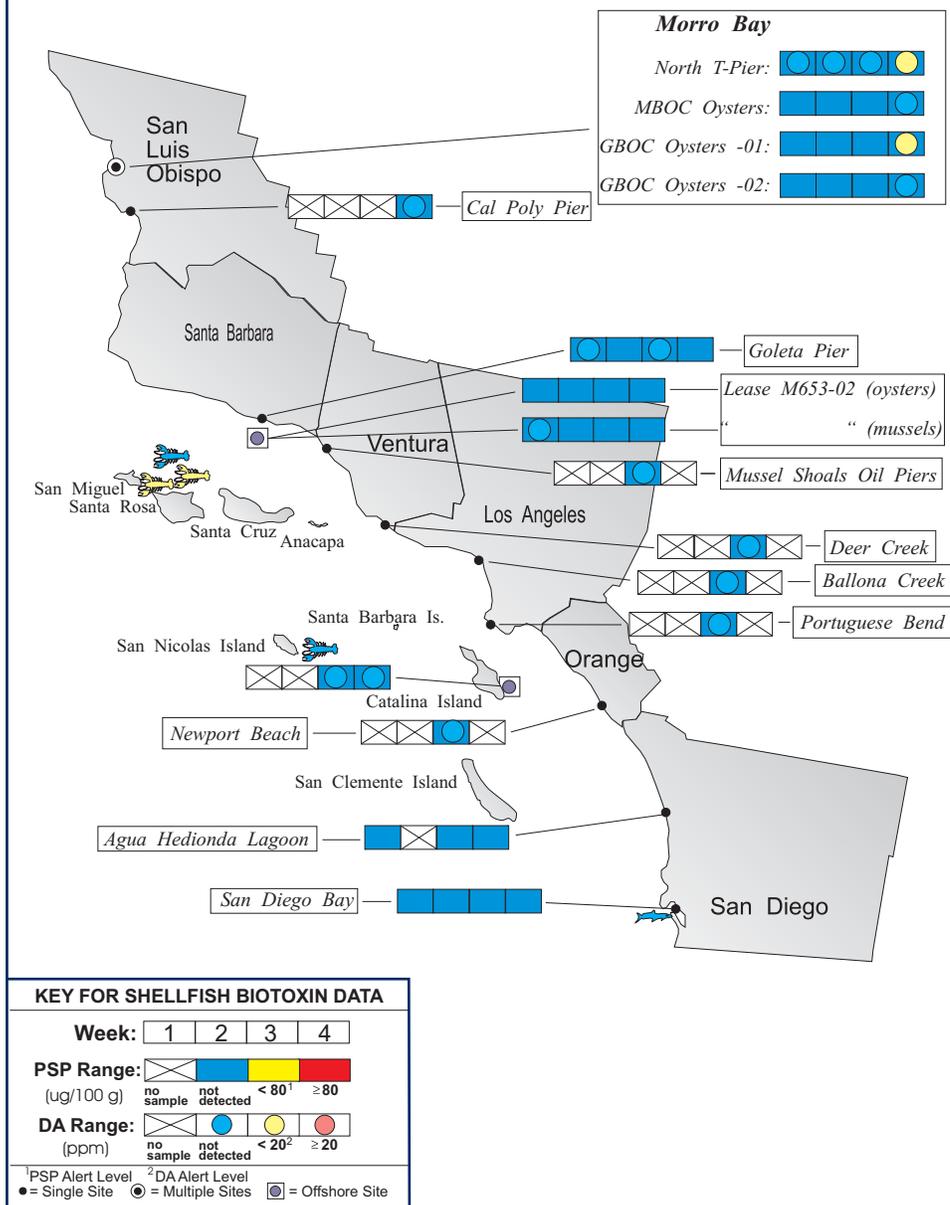
MONTHLY SAMPLING STATIONS:

- 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 October, 2012.



(Continued from Page 2)

detected by mid-month in Humboldt County, reaching 268 ug/100 g at the sentinel mussel station in the outer bay by October 25. A report of elevated PSP levels in southern Oregon prompted the collection of samples in Del Norte County. A mussel sample collected by the Yurok Tribe Environmental Program just north of the Klamath River mouth in Del Norte County contained 6394 ug/100g of PSP toxins, the highest level on record for this County. See the Quarantine section below for information on health advisories. Several samples of Dungeness crab viscera from Del Norte, Humboldt, and Mendocino counties were analyzed and did not contain PSP toxins.

Domoic Acid

Pseudo-nitzschia was common at a number of locations and abundant at Monterey sites (Figure 2). Domoic acid was not detected in any samples collected in September (Figure 4). The majority of preseason Dungeness crab samples collected by the Department of Fish and Game and the CDPH Food and Drug Branch did not contain domoic acid. The exception was a number of crab viscera samples from the Sonoma coast that contained low levels of this toxin and one sample that contained 240 ppm. Immediate follow-up samples

(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)
 from this region had acceptable or nondetectable toxin concentrations.



QUARANTINES:

The annual mussel quarantine was rescinded on October 31 for all counties except Del Norte and Humboldt due to the dangerous toxin levels detected at the end of the month. Oregon issued a mussel quarantine on October 18 for its southern beaches due to elevated PSP toxins. CDPH also issued a health advisory for all bivalve shellfish in Del Norte County on November 6. More details will be provided in the November monthly report.

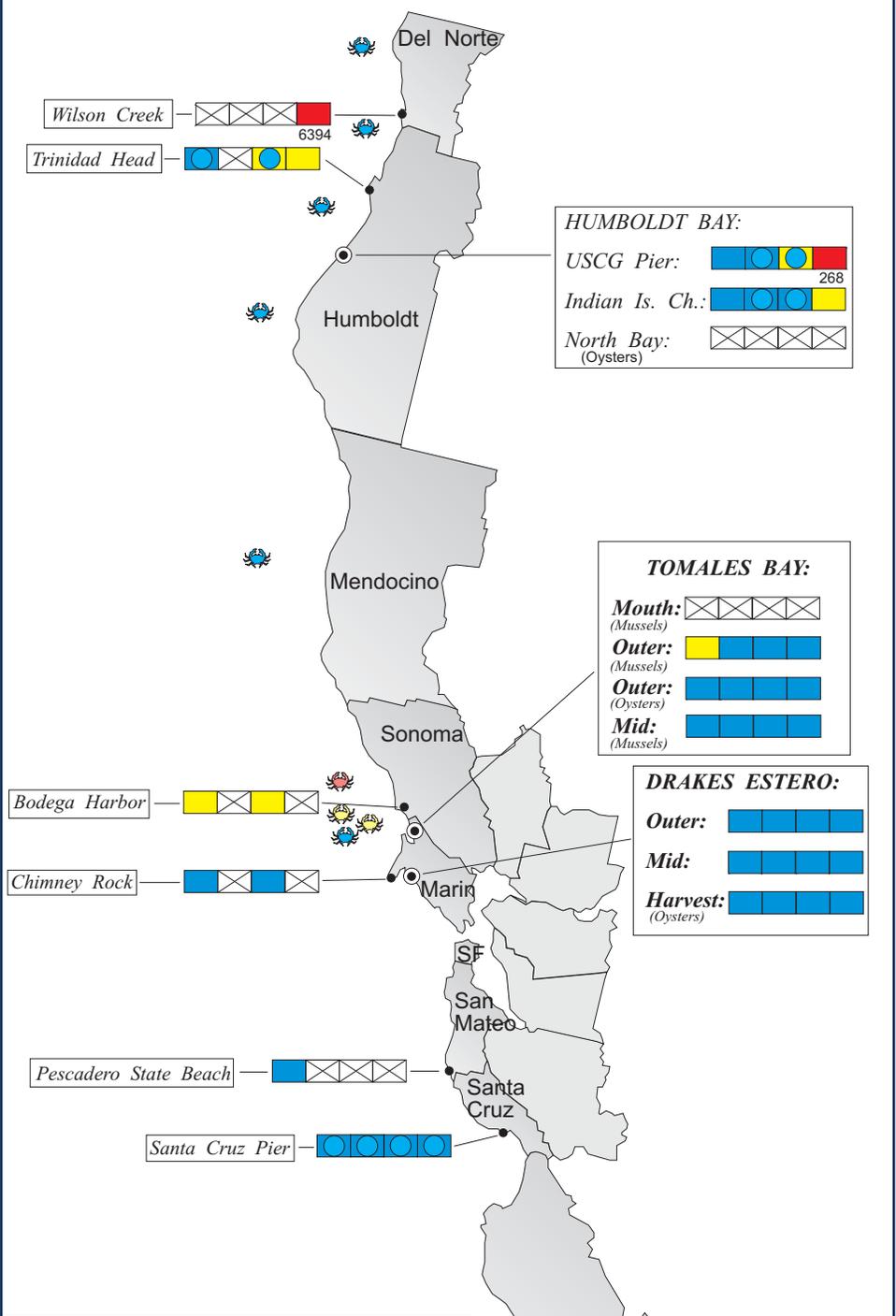
A health advisory was issued on September 14 for the northern Channel Islands as a result of high levels of domoic acid in samples of crab viscera, also known as ‘crab butter’. This alert warned consumers to avoid eating bivalve shellfish or the internal organs of crab, lobster, and small finfish like sardines and anchovies from the affected region.

The health advisory issued on August 20 for Ventura County, identical in scope to the Channel Island advisory, was rescinded on October 25.

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

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during October, 2012.



KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: [Legend: white box, blue box, yellow box, red box]
 (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: [Legend: white box, blue circle, yellow circle, red circle]
 (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 October, 2012.

COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	1
	CDPH Food and Drug Branch	6
Humboldt	Coast Seafood Company	15
	Humboldt County Environmental Health Department	2
	CDPH Volunteer (Georgianna Woods)	1
Mendocino	CDPH Food and Drug Branch	11
	CDPH Food and Drug Branch	2
Sonoma	CDPH Marine Biotoxin Program	2
	CDPH Food and Drug Branch	12
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	24
	Hog Island Oyster Company	5
	Marin Oyster Company	4
San Francisco	CDPH Marine Biotoxin Program	2
	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	15
	Morro Bay Oyster Company	7
	Avila Beach Sea Life Center	1
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	5
	California Department of Fish and Game (<i>SB Office</i>)	7
Ventura	Ventura County Environmental Health Department	2
	California Department of Fish and Game (<i>SB Office</i>)	1
Los Angeles	CDPH Volunteer (<i>Cal Parsons</i>)	2
	Los Angeles County Health Department	2
	U.S. Navy Environmental Planning and Management	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	6

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during October, 2012.

COUNTY	AGENCY	#
Del Norte	Humboldt State University Marine Lab	1
Humboldt	Coast Seafood Company	5
	Humboldt State University Marine Lab	5
Mendocino	CDPH Volunteer (<i>Marie de Santis</i>)	4
Sonoma	Bodega Marine Lab	5
	California Department of Fish and Game	5
	CDPH Marine Biotoxin Program	2
	Sonoma Coast Watch	6

(Continued on Page 6)

(Continued from Page 4)

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 seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. 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 5)

Marin	Drakes Bay Oyster Company	14
	CDPH Volunteer (<i>Brent Anderson</i>)	4
	SFSU, Romberg Tiburon Center	2
	CDPH Marine Biotoxin Program	5
	Golden Gate National Recreational Area	2
Contra Costa	None Submitted	
Alameda	None Submitted	
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	2
	San Francisco Bay Whale Watching Company	1
	Oceanic Society	1
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	5
	San Mateo County Environmental Health Department	1
	U.C. Santa Cruz	2
Santa Cruz	San Lorenzo Valley High School	1
	U.C. Santa Cruz	4
Monterey	Friends of the Sea Otter (<i>Janis Chaffin</i>)	3
	Monterey Abalone Company	5
	Marine Pollution Studies Laboratory	2
	Marine Life Studies	1
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	5
	Grassy Bar Oyster Company	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	2
	Tenera Environmental	1
	The Marine Mammal Center (<i>P.J. Webb, Tim Lytsell</i>)	3
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	5
	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	5
	National Park Service	1
	Tole Mour	1
	CDPH Marine Biotoxin Program	1
	HABNet/CDPH	1
Ventura	CDPH Volunteer (<i>Fred Burgess</i>)	3
	National Park Service	3
	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Sanitation District	2
	CDPH Volunteer (<i>Cal Parsons</i>)	3
	Tole Mour	6
	Southern California Marine Institute	1
Orange	Amigos de Bolsa Chica	2
	California Department of Fish and Game	4
San Diego	Scripps Institute of Oceanography	5
	Carlsbad Aquafarms, Inc.	1
	Tijuana River National Estuary Research Reserve	3
	U.S. Navy Marine Mammal Program	54

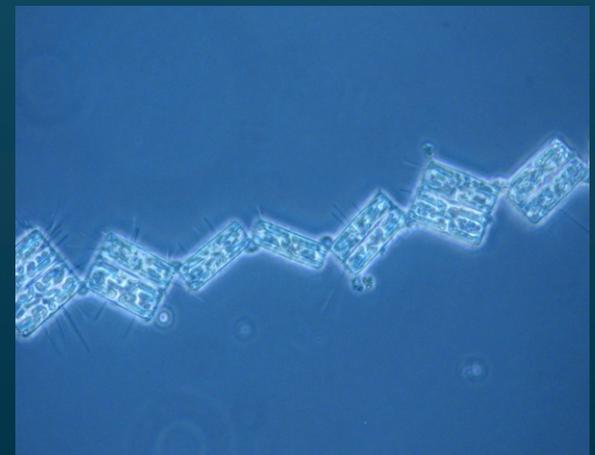
PHYTOPLANKTON GALLERY



A chain of eight cells of the dinoflagellate *Alexandrium* that is responsible for producing the PSP toxins.



The diatom *Rhizosolenia* was common near Catalina Island.



The chained diatom *Grammatophora* is occasionally observed along the California coast.