

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

April 2012

Technical Report No. 12-13

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of April, 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 observed at only one southern California location in April (Figure 1). A low number of cells was observed at Imperial Beach Pier in San Diego County (April 18). PSP toxins were not detected in any shellfish samples collected in April (Figure 3).

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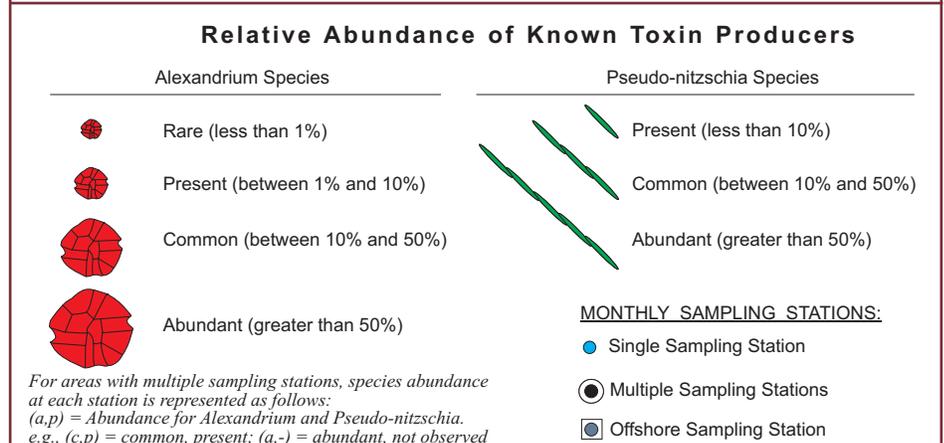
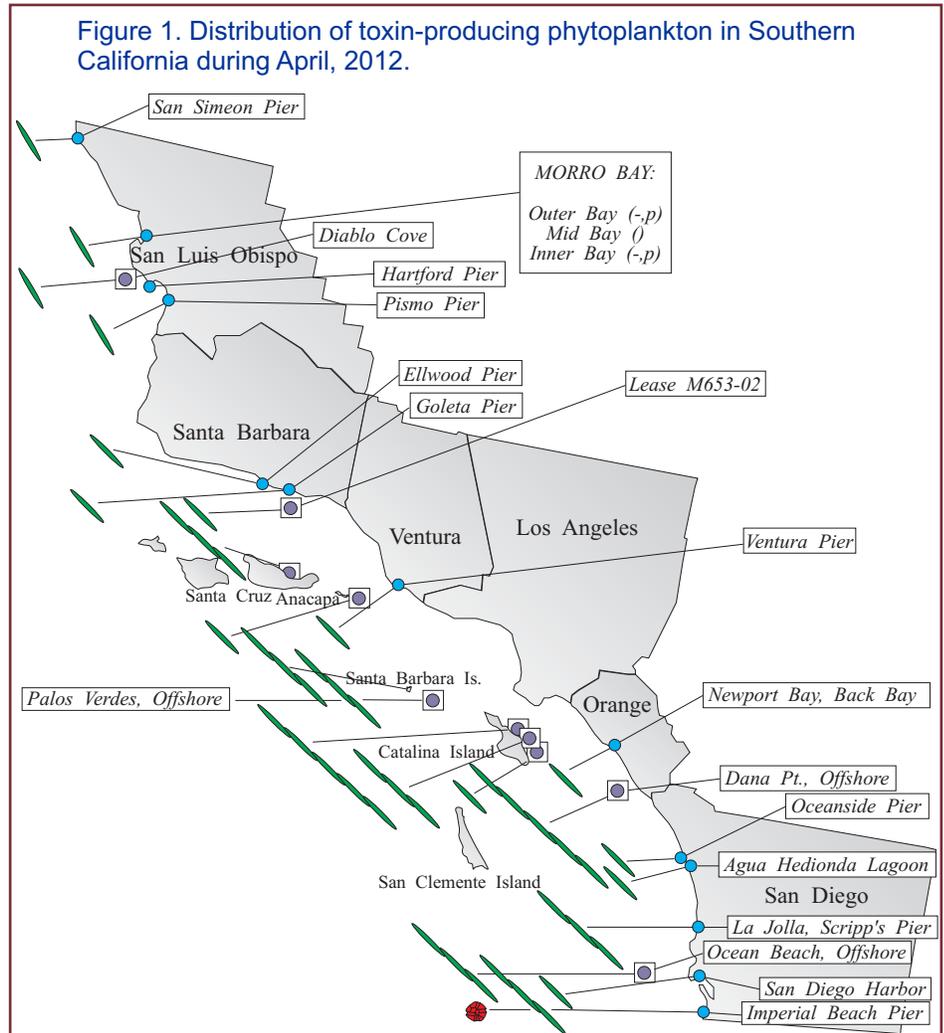
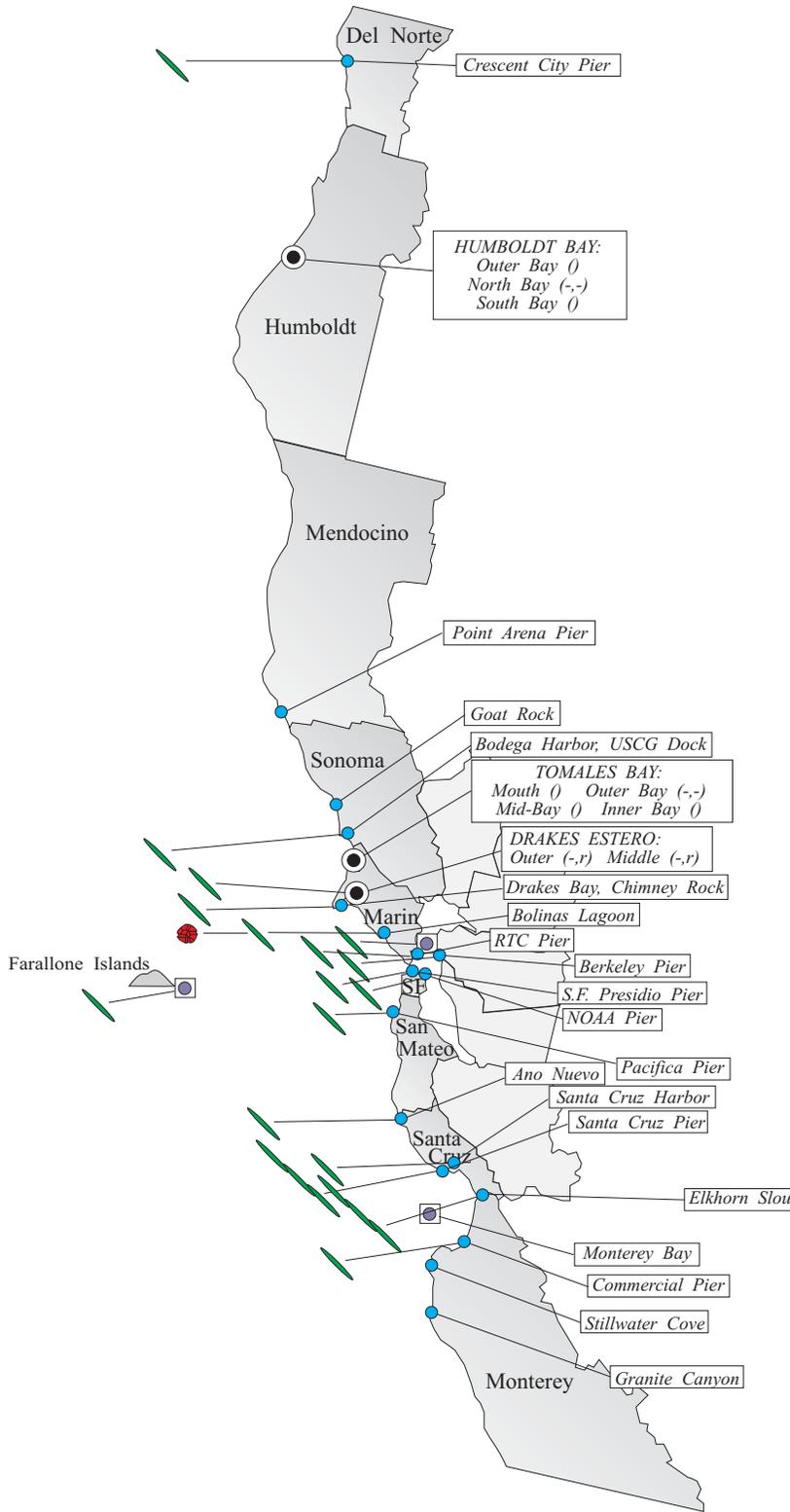


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during April, 2012.



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Domoic Acid

Pseudo-nitzschia was observed along the entire southern California coast in April (Figure 1). There was a noticeable increase in relative abundance at sites south of Point Conception compared to observations in March. There continued to be a mix of toxic and nontoxic species and the overall cell mass of this diatom remained low. The highest relative abundance was observed offshore of Palos Verdes on April 19. Domoic acid was not detected in any shellfish samples collected in April (Figure 3).

Non-toxic Species

Diatoms dominated the southern California coast, with *Chaetoceros* the most common genera. Locally other species were dominant, most notably *Skeletonema*, which was abundant at a very high cell density offshore of Palos Verdes. *Coscinodiscus* was abundant along the San Luis Obispo and Santa Barbara coast, while *Guinardia* was common offshore of Ocean Beach and at Imperial Beach Pier in San Diego County.

Northern California Summary:

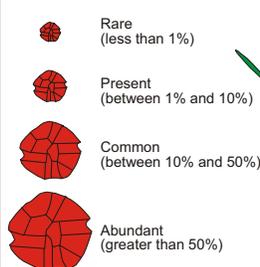
Paralytic Shellfish Poisoning

Alexandrium was observed at only one location during April (Figure 2). A small number of cells of this dinoflagellate was

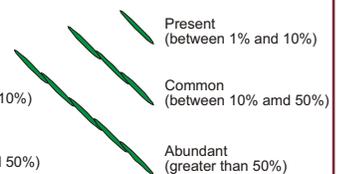
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



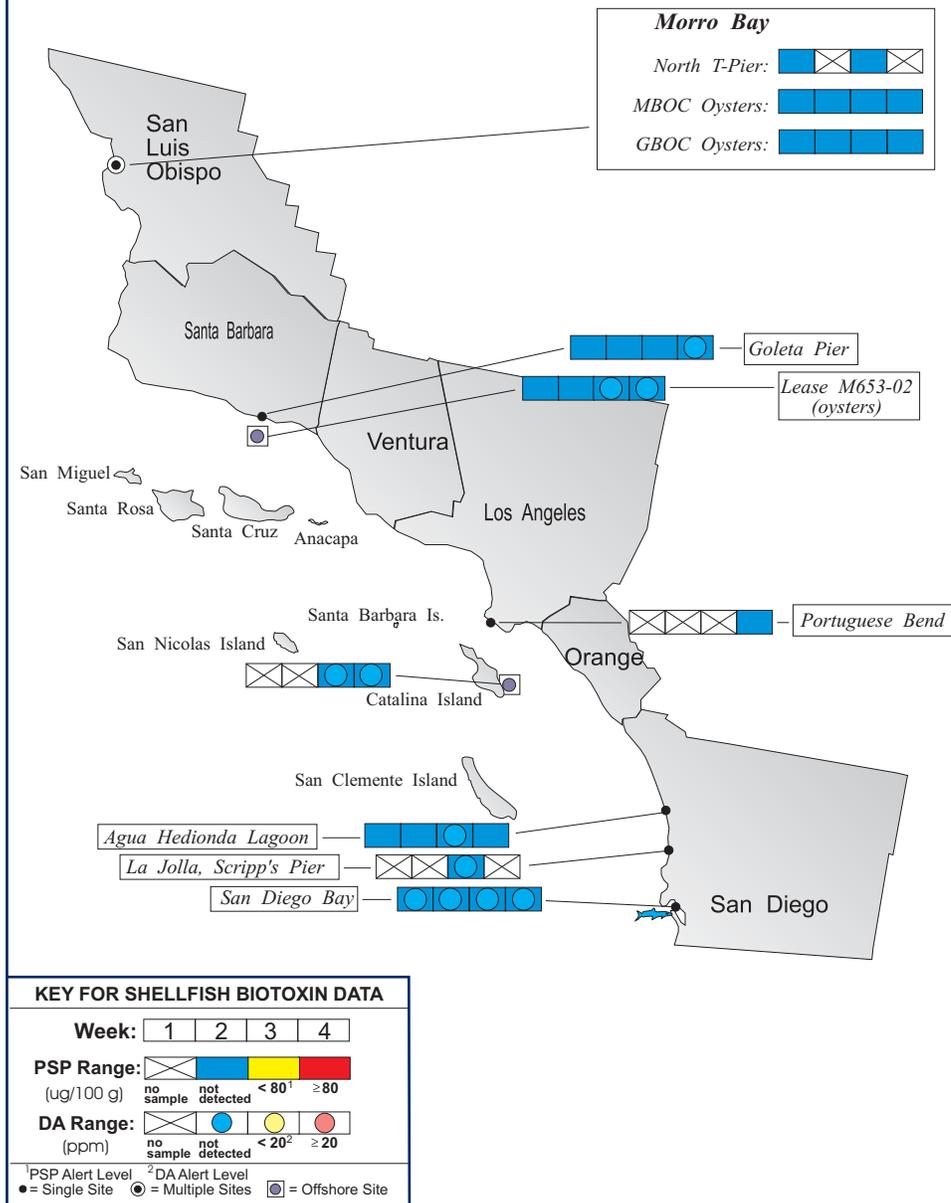
MONTHLY SAMPLING STATIONS:



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 April, 2012.



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observed in a sample from Bolinas Lagoon on April 24.

A low concentration of the PSP toxins was detected in one sample during April. Sentinel mussels from the Drakes Estero channel buoy contained 41 ug/100 g on April 3 (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at several sites along the northern California coast during April (Figure 2). The relative abundance increased at sampling sites in Monterey Bay but overall cell densities remained low. Domoic acid was not detected in any shellfish samples collected in April.

Non-toxic Species

Diatoms increased in diversity and relative abundance along the northern California coast. *Thalassiosira* was abundant in Del Norte and common in Humboldt counties, while *Skeletonema* was the dominant species at sites between Sonoma and Monterey counties. *Chaetoceros* was also common at some locations. The highest cell masses were observed in samples from Pacifica Pier, Bolinas Lagoon, Drakes Bay, and Bodega Harbor.



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

QUARANTINES:

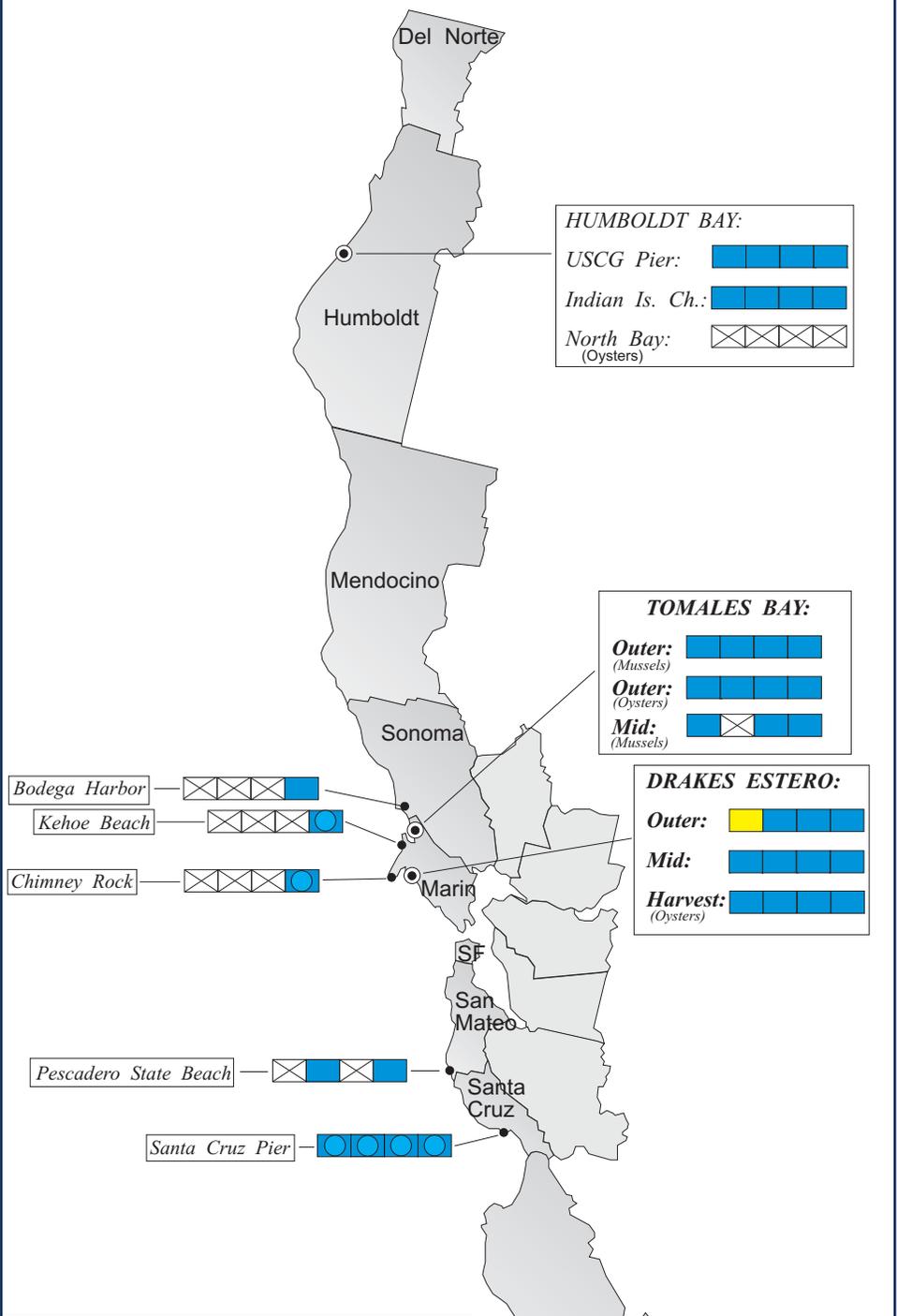
The annual mussel quarantine is scheduled to begin May 1. When in effect this quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. 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 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

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



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 April, 2012.

COUNTY	AGENCY	#
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotoxin Program	1
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	Marin Oyster Company	5
	CDPH Marine Biotoxin 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	Grassy Bar Oyster Co.	9
	Morro Bay Oyster Company	4
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	4
Ventura	None Submitted	
Los Angeles	CDPH Volunteer (<i>Cal Parsons</i>)	3
	Los Angeles County Health Department	1
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	U.S. Navy Marine Mammal Program	5
	Scripps Institute of Oceanography	1

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

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	4
Mendocino	CDPH Volunteer (<i>Marie de Santis</i>)	3
Sonoma	Water Trek Eco Tours	1
	CDPH Marine Biotoxin Program	1
Marin	Drakes Bay Oyster Company	10
	CDPH Volunteer (<i>Brent Anderson</i>)	4
	SFSU, Romberg Tiburon Center	4
	Pickleweed Point Community Shellfish Farm	1

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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. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

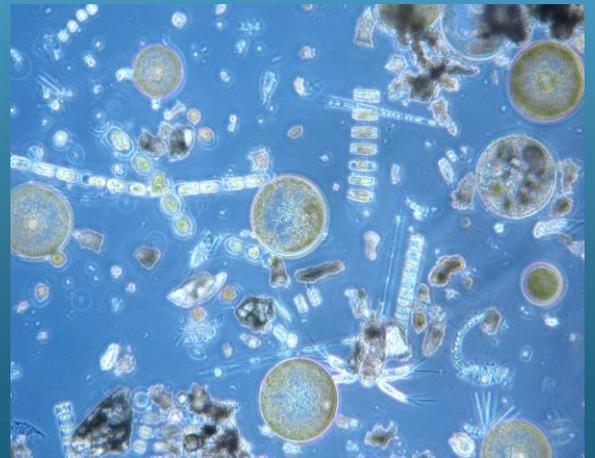


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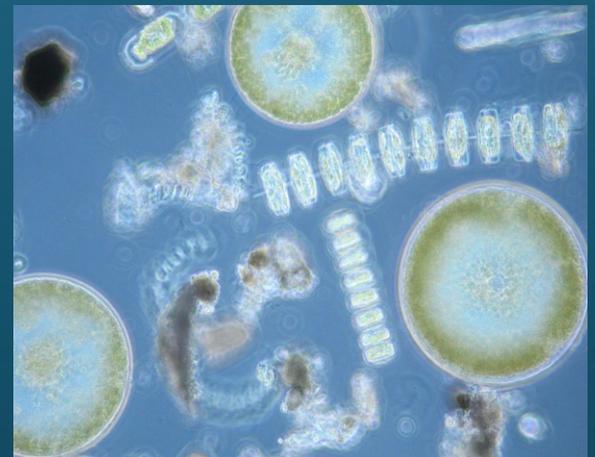
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COUNTY	AGENCY	#
Marin (continued)	CDPH Marine Biotoxin Program	3
Contra Costa	CDPH Marine Biotoxin Program	2
Alameda	City of Berkeley	1
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	1
	Exploratorium	4
	San Francisco Bay Whale Watching Company	1
San Mateo	The Marine Mammal Center (<i>Stan Jensen</i>)	5
	San Mateo County Environmental Health Department	2
	U.C. Santa Cruz	1
Santa Cruz	San Lorenzo Valley High School	2
	California Department of Parks and Recreation	1
	U.C. Santa Cruz	4
Monterey	Friends of the Sea Otter (<i>Janis Chaffin, Cory Utter</i>)	5
	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	3
	Marine Life Science	1
San Luis Obispo	Friends of the Sea Otter (<i>Kelly Cherry</i>)	4
	Grassy Bar Oyster Company	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	3
	Tenera Environmental	5
	The Marine Mammal Center (<i>Tim Lytsell</i>)	1
Santa Barbara	CDPH Volunteer (<i>Sylvia Short</i>)	4
	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	4
	National Park Service	1
	Tole Mour	5
Ventura	CDPH Volunteer (<i>Fred Burgess</i>)	4
	National Park Service	1
Los Angeles	Los Angeles County Sanitation District	2
	CDPH Volunteer (<i>Cal Parsons</i>)	1
	Tole Mour	7
	Catalina Island Marine Institute	2
Orange	California Department of Fish and Game	3
	Ocean Institute	2
San Diego	Carlsbad Aquafarms, Inc.	2
	CDPH Volunteer (<i>Cynthia Hall</i>)	1
	San Diego Whale Watch	1
	Scripps Institute of Oceanography	5
	Tijuana River National Estuary Research Reserve	4
	U.S. Navy Marine Mammal Program	3

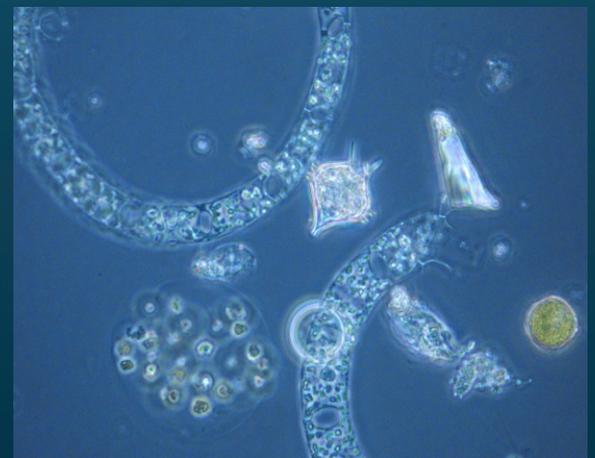
PHYTOPLANKTON GALLERY



Diatom diversity increased dramatically in April.



A closer view of Thalassiosira and Coscinodiscus in a sample from the San Luis Obispo coast.



Although diatoms like Eucampia dominated the coast in April, a few dinoflagellates were observed in low numbers.