Cruise Report
Regional Monitoring Program
Water Sampling Cruise #14

April 7, 9, 14-17, 21-23, 1997

INTRODUCTION

This report describes activities associated with the 1997 wet-season water sampling cruise of the Regional Monitoring Program for Toxic Contaminants in the San Francisco Estuary. Water sampling is one component of this program that is designed to provide long-term data on concentrations of trace elements and organic compounds, as well as toxicity, throughout the estuary. Also being measured are sediment concentrations of trace elements and organic compounds, and survival, bioaccumulation, and condition in transplanted bivalves.

Water samples were collected and distributed to five laboratories for analysis. Samples for the analysis of arsenic, mercury, and selenium 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 (i.e., cadmium, chromium, copper, lead, nickel, silver, and zinc) and most ancillary measurements (i.e., salinity, total suspended solids, dissolved organic carbon, chlorophyll-a, ammonium, nitrate, nitrite, and orthophosphate) were retained by personnel of Dr. Russ Flegal's laboratory at University of California, Santa Cruz, at the conclusion of the cruise. Samples for analysis of total hardness were retained at the conclusion of the cruise by Applied Marine Sciences for delivery to Union Sanitary District in Union City. Samples for analysis of trace organics were obtained by personnel by Dr. Wally Jarman at University of California, Santa Cruz. Measurement of surface water salinity, temperature, conductivity, pH, and dissolved oxygen were conducted at each site, and the water column at each site was profiled for conductivity, temperature, salinity, dissolved oxygen, and optical back-scatterance. All sampling except for the two wetlands sites was conducted from the R/V *David Johnston*.

CRUISE REPORT

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 (nitrate, nitrite, ammonium, orthophosphate, silicate), and dissolved organic carbon.

4) Collect profiles of water-column temperature, conductivity, salinity, dissolved oxygen, and optical back-scatterance at 24 sites.

5) Collect samples at 11 sites for analysis of nickel speciation.

6) Collect hardness samples at all sites with salinities < 5.0 ppt.

7) Collect water samples at three sites for City of San Jose trace metal intercalibration.

Personnel

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

Name	Affiliation	Duties
David Bell (4/9, 14-17, 21-23)	AMS	Watershed Sampling, Cruise Manager, CTD
Khalil Abu–Saba (4/21–23)	UCSC	Trace Metal Chemistry
Corinne Bacon (4/16–17)	UCSC	Organic Chemistry
Jonathan Crick (4/7, 16-17, 21–23)	UCSC	Trace Metal Chemistry
Charlie Dunlap (4/21–23)	UCSC	Trace Metal Chemistry
Eric Furtado (4/7, 4/21-23)	UCSC	Organic Chemistry
Priya Ganguli (4/14-16)	UCSC	Trace Metal Chemistry
Jordan Gold (4/7)	AMS	Watershed Sampling
Sharon Hibdon (4/14-15)	UCSC	Trace Metal Chemistry
Wally Jarman (4/14-15)	UCSC	Organic Chemistry
Niki Mesterheide (4/14-16)	UCSC	Trace Metal Chemistry
Ben Owens (4/21–17)	UCSC	Organic Chemistry
Ignacio Rivera-Duarte (4/16-17, 21–23)	UCSC	Trace Metal Chemistry
Genine Scelfo ()	UCSC	Trace Metal Chemistry
Gordon Smith (4/14–17, 21–23)	UCSC	Vessel Skipper
Lisa Weetman (4/14)	CSJ	Observer
Jossyln Vedder (4/14-16, 4/21–23)	UCSC	Organic Chemistry

Activities

Date	Activity	Time
Day 1		
April 7, 1997	Sampled Guadalupe River (BW15).	1430–1530

Day 2		
April 9, 1997	Sampled Standish Dam (BW10).	1330-1430
Day 3		
April 14, 1997	Mobilized gear at vessel R/V *David Johnston*, Emeryville Marina, conducted safety orientation. Departed for Point Isabel (BC41).	0700–0830
	Sampled Point Isabel, departed for Red Rock (BC60).	0930-1030
	Sampled Red Rock, departed for Richardson Bay (BC30).	1130-1250
	Sampled Richardson Bay, departed for Yerba Buena Island (BC10).	1330-1430
Date	Activity	Time
April 14, 1997	Sampled Yerba Buena Island, departed for Emeryville Marina.	1500-1630
	Arrived Emeryville Marina, demobilized vessel.	1700
Day 4		
April 15, 1997	Mobilized gear at vessel, Emeryville Marina, departed for Golden Gate (BC20).	0800-0830
	Sampled Golden Gate, departed for Alameda (BB70).	1010-1200
	Sampled Alameda, departed for Emeryville Marina.	1435-1530
	Arrived Emeryville Marina, demobilized vessel.	1655-1730
Day 5		
April 16, 1997	Mobilized gear at vessel, Emeryville Marina, departed for Oyster Point (BB30).	0700-0740
	Sampled Oyster Point, departed for San Bruno Shoal (BB15).	0900-1000
	Sampled San Bruno Shoal, departed for Redwood Creek (BA40).	1030-1130
	Sampled Redwood Creek, departed for Dumbarton Bridge (BA30).	1210-1400
	Sampled Dumbarton Bridge, departed for South Bay (BA20).	1445-1610
	Sampled South Bay, departed for USGS dock at Redwood City.	1630-1730

	Arrived USGS dock at Redwood City, demobilized vessel.	1820-1900
Day 6		
April 17, 1997	Mobilized gear at vessel, USGS dock, Redwood City. Departed for San Jose (C-3-0).	0800-0830
	Sampled San Jose, departed for Sunnyvale (C-1-3).	1020-1140
	Sampled Sunnyvale, departed for Coyote Creek (BA10).	1245-1445
	Sampled Coyote Creek, departed for Emeryville Marina.	1615-1715
	Arrived Emeryville Marina, demobilized vessel.	1950-2030
Day 7		
April 20, 1997	Vessel transits to Vallejo Marina.	

Date	Activity	Time
Day 8		
April 21, 1997	Mobilized gear at vessel, Vallejo Marina. Departed for Davis Point (BD40).	0700-0730
	Sampled Davis Point, departed for Point Pinole (BD30).	0810-0935
	Sampled Point Pinole, departed for San Pablo Bay (BD20).	1025-1140
	Sampled San Pablo Bay, departed for Petaluma River (BD15).	1215-1330
	Sampled Petaluma River, departed for Vallejo Marina.	1415-1535
	Arrived Vallejo Marina, demobilized vessel.	1745-1820
Day 9		
April 22, 1997	Mobilized gear at vessel, Vallejo Marina. Departed for Napa River (BD50).	0730-0800
	Sampled Napa River, returned to Vallejo Marina to drop off crew to shuttle cars to Martinez Marina. Vessel transits to Martinez Marina.	0815-0955

	Vessel arrived Martinez Marina, picks up crew. Departed for Pacheco Creek (BF10).	1100-1110
	Vessel experienced a problem with engine cooling water pump. Returned to Martinez Marina to buy replacement parts. Pacheco Creek site would be sampled following day.	1215-1405
	Departed Martinez Marina for Honker Bay (BF40).	1405
	Sampled Honker Bay, departed for Grizzly Bay (BF20).	1515-1600
	Sampled Grizzly Bay, departed for Martinez Marina.	1654-1800
	Arrived Martinez Marina, demobilized vessel.	1850-1930
Day 10 April 23, 1997	Mobilized gear at vessel, Martinez Marina, departed for Pacheco Creek (BF10).	0700-0725
	Sampled Pacheco Creek, departed for Sacramento River (BG20).	0750-0840
	Sampled Sacramento River, departed for San Joaquin River (BG30).	1040-1150
	Sampled San Joaquin River, departed for Martinez Marina.	1240-1400
	Arrived Martinez Marina, demobilized vessel.	1610-1700

Discussion

Site Locations and Sampled 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. An additional day was necessary to collect samples because of mechanical difficulties with the vessel.

Table 1. Coordinates of Water Samples Collected During Regional Monitoring Program Water Sampling Cruise #14

Site Name/Code	Latitude (N)	Longitude (W)	Depth When Sampled (m)	Comments
Standish Dam	37° 27.10’	121° 55.29’	shore	Downstream of Standish Dam on E bank
Guadalupe River	37° 25.34’	121° 58.45’	shore	South Bay Yacht Club Dock.
San Jose/C-3-0 (BA05)	37° 27.70’	121° 58.56’	3	Just W of railroad bridge in Coyote Creek
Sunnyvale/C-1-3 (BA06)	37° 26.14’	122° 00.60’	4	Approximately 2.23 nmi up Guadalupe Slough from channel marker “1”
Coyote Creek/BA10	37° 28.19’	122° 03.81’	3	75 m S of channel marker “18”
South Bay/BA20	37° 29.69’	122° 05.32’	3	200 m W of channel marker “16”
Dumbarton Bridge/BA30	37° 30.89’	122° 08.09’	6	20 m E of channel marker “14”
Redwood Creek/BA40	37° 33.65’	122° 12.54’	8	50 m W of channel marker “12”
San Bruno Shoal/BB15	37° 37.03’	122° 17.06’	15	1 nmi NE of channel marker “8”
Oyster Point/BB30	37° 40.21’	122° 19.76’	9	50 m W of channel marker “4”
Alameda/BB70	37° 44.66’	122° 19.29’	11	20 m SSE of Buoy “A”
Yerba Buena Island/BC10	37° 49.34’	122° 20.97’	8	0.25 nmi N of Bay Bridge between bridge supports K and L
Golden Gate/BC20	37° 45.28’	122° 36.80’	15	Off China Beach
Richardson Bay/BC30	37° 51.81’	122° 28.66’	5	30 m NW of channel marker “4”
Point Isabel/BC41	37° 53.37’	122° 20.53’	4	0.61 nmi from Brooks Island and 0.81 nmi from Fleming Point
Red Rock/BC60	37° 55.18’	122° 26.05’	12	0.7 nmi SW of Red Rock
Petaluma River/BD15	38° 06.66’	122° 29.06’	5	50 m W of channel marker “19”
San Pablo Bay/BD20	38° 02.92’	122° 25.21’	3	100 m S of channel marker “2”
Pinole Point/BD30	38° 01.47’	122° 21.71’	8	0.5 nmi from marker off end of pier and 0.7 nmi from channel marker “7”
Davis Point/BD40	38° 03.13’	122° 16.63’	8	0.2 nmi SW from W end of barge pier
Napa River/BD50	38° 05.80’	122° 15.61’	5	50 m off concrete seawall and E of NE corner of Mare Island Naval Shipyard building
Pacheco Creek/BF10	38° 03.08’	122° 05.82’	12	0.2 nmi N of buoy “7”
Grizzly Bay/BF20	38° 06.96’	122° 02.32’	2	100 m S of dolphin

Honker Bay/BF40	38° 04.02’	121° 56.01’	2	0.65 nmi N of Simmons Point
Sacramento River/BG20	38° 03.57’	121° 48.60’	10	0.1 nmi W of channel marker “8”
San Joaquin River/BG30	38° 01.20’	121° 48.25’	10	0.11 nmi E of channel marker “8”

Table 2. Samples Collected During Regional Monitoring Program
Water Sampling Cruise #14

		FILTERED AND UNFILTERED			FILTERED				UNFILTERED	
		As, Hg, Se	Cr	Other Trace Elements	Nutr.	DOC	Sal.	Org. Comp.	Chl	TSS
Site	Day									
Guadalupe River	1	•	•	•	•	•	•	•	•	•
Standish Dam	2	•	•	•	•	•	•	•	•	•
San Jose	6	•	•	•	•	•	•	•[2]	•	•
Sunnyvale	6	•	•	•	•	•	•	[2]	•	•
Coyote Creek	6	•	•	•[1]	•	•	•	•[2]	•	•
South Bay	5	•	•	•[1]	•	•	•	[2]	•	•
Dumbarton Bridge	5	•	•	•[1]	•	•	•	•[2]	•	•
Redwood Creek	5	•	•	•	•	•	•	•[2]	•	•
San Bruno Shoal	5	•	•	•	•	•	•	[2]	•	•
Oyster Point	5	•	•	•	•	•	•	[2]	•	•
Alameda	4	•	•	•	•	•	•	•[2]	•	•
Yerba Buena Island	3	•	•	•	•	•	•	•	•	•
Golden Gate	4	•	•	•	•	•	•	•[2]	•	•
Richardson Bay	3	•	•	•	•	•	•		•	•
Point Isabel	3	•	•	•	•	•	•		•	•
Red Rock	3	•	•	•	•	•	•	•[2]	•	•
Petaluma River	8	•	•	•	•	•	•	•	•	•
San Pablo Bay	8	•	•	•	•	•	•	•	•	•
Point Pinole	8	•	•	•	•	•	•	•	•	•
Davis Point	3	•	•	•	•	•	•	•	•	•
Napa River	9	•	•	•	•	•	•	•	•	•
Pacheco Creek	10	•	•	•	•	•	•		•	•
Grizzly Bay	9	•	•	•	•	•	•	•	•	•
Honker Bay	9	•	•	•	•	•	•		•	•

Sacramento River	10	•	•	•	•	•	•	•	•	•
San Joaquin River	10	•	•	•	•	•	•	•	•	•

1 = sample for CSJ TM intercalibration.

2 = Sample for nickel speciation taken at this site.