

Cruise Plan
Regional Monitoring Program
Bivalve Maintenance Cruise #18
July 14-17, 1998

Objective

The objective of this cruise is to check and maintain bivalve moorings at 13¹ sites in the San Francisco Estuary.

Transplanted bivalves were deployed at 13 sites on June 2-5, 1998. Deployment duration is approximately 100 days. During this cruise, the primary objective will be the evaluation of mooring integrity by checking for abrasion of lines and security of knots and cable ties. The mesh bags containing the bivalves will be gently scrubbed with a nylon brush to remove fouling organisms.

Personnel

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

Name	Affiliation	Duties
David Bell	AMS	Cruise Manager, Dive Master
Jordan Gold	AMS	Diver, Vessel Skipper on 7/17/98
Dane Hardin	AMS	Diver
David Morgan	Romberg Tiburon Institute	Vessel Skipper
Paul Salop	AMS	Diver on 7/17/98

Mr. Bell will be responsible for all scientific operations and safety, Mr. Morgan will be responsible for vessel operation and safety, and Messrs. Hardin and Salop will alternate daily responsibilities as diver and dive tenders. On July 17, Mr. Gold will be responsible for vessel operation and safety.

¹ Bivalves were not deployed at the Sacramento and San Joaquin River stations.

Cruise Schedule

The following cruise schedule assumes that approximately 0.5 hr will be required for operations at each site.

Date	Activity	Time
Day 1		
July 14, 1998	Mobilize gear at Emeryville marina, conduct brief safety meeting aboard R/V Questuary, depart for Yerba Buena site.	0830-0900
	Examine and maintain moorings at Yerba Buena, Alameda, Redwood Creek, Dumbarton Bridge, and Coyote Creek. Slack water at Yerba Buena Island (Figure 1) before flood is at 1039, slack water before ebb is at 1722.	0900-1400
	Demobilize gear at Emeryville marina and fill SCUBA tanks as necessary.	1400-1430
Day 2		
July 15, 1998	Mobilize gear at Emeryville marina aboard R/V Questuary, depart for Horseshoe Bay site.	0830-0900
	Examine and maintain moorings at Horseshoe Bay, Red Rock, Petaluma River, San Pablo Bay and Pinole Point. Slack water at Pinole Point (Figure 2) before flood is at 0734, slack water before ebb is at 1345.	0900-1430
	Demobilize gear at Martinez marina.	1430-1500
Day 3		
July 16, 1998	Mobilize gear at Martinez marina aboard R/V Questuary, depart for Grizzly Bay site.	0900-0930
	Examine and maintain moorings at Grizzly Bay and Napa River. Return to Emeryville marina. Slack water at Point Sacramento (Figure 3) before ebb is at 1053, slack water before flood is at 1645.	0930-1430

Date	Activity	Time
	Demobilize gear at Emeryville marina, refill SCUBA tanks as necessary.	1430-1530
Day 4		
July 17, 1998	Mobilize gear at Vallejo marina aboard the M.E. II. Depart for Davis Point site.	0900-0930
	Examine and maintain mooring at Davis Point. Slack water before ebb is at 1018, slack water before flood is at 1645. Return to Vallejo Marina.	0930-1020
	Demobilize gear at Vallejo Marina. Return SCUBA tanks.	1020-1120

Yerba Buena Island, 0.3 nmi. SE of, South SAN FRANCISCO BAY Latitude: 37° 48' N Long

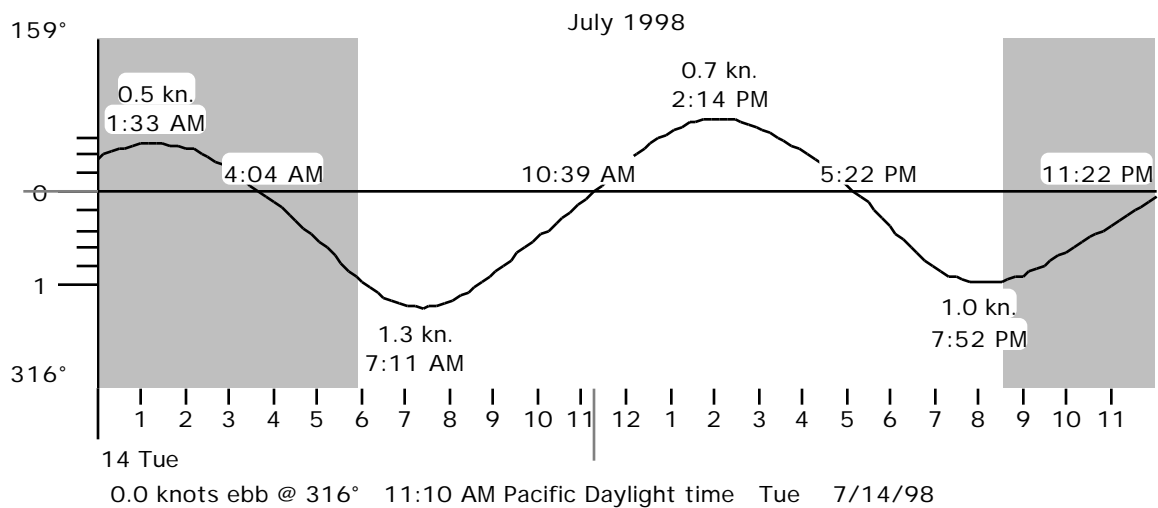


Figure 1. Currents near Yerba Buena Island on July 14, 1998

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

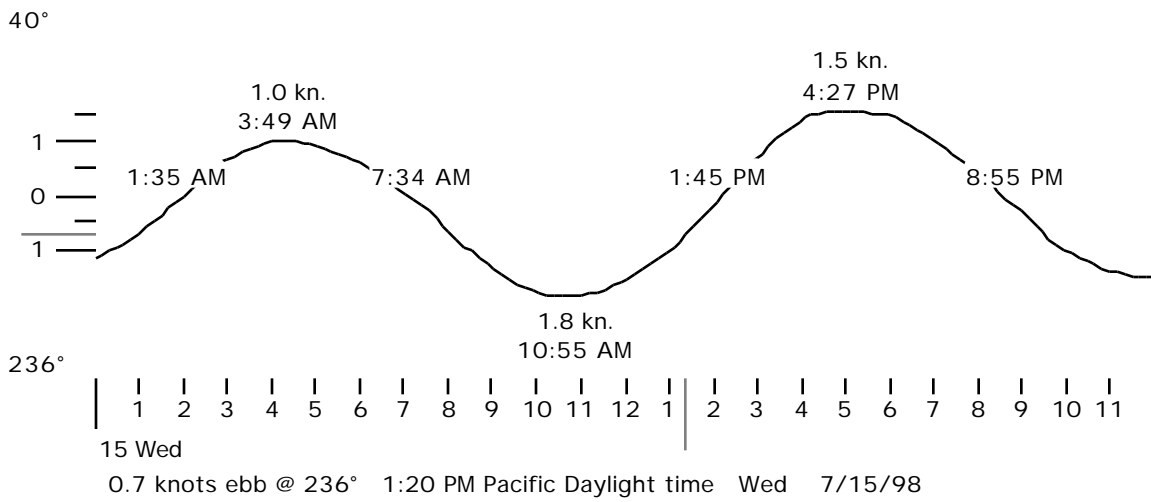


Figure 2. Currents near Pinole Point on July 15, 1998.

Point Sacramento, 0.3 mile NE OF, SACRAMENTO RIVER Latitude: 38° 04' N Longitude:

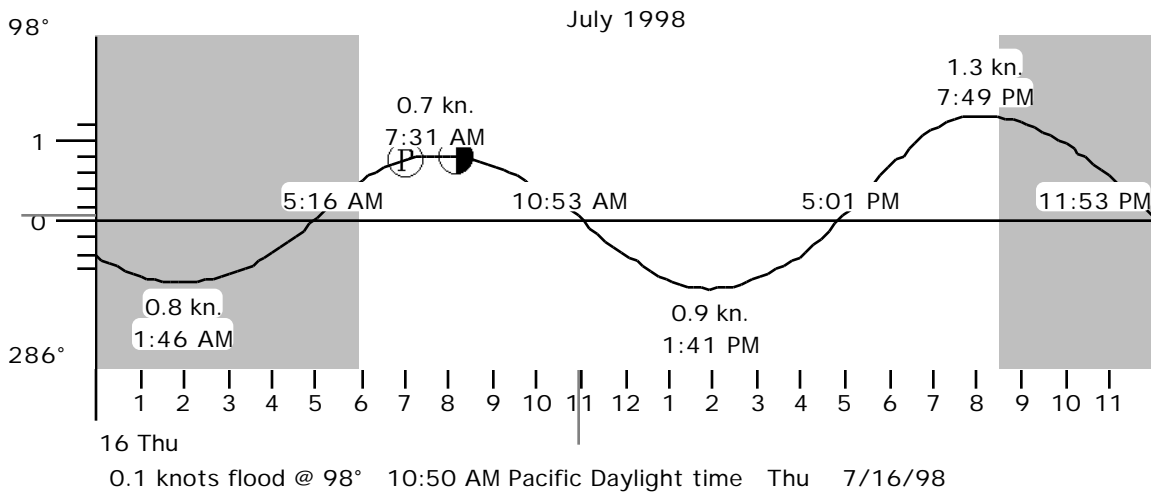


Figure 3. Currents near Point Sacramento on July 16, 1998.

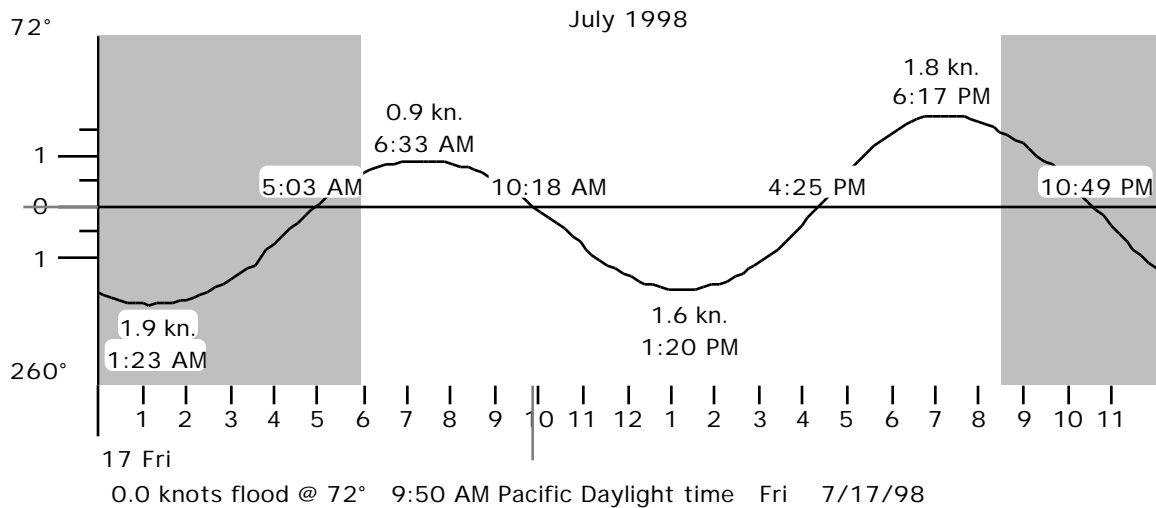


Figure 4. Currents near Davis Point on July 17, 1998.

Lodging

Mr. Hardin will spend the nights of July 13-14 at the Holiday Inn, Emeryville. Messrs. Bell, Gold and Hardin will spend the night of July 15 at the John Muir Inn, Martinez.

Mooring Examination and Maintenance Procedures

All diving operations will be conducted by divers working in pairs and tethered together. The vessel will be tied to the surface marker for each mooring. The divers will 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 secureness 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 bivalve bags and use nylon brushes to gently scrub all debris and fouling organisms from the bags. After the bags have been scrubbed, the divers will return to the surface by retracing their route along the ground line and piling. Spare line, earth anchors and buoys will be onboard the vessel if replacements are required.

Site Locations

The geographic coordinates for the sites are listed in Table 1.

Table 1. Coordinates of Regional Monitoring Program Bivalve Deployment

Site Name/Code	Latitude	Longitude	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/BC61	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 "2"
Grizzly Bay/BF20	38° 06.49'	122° 03.37'	Channel marker "9" 1.0 nmi NW of Garnet Point
Sacramento River/BG20	-NA-	-NA-	Channel marker "8" N of Sherman Island
San Joaquin River/BG30	-NA-	-NA-	Channel marker "8" 0.75 nmi E of Antioch Marina

Bivalve Deployments

Bivalves deployed during the previous cruise are indicated in Table 2.

Table 2. Bivalve deployments from June 2-5, 1998.

Site Name/Code	Quantity and Species Deployed
Coyote Creek/BA10	144 <i>C. gigas</i>
Dumbarton Bridge/BA30	160 <i>M. californianus</i> 144 <i>C. gigas</i>
Redwood Creek/BA40	160 <i>M. californianus</i>
Alameda/BB71	160 <i>M. californianus</i>
Yerba Buena Island/BC10	160 <i>M. californianus</i>
Horseshoe Bay/BC21	160 <i>M. californianus</i>
Red Rock/BC60	160 <i>M. californianus</i>
Pinole Point/BD30	160 <i>M. Californianus</i> 144 <i>C. gigas</i>
San Pablo Bay/BD20	144 <i>C. gigas</i>
Petaluma River/BD15	144 <i>C. gigas</i>
Davis Point/BD40	144 <i>C. gigas</i>
Napa River/BD50	144 <i>C. gigas</i>
Grizzly Bay/BF20	144 <i>C. gigas</i>
Sacramento River/BG20	No bivalves deployed
San Joaquin River/BG30	No bivalves deployed