

Cruise Report
Regional Monitoring Program
Bivalve Retrieval Cruise #16
April 22-24, 28, 1998

1. INTRODUCTION

This report describes activities associated with the 1998 wet-season bivalve retrieval cruise of the Regional Monitoring Program for Toxic Contaminants in the San Francisco Estuary. Measurement of contaminant bioaccumulation in transplanted bivalves during wet-season and dry-season deployments is one component of this program that is designed to provide long-term data on concentrations of trace metals and organic compounds in water, sediments, and tissues, as well as toxicity throughout the estuary.

Contaminant bioaccumulation in bivalves is being measured in this program by attempting to collect bivalves from sites that are known to be clean and transplanting them to 13ⁱ separate mooring locations in the Estuary. Three species of bivalves, *Mytilus californianus*, *Crassostrea gigas*, and *Corbicula fluminea* were deployed at different locations depending upon the expected range of salinity. *M. californianus* were deployed at the most saline sites, from San Pablo Bay southward to the Dumbarton Bridge; *C. gigas* were deployed at sites with intermediate salinities between Grizzly Bay and San Pablo Bay and south of the Dumbarton Bridge; and *C. fluminea* were deployed in Grizzly Bay, east of Carquinez Strait. *M. californianus* were collected from Bodega Head, *C. gigas* were obtained from a commercial grower in Tomales Bay and *C. fluminea* were collected from Lake Chabot in Alameda County and held in the lake four weeks prior to deployment. The limited quantity of *C. fluminea* obtained from Lake Chabot were transplanted to Grizzly Bay during Bivalve Deployment Cruise #16. Consequently, additional specimens were collected for analysis on this cruise from the native populations in the Sacramento and San Joaquin rivers.

2. CRUISE REPORT

2.1. Objectives

The objectives of this cruise were:

- 1) Retrieve bivalves that were deployed at 13 sites in January, 1998.
- 2) Collect native *Corbicula fluminea* from the Sacramento and San Joaquin rivers.
- 3) Divide bivalves into groups to be frozen and delivered to East Bay Municipal Utilities District, U.C. Santa Cruz, Texas A&M University and AMS for analysis of trace element and organic compounds, intercalibration of trace elements, intercalibration of organic compounds, and analysis of condition, respectively.
- 4) Conduct survey of Yerba Buena Island (YBI) to find locations for a new YBI bivalve mooring.

ⁱ Bivalves were not deployed at the Sacramento and San Joaquin River Sites.

2.2. Personnel

The personnel and work assignments for this cruise were as follows:

<u>Name</u>	<u>Affiliation</u>	<u>Duties</u>
David Bell	AMS	Cruise Manager, Dive Master
Jordan Gold	AMS	Diver, Dive Tender, Vessel Skipper on 4/28/98
Dave Morgan	Romberg Tiburon Center	Vessel Skipper
Paul Salop	AMS	Diver, Dive Tender

2.3. Activities

<u>Date</u>	<u>Time</u>	<u>Activity</u>
4/22/98	0700-0730	Mobilized gear and conducted safety briefing aboard <i>R/V Questuary</i> , Emeryville Marina. Departed for Alameda site (BB71).
	0830-0930	Retrieved bivalves at Alameda, departed for Redwood Creek site (BA40).
	1020-1050	Retrieved bivalves at Redwood Creek, departed for Dumbarton Bridge site (BA30).
	1115-1140	Retrieved bivalves at Dumbarton Bridge, departed for Coyote Creek site (BA10).
	1200-1230	Retrieved bivalves at Coyote Creek, departed for Yerba Buena Island.
	1330-1430	Conducted photographic survey of Yerba Buena Island, departed for Emeryville Marina.
4/23/98	1445-1500	Arrived Emeryville Marina, demobilized vessel. All bivalves stored on dry ice aboard vessel.
	0900-0920	Mobilized gear aboard <i>R/V Questuary</i> , Emeryville Marina. Departed for Horseshoe Bay site (BC21).
	1000-1035	Retrieved bivalves at Horseshoe Bay, departed for Red Rock site (BC60).
	1105-1130	Retrieved bivalves at Red Rock, departed for Pinole Point site (BD30).
	1200-1225	Retrieved bivalves at Pinole Point, departed for San Pablo Bay site (BD20).

<u>Date</u>	<u>Time</u>	<u>Activity</u>
	1240-1300	Retrieved bivalves at San Pablo Bay, departed for Petaluma River site (BD15).
	1330-1400	Retrieved bivalves at Petaluma River, departed for Napa River site (BD50).
	1515-1530	Retrieved bivalves at Napa River, departed for Martinez Marina.
	1610-1645	Arrived Martinez Marina, demobilized gear. All bivalves stored on dry ice aboard vessel.
4/24/98	0830-0920	Mobilized gear aboard <i>R/V Questuary</i> and refueled vessel at Martinez Marina. Departed for Grizzly bay site (BF20).
	1000-1015	Retrieve bivalves at Grizzly bay, departed for Sacramento River.
	1115-1510	Collect <i>C. fluminea</i> from the Sacramento River. Departed for the San Joaquin River.
	1530-1605	Collect <i>C. fluminea</i> from the San Joaquin River. Departed for Emeryville Marina.
	1835-1900	Arrived Emeryville Marina, demobilized vessel. All bivalves transferred to AMS for processing.
4/28/98	1100-1130	Mobilized gear aboard vessel, <i>M.E. II</i> at Vallejo Marina. Departed for Davis Point (BD40).
	1155-1220	Attempted to locate Davis Point bivalve mooring. The mooring was buried in sand 4-6 feet deep and could not be located. Departed for Vallejo Marina.
	1330-1245	Arrived Vallejo Marina, demobilized vessel.

2.4. Discussion

Site Locations

The geographic coordinates for all bivalve moorings are listed in Table 1.

Table 1. Coordinates of Regional Monitoring Program Bivalve Deployment.

<u>Site Name/Code</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Comments</u>
Coyote Creek BA10	37° 28.19'	122° 03.83'	Channel marker "18"
Dumbarton Bridge BA30	37° 30.80'	122° 08.08'	Channel marker "14"
Redwood Creek BA40	37° 32.82'	122° 11.70'	Channel marker "4"
Alameda BB71	37° 41.73'	122° 20.38'	Channel marker "1" 1.65 nmi. SE of Hunters Point Station Missing
Yerba Buena Island BC10	—	—	Station Missing
Horseshoe Bay BC21	37° 49.87'	122° 28.65'	Dolphin 100 ft W of fishing pier
Red Rock BC60	37° 55.70'	122° 28.13'	Channel marker "2" for Larkspur ferry terminal
Pinole Point BD30	38° 01.00'	122° 22.05'	Channel marker "P"
San Pablo Bay BD20	38° 02.72'	122° 25.71'	Channel marker "1"
Petaluma River BD15	38° 06.77'	122° 30.05'	NE end of railroad bridge
Davis Point BD40	—	—	Station Missing
Napa River BD50	38° 04.84'	122° 14.82'	Mare Island Strait adjacent to General Foods facility, 0.7 nmi. from channel marker "2"
Grizzly Bay BF20	38° 06.49'	122° 03.37'	Channel marker "9" 1.0 nmi. NW of Garnet Point
Sacramento River BG20	38° 03'.58	121° 47.50'	Channel marker "8" N of Sherman Island
San Joaquin River BG30	38° 01.27'	121° 48.32'	Channel marker "8" 0.75 nmi. E of Antioch Marina

General Comments

Bivalves were successfully retrieved from 11 sites. The mooring at YBI (BC10) was removed without notice by work crews preparing for the construction of the Bay Bridge. A survey of the South-eastern area of YBI indicated several potential locations where a new mooring could be installed in close proximity (within 0.5 nmi) of the historical BC10 mooring. The new mooring has been approved by the U. S. Coast Guard (the agency administrating the site) and is scheduled for installation between June 8-13, 1998.

As occurred during the spring of 1997, the mooring at Davis Point (BD40) was buried under a sand deposit and could not be located through an extensive search. This mooring will be replaced during the next bivalve deployment cruise scheduled for June 2-5, 1998.

Native *C. fluminea* were successfully collected from the Sacramento and San Joaquin rivers, although the population in the Sacramento River was scarce and required four hours to collect.

All other cruise objectives were achieved.

Bivalve Species Retrieved at Each Site

The fate of bivalves retrieved from each site are summarized in Table 2.

Table 2. Summary of bivalves collected from Bioaccumulation Cruise 16, 1998.
Retrieval Information:

Tissue For Analysis:

<u>Site Name</u>	<u>Site Code</u>	<u>Species</u>	<u># Deployed</u>	<u># ORG</u>	<u># TM</u>	<u># CI</u>	<u># Dead</u>	<u># Discard</u>	<u>Survival</u>	<u>Org</u>
Coyote Creek	BA10	CGIG	156	45	31	0	80	0	49%	Y
Dumbarton Bridge	BA30	MCAL	160	26	0	0	129	0	17%	N
Redwood Creek	BA40	MCAL	160	35	0	0	118	0	22%	N
Alameda	BB71	MCAL	160	65	51	21	9	0	86%	Y
Yerba Buena Island ⁱⁱ	BC10	MCAL	160	0	0	0	N/A	0	N/A	N
Horseshoe Bay	BC21	MCAL	160	50	40	30	8	31	94%	Y
Red Rock	BC60	MCAL	160	0	0	0	0	0	0%	N
Petaluma River	BD15	CGIG	117	0	0	0	0	0	0%	N
San Pablo Bay	BD20	CGIG	117	30	20	19	58	0	59%	Y
Pinole Point	BD30	MCAL	160	0	0	0	0	0	0%	N
Pinole Point	BD30	CGIG	117	35	30	30	29	3	84%	Y
Davis Point	BD40	CGIG	156	0	0	0	0	0	0%	N
Napa River	BD50	CGIG	117	0	0	0	0	1	1%	N
Grizzly Bay	BF20	CFLU	80	45	34	0	1	0	99%	Y
Sacramento River ⁱⁱⁱ	BG20	CFLU	N/A	40	40	25	N/A	N/A	N/A	Y
San Joaquin River	BG30	CFLU	N/A	>40	>40	>40	N/A	N/A	N/A	Y
Bodega Head	T-0	MCAL	N/A	40	30	30	N/A	N/A	100%	Y
Lake Chabot	T-0	CFLU	N/A	25	20	20	N/A	N/A	100%	Y
Tomales Bay	T-0	CGIG	N/A	35	30	30	N/A	N/A	100%	Y

ⁱⁱ Bivalve mooring was missing during Bivalve Maintenance Cruise 16.

ⁱⁱⁱ *C. fluminea* were collected from the native population from the Sacramento and San Joaquin Rivers. Total quantity were not recorded.