

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

June 2015

Technical Report No. 15-15

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of June, 2015. 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.

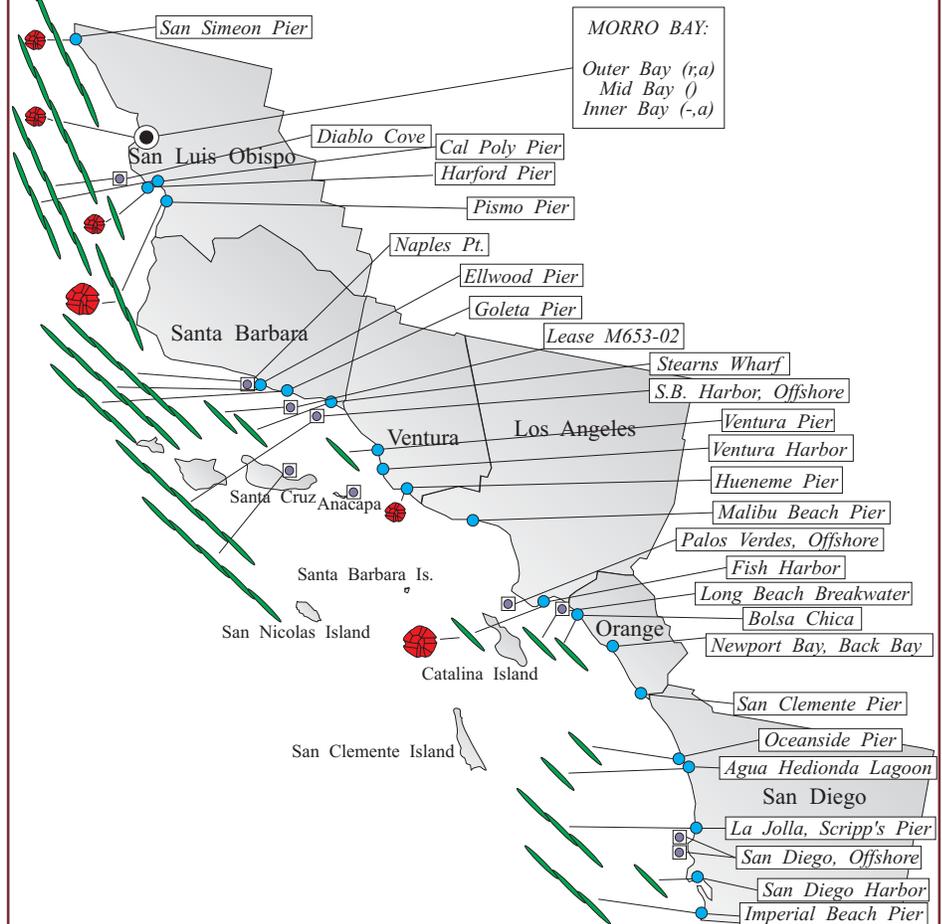
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at six sites between San Luis Obispo and Los Angeles counties in June (Figure 1). Low levels of PSP toxins were detected in San Luis Obispo County during the last week of June in mussel samples from Morro Bay and Cal Poly Pier and in an oyster sample from Morro Bay. PSP

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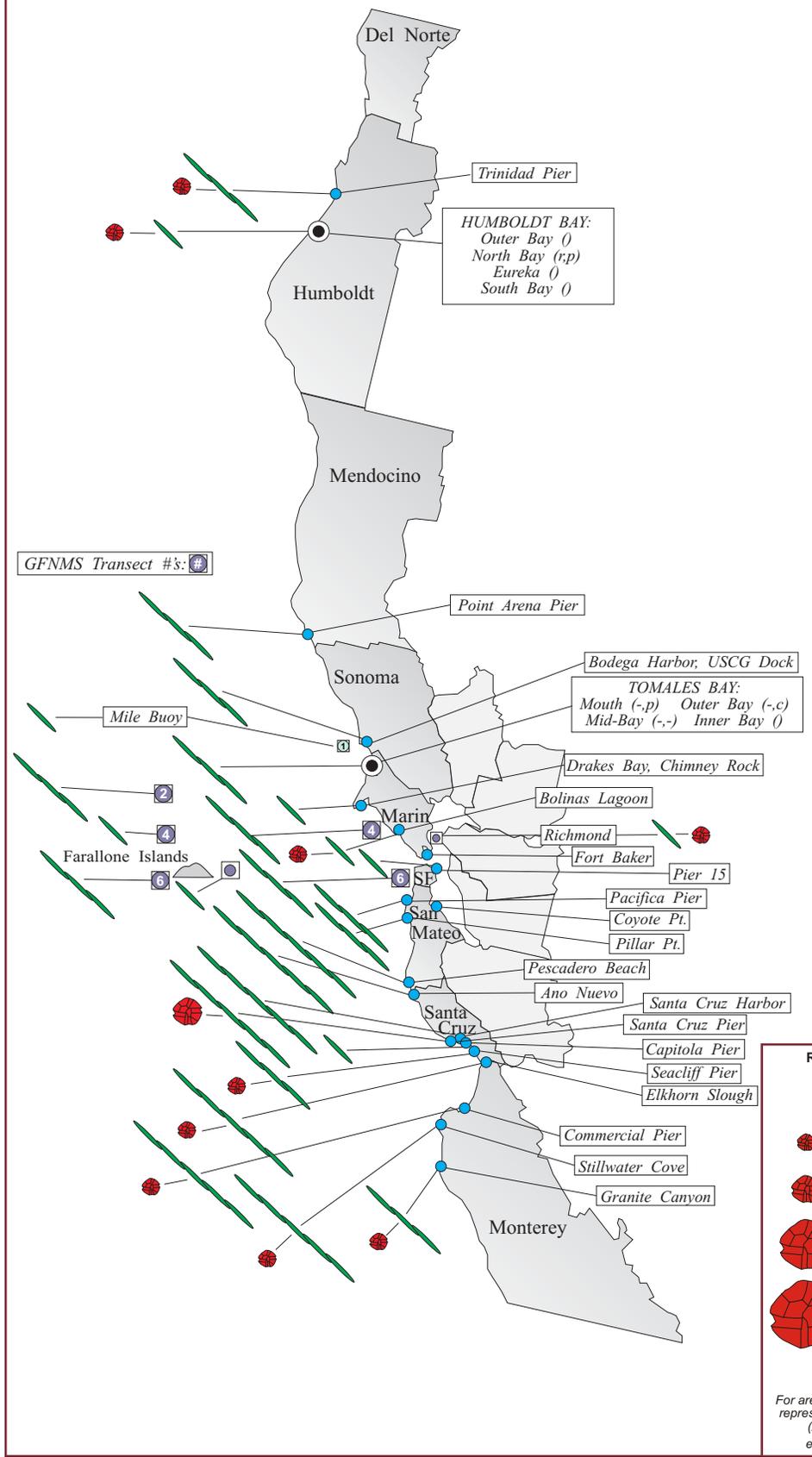
Figure 1. Distribution of toxin-producing phytoplankton in Southern California during June, 2015.



Relative Abundance of Known Toxin Producers

Alexandrium Species	Pseudo-nitzschia Species
<ul style="list-style-type: none"> Rare (less than 1%) Present (between 1% and 10%) Common (between 10% and 50%) Abundant (greater than 50%) 	<ul style="list-style-type: none"> Present (less than 10%) Common (between 10% and 50%) Abundant (greater than 50%)
<p>MONTHLY SAMPLING STATIONS:</p> <ul style="list-style-type: none"> Single Sampling Station Multiple Sampling Stations Offshore Sampling Station 	
<p>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</p>	

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during June, 2015.



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toxins below the alert level were detected in a rock scallop viscera sample from the Santa Barbara Channel during the second week of June (Figure 3).

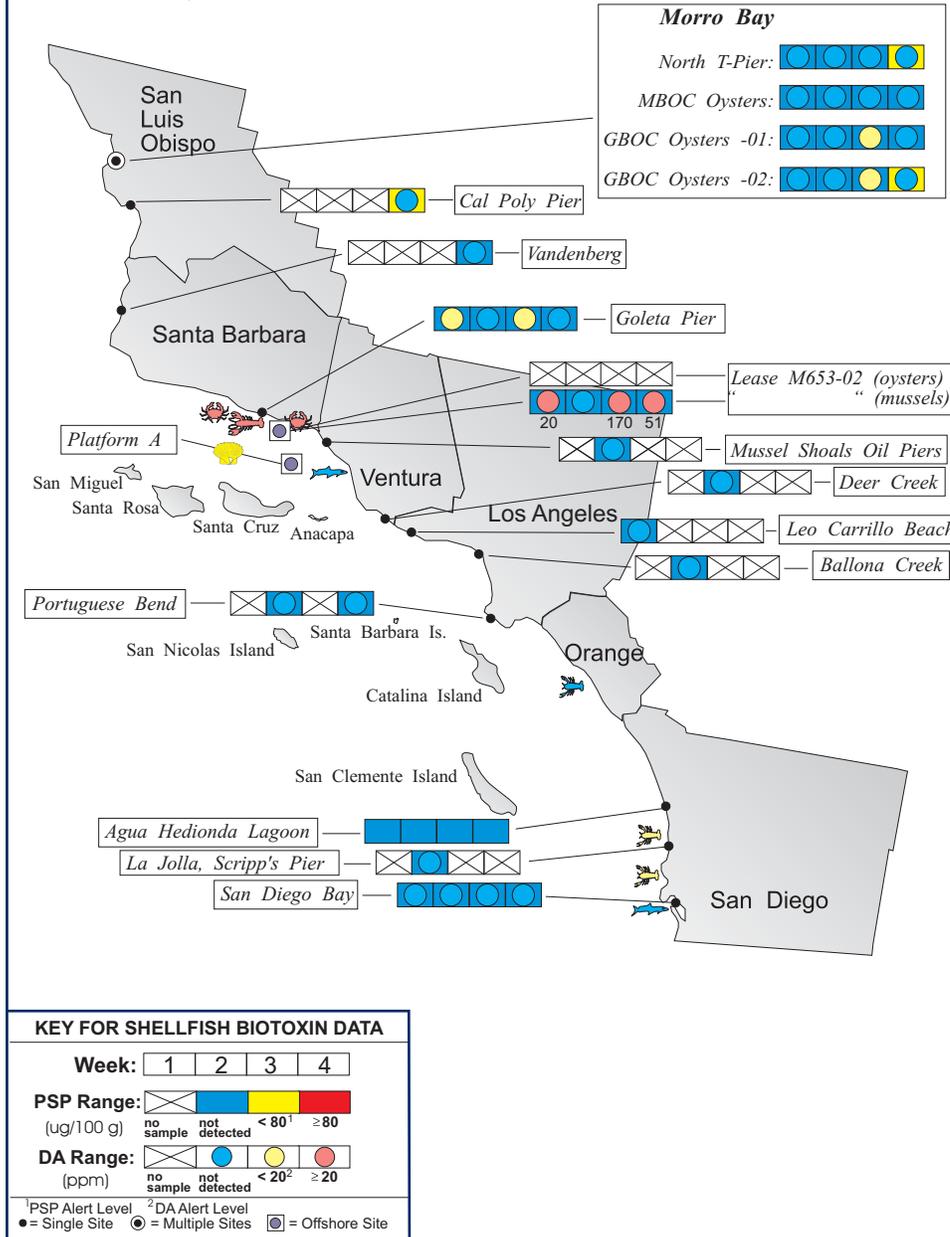
Domoic Acid

Pseudo-nitzschia was observed at the majority of sampling sites in all Southern California counties (Figure 1). The percent composition of this diatom increased in San Luis Obispo County and decreased in Ventura and Los Angeles counties compared to May. The highest relative abundance was observed at San Simeon Pier (San Luis Obispo County) during the second week of June. The cell mass was low at most locations. Domoic acid was detected in shellfish samples from San Luis Obispo to Santa Barbara counties (Figure 3). Shellfish samples were above the alert level at the offshore aquaculture lease in Santa Barbara. Shellfish samples from Morro Bay (San Luis Obispo) aquaculture leases, Goleta Pier (Santa Barbara), and the Santa Barbara Channel had low levels of domoic acid. Domoic acid was detected in crustacean samples from Santa Barbara and San Diego counties. Rock crabs collected offshore of Isla Vista were above the alert level for domoic acid the viscera and body meat with low levels in the leg meat for approximately half of the samples. Viscera from a lobster sample collected at Isla Vista on June 15 was

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Figure 3. Distribution of shellfish biotoxins in Southern California during June, 2015.



over the alert level. One of two rock crabs collected from Stearns Wharf in Santa Barbara at the end of June exceeded the alert level in the viscera. Two out of three samples of red pelagic crabs (*Pleuroncodes planipes*) collected from shore sites in Orange and San Diego counties contained detectable levels of domoic acid.

Non-Toxic Species

The diatom *Rhizosolenia* was common to abundant at sites in San Luis Obispo. The dinoflagellate *Ceratium furca* was common to abundant at sites between Santa Barbara and San Diego counties. The dinoflagellate *Prorocentrum* was common at select sites in Santa Barbara, Orange and San Diego counties.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at ten sampling sites between Humboldt and Monterey counties (Figure 2). Cell numbers were low at all sites. Low levels of PSP toxins were detected in mussel samples collected at sites in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo and Santa Cruz counties (Figure 4). Low concentrations of PSP toxins were detected in razor clam sample from Clam Beach in Humboldt County collected during the first week of June.

Domoic Acid

Pseudo-nitzschia was observed at the

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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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majority of sampling sites in all northern California counties (Figure 2). The percent composition of this diatom increased at sites in Monterey compared to May. The highest relative abundance and cell mass was observed at a Gulf of the Farallones National Marine Sanctuary site offshore of Marin County on June 22. The cell mass was low at most locations.

Domoic acid was detected from Humboldt to Monterey counties (Figure 4). Only one mussel sample was above the alert level at Santa Cruz Pier on June 10. Low concentrations of domoic acid were detected in razor clam samples from Clam Beach and Moonstone Beach (Humboldt County). Surfperch samples collected by the Bureau of Land Management at Seacliff Pier at the beginning of June had only one sample with a low level of domoic acid in the viscera. Fish samples were collected by CDPH Food and Drug Branch from Monterey Bay. Concentrations of domoic acid in anchovies exceeded the alert level. The highest domoic acid concentrations in the anchovies were 230 ppm for the whole fish, 130 ppm for the meat, and 1298 ppm for the viscera. Sardines and blue mackerel had domoic acid concentrations above the alert level in the viscera (220 ppm and 42 ppm respectively) and low concentrations in the meat. The spanish mackerel sample had low concentrations in both the viscera and meat. The surfperch sample was over alert level in viscera (26 ppm) and non-detect in meat.

Non-Toxic Species

The diatom *Chaetoceros* was common to abundant at most sites between Humboldt and San Mateo counties. The diatom *Skeletonema* was common to abundant at select sites from Humboldt to Marin counties. The dinoflagellate *Prorocentrum* was common at sites in Santa Cruz County.



Figure 4. Distribution of shellfish biotoxins in Northern California during June, 2015.

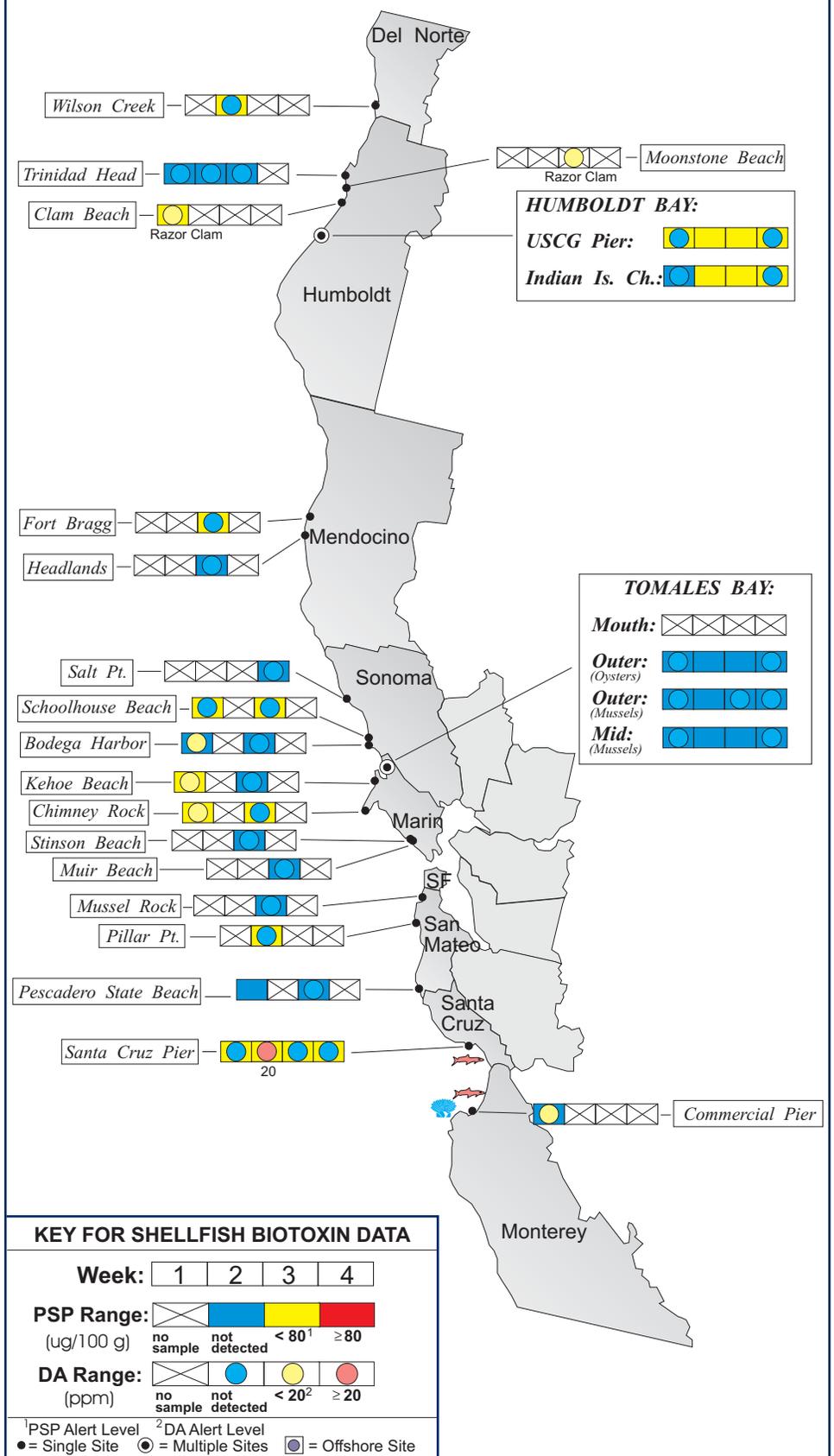


Table 1. Program participants collecting phytoplankton samples during June, 2015.

AGENCY	#	AGENCY	#
HUMBOLDT COUNTY			
Coast Seafood Company	5	Humboldt State University Marine Lab	1
MENDOCINO COUNTY			
		CDPH Volunteer (<i>Marie DeSantis</i>)	3
SONOMA COUNTY			
Bodega Marine Lab & Farallone Institute	1	CDPH Marine Biotoxin Program	1
MARIN COUNTY			
		Hog Island Oyster Company	2
CDPH Marine Biotoxin Program	3	CDPH Volunteers (<i>Anderson, Clyde</i>)	6
Gulf Farallones National Marine Sanctuary	4	NatureBridge	1
CONTRA COSTA COUNTY			
		CDPH Marine Biotoxin Program	1
SAN FRANCISCO COUNTY			
		Bodega Marine Lab & Farallone Institute	4
San Francisco Bay Whale Watching Company	1	Exploratorium	3
SAN MATEO COUNTY			
San Mateo County Envir. Health Department	6	Friends of the Sea Otter (<i>Diane Larson</i>)	3
The Marine Mammal Center	4	U.C. Santa Cruz - Ano Nuevo	5
SANTA CRUZ COUNTY			
U.C. Santa Cruz	4	Santa Cruz County Envir. Health Department	3
San Lorenzo Valley High School	1	The Otter Project (<i>Jeff Palsgaard</i>)	4
MONTEREY COUNTY			
Marine Pollution Studies Laboratory	1	Monterey Abalone Company	3
Friends of the Sea Otter (<i>Janis Chaffin</i>)	3	The Otter Project (<i>Rose, Noke</i>)	5
SAN LUIS OBISPO COUNTY			
		CDPH Marine Biotoxin Program	2
Morro Bay National Estuary Program	3	Morro Bay Oyster Company	5
Coastal Discovery Center, San Simeon	4	Tenera Environmental	3
Friends of the Sea Otter (<i>Cherry</i>)	4	CDPH Volunteer (<i>Guild, Shay</i>)	3
SANTA BARBARA COUNTY			
		Ty Warner Sea Life Center/HABNet	1
CDPH Volunteer (<i>Sylvia Short</i>)	3	U.C. Santa Barbara	4
Santa Barbara Channel Keeper	2	Santa Barbara Mariculture Company	2
CDPH Marine Biotoxin Program	1	Island Packers/HABNet	1
VENTURA COUNTY			
National Park Service	1	CDPH Volunteer (<i>Fred Burgess</i>)	4
Ventura County Envir. Health Department	1	Channel Islands High School	2
LOS ANGELES COUNTY			
Los Angeles County Sanitation District	2	Southern California Marine Institute	1
Los Angeles County Health Department	1	Long Beach Marine Institute	1
ORANGE COUNTY			
		Amigos de Bolsa Chica	4
CDPH Volunteer (<i>Truong Nguyen</i>)	3	California Department of Fish and Wildlife	4
SAN DIEGO COUNTY			
U.S. Navy Marine Mammal Program	4	Tijuana River National Estuary Research	4
Scripps Institute of Oceanography	5	Carlsbad Aquafarms, Inc.	4
Sea Camp/HABNet	2	CDPH Volunteer (<i>Cynthia Hall</i>)	1

QUARANTINES:

On June 1 the Department issued a Health Advisory warning consumers not to eat recreationally harvested mussels and clams, commercially or recreationally caught anchovy and sardines, or the internal organs of commercially or recreationally caught crab taken from Monterey and Santa Cruz counties. This advisory was issued because of elevated levels of domoic acid in samples from this region.

On June 8 the advisory was expanded to include the internal organs of scallops.

The annual mussel quarantine began on May 1. This annual quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries.

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 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

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Table 2. CDPH program participants submitting shellfish samples during June, 2015.

COUNTY	AGENCY	#
Del Norte	Yurok Tribe Environmental Program	1
Humboldt	Coast Seafood Company	10
	CDPH Volunteer (<i>Georgianna Wood</i>)	1
	Yurok Tribe Environmental Program	1
	Humboldt County Environmental Health Department	1
	California Department of Fish and Wildlife	1
Mendocino	Mendocino County Environmental Health Department	1
	CDPH Volunteer (<i>Charlie Lorenz</i>)	1
Sonoma	CDPH Marine Biotoxin Program	4
	CDPH Volunteer (<i>John Morozumi</i>)	1
Marin	Cove Mussel Company	5
	Hog Island Oyster Company	10
	CDPH Marine Biotoxin Program	4
	CDPH Volunteers (<i>Jamie Sutton, Rand Dobleman</i>)	2
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	3
	CDPH Volunteer (<i>Gary Della Maggiora</i>)	1
Santa Cruz	U.C. Santa Cruz	4
	Bureau of Land Management	16
Monterey	CDPH Food and Drug Branch	42
	Monterey Abalone Company	19
San Luis Obispo	Grassy Bar Oyster Company	15
	Morro Bay Oyster Company	10
	CDPH Marine Biotoxin Program	1
Santa Barbara	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	5
	Vandenberg AFB	1
	Sea Grant, U.C. Santa Barbara	22
Ventura	Ty Warner Sea Life Center/HABNet	6
	Ventura County Environmental Health Department	2
	CDPH Food and Drug Branch	3
Los Angeles	Los Angeles County Health Department Sims	1
	Los Angeles County Health Department Torrance	2
	CDPH Volunteer (<i>Steven Field</i>)	1
Orange	CDPH Volunteer (<i>Jayme Smith</i>)	1
San Diego	Carlsbad Aquafarms, Inc.	5
	U.S. Navy Marine Mammal Program	6
	Scripps Institute of Oceanography	3

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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 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.



PHYTOPLANKTON GALLERY



The ubiquitous chain diatom *Chaetoceros*. The thin spines called setae link the individual cells together. Note the long terminal setae on this specimen.



Multiple chains of the diatom *Skeletonema*. It was common to abundant at select sites in Northern California in June.