



Marine Biotoxin Monitoring Report

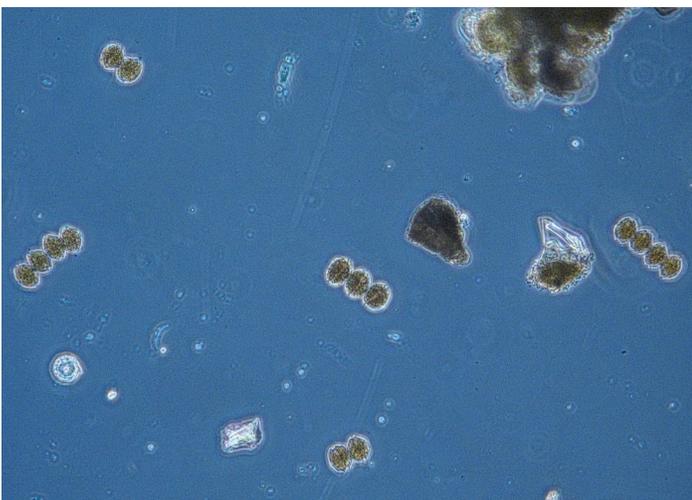
December 2018

Technical Report No. 18-26

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of December, 2018. Toxin concentration ranges 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 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



When present, *Alexandrium* is most often observed as single cells. Chains of varying numbers of cells can also be observed, indicative of cell division, increasing population density, and elevated risk for PSP toxicity in shellfish.

are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (e.g., 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.

Northern California Summary:

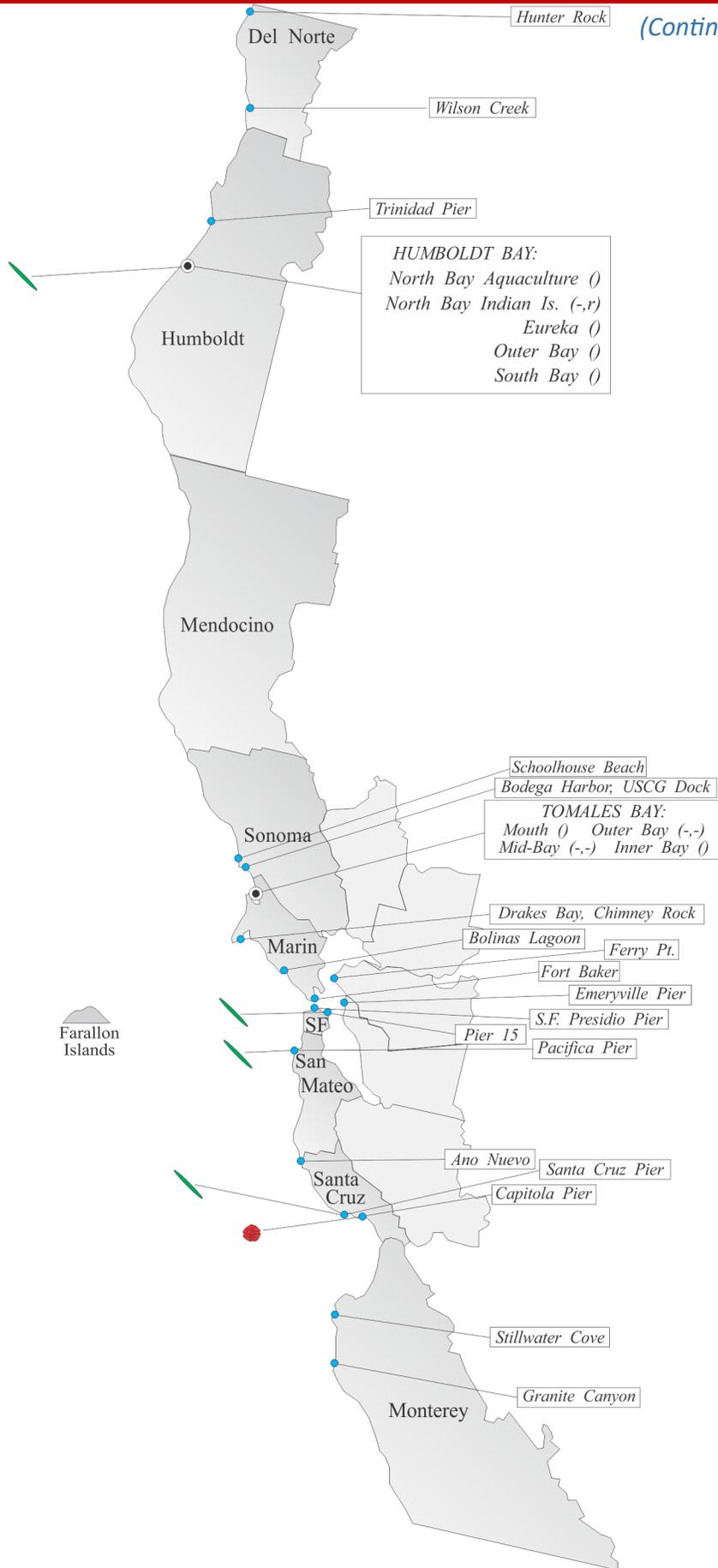
Paralytic Shellfish Poisoning

Alexandrium was observed at only one location in December (Figure 1). A small number of cells were present in a sample from the Capitola Pier (Santa Cruz County) on December 16, a significant decrease in distribution compared to observations in November.

PSP toxicity was detected in shellfish samples from several sites in December (Figure 2). Low concentrations of the PSP toxins were detected in mussel samples from Del Norte, Santa Cruz, and Monterey counties. The highest toxin concentration detected in mussels was 43 $\mu\text{g}/100\text{ g}$ in a sample from the Santa Cruz Pier on December 19.

Slightly higher PSP toxicity was detected in rock scallop viscera from the Monterey Commercial Pier (53 $\mu\text{g}/100\text{ g}$ on December 4). PSP toxins have been detected in rock scallop viscera from this location since

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August 2016, with previous concentrations often well above the alert level.

Domoic Acid

Low numbers of *Pseudo-nitzschia* were observed at several sampling sites along the northern California coast in December (Figure 1). The overall relative abundance and distribution of this diatom declined compared to observations in November.

Domoic acid was not detected in any shellfish samples in December (Figure 2).

The CDPH Food and Drug Branch and the California Department of Fish and Wildlife (CDFW) coordinated the collection and analysis of Dungeness crab viscera from Del Norte and Humboldt counties in De-

cember. Domoic acid was detected in all samples, with the concentrations ranging from below to well above the alert level (Figure 2). The highest concentration detected was in a sample from offshore of Humboldt County (110 ppm).

Non-Toxic Species

Phytoplankton abundance was low in most samples. Dinoflagellates dominated the phytoplankton assemblage in samples from Sonoma and Marin counties,

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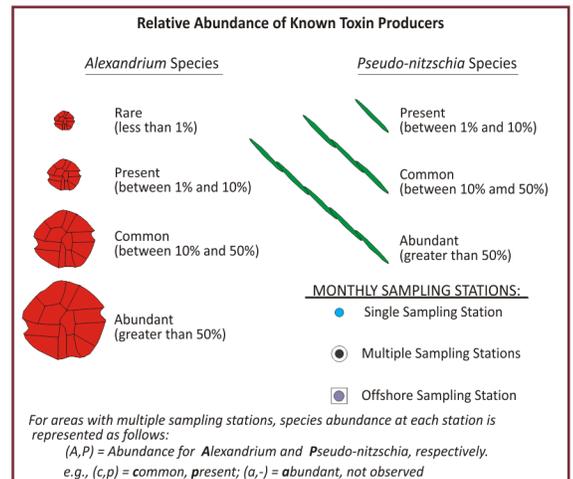


Figure 1. Toxic phytoplankton distribution in northern California.

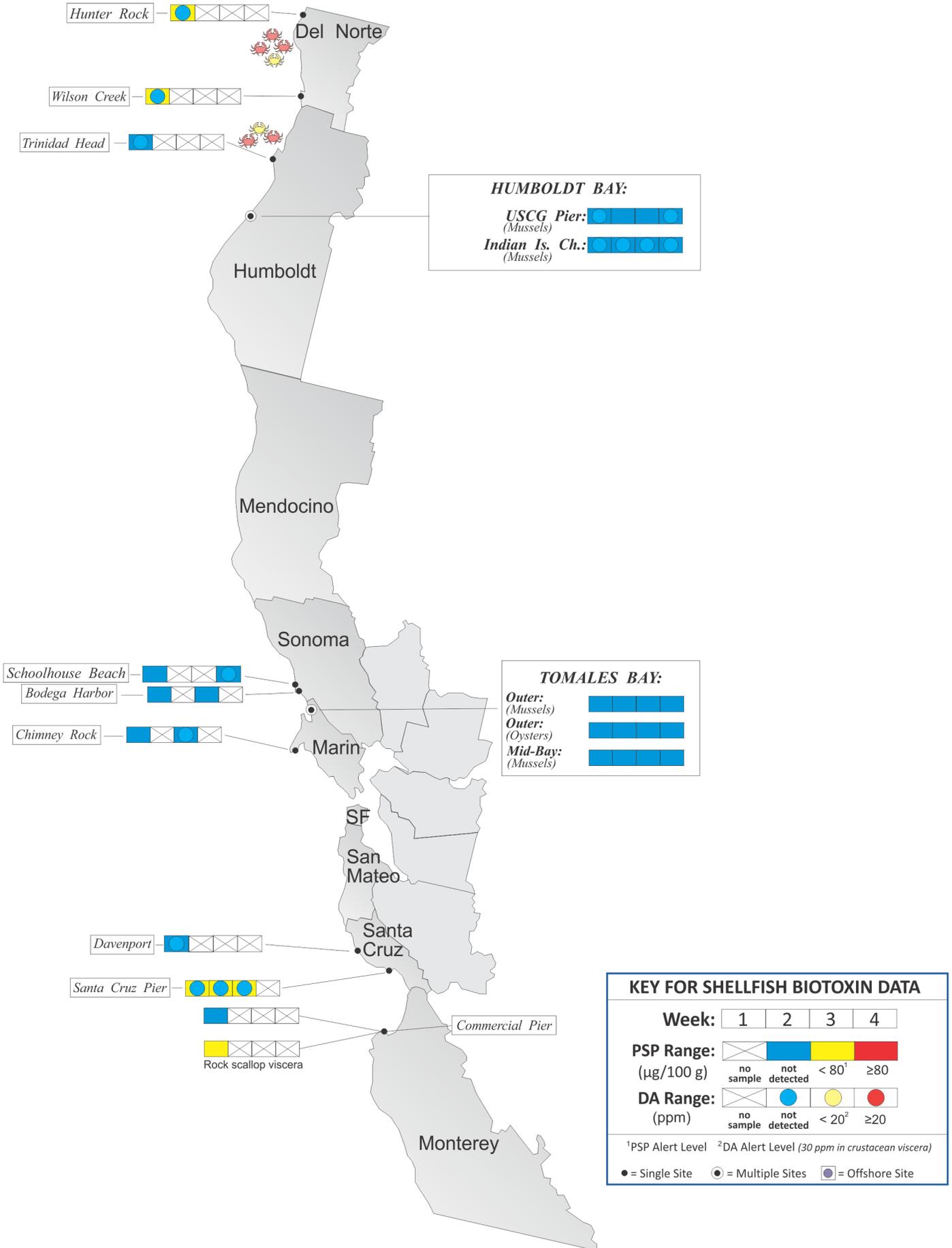


Figure 2. Distribution of shellfish biotoxins in northern California.

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Figure 3. Toxic phytoplankton distribution in southern California.

with *Ceratium furca* and *C. fusus* the most common species. *Akashiwo sanguineum* was abundant in mid-Tomales Bay.

Southern California Summary:

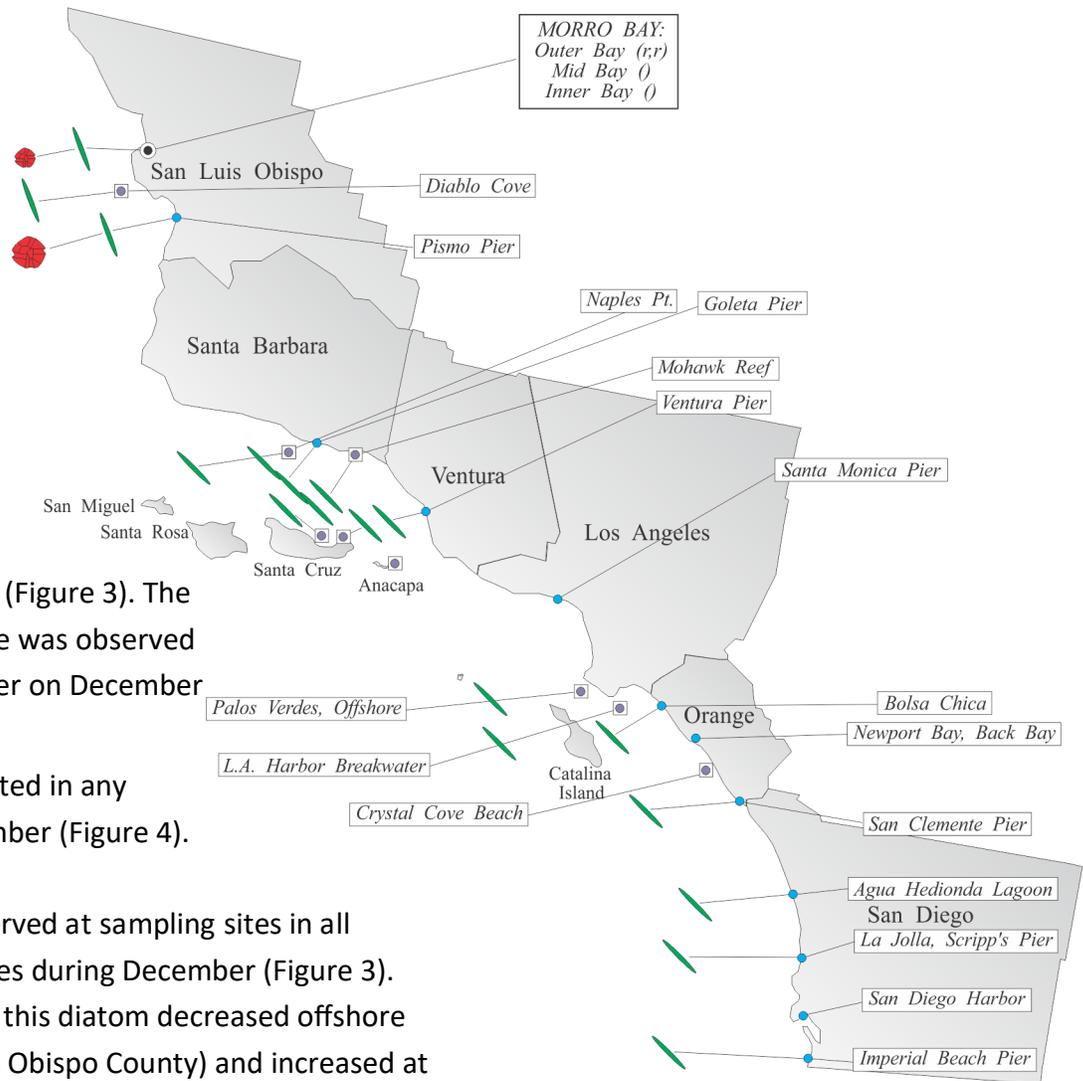
Paralytic Shellfish Poisoning:

Alexandrium remained present along the San Luis Obispo coast for the eighth consecutive month (Figure 3). The highest relative abundance was observed in a sample from Pismo Pier on December 11.

PSP toxicity was not detected in any shellfish samples in December (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at sampling sites in all southern California counties during December (Figure 3). The relative abundance of this diatom decreased offshore of Diablo Canyon (San Luis Obispo County) and increased at Goleta Pier (Santa Barbara County) compared to observations in November. The cell mass was low at all sites. Domoic acid was not detected in any shellfish samples analyzed in December (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's health is threatened.

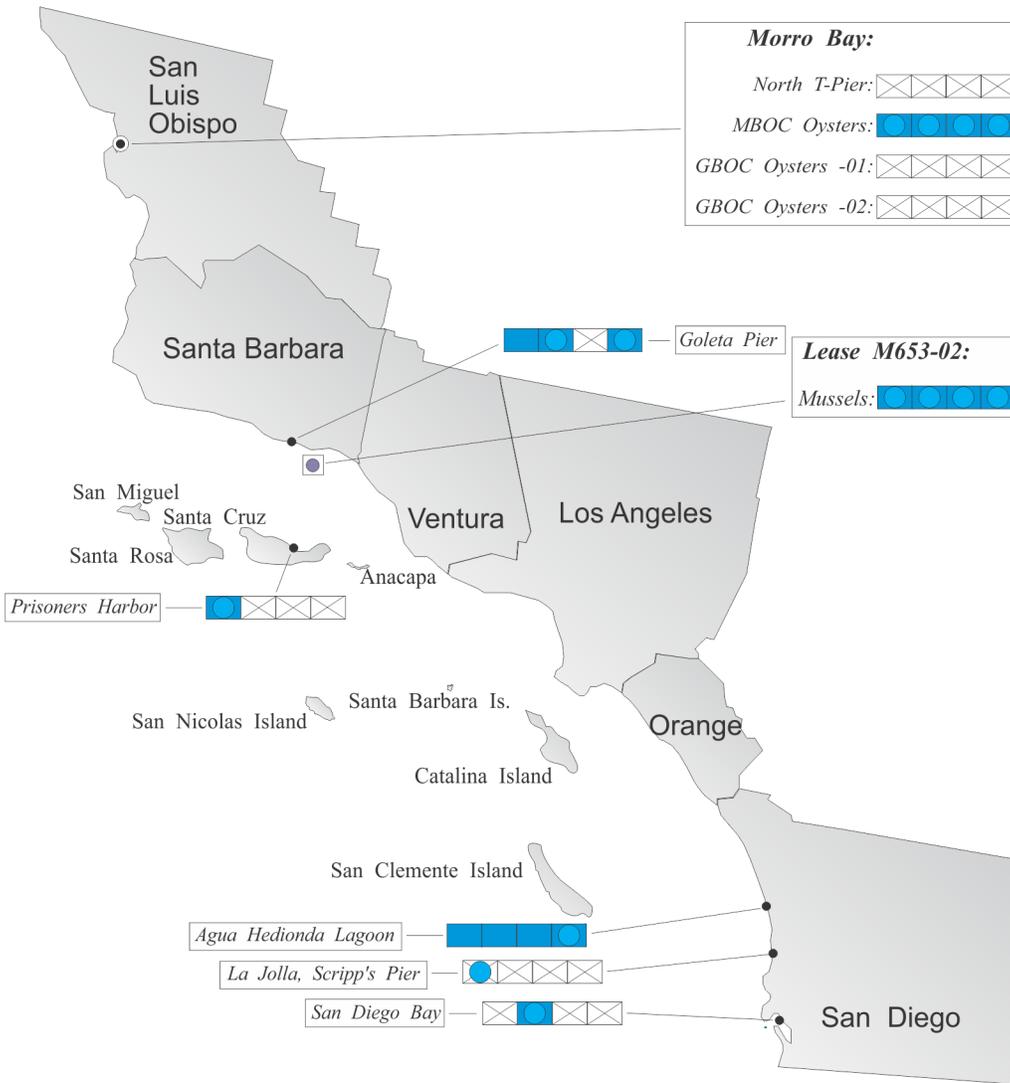
For Information on Volunteering:

For Recorded Biotoxin Information Call:

Email redtide@cdph.ca.gov or call 510-412-4635

(800) 553 - 4133

Figure 4. Distribution of shellfish biotoxins in southern California.



Dungeness crabs caught in state waters near Bodega Head and Russian River in Sonoma County.

On November 19 CDPH rescinded the domoic acid health advisory for sport-harvested mussels, scallops, and clams (other than razor clams) in Del Norte and Humboldt counties.

On November 19 CDPH also rescinded the domoic acid health advisory for lobsters caught in state waters around Anacapa Island in Ventura County, which was issued on October 16.

On November 1 CDPH advised consumers not to consume the viscera (internal organs) of Dungeness crab

caught near Bodega Head and Russian River in Sonoma County due to the detection of elevated levels of domoic acid in samples from these areas.

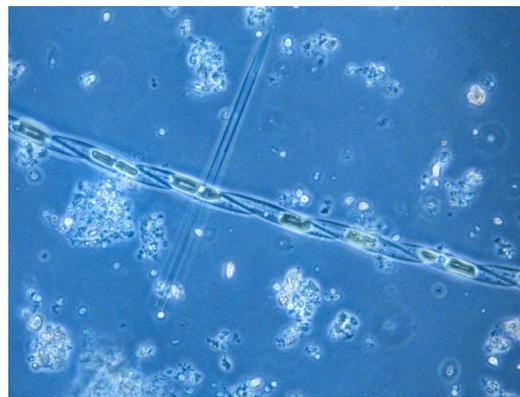
On October 31 CDPH issued a press release announcing that the statewide annual quarantine on sportharvesting of mussels ended at midnight on Wednesday, October 31, 2018, for all coastal counties except Del Norte and Humboldt. The annual mussel quarantine is normally scheduled to begin on May 1 each year and end at

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Non-Toxic Species

Cell mass was low in most phytoplankton samples collected in December. The diatom *Chaetoceros* was common in samples from offshore of Santa Barbara, at two locations on Santa Cruz Island, and offshore of Los Angeles County. *Bacteriastrum* was also common in a sample from Santa Cruz Island. The dinoflagellate *Akashiwo sanguineum* was common offshore of the Palos Verdes peninsula (Los Angeles

County) and at Crystal Cove (Orange County).



Pseudo-nitzschia was common at Goleta Pier in Santa Barbara County but rare elsewhere.

QUARANTINES:

On December 3 CDPH lifted the domoic acid health advisory for

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midnight on October 31. These dates can change, however, based on the detection of dangerous toxin levels. The annual quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries.

On October 24 CDPH advised recreational anglers not to eat Dungeness crab caught between Patrick's Point North (Humboldt County) and the Oregon border due to elevated levels of domoic acid in some samples.

The CDFW closure of the razor clam fishery remains in effect due to the continued presence of dangerous levels of domoic acid in razor clams from beaches in Humboldt and Del Norte counties.

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 vis-

Table 1. Program participants collecting phytoplankton samples.

AGENCY	#	AGENCY	#
DEL NORTE COUNTY			
Tolowa Dee-ni' Nation	1	Yurok Tribe Environmental Program	1
HUMBOLDT COUNTY			
Coast Seafood Company	4	Humboldt State University Marine Lab	1
MENDOCINO COUNTY			
None Submitted			
SONOMA COUNTY			
CDPH Marine Biotoxin Program			
MARIN COUNTY			
CDPH Volunteers (<i>Brent Anderson, Ignacio Martin-Bragado</i>)			
CDPH Marine Biotoxin Program	2	Hog Island Oyster Company	8
CONTRA COSTA COUNTY			
CDPH Volunteer (<i>Russel Shearer</i>)	1	CDPH Marine Biotoxin Program	1
ALAMEDA COUNTY			
U.S. Food and Drug Administration			
SAN FRANCISCO COUNTY			
CDPH Volunteer (<i>Eugenia McNaughton</i>)	2	Exploratorium	2
SAN MATEO COUNTY			
The Marine Mammal Center	5	U.C. Santa Cruz	1
SANTA CRUZ COUNTY			
U.C. Santa Cruz			
CDPH Volunteers (<i>Jeff Palsgaard, Ignacio Martin-Bragado</i>)			
MONTEREY COUNTY			
Marine Pollution Studies Laboratory	1	Pacific Grove Museum of Natural History	3
SAN LUIS OBISPO COUNTY			
Friends of the Sea Otter	1	Morro Bay National Estuary Program	1
Morro Bay Oyster Company	3	Tenera Environmental	1
SANTA BARBARA COUNTY			
National Park Service			
Santa Barbara Channel Keeper	4	U.C. Santa Barbara	4
VENTURA COUNTY			
CDPH Volunteer (<i>Fred Burgess</i>)			
LOS ANGELES COUNTY			
Los Angeles County Health Department			
Los Angeles County Sanitation District	2	Los Angeles Water Keeper	2
ORANGE COUNTY			
Amigos de Bolsa Chica	4	Back Bay Science Center	4
Crystal Cove Alliance	1	CDPH Volunteer (<i>Truong Nguyen</i>)	2
SAN DIEGO COUNTY			
Carlsbad Aquafarms, Inc.	4	Scripps Institute of Oceanography	6
Tijuana River National Estuary Research	3	U.S. Navy Marine Mammal Program	2

cera.

PSP toxins can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be 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,

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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 seafood species such as crab, lobster, and small finfish like sardines and anchovies.

Sportharvesters should only collect shellfish from areas that are not affected by a current health advisory or quarantine. Contact the “Biotxin Information Line” at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



Table 2. Program participants collecting shellfish samples.

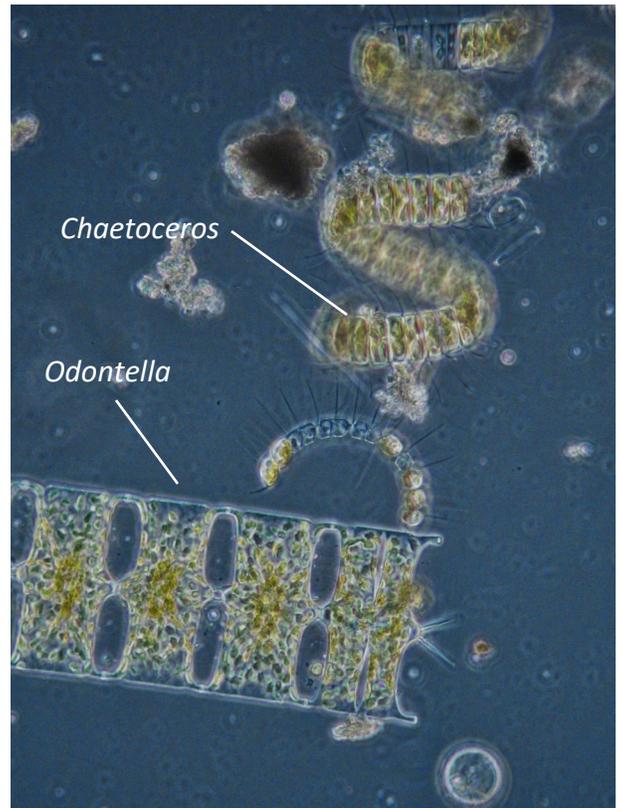
COUNTY	AGENCY	#
Del Norte	Tolowa Dee-ni' Nation	1
	Yurok Tribe Environmental Program	1
Humboldt	Coast Seafood Company	8
	Humboldt County Environmental Health Department	1
Mendocino	None Submitted	
Sonoma	CDPH Marine Biotxin Program	4
Marin	CDPH Marine Biotxin Program	2
	Cove Mussel Company	5
	Hog Island Oyster Company	5
	Point Reyes Oyster Company	5
San Francisco	None Submitted	
San Mateo	None Submitted	
Santa Cruz	CDPH Volunteer (<i>Stuart Jackson</i>)	1
	U.C. Santa Cruz	3
Monterey	Monterey Abalone Company	2
San Luis Obispo	Morro Bay Oyster Company	4
Santa Barbara	National Park Service	1
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
Ventura	None Submitted	
Los Angeles	None Submitted	
Orange	None Submitted	
San Diego	Carlsbad Aquafarm, Inc.	5
	Scripps Institute of Oceanography	1
	U.S. Navy Marine Mammal Program	1

If you are having difficulty accessing this document, please contact CDPH at 1-800-553-4133 to request this information in an alternate format.

Phytoplankton Gallery



The diatom *Chaetoceros* with epiphytic bacteria on its setae.



Two diatoms frequently observed in December.



Zooplankton like this cladoceran are occasionally captured in our phytoplankton nets.