

Cruise Report
Regional Monitoring Program
Bivalve Retrieval Cruise #18
September 1-4, 1998

1. INTRODUCTION

This report describes activities associated with the 1998 dry-season bivalve retrieval cruise of the Regional Monitoring Program for Toxic Substances 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 collecting bivalves from sites that are relatively clean and transplanting them to 13ⁱ separate mooring locations in the Estuary. Two species of bivalves, *Mytilus californianus* and *Crassostrea gigas* 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. *M. californianus* were collected from Bodega Head and *C. gigas* were obtained from a commercial grower in Tomales Bay. Additionally, specimens of *Corbicula fluminea* were collected from the native populations in areas adjacent to the historical mooring sites in the Sacramento River and San Joaquin River.

2. CRUISE REPORT

2.1. Objectives

The objectives of this cruise were:

- 1) Retrieve bivalves that were deployed at 13 sites on June 2-5, 1998.
- 2) Collect native *Corbicula fluminea* from the Sacramento and San Joaquin River.
- 3) Divide surviving bivalves into three groups for analysis of trace organics by Texas A&M University (GERG), trace elements by Bay Area Dischargers Authority (BADA) and Brooks-Rand, Ltd., and condition by Applied Marine Sciences (AMS). In addition, three trace element intercalibration samples were prepared from samples collected from Bodega Head, Tomales Bay and Pinole Point. Splits from this intercalibration sample were sent to UC Santa Cruz and BADA.

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:

Name	Affiliation	Duties	Contact
David Bell	AMS	Cruise Manager, Dive Master	bell@amarine.com
Jordan Gold	AMS	Diver, Vessel Skipper on 9/1	gold@amarine.com
Sarah Lowe	SFEI	Bivalve collections on 9/18	sarah@sfei.org
Dave Morgan	Romberg Tiburon Centers	Vessel Skipper	rvquest@aol.com
Paul Salop	AMS	Diver, Dive Tender	salop@amarine.com

2.3. Activities

The activities for this cruise were as follows:

Date	Time	Activity
9/1/98	1115-1140	Mobilized gear aboard vessel <i>M.E. II</i> at Vallejo Marina. Departed for Davis Point site (BD40).
	1140-1250	Retrieved bivalves at Davis Point, departed for Vallejo Marina.
	1320	Arrived at Vallejo Marina, demobilized vessel. All bivalves stored on dry ice.
9/2/98	0800-0900	Mobilized gear and conducted safety briefing aboard <i>R/V Questuary</i> , Emeryville Marina. Departed for Yerba Buena Island site (BC11).
	0930-1020	Retrieved bivalves at Yerba Buena Island, departed for Alameda site (BB71).
	1055-1130	Retrieved bivalves at Alameda, departed for Redwood Creek site (BA40).
	1240-1320	Retrieved bivalves at Redwood Creek, departed for Dumbarton Bridge site (BA30).
	1335-1435	Retrieved bivalves at Dumbarton Bridge, departed for Coyote Creek site (BA10).
	1500-1530	Retrieved bivalves at Coyote Creek, departed for Emeryville Marina.
	1830	Arrived at Emeryville Marina, demobilized vessel. All bivalves stored on dry ice aboard vessel.

Date	Time	Activity
9/3/98	0900-0930	Mobilized gear aboard vessel <i>R/V Questuary</i> , Emeryville Marina. Departed for Horseshoe Bay site (BC21).
	1000-1025	Retrieved bivalves at Horseshoe Bay, departed for Red Rock site (BC60).
	1100-1115	Retrieved bivalves at Red Rock, departed for Pinole Point site (BD30).
	1150-1205	Retrieved bivalves at Pinole Point, departed for San Pablo Bay site (BD20).
	1255-1305	Retrieved bivalves at San Pablo Bay, departed for Petaluma River site (BD15).
	1345-1410	Retrieved bivalves at Petaluma River, departed for Napa River site (BD50).
	1510-1540	Retrieved bivalves at Napa River, departed for Martinez Marina.
	1640	Arrived at Martinez Marina, demobilized gear. All bivalves stored on dry ice aboard vessel.
9/4/98	0830-0840	Mobilized gear aboard vessel <i>R/V Questuary</i> , Martinez Marina. Departed for Grizzly bay site (BF20).
	0915-1010	Retrieved bivalves at Grizzly bay, departed for San Joaquin River.
	1020-1320	Attempted to collect <i>C. fluminea</i> from native population in the San Joaquin River. Encountered problems with new clam dredge. Returned to Emeryville Marina.
	1700	Arrived at Emeryville Marina, demobilized vessel. All bivalves transferred to AMS for processing.
9/18/98	1330-1400	Mobilized gear aboard vessel <i>M.E. II</i> , Antioch public boat ramp. Departed for San Joaquin River.
	1400-1630	Collected <i>C. fluminea</i> from native populations in the San Joaquin River and Sacramento River. Returned to Antioch boat ramp. Demobilized vessel. Bivalves transferred to AMS for processing.

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.

Site Name/Code	Latitude (N)	Longitude (W)	Comments
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
Yerba Buena Island BC10	37° 48.35'	122° 22.25'	Dolphin 0.1 nmi. S of Bay Bridge
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
Point Pinole 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	38° 03.26'	122° 15'.63	E side of Unocal loading dock
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	–	–	No bivalves deployed
San Joaquin River BG30	–	–	No bivalves deployed

General Comments

Bivalves were successfully retrieved from 13 sites and all cruise objectives were completed. A new clam dredge was used for collections of native *C. fluminea* from the San Joaquin and Sacramento Rivers. After minor modifications, the dredge proved to be efficient.

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 18, 1998.

Retrieval Information:										Tissue For
Site Name	Site Code	Species	# Deployed	# ORG	# TM	# CI	# Dead	# Discard	Survival	Organics
Coyote Creek	BA10	CGIG	144	25	25	30	21	43	85%	
Dumbarton Bridge	BA30	MCAL	160	35	35	30	3	57	98%	
Dumbarton Bridge	BA30	CGIG	144	25	25	25	9	60	94%	–
Redwood Creek	BA40	MCAL	160	35	35	30	6	54	96%	
Alameda	BB71	MCAL	160	35	35	30	2	58	99%	
Yerba Buena Island	BC10	MCAL	160	35	35	30	3	57	98%	
Yerba Buena Island	BC10	MCAL	144	25	25	30	29	35	80%	–
Horseshoe Bay	BC21	MCAL	160	35	35	30	1	59	99%	
Red Rock	BC60	MCAL	160	35	35	30	0	60	100%	
Petaluma River	BD15	CGIG	144	0	0	0	143	1	1%	–
San Pablo Bay	BD20	CGIG	144	25	25	30	4	60	97%	
Pinole Point	BD30	MCAL	160	35	35	30	5	55	97%	
Pinole Point	BD30	CGIG	144	25	25	30	8	56	94%	–
Davis Point	BD40	CGIG	144	9	0	0	135	0	6%	–
Napa River	BD50	CGIG	144	25	25	30	48	16	67%	
Grizzly Bay	BF20	CFLU	144	0	0	0	144	0	0%	–
Sacramento River	BG20	CFLU	N/A						N/A	
San Joaquin River	BG30	CFLU	N/A						N/A	
Bodega Head	T-0	MCAL	N/A						N/A	
Tomaes Bay	T-0	CGIG	N/A						N/A	

Note: – = Sample taken.