

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

July 2007

Technical Report No. 07-22

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of July, 2007. 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 a number of sampling stations between San Luis Obispo and San Diego counties during July (Figure 1).

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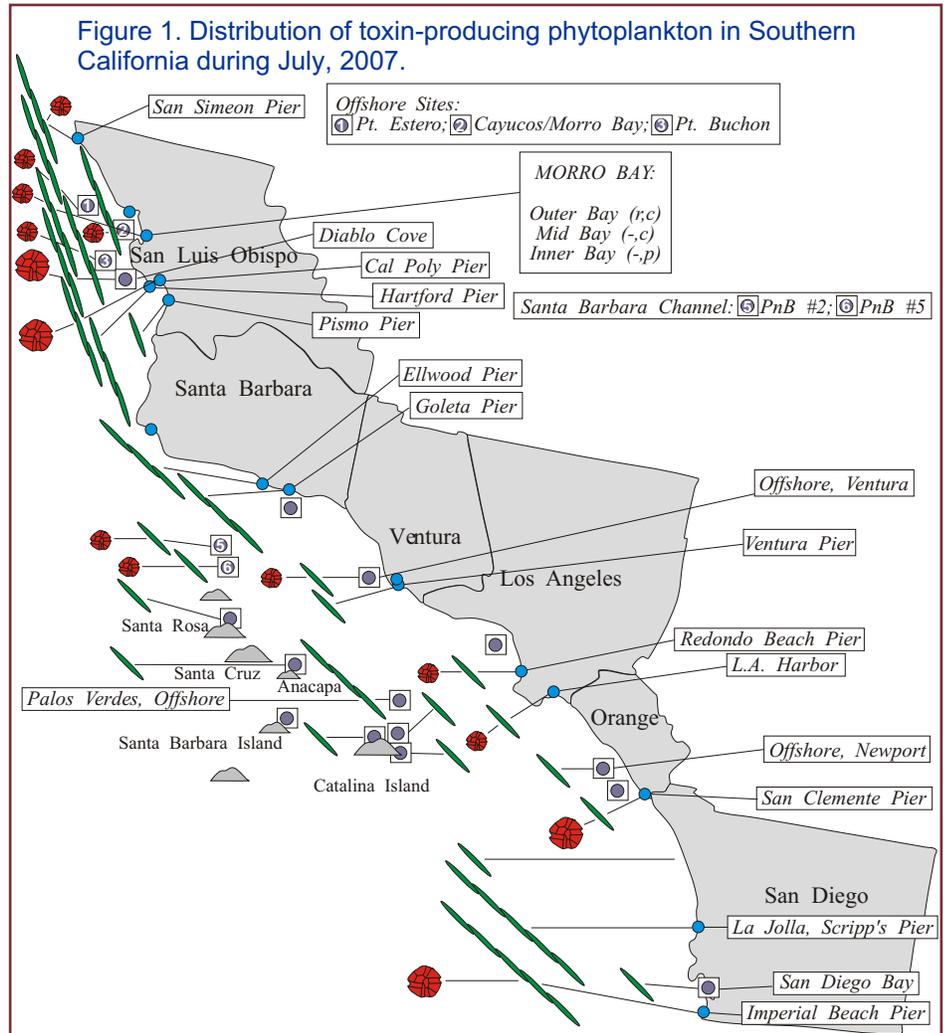


Figure 1. Distribution of toxin-producing phytoplankton in Southern California during July, 2007.

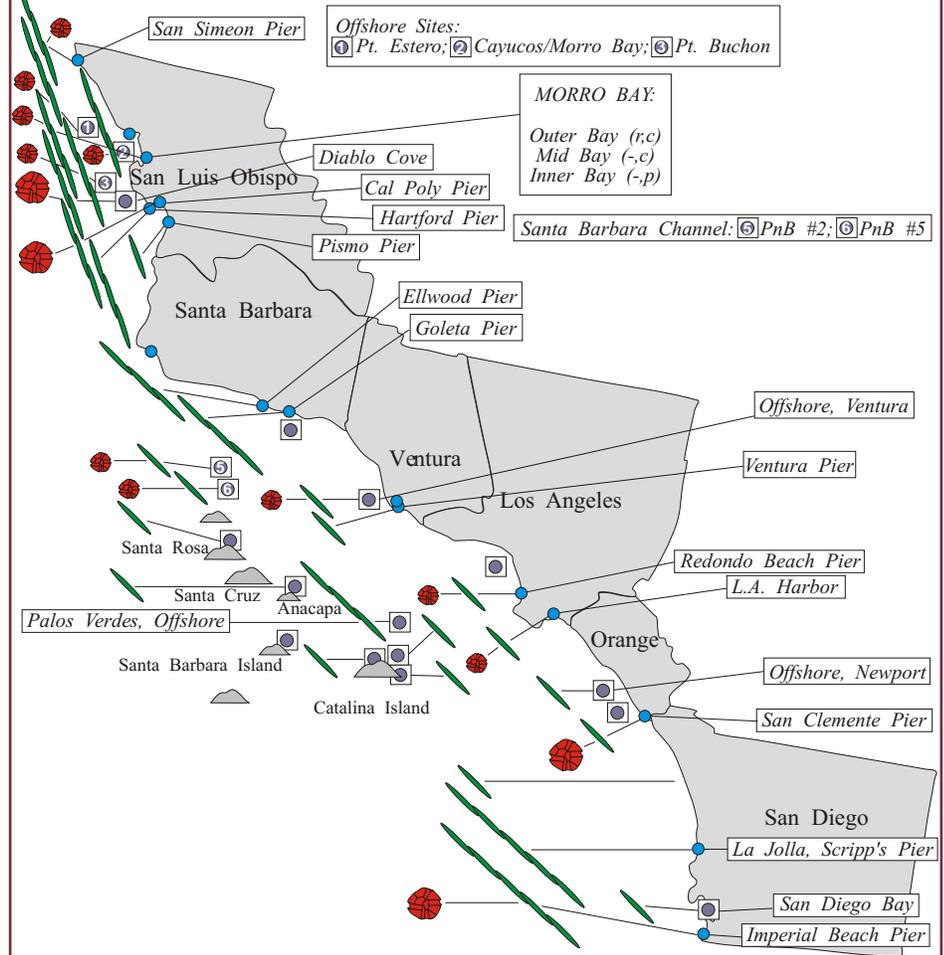
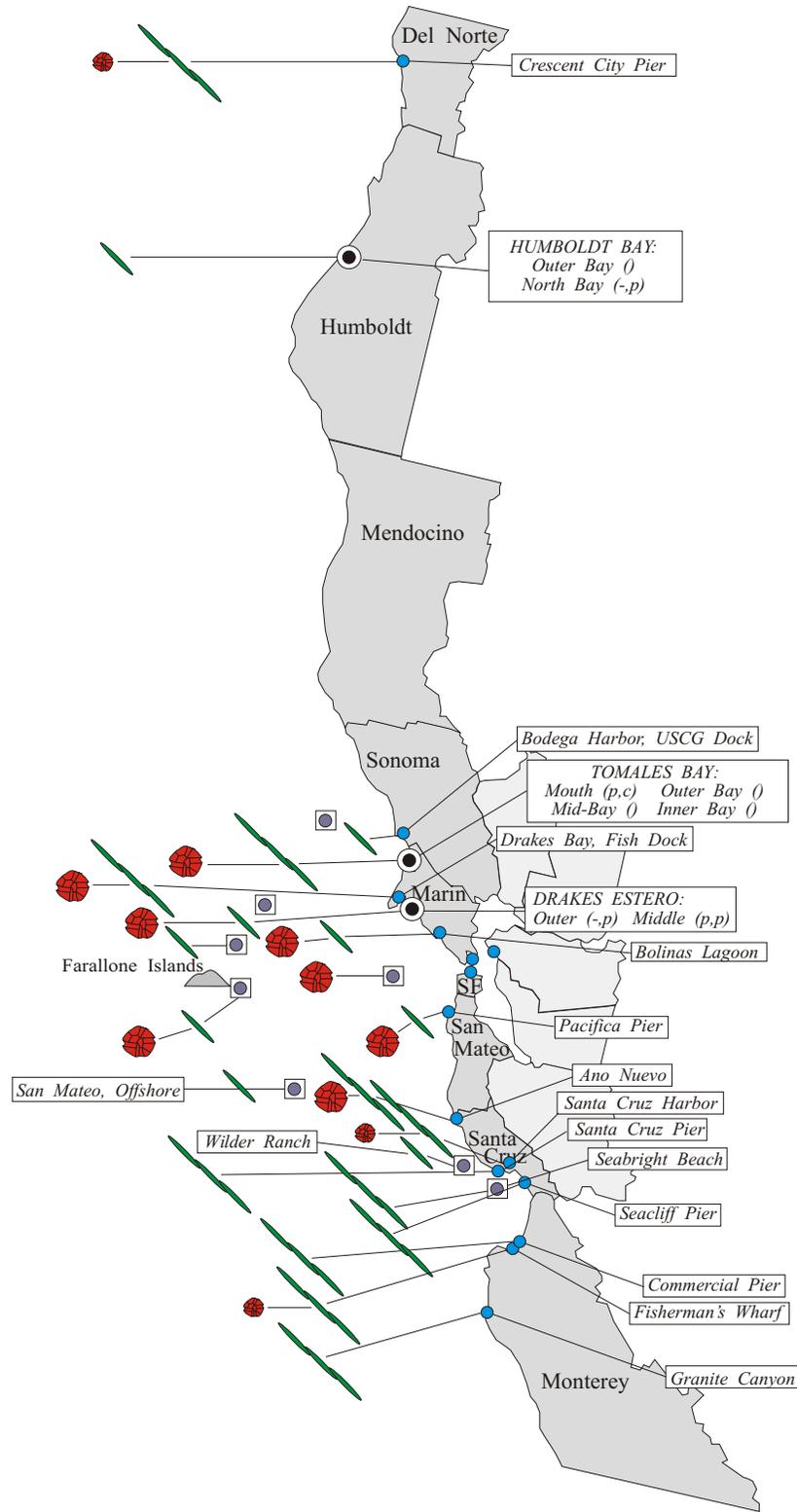


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during July, 2007.



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The distribution and relative abundance of this dinoflagellate increased in most regions, with the exception of the Santa Barbara sites where *Alexandrium* was absent. *Alexandrium* was also observed at sites offshore of Santa Barbara and Ventura counties. PSP toxins were not detected in shellfish samples from any Southern California sampling station during July (Figure 3).

Domoic Acid

Pseudo-nitzschia numbers increased at several sites along the Southern California coast, particularly in San Luis Obispo and San Diego counties (Figure 1). The highest relative abundances of *Pseudo-nitzschia* were observed offshore of Diablo Cove (July 6) and at the Imperial Beach Pier (July 3). The high numbers of this diatom observed along the San Diego coast were mostly the presumed nontoxic species in the delicatissima complex.

Domoic acid was not detected in any shellfish samples collected in July. A low concentration of this toxin was detected in a sample of lobster viscera from Santa Cruz Island on July 12 (Figure 3).

Non-toxic Species

Unusual for mid-summer, diatoms dominated

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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:

- 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

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the last week of the month. These toxins were detected above the alert level at other sites along the Marin coast as well. Low levels of the PSP toxins persisted through most of the month at sites in San Francisco, San Mateo, and Santa Cruz counties.

Domoic Acid

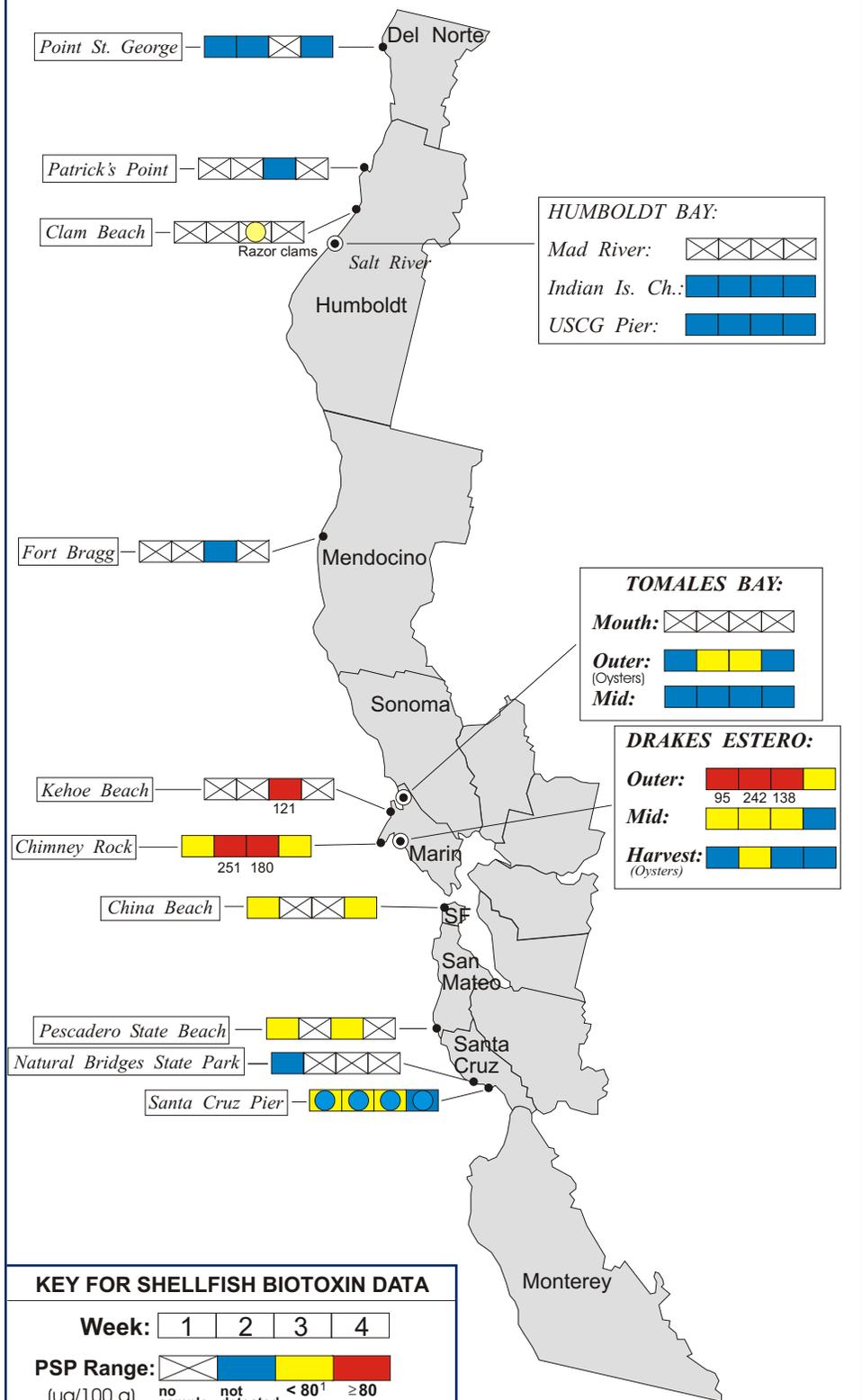
The distribution of *Pseudo-nitzschia* was similar to observations in June (Figure 2). Domoic acid was not detected in any shellfish samples collected in July.

Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the Northern California coast. *Chaetoceros* was by far the most common diatom. *Asterionella* and *Leptocylindrus* were common at many locations as well.



Figure 4. Distribution of shellfish biotoxins in Northern California during July, 2007.



QUARANTINES:

The annual mussel quarantine was initiated early, on April 20, due to the widespread increase in domoic acid levels along the coast. The annual quarantine, which normally goes into effect on May 1 of each year, applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and

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KEY FOR SHELLFISH BIOTOXIN DATA

Week: [1] [2] [3] [4]

PSP Range: [White] [Blue] [Yellow] [Red]
 (ug/100 g) no sample not detected < 80¹ ≥ 80

DA Range: [White] [Blue] [Yellow] [Red]
 (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 July, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	10
	Humboldt County Environmental Health Department	1
	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	5
	Drakes Bay Oyster Company	45
	Hog Island Oyster Company	7
	CDPH Marine Biotoxin Monitoring Program	11
	Marin Oyster Company	3
San Francisco	San Francisco County Health Department	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	1
San Luis Obispo	Cal Poly	6
	Tomales Bay Oyster Company	6
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	Vandenberg AFB	2
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	2
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	5
	CDPH Volunteer (Steve Crooke)	2

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biotoxin monitoring is maintained throughout the quarantine period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. 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.

On April 27 the State Public Health Officer warned the public to avoid eating sport-harvested species of bivalve shellfish, sardines and anchovies, or the organs or viscera of sport-harvested or commercially sold lobster or crab taken from the coast between San Luis Obispo and Orange counties. This advisory was the result of the Department's monitoring efforts, which detected elevated levels of domoic acid in a variety of seafood species.

Consumers of Washington clams, also known as butter clams, 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 are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sportharvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity



Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during July, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	5
Mendocino	None Submitted	
Sonoma	Cordell Banks National Marine Sanctuary	1
	CDPH Biotoxin Program	1
Marin	Audubon California	1
	CDPH Volunteers (<i>Brent Anderson, Cal Strobel, Marjorie Siegel, Mary Von Tolksdorf, Richard Plant</i>)	8
	Drakes Bay Oyster Company	16
	CDPH Marine Biotoxin Monitoring Program	7
	Gulf of the Farallones National Marine Sanctuary	3
	Hog Island Oyster Company	1
Contra Costa	CDPH Marine Biotoxin Monitoring Program	2
San Francisco	CDPH Volunteer (<i>Eugenia McNaughton</i>)	2
	Gulf of the Farallones National Marine Sanctuary	2
San Mateo	San Mateo County Environmental Health	1
	The Marine Mammal Center (<i>Stan Jensen</i>)	5
	U.C. Santa Cruz	4
	Gulf of the Farallones National Marine Sanctuary	1
Santa Cruz	The Marine Mammal Center (<i>Nancy Scarborough</i>)	1
	Santa Cruz County Environmental Health	3
	U.C. Santa Cruz	4
	California Department of Parks and Recreation	2
Monterey	Monterey Abalone Company	5
	Marine Pollution Studies Laboratory	4
San Luis Obispo	CDPH Volunteer (<i>Renee and Auburn Atkins</i>)	2
	Cal Poly	5
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	4
	Tenera Environmental	4
	The Marine Mammal Center (<i>Tim Lytsell, P.J. Webb</i>)	14
Santa Barbara	Tomales Bay Oyster Company	1
	CDPH Volunteer (<i>Sylvia Short</i>)	2
	Channel Islands National Marine Sanctuary	2
	National Park Service	1
	Santa Barbara Mariculture Company	3
	Guided Discoveries, Tole Mour	1
	U.C. Santa Barbara	6
	Vandenberg AFB	1
Ventura	CDPH Volunteers (<i>Fred Burgess, Dennis Carlson</i>)	6
	National Park Service	1
	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	2
	Los Angeles County Sanitation District	5
	Southern California Marine Institute	2
	Guided Discoveries, Tole Mour	6
Orange	Ocean Institute	2
	Guided Discoveries, Tole Mour	1
San Diego	Avian Research Associates	4
	CDPH Volunteers (<i>Paul Sims</i>)	2
	Scripps Institute of Oceanography	5

PHYTOPLANKTON GALLERY



The diatom *Chaetoceros* was common to abundant along much of the California coast.



The diatom *Pleurosigma* was common inside Drakes Estero during July.



Several species of the genus *Chaetoceros* were observed along the coast in July.