

# **Cruise Report Regional Monitoring Program Water Sampling Cruise #19**

February 1-5, 8-11, 1999

## **1.0 INTRODUCTION**

This report describes activities associated with the first 1999 water sampling cruise (cruise 19) of the Regional Monitoring Program for Toxic Substances in the San Francisco Estuary.

Water samples were collected and distributed to five laboratories for analysis. Samples for the analysis of arsenic and selenium collected from 26 sites, and mercury intercalibration samples collected from three sites were sent to Brooks-Rand, Ltd. in Seattle, Washington at the mid-point and end of the cruise. Samples for the analysis of other trace elements (cadmium, chromium, copper, lead, nickel, silver, and zinc) and ancillary measurements (salinity, total suspended solids, dissolved organic carbon, chlorophyll a, ammonium, nitrate, nitrite, and orthophosphate) were collected from 26 sites and retained by personnel of Dr. Russ Flegal's laboratory at the University of California, Santa Cruz, at the conclusion of the cruise. Samples for mercury analysis collected from 26 sites were sent to Dr. Rob Mason at the University of Indiana. Samples for analysis of total hardness were collected from 15 sites and retained at the conclusion of the cruise by Applied Marine Sciences, Inc. (AMS) personnel for delivery to Union Sanitary District in Union City. Samples for analysis of trace organics collected from 18 sites were retained by personnel of Dr. Wally Jarman at University of Utah. Measurement of surface water salinity, temperature, conductivity, pH, and dissolved oxygen were conducted by Flegal's group at each site, and the water column at each site (except Standish dam and Guadalupe slough) was profiled by AMS personnel for conductivity, temperature, salinity, dissolved oxygen, and optical back-scatterance. Toxicity samples were collected from six sites by AMS personnel and picked up by PERL personnel three times during the course of the cruise. All sampling except for the two watershed sites was conducted from the R/V *David Johnston*. Additionally, water samples for total suspended solids, total and dissolved trace metals and mercury were collected from 4 sites for the city of San Jose, and samples for bacterial analysis were collected from 26 sites for Dr. Brian Palenik of UCSD.

## **2.0 CRUISE REPORT**

### **2.1 Objectives**

The objectives of this cruise were:

1. Collect water samples from 26 sites for analysis of total and dissolved trace elements.
2. Collect water samples from 18 sites for analysis of particulate and dissolved organic contaminants.
3. Collect water samples from 26 sites for analysis of salinity, total suspended solids, chlorophyll a, nutrients (ammonium, nitrate, nitrite, orthophosphate, silicate), and dissolved organic carbon.
4. Collect water samples for analysis of total hardness at sites where salinity is <5ppt and at 13 new locations.
5. Collect profiles of water-column temperature, conductivity, salinity, dissolved oxygen, and optical back-scatterance at 24 sites (not done at watershed sites).
6. Collect total and dissolved (filtered and unfiltered) water samples from Coyote Creek, San Jose, South Bay, and Dumbarton Bridge sites for the city of San Jose.
7. Collect samples for toxicity analysis from six stations.
8. Collect profiles of water-column temperature, conductivity, salinity, dissolved oxygen, and optical back-scatterance at 24 sites (not done at watershed sites).
9. Collect water samples for total suspended solids, and total and dissolved trace metals, and mercury from 2 sites for the city of San Jose.
10. Collect water samples for bacterial analysis from 26 sites for UCSD.

Table 2 identifies all samples taken from each of the 26 RMP water monitoring sites.

## 2.2 Personnel

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

<u>Name</u>	<u>Affiliation</u>	<u>Duties</u>
Charlie Dunlap (2/1-4)	UCSC	Trace Metal Chemistry
Myra Finkelstein (2/8-11)	UU	Organic Chemistry
Priya Ganguli (2/1-4)	UCSC	Trace Metal Chemistry
Jordan Gold (2/1-4, 8-11)	AMS	Cruise Manager, Aquatic Toxicity, CTD, Bacteria
Sharon Hibdon (2/8-11)	UCSC	Trace Metal Chemistry
Lisa Jacobsen (2/1-4)	UU	Organic chemistry
Jennifer Ostowski (2/8-11)	UCSC	Trace Metal Chemistry
Genine Scelfo (2/8-11)	UCSC	Trace Metal Chemistry
Gordon Smith (2/1-5, 8-10)	UCSC	Vessel Skipper
Nick Sosin (2/1-4)	UCSC	Trace Metal Chemistry
Glenn Spinelli (2/10)	UCSC	Observer
Martha Thomas (2/8-11)	UCSC	Trace Metal Chemistry
Jocelyn Vedder (2/1-4, 8-11)	UU	Organic Chemistry
Lindsay Whalin (2/1-4)	UCSC	Trace Metal Chemistry
Tom Young (2/10)	UCD	Observer

## 2.3 Sampling Activities

<u>Date</u>	<u>Time</u>	<u>Activity</u>
February 1, 1999	0700–0842	Mobilized gear onto the R/V David Johnston at the Emeryville marina, conducted safety briefing, and departed for Oyster Point site (BB30).
	0957–1115	Sampled at Oyster point, departed for San Bruno Shoal site (BB15).
	1142–1306	Sampled at San Bruno shoal, departed for Coyote Creek site (BA10).
	1445–1615	Sampled at Coyote Creek, departed for Redwood Creek site (BA40).
	1710–1825	Sampled at Redwood Creek, departed for MARFAC (USGS Marine Facility in Redwood City).
	1855–1915	Arrived at MARFAC, demobilized gear and departed for the motel.

Date	Time	Activity
February 2, 1999	0645–0751	Departed from the motel, mobilized gear onto the vessel and departed for Dumbarton Bridge site (BA30).
	0835–1023	Sampled at Dumbarton Bridge, departed for Sunnyvale site (C-1-3).
	1128–1240	Sampled at Sunnyvale, departed for San Jose site (C-3-0).
	1342–1457	Sampled at San Jose, departed for South Bay site (BA20).
	1536–1655	Sampled at South Bay, departed for Emeryville marina.
February 2, 1999	1935–2000	Arrived at Emeryville marina, demobilized gear off vessel, delivered toxicity samples to PERL personnel and departed for motel and home.
February 3, 1999	0800–0827	Mobilized gear onto vessel, conducted safety briefing and departed for Golden Gate site (BC20).
	1023–1145	Sampled at Golden Gate, departed for Richardson Bay site (BC30).
	1255–1453	Sampled at Richardson Bay, departed for Red Rock site (BC60).
	1527–1640	Sampled at Red Rock, departed for Emeryville marina
	1736–1746	Arrived at Emerville marina, demobilized gear off vessel and departed for motel and home.
February 4, 1999	0800–0811	Mobilized gear onto vessel, departed for Pt. Isabel site (BC41).
	0850–0953	Sampled at Point Isabel, departed for Alameda site (BB70).
	1049–1200	Sampled at Alameda, departed for Yerba Buena Island site (BC10).

Date	Time	Activity
February 4, 1999	1250–1403	Sampled at Yerba Buena Island, departed for Emeryville marina.
	1425–1630	Arrived at Emeryville marina, demobilized gear off vessel, delivered toxicity samples to PERL, shipped As, Se, Hg samples to Brooks-Rand and departed for home.
February 5, 1999	0752–1146	Captain Smith transits vessel to Benicia marina.
February 8, 1999	0630–0806	Departed motel, mobilized gear onto vessel at Benicia marina, conducted safety briefing and departed for Petaluma river site (BD15).
	1006–1141	Sampled at Petaluma river, departed for San Pablo Bay site (BD20).
	1233–1348	Sampled at San Pablo Bay, departed for Pinole Point site (BD30).
	1430–1556	Sampled at Pinole Point, departed for Davis Point site (BD40).
	1638–1753	Sampled at Davis Point, departed for Benicia marina.
	1834–1850	Arrived at Benicia marina, demobilized gear off vessel, delivered toxicity samples to PERL personnel and departed for motel.
	0630–0713	Departed from motel, mobilized gear onto vessel, departed for Honker Bay site (BF40).
February 9, 1999	0818–0934	Sampled at Honker Bay, departed for Grizzly Bay site (BF20).
	1018–1143	Sampled at Grizzly Bay, departed for for Napa river site (BD50).
	1317–1512	Sampled at Napa river, departed for Benicia marina.
	1607–1630	Arrived at Benicia marina, demobilized gear off vessel, departed for motel.

Date	Time	Activity
February 10, 1999	0730–0816	Departed from motel, mobilized gear onto vessel, conducted safety briefing, departed for Pacheco creek site (BF10).
	0840–1002	Sampled at Pacheco creek, departed for Sacramento river site (BG20).
	1132–1247	Sampled at Sacramento river site, departed for San Joaquin river site (BG30).
	1323–1438	Sampled at San Joaquin river site, departed for Benicia marina.
	1615–1830	Arrived at Martinez marina, demobilized gear off vessel, delivered toxicity samples to PERL personnel, shipped As and Se samples to Brooks–Rand and departed for motel.
February 11, 1999	0700–1120	Sampled at Standish dam (BW10), departed for Guadalupe river site (BW15).
February 11, 1999	1130–1730	Sampled at Guadalupe river (South Bay Yacht Club), shipped As and Se samples to Brooks Rand, departed for home.

## 2.4 Discussion

### *Site Locations and Sample Collections*

Sampling was conducted at the locations described in Table 1. Samples collected from each site are indicated in Table 2.

### *General Comments*

All cruise objectives were accomplished within the scheduled number of days.

**Table 1. Coordinates of Water Samples Collected During Regional Monitoring  
Program water sampling cruise #19  
February 1-5, 8-11, 1999**

Site Name/Code	Latitude (N)	Longitude (W)	Depth When Sampled (m)	Comments
Standish Dam/BW10	37° 27.158'	121° 55.520'	shore	Standish Dam on E bank
Guadalupe River/BW15	37° 27.158'	121° 55.522'	shore	South Bay Yacht Club Dock
San Jose/C-3-0	37° 27.606'	121° 58.524'	3	Just W of railroad bridge in Coyote Creek
Sunnyvale/C-1-3	37° 26.054'	122° 00.617'	1.5	Approximately 2.23 nmi up Guadalupe Slough from channel marker "1"
Coyote Creek/BA10	37° 28.115'	122° 03.803'	6.5	75 m S of channel marker "18"
South Bay/BA20	37° 29.583'	122° 05.268'	3.5	200 m W of channel marker "16"
Dumbarton Bridge/BA30	37° 30.828'	122° 08.088'	7.5	20 m E of channel marker "14"
Redwood Creek/BA40	37° 33.507'	122° 12.505'	3	50 m W of channel marker "12"
San Bruno Shoal/BB15	37° 36.863'	122° 16.896'	13.5	1 nmi NE of channel marker "8"
Oyster Point/BB30	37° 40.127'	122° 19.736'	9	50 m W of channel marker "4"
Alameda/BB70	37° 44.504'	122° 19.315'	10	20 m SSE of Buoy "A"
Yerba Buena Island/BC10	37° 49.299'	122° 20.968'	7.3	0.25 nmi N of Bay Bridge between bridge supports K and L
Golden Gate/BC20	37° 46.229'	122° 39.173'	21	near the shipping channel
Richardson Bay/BC30	37° 51.723'	122° 28.726'	3.5	30 m NW of channel marker "4"
Point Isabel/BC41	37° 53.223'	122° 20.543'	2	0.61 nmi from Brooks Island and 0.81 nmi from Fleming Point
Red Rock/BC60	37° 55.037'	122° 26.141'	10.5	0.7 nmi SW of Red Rock
Petaluma River/BD15	38° 06.578'	122° 29.179'	3	50 m W of channel marker "19"
San Pablo Bay/BD20	38° 02.890'	122° 25.332'	3	100 m S of channel marker "2"
Pinole Point/BD30	38° 01.500'	122° 21.685'	5.9	0.5 nmi from marker off end of pier and 0.7 nmi from channel marker "7"
Davis Point/BD40	38° 03.045'	122° 16.692'	6.2	0.2 nmi SW from W end of barge pier
Napa River/BD50	38° 05.807'	122° 15.643'	2.3	50 m off concrete seawall and E of NE corner of Mare Island Naval Shipyard building
Pacheco Creek/BF10	38° 03.058'	122° 05.918'	13.5	0.2 nmi N of buoy "7"
Grizzly Bay/BF20	38° 06.971'	122° 02.340'	2	100 m S of dolphin
Honker Bay/BF40	38° 04.003'	121° 56.054'	2.7	0.65 nmi N of Simmons Point
Sacramento River/BG20	38° 03.586'	121° 48.679'	10	0.1 nmi W of channel marker "8"

San Joaquin River/BG30	38° 01.249'	121° 48.299'	6.9	0.11 nmi E of channel marker "8"
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Table 2. Samples Collected During Regional Monitoring Program  
Water sampling Cruise #19  
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COLLECTION INFORMATION		FILTERED AND UNFILTERED			FILTERED				UNFILTERED		
Site	Day	As, Hg, Se	Cr	Other Trace Elements	Nutr.	DOC	Sal.	Org. Comp.	Chl	TSS	TOX
Oyster Point	1	•	•	•	•	•	•		•2	•	
San Bruno Shoal	1	•	•	•5	•	•	•		•2	•	
Coyote Creek	1	•3	•	•	•	•	•	•	•2	•	
Redwood Creek	1	•	•	•	•	•	•	•	•2	•	
Dumbarton Bridge	2	•3	•	•5	•	•	•	•	•2	•	•
Sunnyvale	2	•	•	•	•1	•	•		•2	•	•
San Jose	2	•3	•	•	•1	•	•	•	•2	•	•
South Bay	2	•3	•	•	•1	•	•		•2	•	
Golden Gate	3	•	•	•	•	•	•	•	•2	•	
Richardson Bay	3	•	•	•5	•	•	•		•2	•	
Red Rock	3	•	•	•	•	•	•	•	•2	•	
Point Isabel	4	•	•	•	•	•	•	•	•2	•	
Alameda	4	•	•	•	•	•	•	•	•2	•	
Yerba Buena Island	4	•	•	•	•	•	•	•	•2	•	
Petaluma River	6	•	•	•	•1	•	•	•	•2	•	
San Pablo Bay	6	•	•	•	•1	•	•	•	•2	•	
Pinole Point	6	•	•	•	•1	•	•	•	•2	•	•
Davis Point	6	•	•	•	•1	•	•	•	•2	•	
Honker Bay	7	•	•	•	•1	•	•		•2	•	
Grizzly Bay	7	•	•	•	•1	•	•	•	•2	•	•
Napa River	7	•	•	•	•1	•	•	•	•2	•	
Pacheco Creek	8	•	•	•	•1	•	•		•2	•	
Sacramento River	8	•	•	•	•1	•	•	•	•2	•	
San Joaquin River	8	•	•	•	•1	•	•	•	•2	•	•4
Standish Dam	9	•	•	•	•1	•	•	•	•2	•	
Guadalupe River	9	•	•	•	•1	•	•	•	•2	•	

- = Indicates that a sample was collected.
- 1 = Samples were collected for analysis of total hardness.
- 2 = Samples were collected for bacterial analysis.
- 3 = TSS, Hg, and TM samples taken for the city of San Jose.
- 4 = Toxicity sample blank also taken here.

5 = Hg intercalibration samples taken here.