

Cruise Plan
Regional Monitoring Program
Bivalve Retrieval Cruise #19
April 27-28, 30, 1999

1 INTRODUCTION

This report describes activities associated with the 1999 wet-season bivalve deployment cruise of the Regional Monitoring Program for Trace Substances in the San Francisco Estuary. Bivalves were attached to moorings at 12 sites in the Estuary during the January 1999 deployment cruise. 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.

2 CRUISE PLAN

2.1 Objectives

The objectives of this cruise are:

- 1) Retrieve bivalves that were deployed at 12¹ sites in January 1999.
- 2) Collect *Corbicula fluminea* from native populations near the Sacramento River and San Joaquin River bivalve stations.
- 3) Bivalves will be portioned from each station into three groups for homogenization and analysis of condition by AMS and trace organics homogenization by GERG. From the bivalve homogenate, five sub-samples will be prepared for:
 - Trace metals analysis by BADA.
 - Trace organics analysis by BADA.
 - As, Hg, Se analysis by BRL.
 - Tissue splits at three stations for intercalibration trace metals analysis by UCSCDET.
 - Tissue archive.

During this cruise, mooring integrity will be evaluated by checking for abrasion of lines and security of knots and cable ties. The mesh bags containing the bivalves will be removed from the moorings and brought aboard the vessel where they will be portioned, packaged and frozen on dry ice.

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

2.2 Personnel

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

<u>Name</u>	<u>Affiliation</u>	<u>Duties</u>	<u>Contact</u>
David Bell	AMS	Cruise Manager, Dive Master	H(510)833-8670
Jordan Gold	AMS	Vessel Skipper on 4/27	H(510)533-3475
Dave Morgan	Romberg Tiburon Centers	Vessel Skipper	W(415)435-7123 F(510)229-4194
Paul Salop	AMS	Diver, Dive Tender, Bivalve Delivery to BADA	H(510)465-6907

Mr. Bell will be responsible for scientific operations and safety. Mr. Morgan will be responsible for vessel operation and safety. Messrs. Gold and Salop will trade off, assisting with mooring examinations and bivalve retrievals, assisting the divers in and out of the water, handing divers' equipment as necessary, and recording data for each station. Mr. Gold will be responsible for vessel operation and safety on April 27, 1999.

2.3 Cruise Schedule

The following cruise schedule assumes that a maximum of 1.0 hr will be required for vessel operations at each site. Bivalves will be counted, packaged, and frozen on dry ice as the vessel is underway to the next site.

<u>Date</u>	<u>Time</u>	<u>Activity</u>
Day 1 April 27, 1999	0800-0830	Mobilize gear on vessel <i>M.E. II</i> , Vallejo public launch ramp. Depart for Davis Point.
	0900-1100	Examine moorings and retrieve bivalves at Davis Point and Napa River. The thermosalinograph at Napa River will be retrieved and the data collected will be transferred to a computer for later analysis. Slack water before flood at approximately 0918 (Figure 1).
	1100-1600	Return to Vallejo public launch ramp. Mr. Bell will be dropped off with the dive equipment and will travel to Napa to replace the pager battery on the water toxicity autosampler. Messrs. Gold and Salop will travel by boat to the Sacramento River and San Joaquin River bivalve sites and collect native <i>C. fluminea</i> .
	1600-1700	Demobilize vessel. All bivalves will be stored on dry ice.

Day 2 April 28, 1999	0800-0830	Mobilize gear on vessel <i>R/V Questuary</i> , Emeryville Marina. Conduct safety briefing. Depart for Yerba Buena Island.
	0830-1400	Examine moorings and retrieve bivalves at, Yerba Buena Island, Alameda, Redwood Creek, Dumbarton Bridge, and Coyote Creek. Slack water before ebb at approximately 1235 (Figure 2).
	1400-1445	Demobilize gear at Emeryville Marina, fill up SCUBA tanks as necessary. All bivalves will be stored on dry ice.
Day 3 April 30, 1999	0700-0730	Mobilize gear on vessel <i>R/V Questuary</i> , Emeryville Marina. Depart for Horseshoe Bay.
	0730-1430	Examine moorings and retrieve bivalves at Horseshoe Bay, Red Rock, Pinole Point, San Pablo Bay, and Petaluma River. Slack water before flood at approximately 0949 (Figure 3).
	1430-1515	Demobilize vessel. All bivalves will be transferred to AMS for shipment.

2.4 Mooring Examination and Bivalve Retrieval Procedures

All diving operations will be conducted by divers working in pairs and tethered together. The vessel will tie up to the deployment sites and the vessel crew will attach a safety line (floating line with large life ring on end) to the structure. The divers will enter the water, descend to the bottom and locate the ground line to the mooring. When the ground line has been located, its attachment to the piling will be examined by feeling for abrasion and looseness in the knots and cable ties. After this examination, the divers will proceed along the ground line checking its integrity. At the mooring, the earth anchors will be checked to confirm that they have not worked out of the bottom and that serious erosion of bottom sediments has not occurred around them. All knots will be checked for integrity and the presence of intact cable ties. When the integrity of all lines and knots has been verified and any problems have been corrected, the divers will ascend the mooring line to the bags of bivalves and cut the cable ties holding the bags to the mooring line. The divers will then return to the surface by retracing their route along the ground line and piling.

When the bivalves are onboard the vessel, they will be carefully removed from the bags and packaged for shipment to the analytical laboratories. Initially, the bags of bivalves will be removed from the mesh bags and placed into a cleaned (scrubbed with Alconox and rinsed with ambient water) cooler. Dead bivalves will be counted and discarded. Approximately 80% of the live organisms will be equally divided for trace organic and trace metal analyses, with the remaining 20% being saved for analysis of condition. The bivalves for organic analyses will be wrapped in aluminum foil, placed into Ziploc bags, and frozen on dry ice. Bivalves for trace metal analyses will be placed into doubled Ziploc bags and frozen on dry ice. Bivalves for analysis of condition will be cleaned, sealed shut with cable ties, air-dried, placed into Ziploc bags, and frozen on dry ice. All bags will be labeled by station, date, species and quantity. Bivalves will remain frozen on-board the vessel until the conclusion of the cruise.

At the conclusion of the cruise, the bivalves for trace organics analysis will be shipped to GERG for homogenization. Bivalves for trace metals analyses will remain with AMS for tissue homogenization at UCSC. Homogenized bivalves will be shipped to BADA following processing. Bivalves for condition analyses will be retained by AMS.

2.5 Species Deployed and Site Locations

The number and species of bivalves deployed at each site are shown in Table 1. The location (Latitude, Longitude) for the deployment sites are listed in Table 2.

Table 1. Bivalve deployments from January 1999.

<u>Site Name/Code</u>	<u>Date</u>	<u>Number per Species</u>
Coyote Creek/BA10	1/6/99	144 <i>C. gigas</i> 144 triploid <i>C. gigas</i> 160 <i>M. californianus</i> 144 <i>O. conchaphilia</i> 160 <i>M. edulis</i>
Dumbarton Bridge/BA30	1/6/99	160 <i>M. californianus</i>
Redwood Creek/BA40	1/6/99	160 <i>M. californianus</i>
Alameda/BB71	1/6/99	160 <i>M. californianus</i>
Yerba Buena Island/BC10	1/7/99	144 <i>C. gigas</i> 144 triploid <i>C. gigas</i> 160 <i>M. californianus</i> 160 <i>M. edulis</i> 144 <i>O. conchaphilia</i>
Horseshoe Bay/BC21	1/7/99	160 <i>M. californianus</i>
Red Rock/BC60	1/7/99	160 <i>M. californianus</i>
Pinole Point/BD30	1/8/99	144 <i>C. gigas</i> 160 <i>M. californianus</i>
San Pablo Bay/BD20	1/8/99	144 <i>C. gigas</i>
Petaluma River/BD15	1/8/99	116 <i>C. gigas</i>
Davis Point/BD40	1/5/99	144 <i>C. gigas</i>
Napa River/BD50	1/5/99	144 <i>C. gigas</i> 144 Triploid <i>C. gigas</i> 160 <i>M. californianus</i> 160 <i>M. edulis</i> 144 <i>O. conchaphilia</i>
Grizzly Bay/BF20	-	No bivalves deployed
Sacramento River/BG20	-	No bivalves deployed
San Joaquin River/BG30	-	No bivalves deployed

Table 2. Locations of bivalve moorings for the Regional Monitoring Program.

<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 0.2 nmi. SW 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

Davis Point, 1.0 nmi. NW of, SAN PABLO BAY Latitude: 38° 04' N Longitude: 122° 17' W

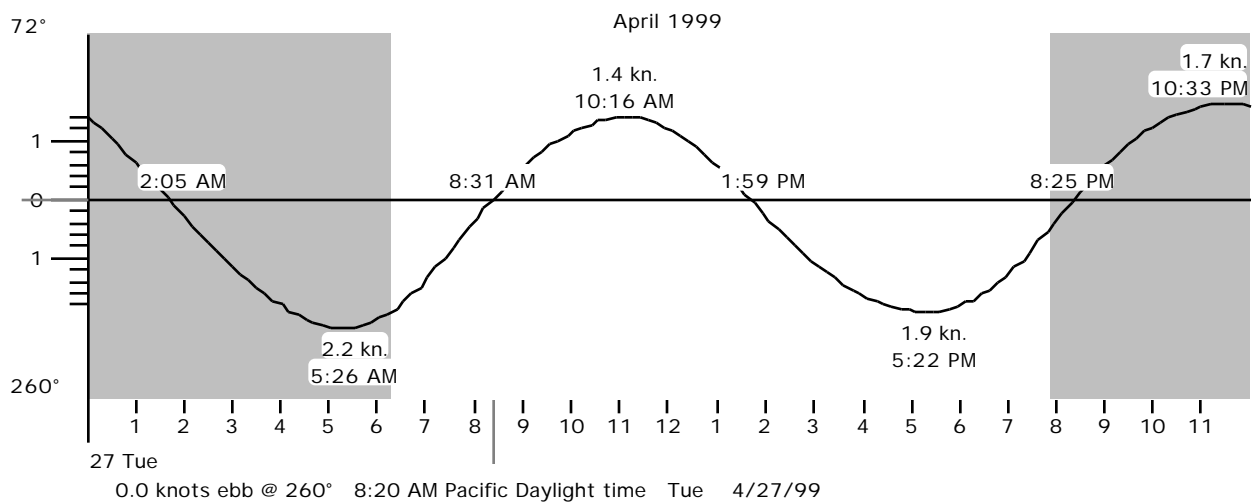


Figure 1. Currents for Davis Point, April 27, 1999.

Oyster Point, 2.8 miles east of, South SAN FRANCISCO BAY Latitude: 37° 40' N Longitude: 122° 19' W

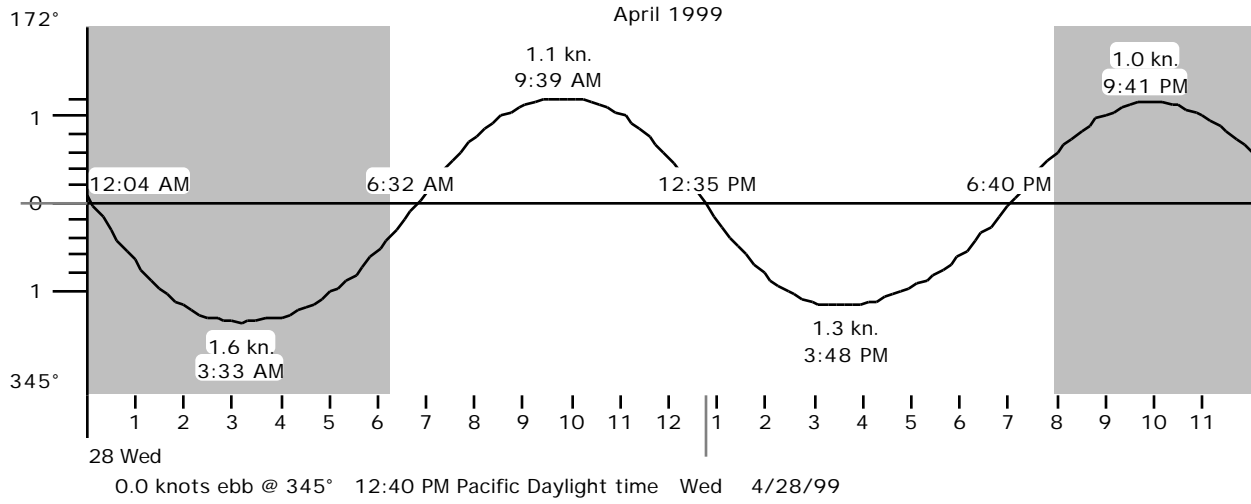


Figure 2. Currents for Oyster Point, April 28, 1999.

Pinole Point, 1.2 miles off, SAN PABLO BAY Latitude: 38° 02' N Longitude: 122° 23' W

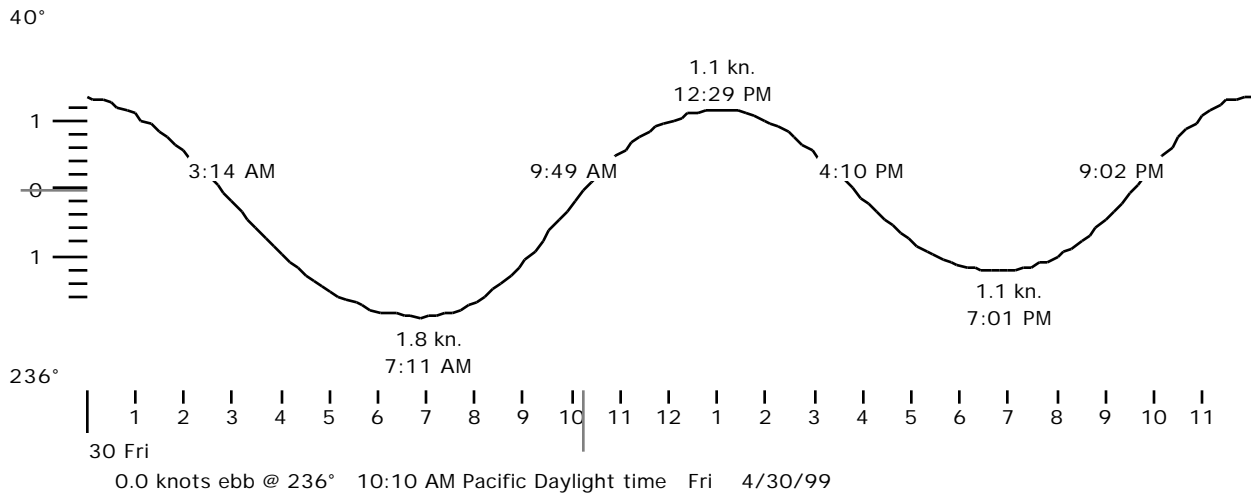


Figure 3. Currents for Pinole Point, April 30, 1999.