

Cruise Report
Regional Monitoring Program
Bivalve Deployment Cruise #21, Dry Season
June 2-4, 1999

1 INTRODUCTION

This report describes activities associated with the 1999 dry-season bivalve deployment cruise of the Regional Monitoring Program for Trace Contaminants in the San Francisco Estuary. Bivalves were attached to moorings at 12¹ sites. 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 contaminant-free and transplanting them to separate mooring locations in the Estuary. Three species of bivalves, *Mytilus californianus*, *Mytilus edulis*, and *Crassostrea gigas* (both diploid and triploid varieties) were deployed at different locations depending upon the expected range of salinity. *M. californianus* and *M. edulis* were deployed at all twelve of the sites, while *C. gigas* was deployed only at sites with intermediate salinities between the Carquinez Strait and San Pablo Bay and south of the Dumbarton Bridge. *M. californianus* were collected from Bodega Head, *M. edulis* were collected from Tomales Bay, and *C. gigas* were obtained from a commercial grower in Tomales Bay. An additional deployment of *M. californianus* was made at San Pablo Bay to test an alternative sample containment system that would not require an intermediate cruise to maintain. Finally, a thermosalinograph was deployed at the Napa River site to allow for continuous measurement of temperature and salinity.

2 CRUISE REPORT

2.1 Objectives

The objectives of this cruise were:

- 1) Collect *M. californianus* from Bodega Head and *M. edulis* from Tomales Bay and deploy them at twelve sites, and obtain *C. gigas* from Tomales Bay (Hog Island Oyster Co.) and deploy the diploids at six sites and the triploids at three sites.
- 2) Examine the bivalve moorings and make any necessary repairs.
- 3) Deploy a thermosalinograph at the Napa River site.
- 4) Prepare and deploy a prototype "cage" bivalve containment system.

¹ Bivalves were not deployed at Grizzly Bay, Sacramento River and San Joaquin River stations.

2.2 Personnel

The personnel and work assignments for this cruise are shown in the following table:

<u>Name</u>	<u>Affiliation</u>	<u>Duties</u>
David Bell	AMS	Bivalve Collections, Cruise Manager, Dive Master
Jordan Gold	AMS	Bivalve Collections, Diver, Dive Tender, Vessel Skipper 6/2
Jay Johnson	AMS	Dive Tender 6/2
David Morgan	Romberg Tiburon Center	Vessel Skipper 6/3 and 6/4
Paul Salop	AMS	Bivalve Collections, Diver

2.3 Activities

<u>Date</u>	<u>Time</u>	<u>Activity</u>
5/20/99	0800-1400	Bell, Gold and Salop collect <i>M. Californianus</i> at Bodega Head. Will Borgeson of Bodega Marine Laboratory (BML) collects <i>M. edulis</i> from Tomales Bay. All bivalves are transferred to mesh bags and placed into holding tanks at BML.
6/1/99	1000-1500	Gold picks up <i>C. gigas</i> at Hog Island Oyster Company and all bivalves from BML.
6/2/99	1000-1050	Mobilized gear and conducted safety briefing aboard <i>M.E. II</i> at Vallejo public boat launch. Departed for Napa River site (BD50).
	1100-1130	Deployed bivalves and thermosalinograph at Napa River, departed for Davis Point site (BD40).
	1140-1250	Installed new mooring and deployed bivalves at Davis Point. Departed for Vallejo public boat launch.
	1300-1330	Arrived Vallejo public launch ramp, demobilized vessel.

<u>Date</u>	<u>Time</u>	<u>Activity</u>
6/3/99	0730-0800	Mobilized gear aboard <i>R/V Questuary</i> , Emeryville Marina. Departed for Alameda Creek site (BB71).
	0850-0920	Deployed bivalves at Alameda Creek, departed for Redwood Creek site (BA40).
	1010-1100	Replaced mooring and deployed bivalves at Redwood Creek, departed for Dumbarton Bridge site (BA30).
	1145-1230	Deployed bivalves at Dumbarton Bridge, departed for Yerba Buena Island (BC10).
	1440-1510	Deployed bivalves at Yerba Buena Island, departed for Emeryville Marina.
	1520-1600	Arrived at Emeryville Marina, demobilized vessel.
6/4/99	0745-0800	Mobilized gear aboard vessel <i>R/V Questuary</i> , Emeryville Marina. Departed for Horseshoe Bay site (BC21).
	0840-0920	Deployed bivalves at Horseshoe Bay, departed for Red Rock site (BC60).
	1045-1105	Deployed bivalves at Red Rock, departed for Pinole Point site (BD30).
	1135-1150	Deployed bivalves at Pinole Point, departed for San Pablo Bay site (BD20).
	1215-1235	Deployed bivalves at San Pablo Bay, departed for Petaluma River site (BD15).
	1300-1325	Deployed bivalves at Petaluma River, departed for Emeryville Marina.
	1505-1530	Arrived Emeryville Marina, demobilized vessel.

2.4 Discussion

Site Locations

The coordinates for all bivalve moorings are listed in the following table:

<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
Yerba Buena Island BC10	37° 49.12'	122° 20.81'	Dolphin 0.1 nmi. N 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
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	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
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

Bivalve Species at Each Site

Bivalve species were deployed at each site according to the following table:

<u>Site Name/Code</u>	<u>Date</u>	<u>Number per Species</u>
Coyote Creek/BA10	6/3/99	144 <i>C. gigas</i> 80 <i>triploid C. gigas</i> 160 <i>M. californianus</i> 120 <i>M. edulis</i>
Dumbarton Bridge/BA30	6/3/99	160 <i>M. californianus</i> 80 <i>M. edulis</i>
Redwood Creek/BA40	6/3/99	160 <i>M. californianus</i> 120 <i>M. edulis</i>
Alameda/BB71	6/3/99	160 <i>M. californianus</i> 80 <i>M. edulis</i>
Yerba Buena Island/BC10	6/3/99	72 <i>C. gigas</i> 80 <i>triploid C. gigas</i> 160 <i>M. californianus</i> 120 <i>M. edulis</i>
Horseshoe Bay/BC21	6/4/99	160 <i>M. californianus</i> 120 <i>M. edulis</i>
Red Rock/BC60	6/4/99	160 <i>M. californianus</i> 80 <i>M. edulis</i>
Pinole Point/BD30	6/4/99	160 <i>M. californianus</i> 80 <i>M. edulis</i>
San Pablo Bay/BD20	6/4/99	144 <i>C. gigas</i> 80 <i>M. californianus</i> 80 <i>M. edulis</i> 40 <i>M. edulis</i> (in cage)
Petaluma River/BD15	6/4/99	144 <i>C. gigas</i> 80 <i>M. californianus</i> 80 <i>M. edulis</i>
Davis Point/BD40	6/2/99	144 <i>C. gigas</i> 80 <i>M. californianus</i> 120 <i>M. edulis</i>
Napa River/BD50	6/2/99	144 <i>C. gigas</i> 80 <i>Triploid C. gigas</i> 160 <i>M. californianus</i> 120 <i>M. edulis</i>
Grizzly Bay/BF20	-	No bivalves deployed
Sacramento River/BG20	-	No bivalves deployed
San Joaquin River/BG30	-	No bivalves deployed

General Comments

All cruise objectives were achieved. Two bivalve moorings were replaced, at Davis Point and at Redwood Creek. A prototype, low maintenance bivalve container was deployed at the San Pablo Bay site. A thermosalinograph was installed at the Napa River site.