

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

August 2010

Technical Report No. 10-14

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of August, 2010. 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 locations during August (Figure 1). Low numbers of this dinoflagellate were detected at sites along most southern California coastal counties. There was a

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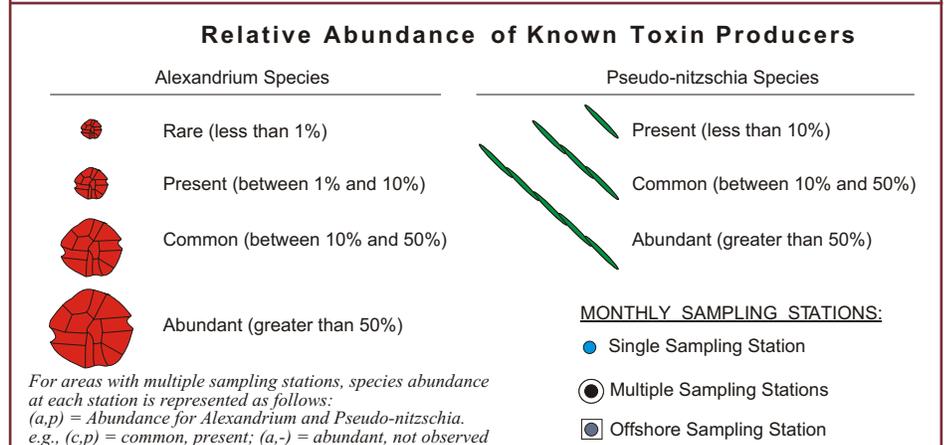
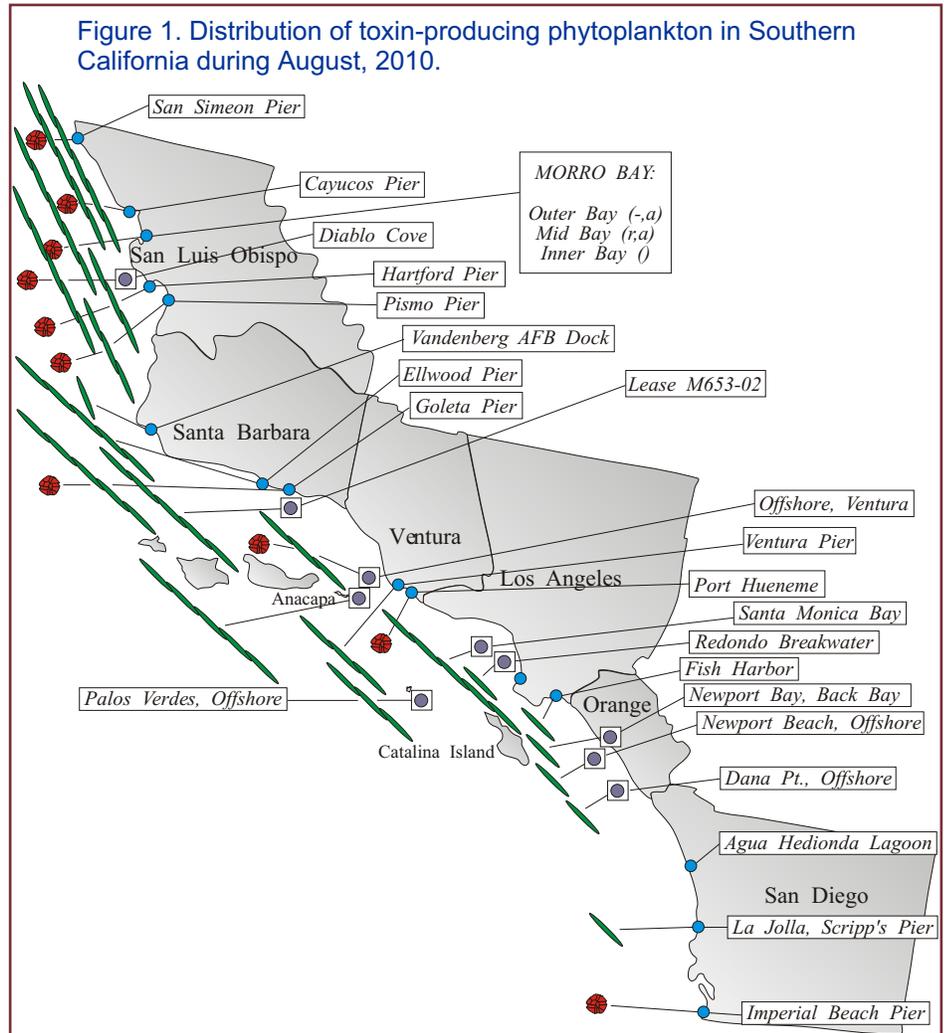
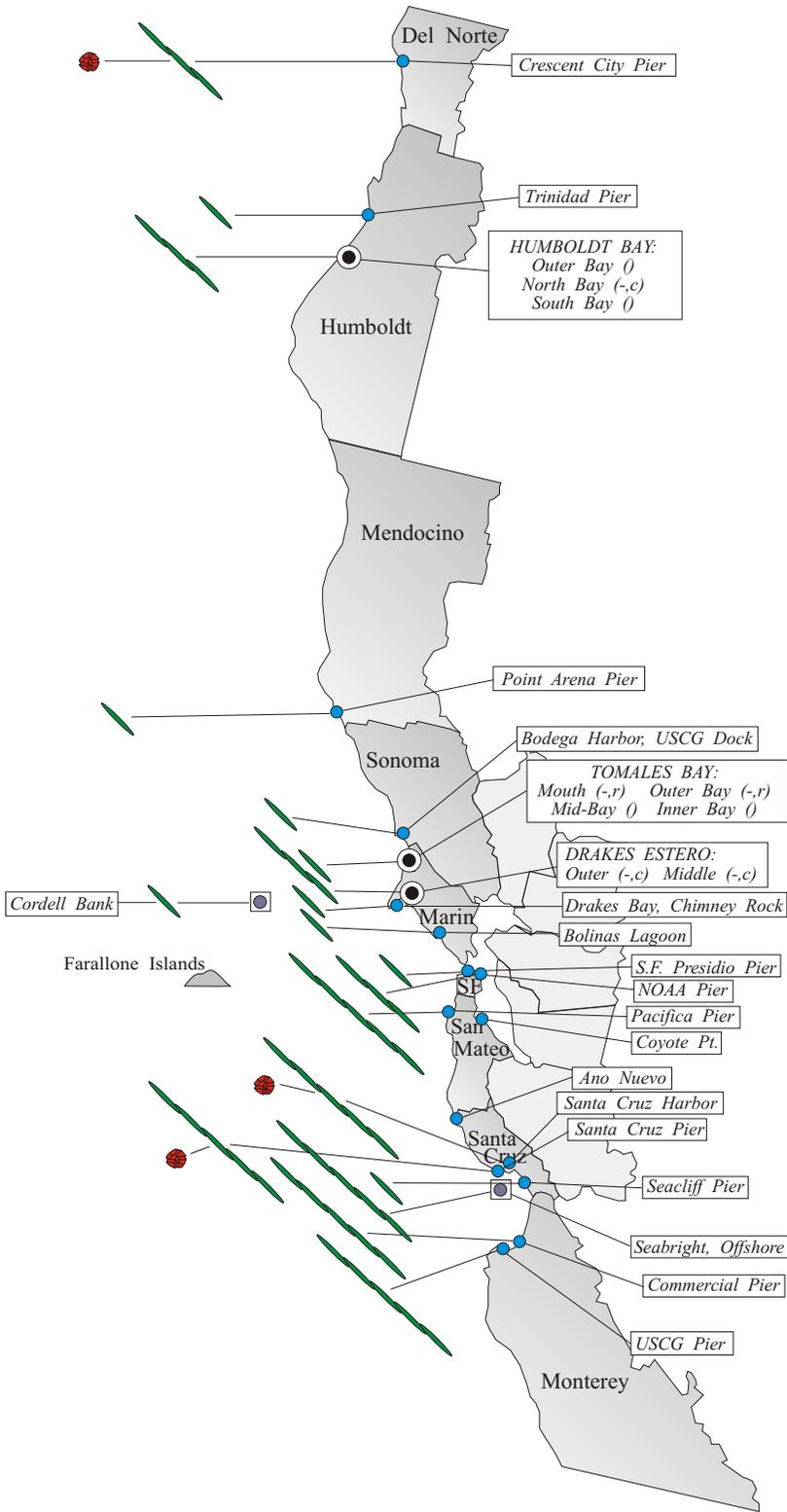


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during August, 2010.



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noticeable increase in this dinoflagellate along the San Luis Obispo coast compared to its distribution in July.

Persistent low levels of PSP toxins were detected in shellfish samples from an aquaculture site just offshore of Santa Barbara for the entire month (Figure 3). In addition, mussels from an offshore platform in this region and from southern Ventura County also contained a low concentration of these toxins.

Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast during August (Figure 1). This diatom increased significantly along the San Luis Obispo coast and was also abundant between Santa Barbara and Los Angeles counties. *Pseudo-nitzschia* also remained abundant in offshore samples from Anacapa Island. The highest relative abundances of *Pseudo-nitzschia* were observed in Santa Monica Bay (August 3), outer Morro Bay (August 14), and offshore of Diablo Cove (August 27).

The high domoic acid concentrations detected offshore of Santa Barbara throughout July persisted into the first week of August (Figure 3). Toxin levels declined but remained at low levels throughout the month at an offshore aquaculture lease. This is the

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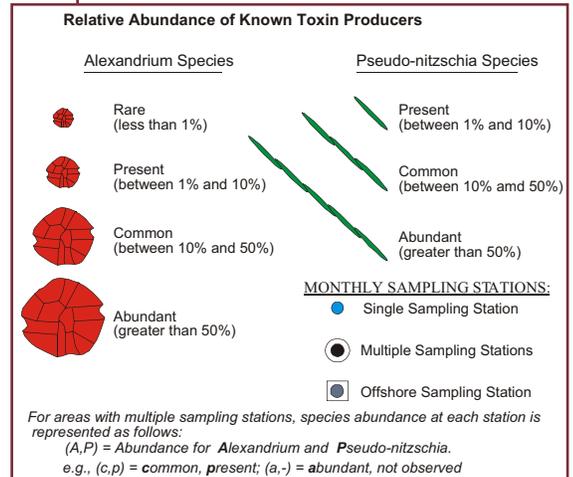
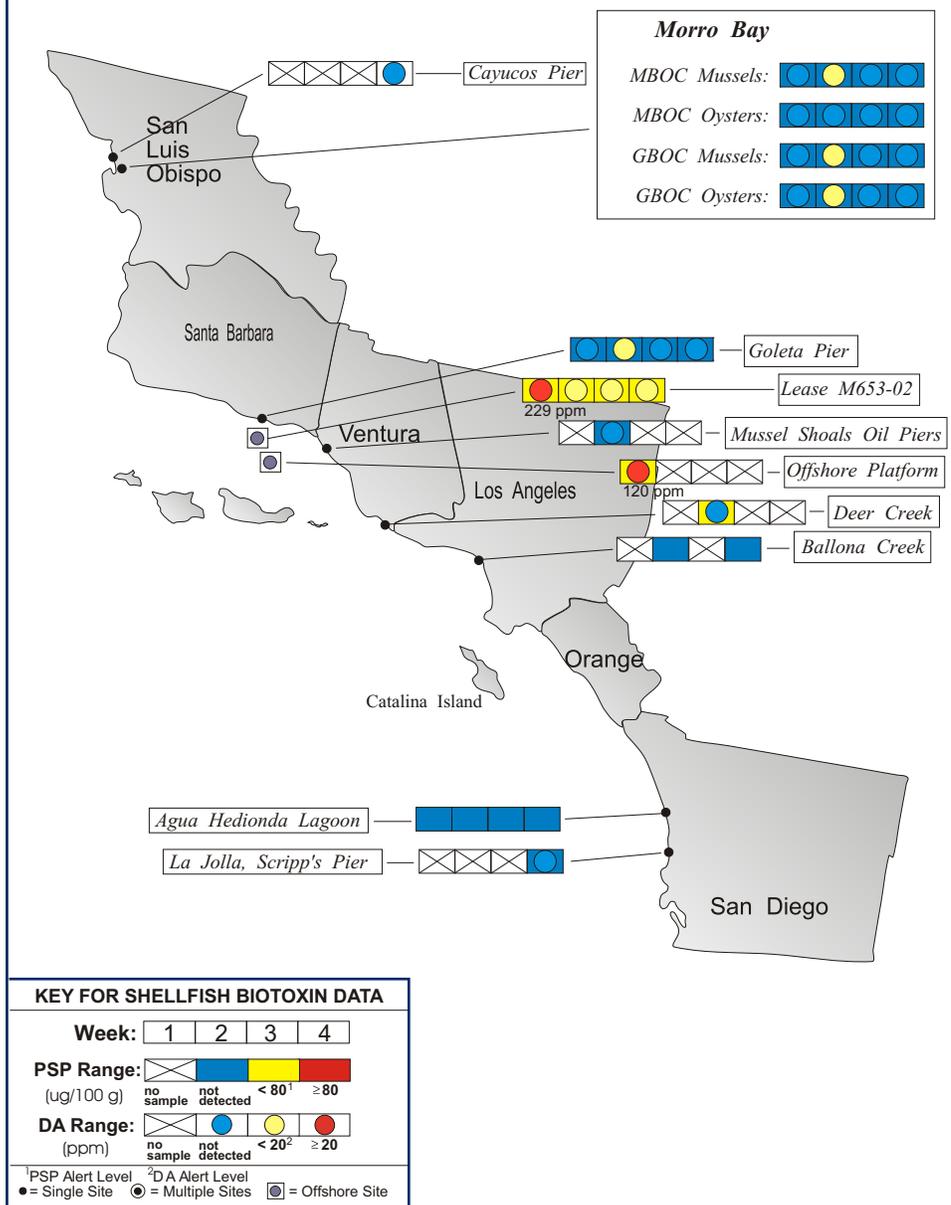


Figure 3. Distribution of shellfish biotoxins in Southern California during August, 2010.



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same location that experienced low levels of the PSP toxins throughout the month, an unusual co-occurrence of these different toxins. A high concentration of domoic acid was also detected in shellfish from an offshore oil platform during the first week of the month. A low level of this toxin was detected at Goleta Pier by the second week of the month.

Non-toxic Species

Due to the abundance of *Pseudo-nitzschia* along much of the southern California coast there were few other genera observed to be common. *Chaetoceros* and *Skeletonema* were common at several San Luis Obispo sites. Dinoflagellates became increasingly common between Los Angeles and San Diego counties. *Prorocentrum*, *Ceratium*, and *Lingulodinium* were the most common genera observed.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at three sampling locations during August, representing a very slight increase compared to observations in July (Figure 2). PSP toxins were not detected in any shellfish samples collected during August (Figure 4).

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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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Domoic Acid

Pseudo-nitzschia was observed at most sampling locations along the northern California coast during August (Figure 2). This diatom remained abundant in Monterey Bay and increased noticeably at sites in Humboldt and Del Norte counties. The highest relative abundance of *Pseudo-nitzschia* was again observed at Pacifica Pier (August 10).

Domoic acid was only detected in one sample during the month. A sentinel mussel sample from Santa Cruz Pier contained a low level of this toxin by the last week of the month (Figure 4).

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the northern California coast during August. *Chaetoceros* and *Skeletonema* were common to abundant at sites between Del Norte and San Mateo counties. The highest relative abundances of nontoxic species were observed in samples from Trinidad Pier (*Skeletonema*), Drakes Bay

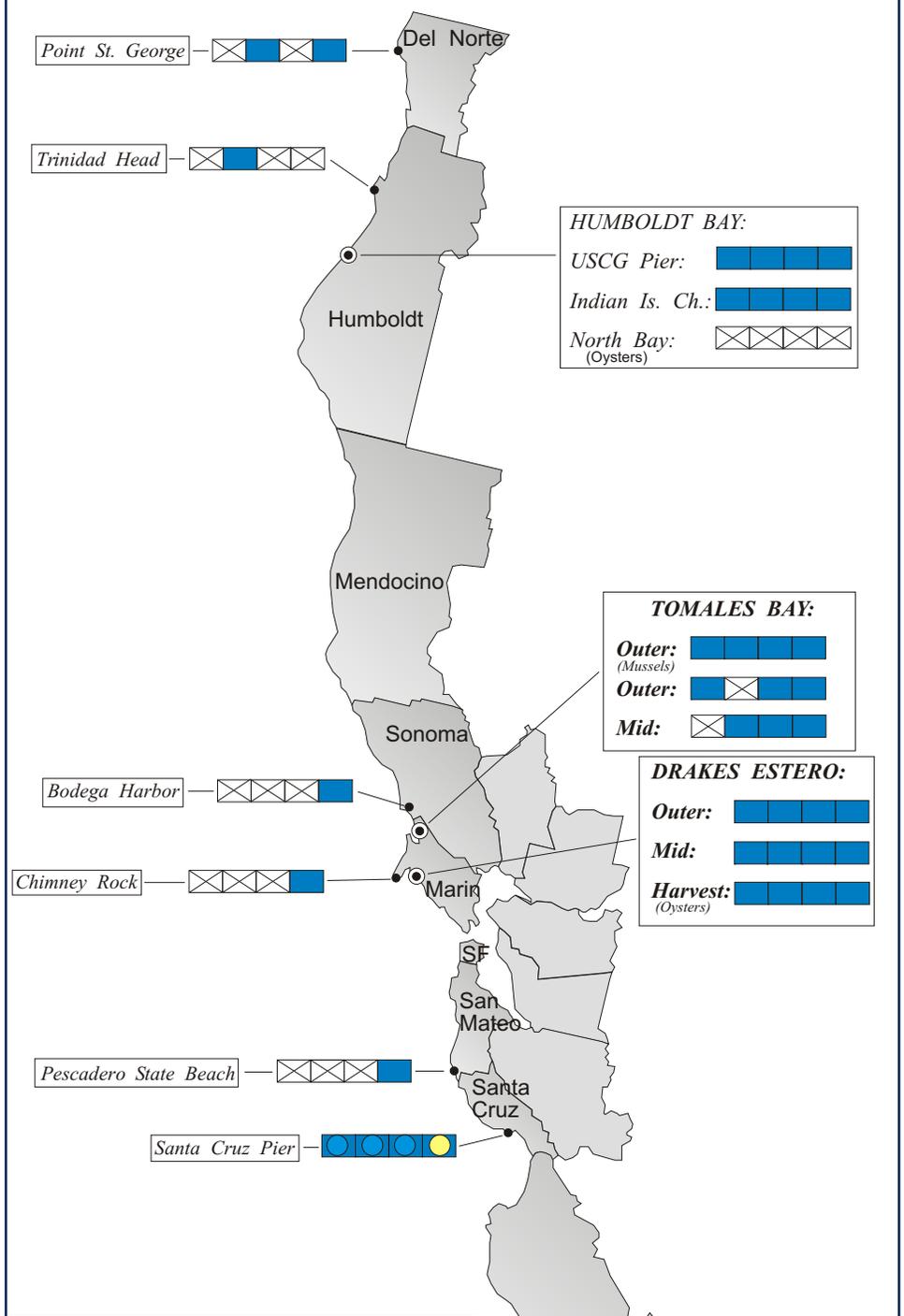


QUARANTINES:

The annual mussel quarantine went into effect on May 1. This quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. All certified shellfish growers are required to

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Figure 4. Distribution of shellfish biotoxins in Northern California during August, 2010.



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 August, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	10
	Humboldt County Environmental Health Department	1
	None Submitted	
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Monitoring Program	1
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	24
	Hog Island Oyster Company	4
	Marin Oyster Company	3
	CDPH Marine Biotoxin Monitoring Program	1
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	Grassy Bar Oyster Co.	14
	Morro Bay Oyster Company	14
Santa Barbara	Santa Barbara Mariculture Company	14
	U.C. Santa Barbara	5
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	Scripps Institute of Oceanography	1

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.

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.



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 submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

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

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during August, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	5
	Humboldt State University Marine Lab	1
Mendocino	CDPH Volunteer (<i>Marie De Santis</i>)	3
Sonoma	CDPH Marine Biotoxin Program	1
Marin	CDPH Volunteer (<i>Brent Anderson, Cal Strobel</i>)	5
	Cordell Bank National Marine Sanctuary	1
	Drakes Bay Oyster Company	14
San Francisco	CDPH Marine Biotoxin Program	1
	Hog Island Oyster Company	1
	San Francisco Health Department	5
San Mateo	CDPH Volunteer (<i>Eugmia McNaughton</i>)	4
	The Marine Mammal Center (<i>Stan Jensen</i>)	5
	Friends of the Sea Otter (<i>Diane Larsen</i>)	3
Santa Cruz	U.C. Santa Cruz	2
	California Department of Parks and Recreation	3
	San Lorenzo Valley High School	2
Monterey	The Marine Mammal Center (<i>Nancy Scarborough</i>)	1
	U.C. Santa Cruz	4
	CDPH Volunteer (<i>Jerry Norton</i>)	1
San Luis Obispo	Friends of the Sea Otter (<i>Aya Obara</i>)	1
	Monterey Abalone Company	1
	Friends of the Sea Otter (<i>Kelly Cherry</i>)	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	4
Santa Barbara	Morro Bay Oyster Company	5
	Tenera Environmental	4
	The Marine Mammal Center (<i>Tim Lytsell, P.J. Webb</i>)	6
	CDPH Volunteer (<i>Sylvia Short</i>)	5
Ventura	Santa Barbara Mariculture Company	7
	U.C. Santa Barbara	4
	Vandenberg AFB	2
	CDPH Volunteer (<i>Fred Burgess</i>)	4
Los Angeles	Channel Islands National Marine Sanctuary	1
	National Park Service	2
	Ventura County Environmental Health Department	1
Orange	Los Angeles County Sanitation District	4
	City of Los Angeles Environmental Monitoring Div.	3
	Southern California Marine Institute	1
San Diego	California Department of Fish and Game	10
	Ocean Institute	2
	Orange County Health Care Agency	1
San Diego	Avian Research Associates	1
	Carlsbad Aquafarms, Inc.	3
	Scripps Institute of Oceanography	5

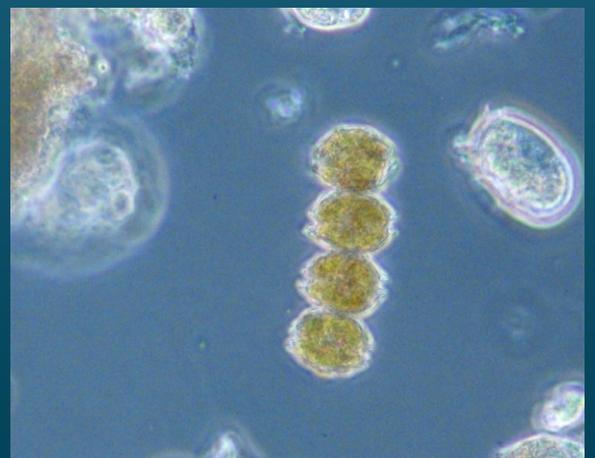
PHYTOPLANKTON GALLERY



Numerous chains of the diatom *Odontella* were observed at several sites.



The diatom *Ditylum* usually occurs as single cells. The chain of cells in the photo indicates rapid cell division.



The PSP toxin-producing dinoflagellate *Alexandrium* was observed at a number of locations.