



Marine Biotoxin Monitoring Report

January 2020

Technical Report No. 20-12

INTRODUCTION:

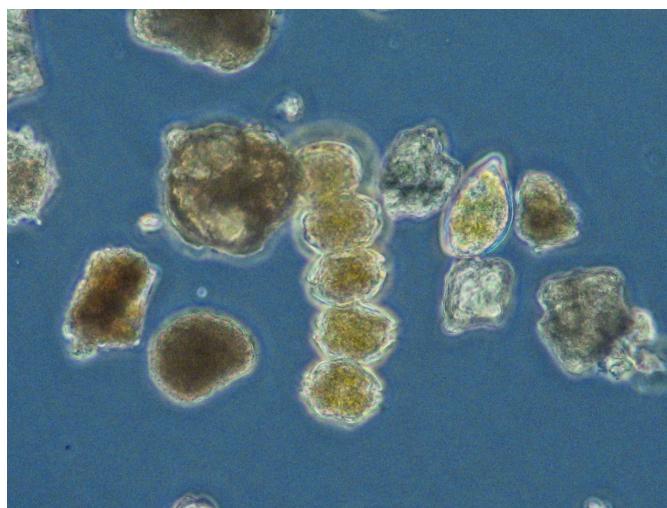
This report contains results from the California Department of Public Health (CDPH) monitoring programs for shellfish toxins and associated toxin-producing phytoplankton. Toxin concentration ranges are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA), the latter associated with the syndrome called Amnesic Shellfish Poisoning. Estimates are provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. This report also contains summary information for any quarantine or health advisory in effect during the reporting period. Finally, lists of participating agencies and volunteers for each monitoring effort are provided.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium distribution was limited to two locations in January (Figure 1). Low numbers of this dinoflagellate were observed at the Richmond Ferry Point Pier inside San Francisco Bay (January 28) and at the Pacifica Pier in San Mateo County (January 12).

PSP toxicity was not detected in any mussel or oys-



A chain of five *Alexandrium* cells observed in a sample from the Santa Barbara coast. A *Prorocentrum micans* cell is to the right of the chain. The remaining objects are assorted boulders and other detritus typical of winter samples.

ter samples in January (Figure 2).

Domoic Acid

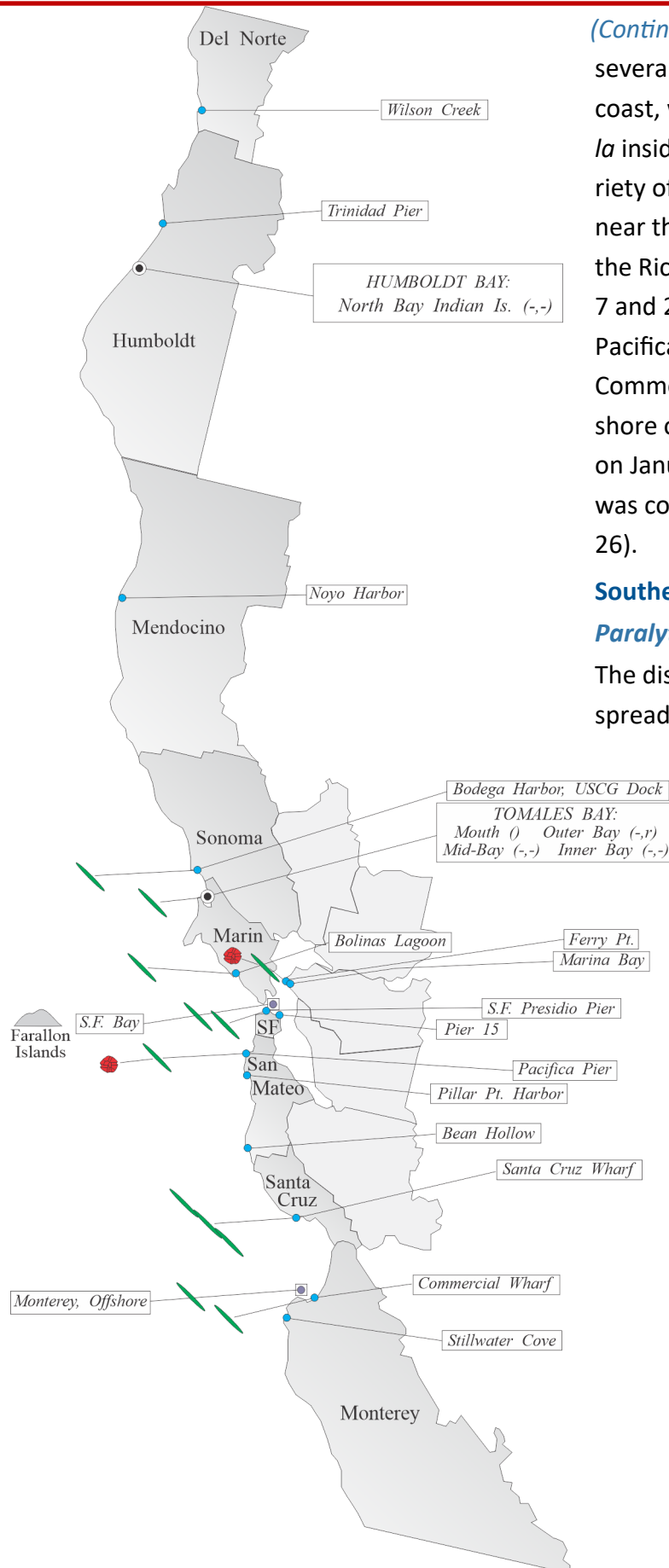
Pseudo-nitzschia was observed at numerous sites between Sonoma and Monterey counties in January (Figure 1). This diatom was common in a January 8 sample from the Santa Cruz Wharf, however the cell mass was low in all samples. Domoic acid was not detected in any shellfish samples collected in January (Figure 2).

Non-Toxic Species

Phytoplankton abundance remained low overall, with a few exceptions. Diatoms were common at

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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) Only known toxin-producing species (e.g., *seriata* complex for *Pseudo-nitzschia*) are represented on the maps; (iii) All toxin data are for mussel samples, unless otherwise noted; (iv) 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); (v) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.



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several locations along the northern California coast, with notable observations including: *Surirella* inside Humboldt Bay (25% on January 13); a variety of centric diatoms inside San Francisco Bay near the Golden Gate (20% on January 29) and at the Richmond Marina Bay Harbor (30% on January 7 and 25% on January 21); *Chaetoceros* at the Pacifica Pier (35% on January 25), the Monterey Commercial Wharf (35% on January 16), and offshore of Lover's Point inside Monterey Bay (40% on January 29). The dinoflagellate *Heterocapsa* was common in mid Tomales Bay (20% on January 26).

Southern California Summary:

Paralytic Shellfish Poisoning:

The distribution of *Alexandrium* remained widespread along the southern California coast in Janu-

ary (Figure 3). *Alexandrium* was observed at sites in each coastal county except Ventura and Los Angeles. The relative abundance of this dinoflagellate increased in a January 15 sample from the south La Jolla Marine Reserve. Low numbers of *Alexandrium* were observed offshore of Diablo Cove in San Luis Obispo County (January 7); at Mohawk Reef in Santa Barbara County (January

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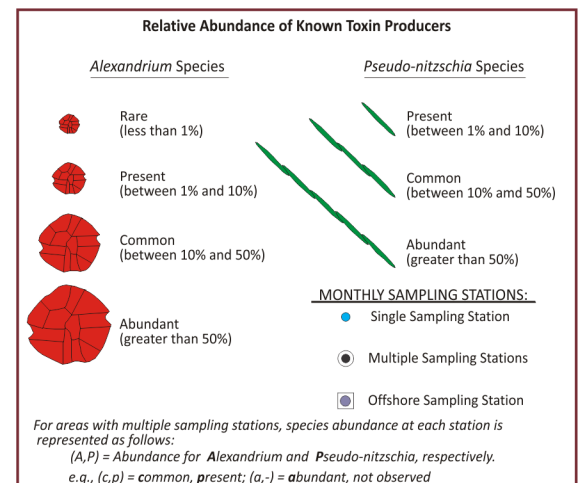


Figure 1. Toxic phytoplankton distribution in northern California.

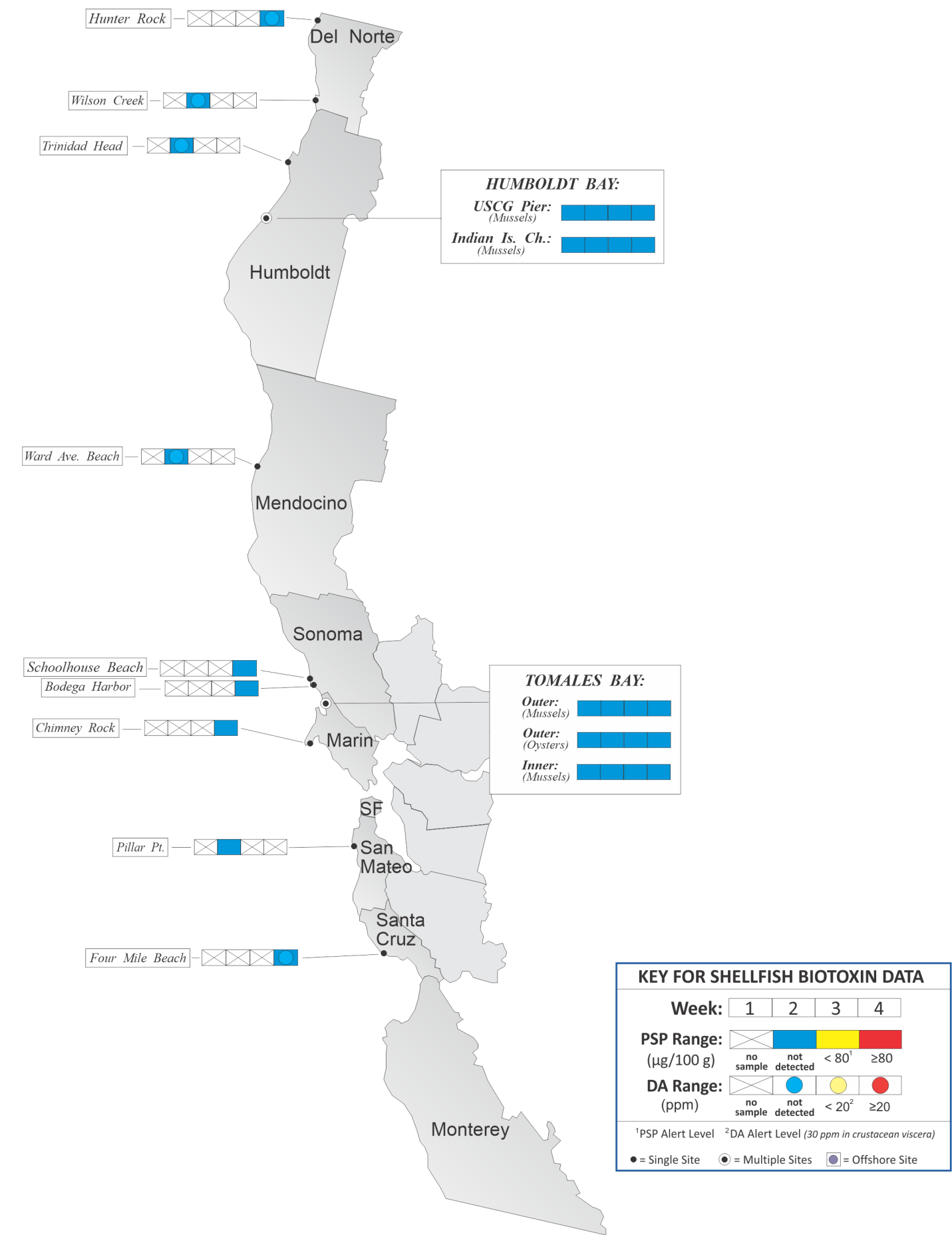


Figure 2. Distribution of shellfish biotoxins in northern California.

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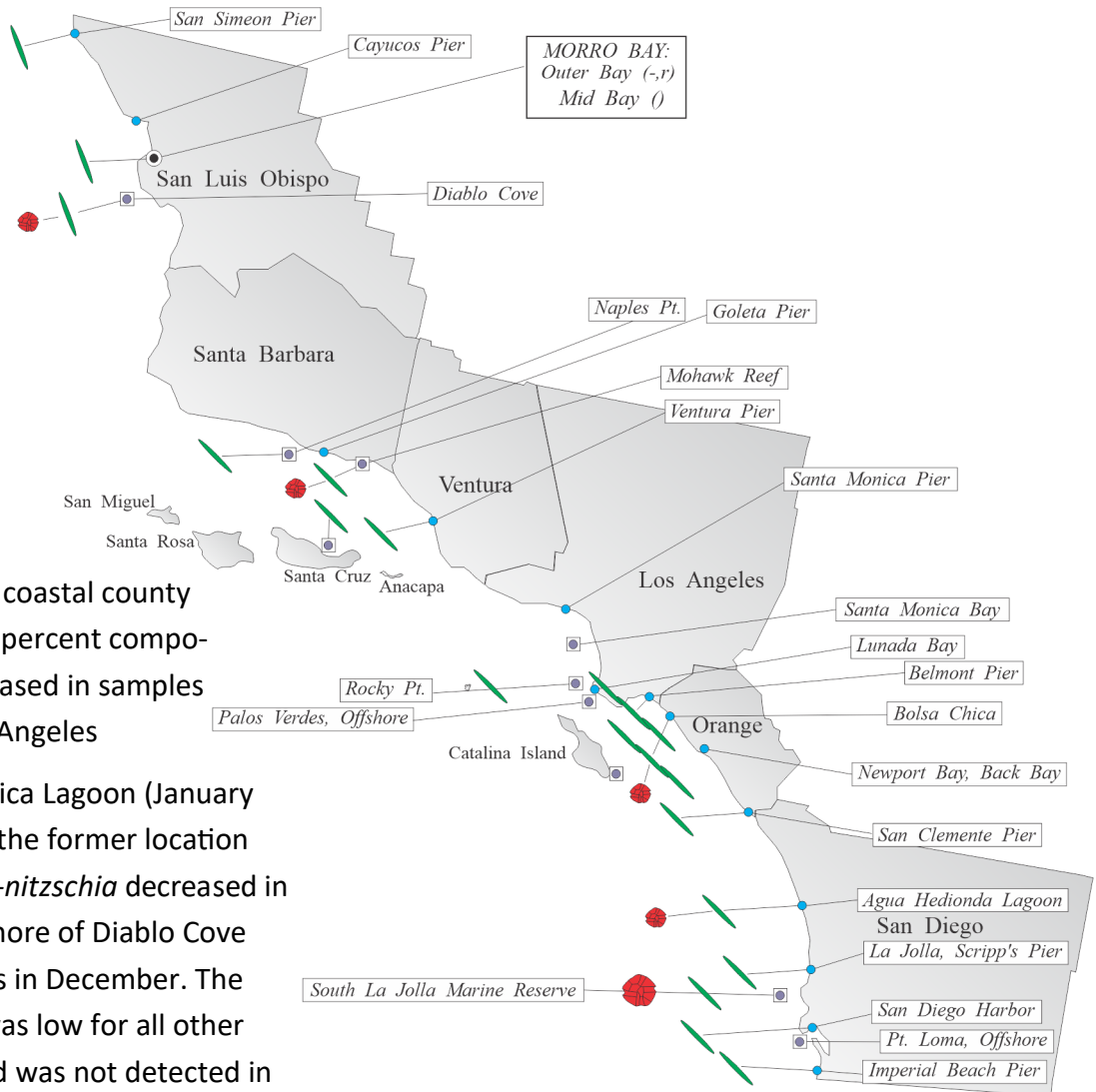
Figure 3. Toxic phytoplankton distribution in southern California.

3); in Bolsa Chica Lagoon in Orange County (January 24); and inside Agua Hedionda Lagoon in San Diego County (January 15). PSP toxicity was not detected in any mussel or oyster samples in January (Figure 4).

Domoic Acid

Pseudo-nitzschia continued to be observed at one or more sites in each coastal county in January (Figure 3). The percent composition of this diatom increased in samples from Belmont Pier in Los Angeles

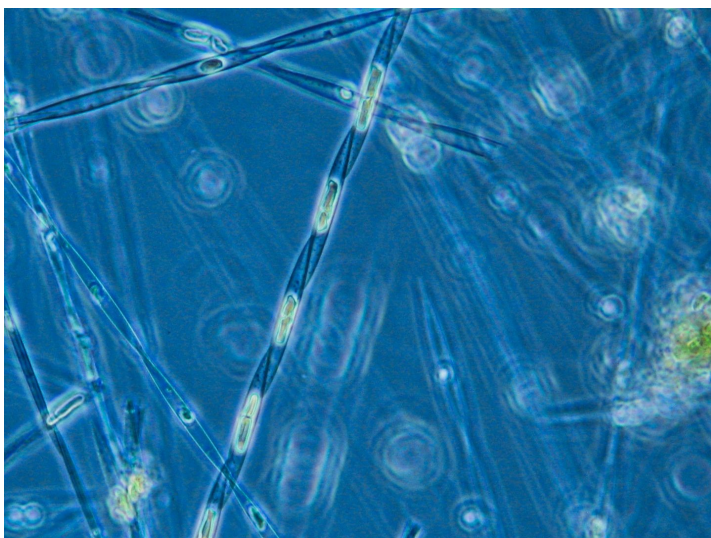
(January 31) and Bolsa Chica Lagoon (January 24), with the cell mass at the former location slightly elevated. *Pseudo-nitzschia* decreased in percent composition offshore of Diablo Cove compared to observations in December. The cell mass of this diatom was low for all other observations. Domoic acid was not detected in any mussel or oyster samples during January (Figure 4).



Non-Toxic Species

Diatoms once again dominated the phytoplankton assemblage at most sampling sites, although dinoflagellates remained common at a few locations. The diatom *Chaetoceros* was common in a sample from Prisoners Harbor at Santa Cruz Island (January 28). This diatom was also common to abundant at sites between Los Angeles and San Diego counties. The cell mass was low for all observations. Other common diatoms observed included *Skeletonema* in Bolsa Chica Lagoon (January 24 and 31) and *Asterionella* in the Back Bay region of Newport Bay in Orange County (January 24 and 30).

The dinoflagellate *Lingulodinium polyedrum* was



Pseudo-nitzschia continued to be observed in low numbers along much of the California coast.

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common offshore of Diablo Cove (January 23). *Ceratium furca* was common in samples from Mohawk Reef (January 3); Santa Monica Bay (January 18) and Lunada Bay (January 26) in Los Angeles County; and in Bolsa Chica Lagoon (January 17). *Gonyaulax* sp. was common inside Agua Hedionda Lagoon on January 29.

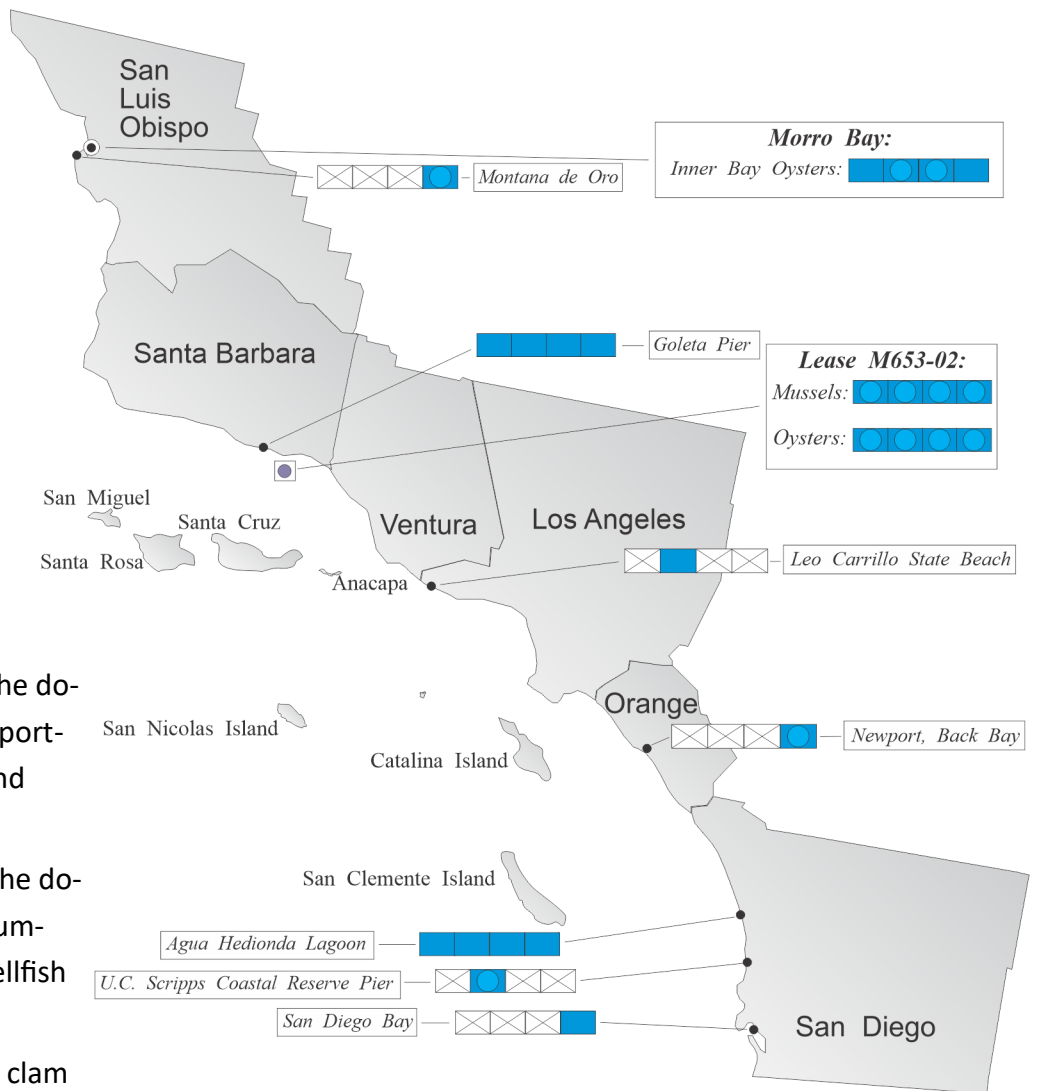
QUARANTINES:

On December 20 CDPH lifted the domoic acid health advisory for sport-harvested mussels, scallops, and clams in Mendocino County.

On November 19 CDPH lifted the domoic acid health advisory in Humboldt County for all bivalve shellfish except razor clams.

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

Figure 4. Distribution of shellfish biotoxins in southern California.



Norte counties.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat.

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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

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Table 1. Program participants collecting phytoplankton samples.

AGENCY	#	AGENCY	#
DEL NORTE COUNTY		Yurok Tribe Environmental Program	1
HUMBOLDT COUNTY			
Coast Seafood Company	4	Humboldt State University Marine Lab	1
MENDOCINO COUNTY		CDPH Marine Biotoxin Program	1
SONOMA COUNTY		CDPH Marine Biotoxin Program	1
MARIN COUNTY			
CDPH Volunteer (<i>Brent Anderson</i>)	3	Hog Island Oyster Company	6
CONTRA COSTA COUNTY			
CDPH Volunteer (<i>Russel Shearer</i>)	1	CDPH Marine Biotoxin Program	4
SAN FRANCISCO COUNTY		CDPH Volunteer (<i>Eugenia McNaughton</i>)	2
CDPH Marine Biotoxin Program	1	Exploratorium	2
SAN MATEO COUNTY			
The Marine Mammal Center	3	San Mateo County Environmental Health Dept	3
SANTA CRUZ COUNTY		U.C. Santa Cruz	4
MONTEREY COUNTY		California Department of Parks and Recreation	1
Monterey Abalone Company	2	Pacific Grove Museum of Natural History	5
SAN LUIS OBISPO COUNTY			
CDPH Volunteers (<i>Dan Hosklins, Skip Rotstein</i>)	3	Monterey Bay National Marine Sanctuary	2
Morro Bay Oyster Company	3	Tenera Environmental	2
SANTA BARBARA COUNTY		National Park Service	1
Santa Barbara Channelkeeper	3	U.C. Santa Barbara	4
VENTURA COUNTY		CDPH Volunteer (<i>Fred Burgess</i>)	5
LOS ANGELES COUNTY			
CDPH Volunteers (<i>Cal Parsons, Michelle Tran, Spencer Peterman</i>)			3
Los Angeles County Sanitation District	1	Los Angeles Water Keeper	4
ORANGE COUNTY		Amigos de Bolsa Chica	6
Back Bay Science Center	4	CDPH Volunteer (<i>Truong Nguyen</i>)	2
SAN DIEGO COUNTY			
Carlsbad Aquafarms, Inc.	3	Scripps Institute of Oceanography	4
SEACAMP/HABNet	1	Tijuana River National Estuary Research	4
U.S. Navy Marine Mammal Program	5	Wildcoast	1

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 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.

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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 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 “Biotoxin 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	Mendocino County Environmental Health Department	1
Sonoma	CDPH Marine Biotoxin Program	2
Marin	CDPH Marine Biotoxin Program	1
	Cove Mussel Company	4
	Hog Island Oyster Company	8
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	CDPH Volunteer (<i>Richard Buddington</i>)	1
Monterey	None Submitted	
San Luis Obispo	CDPH Volunteer (<i>Stuart Helmtoller</i>)	1
	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>Steven Field</i>)	1
Orange	Back Bay Science Center	1
San Diego	Carlsbad Aquafarm, Inc.	4
	University of California Scripps Coastal Reserve Pier	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.

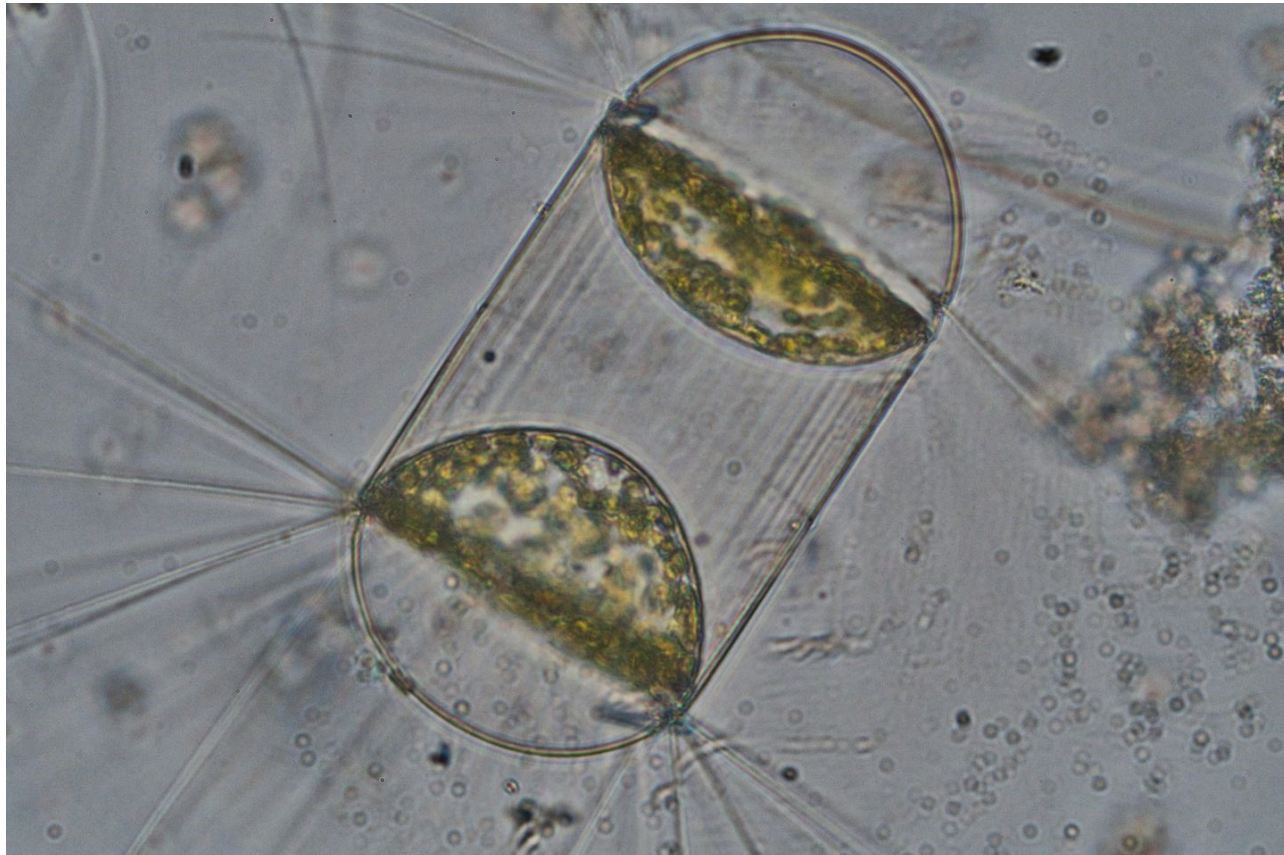
Phytoplankton Gallery



The diatom *Chaetoceros* was common at numerous sites along the coast between San Mateo and San Diego counties.



The dinoflagellate *Ceratium furca*.



The diatom *Corethron*.