

# 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 January 2011 Technical Report No. 11-09

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of January, 2011. 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:

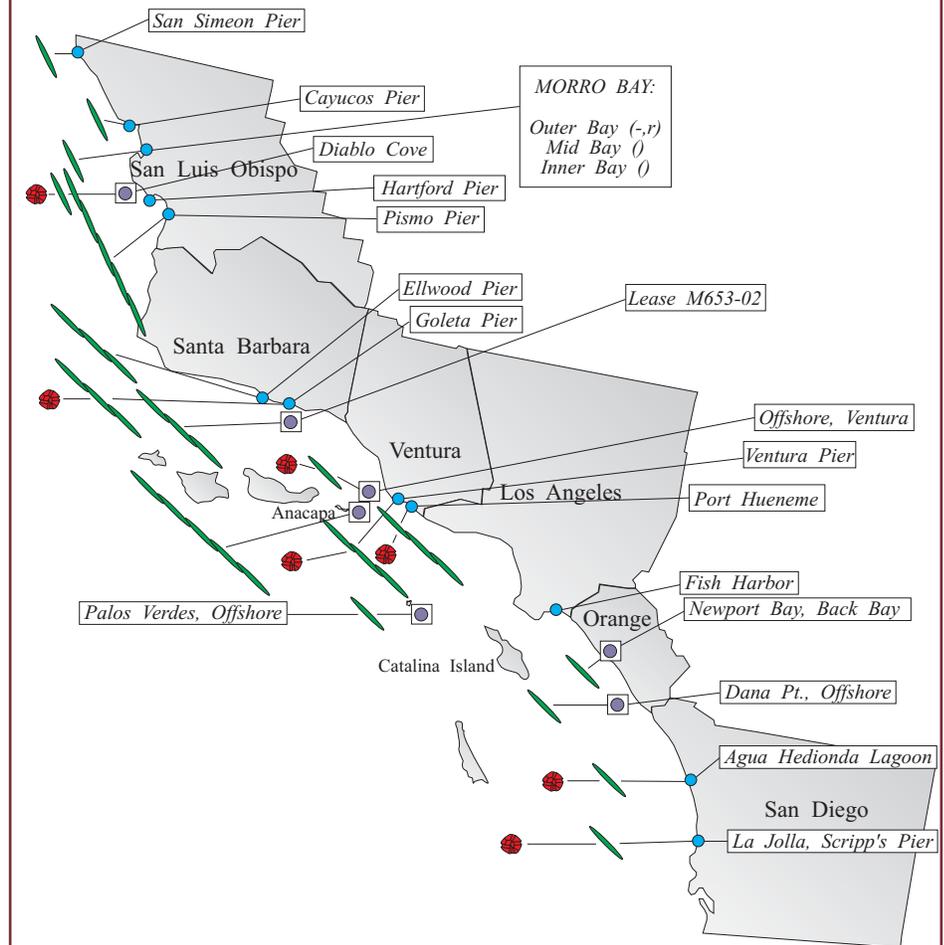
#### Paralytic Shellfish Poisoning

Low numbers of *Alexandrium* were detected at sites in San Luis Obispo, Santa Barbara, Ventura, and San Diego counties (Figure 1).

A low level of the PSP toxins was detected in a mussel sample collected from Goleta Pier on

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during January, 2011.



### Relative Abundance of Known Toxin Producers

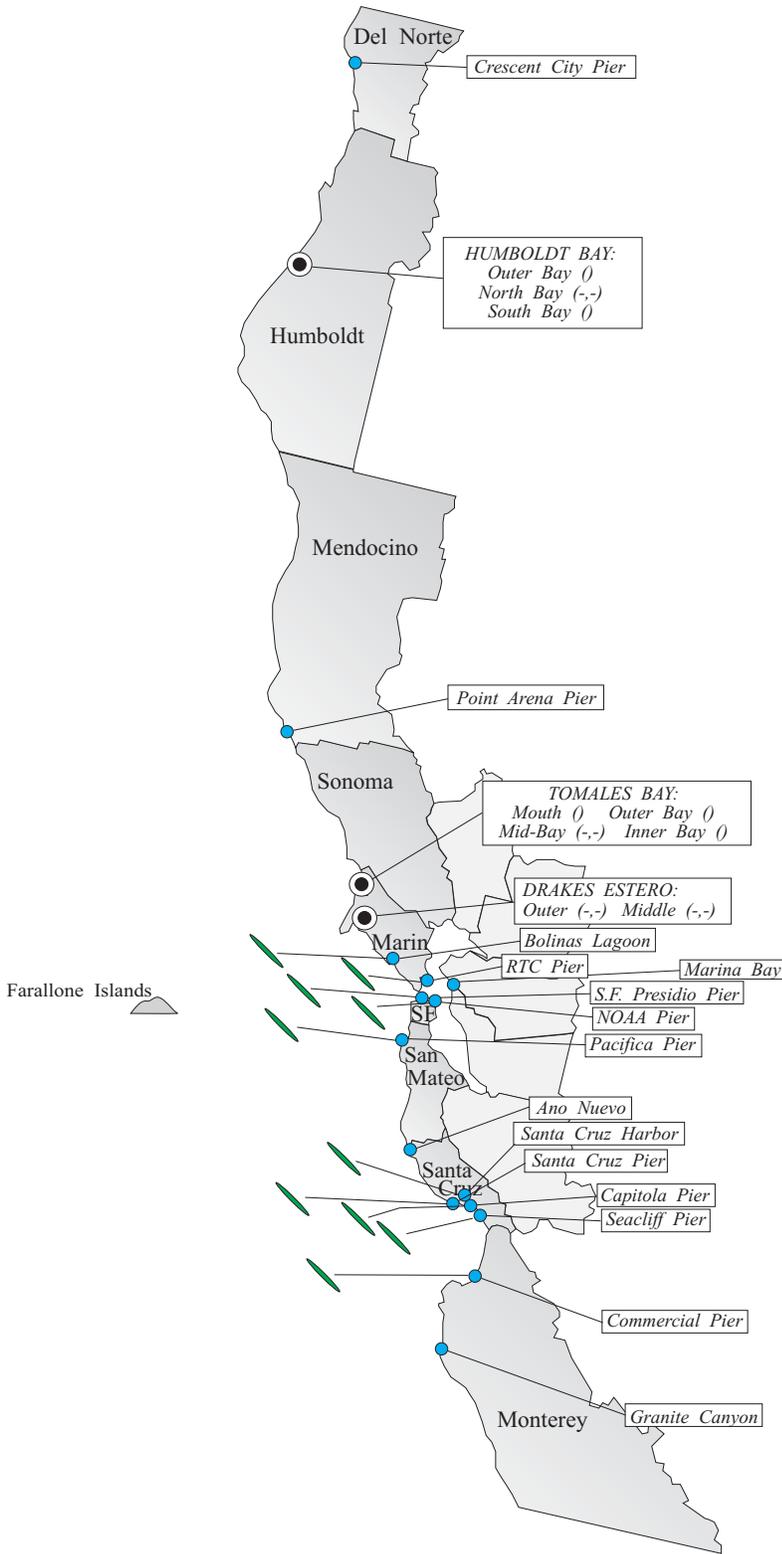
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

#### 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 January, 2011.



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 January 12 (Figure 3). By the latter half of the month low levels of these toxins were also detected in mussels just offshore of Santa Barbara and at Portuguese Bend (Los Angeles County), as well as in a sample of lobster viscera from offshore of Port Hueneme.

**Domoic Acid**

*Pseudo-nitzschia* was observed at a number of sites along the entire southern California coast during January (Figure 1). The relative abundance of *Pseudo-nitzschia* was significantly lower at most sights compared to observations in December. The highest relative abundances of this diatom were observed at Pismo Pier (January 31).

The concentration of domoic acid remained high in samples of lobster viscera from offshore of Port Hueneme (46 ppm) and near San Nicolas Island (77 ppm). Toxin levels in samples from the latter location ranged from nondetectable to greater than the alert level. Domoic acid appeared to be declining in samples collected near Santa Cruz Island. By the third week of the month this toxin increased to the alert level at an aquaculture lease just offshore of Santa Barbara, then declined to low levels by the end of the month (Figure 3).

**Non-toxic Species**

The dominance of *Pseudo-nitzschia* limited

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**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:**

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For areas with multiple sampling stations, species abundance at each station is represented as follows:  
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during January. A surf zone bloom was reported at Clam Beach in Humboldt County. Humboldt State University collected samples and reported the bloom to be a common, nontoxic diatom (*Asterionellopsis socialis*). An additional sample was collected by the Humboldt County Environmental Health Department and sent to CDPH for confirmation. In addition, the Department of Fish and Game collected a mussel sample just north of the bloom site. As expected the sample did not contain detectable levels of either domoic acid or the PSP toxins.

The dinoflagellate *Prorocentrum* was common inside Tomales Bay, *Ceratium furca* was common at the San Francisco Presidio Pier, and the diatoms *Chaetoceros* and *Skeletonema* were common inside Santa Cruz Harbor.



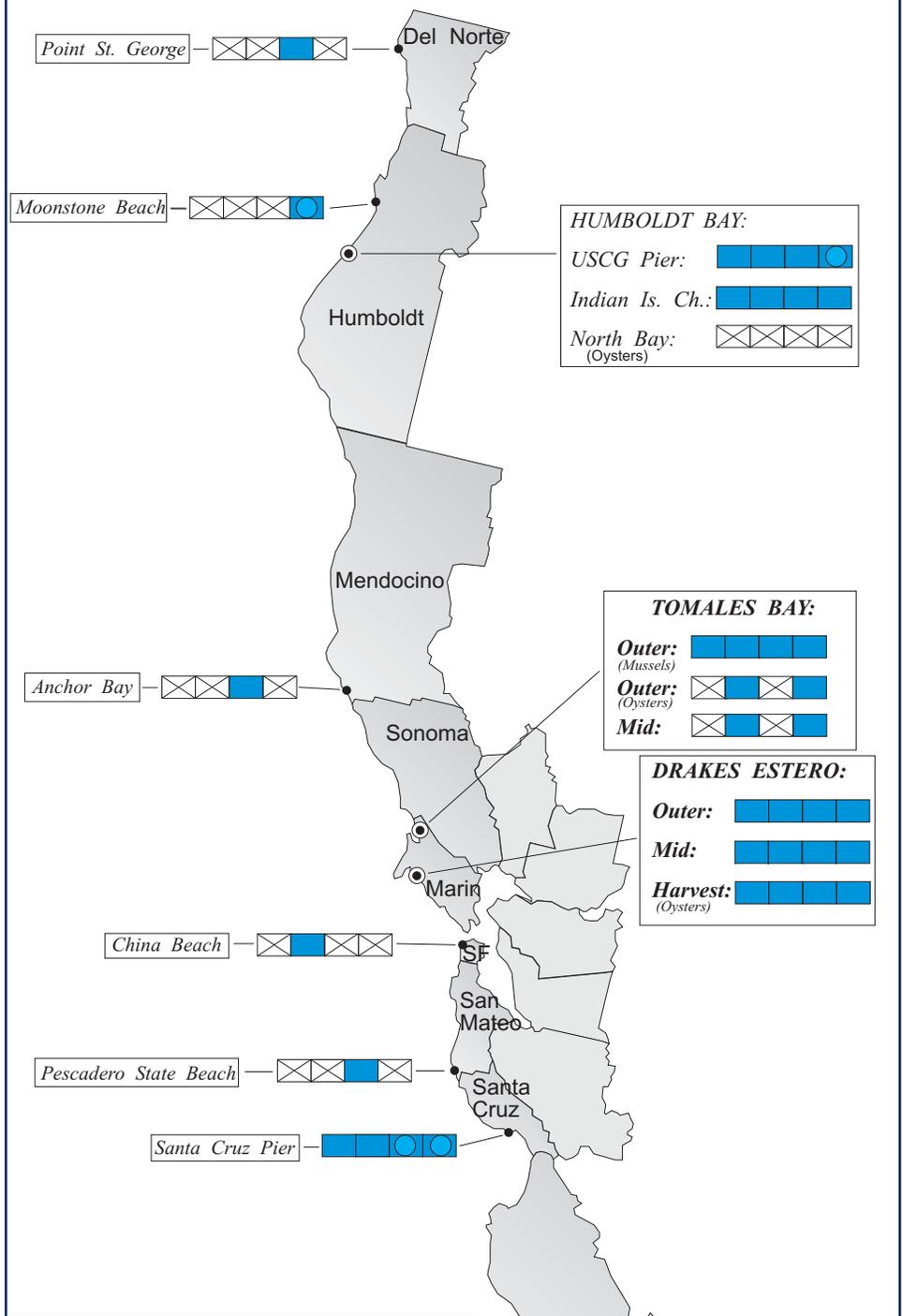
**QUARANTINES:**

The October 16 health advisory remained in effect, warning consumers not to eat sport-harvested shellfish or the internal organs of crustaceans and small finfish from the Channel Islands. Elevated levels of domoic acid were first detected in the viscera of lobster in this region and subsequently in rock crab viscera.

The annual mussel quarantine ended at midnight on October 31, with the exception of the health advisory issued for the Channel Islands. 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

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Figure 4. Distribution of shellfish biotoxins in Northern California during January, 2011.



**KEY FOR SHELLFISH BIOTOXIN DATA**

**Week:** 1 2 3 4

**PSP Range:** [no sample] [not detected] [ < 80<sup>1</sup> ] [ ≥ 80 ]  
(ug/100 g)

**DA Range:** [no sample] [not detected] [ < 20<sup>2</sup> ] [ ≥ 20 ]  
(ppm)

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level  
● = Single Site ● = Multiple Sites ◐ = Offshore Site

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during January, 2011.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
	California Department of Fish and Game	1
	CDPH Volunteer ( <i>Marie De Santis</i> )	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	2
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
	Marin Oyster Company	2
San Francisco	San Francisco Health Department	1
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.	8
	Morro Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	12
	U.C. Santa Barbara	4
	Vandenberg AFB	1
Ventura	CDPH Volunteer ( <i>Bill Weinerth</i> )	2
	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	1
	Department of Fish and Game; Food and Drug Branch	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	CDPH Volunteer ( <i>Steve Croke</i> )	1
	Scripps Institute of Oceanography	1

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 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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throughout the year. 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. 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

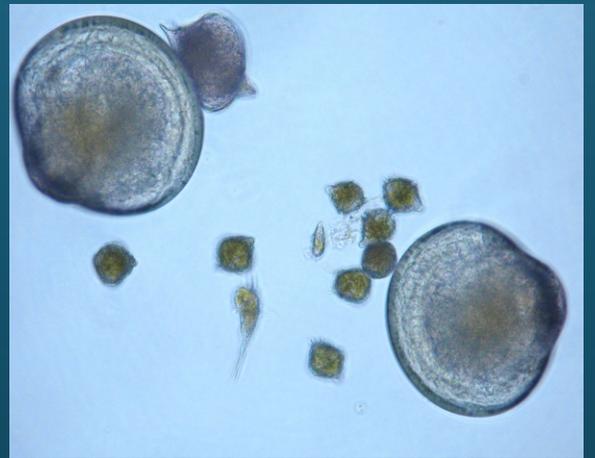
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during January, 2011.

COUNTY	AGENCY	#
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
Mendocino	CDPH Volunteer ( <i>Marie De Santis</i> )	2
Sonoma	None Submitted	
Marin	Drakes Bay Oyster Company	11
	CDPH Volunteer ( <i>Brent Anderson</i> )	5
	Hog Island Oyster Company	1
	SFSU, Romberg Tiburon Center	4
San Francisco	CDPH Volunteer ( <i>Eugenia McNaughton</i> )	3
	Exploratorium	3
	San Francisco Health Department	5
San Mateo	San Mateo County Environmental Health Department	1
	The Marine Mammal Center ( <i>Stan Jensen</i> )	5
	U.C. Santa Cruz	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	3
	San Lorenzo Valley High School	3
Monterey	Monterey Abalone Company	5
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Friends of the Sea Otter ( <i>Kelly Cherry</i> )	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	3
	Tenera Environmental	3
Santa Barbara	The Marine Mammal Center ( <i>Tim Lytsel, P.J. Webb</i> )	5
	CDPH Volunteer ( <i>Sylvia Short</i> )	4
	Santa Barbara Mariculture Company	6
Ventura	U.C. Santa Barbara	3
	CDPH Volunteer ( <i>Fred Burgess</i> )	2
	Channel Island National Marine Sanctuary	1
	National Park Service	2
Los Angeles	Ventura County Environmental Health Department	1
	Los Angeles County Sanitation District	4
	Southern California Marine Institute	1
Orange	California Department of Fish and Game	8
	Ocean Institute	1
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	5

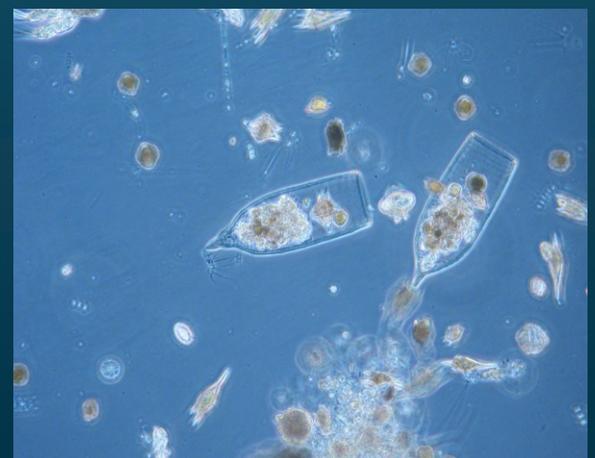
## PHYTOPLANKTON GALLERY



A bloom of the diatom *Asterionellopsis socialis* was reported in the surf zone in Humboldt County.



Bivalve shellfish larvae prior to settlement.



Ciliates are often present, sometimes common, in our samples.