

# Cruise Plan 2001 Regional Monitoring Program Bivalve Deployment Cruise

May 28-29, June 2, 11-15, 2001

## Objectives

The objectives of this cruise are:

- 1) Collect *Mytilus californianus* from Bodega Head and deploy at twelve sites;
- 2) Obtain *Mytilus edulis* from Tomales Bay and deploy at twelve sites
- 3) Obtain *Crassostrea gigas* from Tomales Bay and deploy at five sites;
- 4) Construct and install containment cages at seven sites.
- 5) Deploy multiple species at the same sites to develop data that can be used to move the RMP bivalve program toward use of a single bivalve species at all RMP stations.

## Bivalves Deployed

The Cruise Plan was developed based upon the decision of the RMP Technical Review Committee to investigate use of cages in place of bags to contain bivalves, and to continue moving the RMP toward the use of a single transplanted species, probably *Mytilus edulis*, at all RMP stations.

Limited use of PVC cages on previous deployments suggested that the cages reduce mortality over the deployment period at stations with high predation (e.g., Horseshoe Bay and Yerba Buena Island) without impacting growth. For the 2001 deployment, cages have been redesigned to improve ease of use in the field and reusability over several years. The use of cages will be expanded to seven stations, with both *M. californianus* and *M. edulis* deployed at each site.

Deployments in 1999 and 2000 demonstrated that both *M. californianus* and *M. edulis* survive at all RMP stations during the summer west of Carquinez Strait, indicating that either species could be the sole species for deployment. For the 2001 deployment, full deployments (160 bivalves) of both *M. edulis* and *M. californianus* will be made at every RMP station. In addition, *C. gigas* will be deployed at the stations where it is the base species. This will allow for a side-by-side comparison of bioaccumulation by *M. edulis* and *M. californianus* at each station, although the decision to do this greater amount of chemical analysis has yet to be made.

Deployments at each of the seven stations where cages are to be deployed will consist of the following: (1) a cage with four compartments filled with twenty *M. californianus*; (2) a cage with four compartments filled with twenty *M. edulis*; (3) two bags of forty *M. californianus* and (4) two bags of 30 *M. edulis*. It is planned that the bagged bivalves will be used for all chemical analyses. With these deployments, based on the species survival at each station and discussions with SFEI, the opportunity would be available to perform a side-by-side analysis of growth in bagged vs. caged bivalves of both mussel species at seven potential sites. In addition, condition could also be measured between mussel species at each station. A list of all bivalves to be deployed for the 2001 deployment cruise is given in Table 1

Table 1. Bivalves Scheduled for Deployment for the 2001 Bivalve Deployment Cruise

<i>Site Name</i>	<i>Site Code</i>	<i>#MCAL</i>	<i>#MEDU</i>	<i>#CGIG</i>	<i>Total #Bags</i>	<i>Total #Cages</i>
Coyote Creek	BA10	160	160	144	7	2
Dumbarton Bridge	BA30	160	160		8	
Redwood Creek	BA40	160	160		4	2
Alameda	BB71	160	160		8	
Yerba Buena Island	BC10	160	160		4	2
Horseshoe Bay	BC21	160	160		4	2
Red Rock	BC61	160	160		4	2
Petaluma River	BD15	160	160	144	11	
San Pablo Bay	BD20	160	160	144	11	
Pinole Point	BD30	160	160		8	
Davis Point	BD40	160	160	144	7	2
Napa River	BD50	160	160	144	7	2
<b>Totals</b>		<b>1920</b>	<b>1920</b>	<b>720</b>	<b>83</b>	<b>14</b>

## Personnel

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

<i>Name</i>	<i>Affiliation</i>	<i>Duties</i>	<i>Contact</i>
Gordon Becker	AMS	Bivalve Collection, Tender	steelie@dnai.com
David Bell	AMS	Bivalve Collection, Cruise Manager, Dive Master	bell@amarine.com
Jordan Gold	AMS	Diver, Vessel Skipper (6/15)	gold@amarine.com
Jay Johnson	AMS	Diver (6/15)	johnson@amarine.com
Dave Morgan	Romberg Tiburon Center	Vessel Skipper	cptdavid@aol.com
Paul Salop	AMS	Bivalve Collections	salop@amarine.com

Mr. Bell will be responsible for all scientific diving operations and dive safety. Mr. Morgan will be responsible for vessel operation and safety on 6/26-30. Mr. Gold will be responsible for vessel operation and safety on 6/20-22. Messrs. Gold, Bell, and Johnson will alternate diver responsibilities.

## Cruise Schedule

This cruise schedule assumes that approximately 60 minutes will be required for operations at each site and the vessel proceeds between stations at approximately 15 knots. Table 2 gives an estimated schedule for cruise operations. Figures 1 through 4 present current charts for the appropriate cruise dates.

Table 2. Cruise schedule for RMP Summer 2001 Bivalve Deployment.

<i>Date</i>	<i>Time</i>	<i>Activity</i>
Day 1 5/28/01	1200-1600	Bell purchases <i>Crassostrea gigas</i> from Hog Island Oyster Company and transports to Bodega Bay.
Day 2 5/29/01	0930-1630	Bell, Becker, and Salop collect <i>Mytilus californianus</i> at low tide from Bodega Head, Sonoma County. <i>M. californianus</i> and <i>C. gigas</i> are transferred into plastic mesh bags and placed into filtered seawater tanks at the Bodega Marine Laboratory (BML).
Day 3 6/02/01	0900-1200	Will Borgeson (BML) collects <i>Mytilus edulis</i> from Tomales Bay, Marin County. Bivalves are transferred into plastic mesh bags and placed into filtered seawater tanks at BML.
Day 4 6/11/01	0900-1600	Bell picks up bivalves from BML.
Day 5 6/12/01	1000-1030	Mobilize gear, load bivalves aboard <i>RV Questuary</i> , Emeryville Marina. Depart for San Pablo Bay site.
	1030-1600	Check mooring integrity and deploy bivalves at San Pablo Bay (BD20), Petaluma River (BD15), and Pinole Point (BD30) sites. Slack current near Pinole Point is at 1430. (Figure 1).
Day 6 6/13/01	1030-1100	Mobilize gear, load bivalves aboard <i>RV Questuary</i> , Emeryville Marina. Depart for Yerba Buena Island site.
	1100-1530	Check mooring integrity and deploy bivalves at Yerba Buena Island (BC10), Horseshoe Bay (BC21), and Red Rock (BC61) sites. Slack current near Red Rock is at 1336 (Figure 2).
Day 7 6/14/01	0930-1000	Mobilize gear, load bivalves aboard <i>RV Questuary</i> , Emeryville Marina. Depart for Alameda site.
	1000-1630	Check mooring integrity and deploy bivalves at Alameda (BB71), Coyote Creek (BA10), Redwood Creek (BA40), and Dumbarton Bridge (BA30). Slack current near Alameda is at 1335 (Figure 3).
Day 8 6/15/01	0900-0930	Mobilize gear, load bivalves aboard <i>M.E. II</i> , Vallejo Public Boat Launch. Depart for Davis Point site.
	0930-1130	Check mooring integrity and deploy bivalves at Davis Point (BD40) and Napa River (BD50). Slack current near Davis Point is at 1042 (Figure 4).

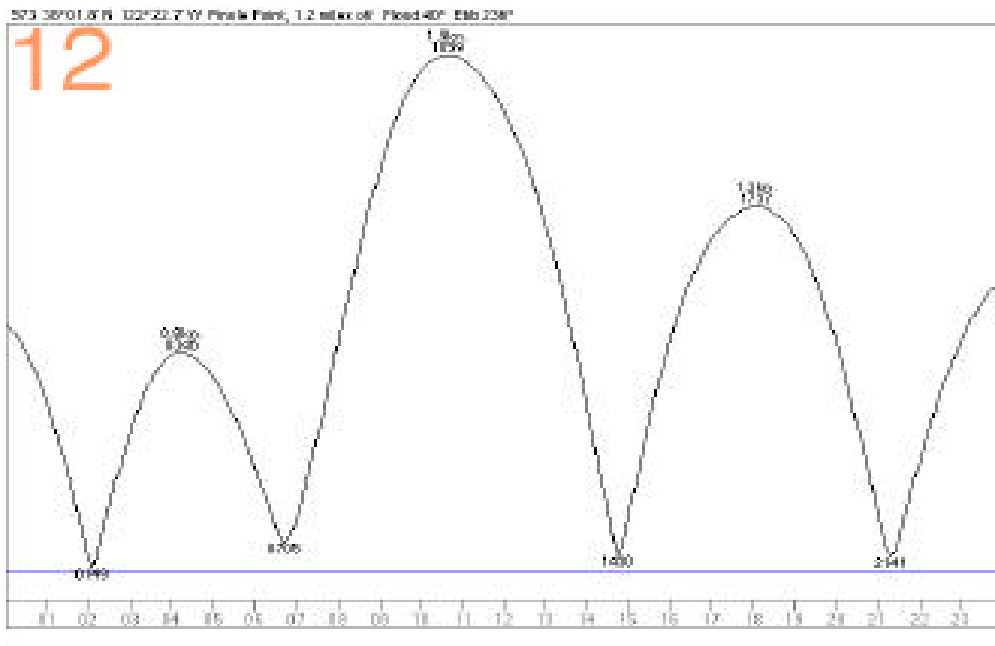


Figure 1. Currents near Pinole Point on June 12, 2001.

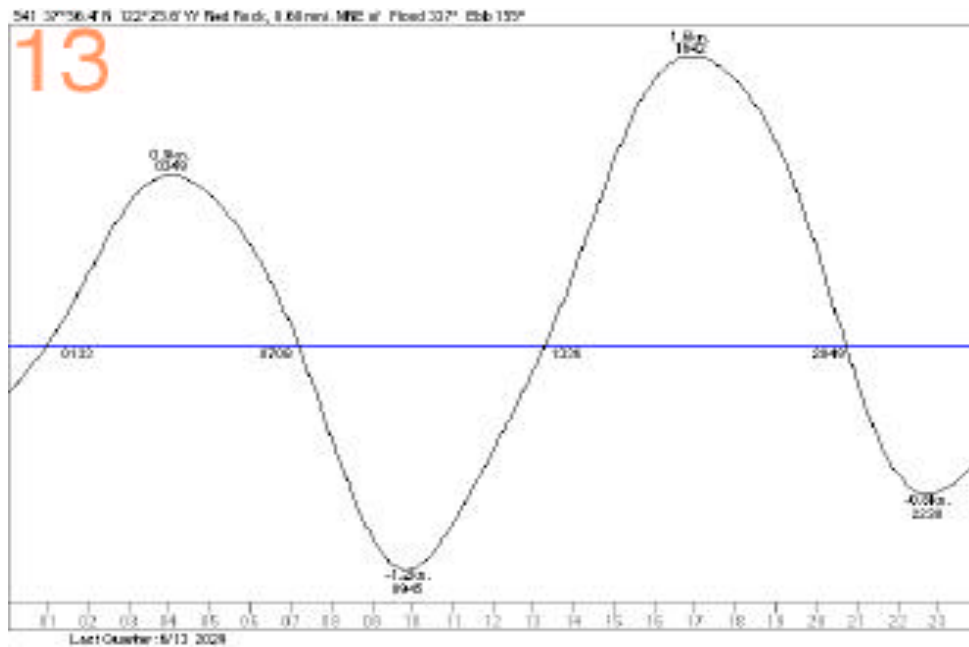


Figure 2. Currents near Red Rock on June 13, 2001.

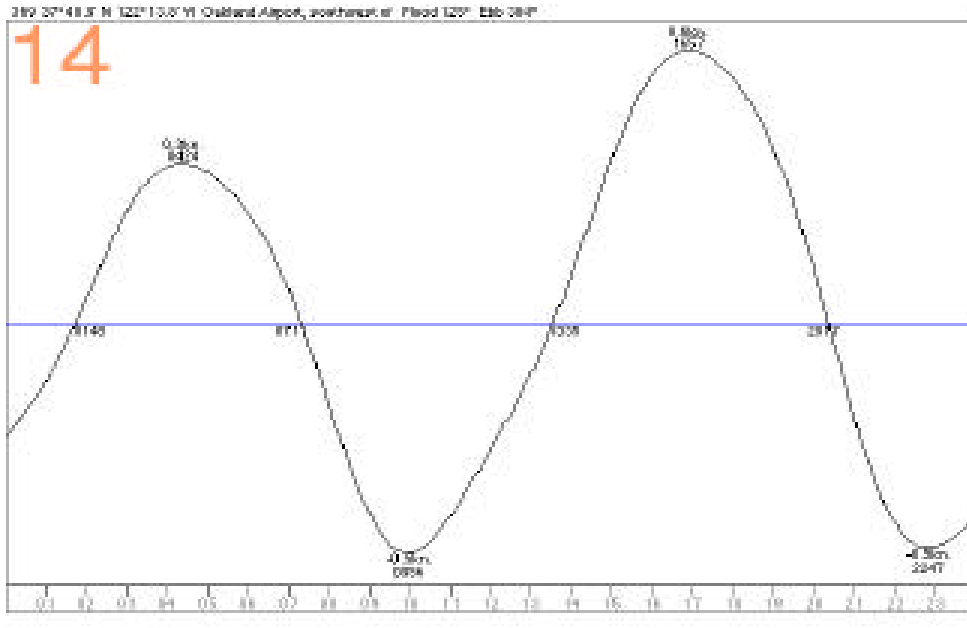


Figure 3. Currents near Alameda on June 14, 2001.

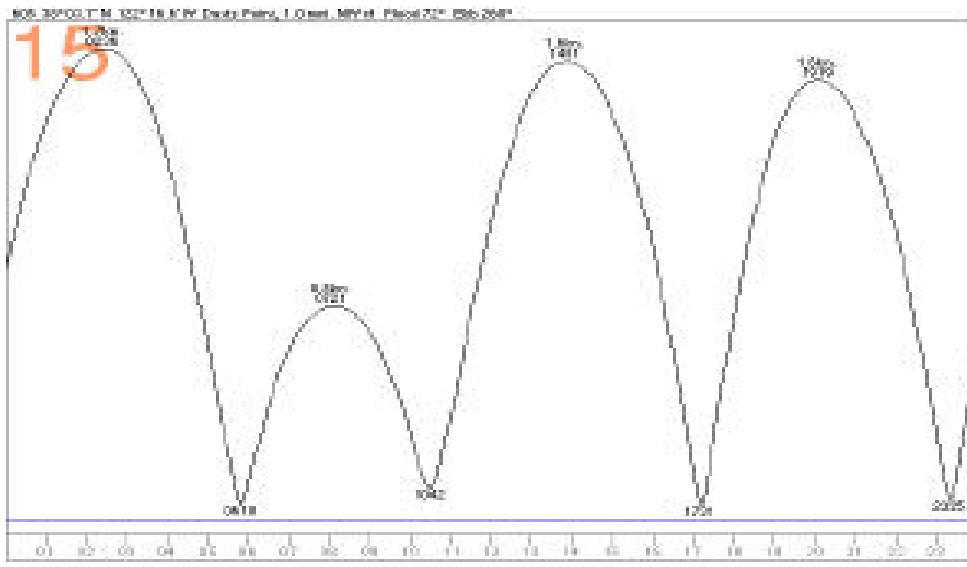


Figure 4. Currents near Davis Point on June 15, 2001.

## Site Locations

The coordinates for all RMP bivalve stations are listed below:

<i>Site Name/Code</i>	<i>Latitude (N)</i>	<i>Longitude (W)</i>	<i>Comments</i>
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
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