# Locations and Descriptions of Gravity, Box, and Push Cores Collected in San Francisco Bay Between January and February, 1990 and 1991

By

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## ABSTRACT

A project to study San Francisco Bay sediments collected over 300 sediment gravity cores; six push cores, and 3 box cores in San Francisco Bay during the years 1990-91. The purpose of the sampling effort is to establish a database on the Holocene sediment history of the bay. The samples described and mapped are the first effort to catalog and present the data collected. Thus far the cores have been utilized in various cooperative studies with state colleges and universities, and other USGS divisions. These cores serve as a base for ongoing multidisciplinary studies. The sediment studies project has initiated subsequent coring efforts within the bay using refined coring techniques to attain deeper cores.

## INTRODUCTION

The initial intent of this project was to focus on attaining sediment gravity cores in as many varying depositional environments within the San Francisco Bay and Delta as possible to establish a data base on the Holocene sedimentary history of San Francisco Bay. This report describes cores collected over four cruises conducted in 1990 and 1991. The first cruise of 1990 focused on the area south of the Dumbarton Bridge in South San Francisco Bay and the Sacramento and San Joaquin rivers to Suisun Bay (http://walrus.wr.usgs.gov/infobank/j/j190sf/html/j-1-90-sf.meta.html). The second cruise in 1990 collected cores from Suisun Bay, San Pablo Bay, Central Bay, and South Bay (http://walrus.wr.usgs.gov/infobank/j/j290sf/html/j-2-90-sf.meta.html). These two cruises occupied a total of 200 core sites. Although not all the sites relinquished a core, sediment samples were attained from the core catcher at each of the sites.

The 1991 cruises focused on areas missed or overlooked during the first year's cruises. The first cruise of 1991 collected cores along the Sacramento River and the confluence of the Sacramento and San Joaquin Rivers, Suisun Bay, Carquinez Strait, and San Pablo Bay (http://walrus.wr.usgs.gov/infobank/j/j191sf/html/j-1-91-sf.meta.html). The second cruise of 1991 focused on the mouth of Richardson Bay, and east of Treasure Island (http://walrus.wr.usgs.gov/infobank/j/j291sf/html/j-2-91-sf.meta.html). A total of 79 cores, including 6 push cores, were collected in Richardson Bay in 1991.

This report describes the methods used to acquire cores and presents core location maps and accompanying core description tables that contain information gathered during the coring operations. The cores have been used for grain size analysis, engineering properties analysis, microfaunal investigation, and geochemical analysis. Analyses of the cores have raised questions that have resulted in further microfaunal, geochemical, and geophysical studies of the bay (Van Geen and others,1991; Luoma and others, 1992 &

1996; Anima, 1994a, b, & 1995; Hornberger and others, 1997, Pereira and others, 1997; Hostettler and others, 1997; Fuller and others, 1997).

The tables of core number, location, length, water depth, and notes are based on the onboard data collection notes taken during the coring process. Unless otherwise noted, the gravity coring was conducted using a 600 lb weight stand. In some instances the table lacks information in one or more categories; this is due to data not being noted at the time of collection. At some locations the coring device was not able to penetrate the bottom or able to retain the core due to either the bottom type or a malfunction of the equipment. In these instances, the core cutter-catcher often did manage to collect a small portion of the surface material; this small piece of material was bagged and saved.

Core locations were obtained through either radar fixes both on land and navigation markers or through Mini-Ranger or Del Norte microwave antenna positions located onshore with distances being recorded onboard the vessel. Depth measurements were obtained using a hull mounted 200 kHz Raytheon DE719 Fathometer.

## METHODS

### Coring Methods

Gravity coring, box coring and push coring were conducted in San Francisco Bay and Delta during January and February of 1990 and 1991. The work utilized the vessel R/V David Johnston on loan to the University of California Santa Cruz. The David Johnston is 43 feet in length equipped with a hydraulically operated A-frame and winch capable of lifting 2 tons. Standard gravity coring techniques utilized a 600 lb. (kilograms) weight stand and 4, 8, 10, and 12 ft (1.2m , 2.4 m, 3.0 m and 3.6 m) core barrels. Box coring used a Soutar Van Veen box corer that is scaled down to 3/4 the size of a normal Soutar corer. This corer was designed for the University of Southern California and purchased by the U.S. Geological Survey to collect undisturbed cores related to infauna studies of the bay sediments. The push coring was a cooperative effort between the U.S. Geological Survey and the University of Mississippi Minerals Technology Center who supplied the coring equipment allowing the collection of continuous cores to a depth of up to 21 meters.

The 600 lb. gravity core weight stand was attached to a core barrel using a quick release pin. Clear 3 in (7.6 cm) polybuterate core liner was cut to length to fit inside the core barrel with a core catcher and cutting head attached by screws to the leading edge of the core barrel. The core barrel, with core liner, catcher ,and cutter, was attached to the weight stand and lowered to approximately 6 to 10 ft (2-3 meters) above the bay floor where possible. From that height the core was allowed to free-fall. Experience showed that to free-fall the corer from a higher distance would cause the corer to hit the bottom at an angle. This could, and did on one occasion, result in a bent and unusable core barrel. Once the corer was on the bottom and penetration made, the core barrel was pulled up and disconnected form the weight stand. Then, the core catcher and cutter were removed and the polybuterate core liner was then removed from the core barrel. The core liner

was then capped using plastic vinyl caps with acetone as a sealant. The core liners were propped in a vertical position where residual seawater was drained from the top of the core. Excess core liner material from the top of the core was then cut off and the core measured for length, with visible physical characteristics, and other observations noted. At sites where little or no core penetration was made, samples of the material left in the core catcher was collected, bagged and marked.

Box coring was accomplished using a 3/4 size Soutar Van Veen corer, with box dimensions of 10 in x 14 in x 20 in (25 cm x 35 cm x 50 cm). The core box is a split casing held together with screws that allow for the sub sampling of the core into slabs that can then be X-radiographed.

The deep penetration coring, conducted only in Richardson Bay, used a 30' x 60' (9 m x 18 m) barge on a three point anchoring system, with a 3 foot by 8-foot (1 m by 2.4 m) moon pool in the middle of the barge. The coring operation used standard 3 in (8 cm) drill casing to case the upper 10 feet (3.0 m) of the core hole. The cores collected were 4 foot (1 meter) Shelby tubes with a 2 in (5 cm) diameter. The casing was lowered to the bottom and pushed into the sediment to a depth of 10 feet (3.0 m) with 10-15 feet (3-4.5 m) of additional drill casing extending to the surface at the moon pool. The Shelby tube was then attached to a 1 in (2.5 cm) pipe threaded to the end of the Shelby tube and sections of the small diameter pipe added on to allow the Shelby tube to be pushed into the bottom. Once the Shelby tube was pushed into the sediment the tube was lifted and disconnected. A water pump connected to the 1 in (2.5 cm) pipe was once again lowered to the bottom of the hole to remove any sediment tailings left behind. Once the tailings were expelled from the top of the drill casing, the Shelby tube was once again lowered to recover the next 4-foot (1 meter) section. The depth of penetration was determined by measuring the number of lengths of 1-inch (2.5 cm) pipe added to the string. This operation was repeated for each 1-meter length of Shelby tube. The drill casing was cleaned with seawater pumped through the 1-inch (2.5 cm) pipe after each core was

collected. Uncertainties arose when material was continuously being pumped out of the drill casing with no clearing of the material. The structure of the upper 2 in (5 cm) of sediment in the Shelby tubes when looked at with X-radiographs suggested that in some instances some of the overlying material did slough into the hole. This is supported by the discrepancies between $C^{14}$ dating and the faunal assemblages found in the stratigraphy. Overall, the method worked well and did allow us to extract the stratigraphic information we were seeking, but, the system needs to be refined and more control needs to be developed for cleaner cores.

## DATA

This report outlines the locations, water depths, and amount of sub bottom penetration attained. Most of the cores have undergone X-radiography, some have been sub-sampling for grain size analysis, microfaunal identification, sediment geochemical analysis, radiometric dating, and stratigraphic interpretation. The maps show core numbers next to either a exclamation point (!), for 1990 cores, or a pound sign (#), for 1991 cores and (s) for the push cores. The numbers correspond to numbers listed on the table for ease of presentation. The map letter (A through Q) that the cores are plotted on is located below the section title and location. The actual core numbers following the map number (Core Tables) are designated as San Francisco Bay (SFB) cores, with the month (01), the day (23), the year (91), and sequential number of the core collected for that particular day, i.e., SFB022190-3 for 1990 cores 39 to 200. Cores 1 to 39, 1990, were labeled with a different sequence 1-G-23, 6-G-26, etc. The setting of the core is based on general area of the sample location and distances to known range marks or land forms in nautical miles (nm), water depth is in meters (m) or feet (ft. or '), core type is either gravity (G), deep penetration (D), Grab (grab), or box core (B). The core length is in meters and the comments describe observations from the actual coring operation and any distinctive information that would aid in working up the final data about each core. The push core locations, at the end of the Core Table, were plotted on the map (I).

The core information is being digitized and put into tables, maps, and core descriptions. It also is being entered into a Geographic Information Systems (GIS).

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**MAP FIGURES**

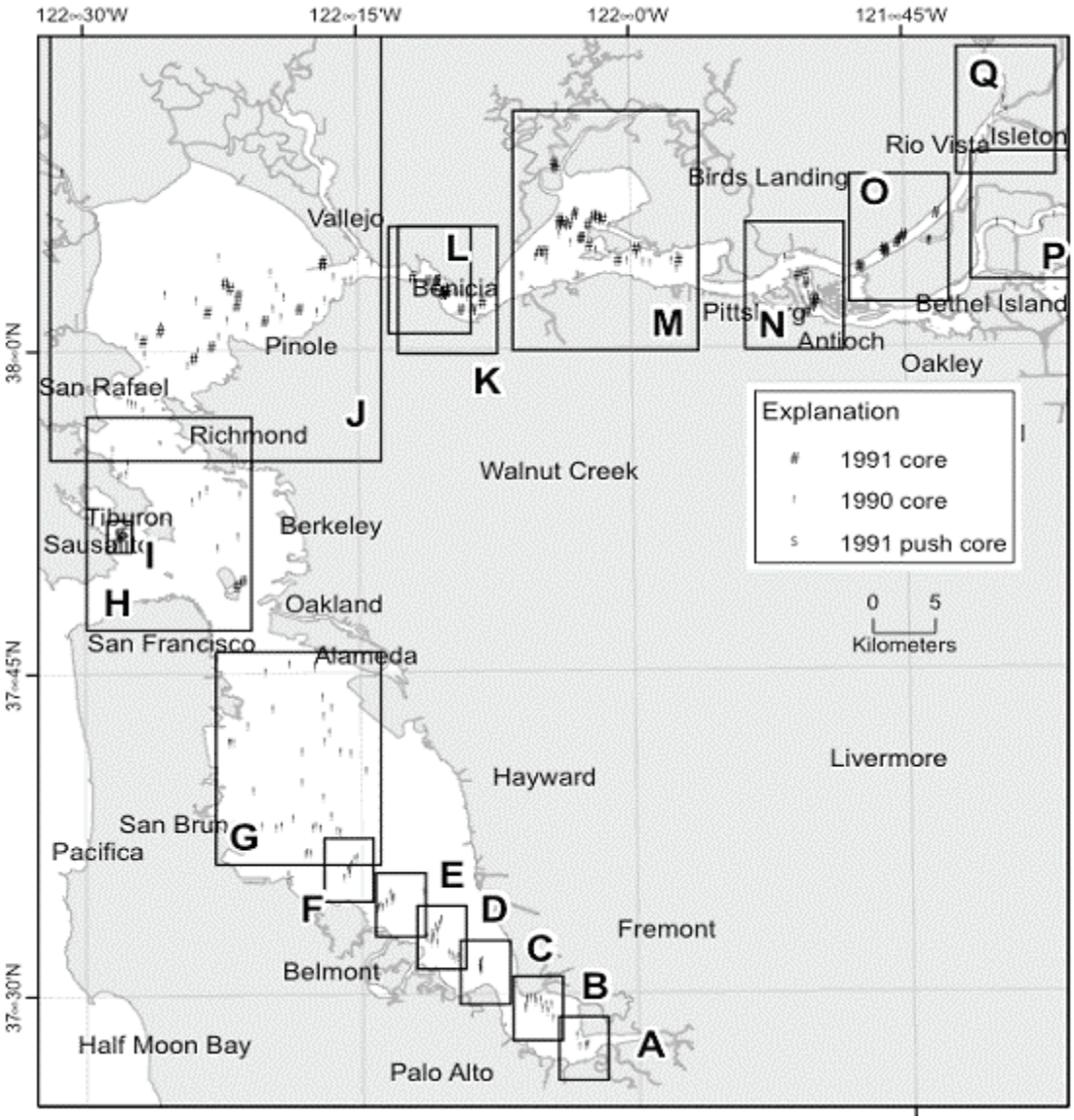


Figure 1 Map of San Francisco Bay and Delta area showing core sites with inset detail maps A through Q. Note that1990 cores represented by exclamation points (!) and 1991 cores represented by pound signs (#). The 1991 push cores are represented by an "s", and are only located in Richardson Bay (Map I).

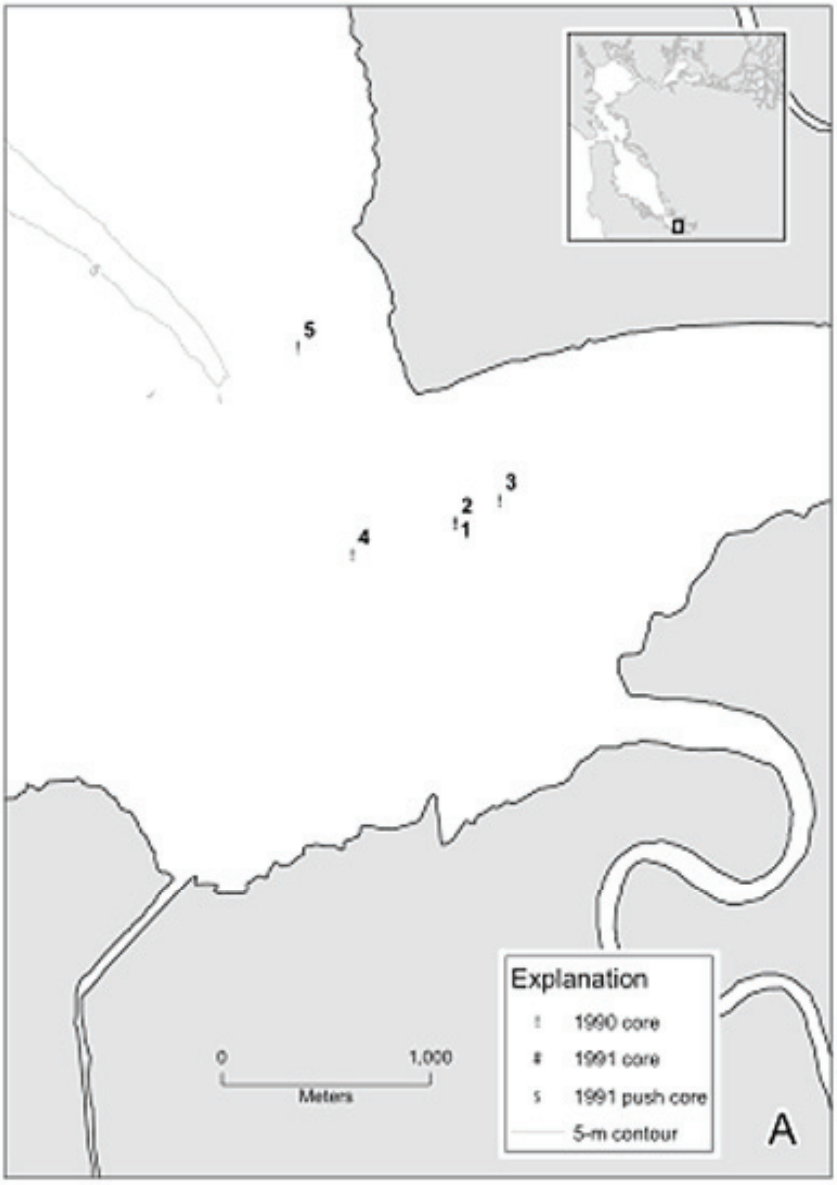


Figure 2 Detailed map of Area A showing locations of cores collected in South San Francisco Bay between the confluences of Guadalupe River and Coyote Creek.

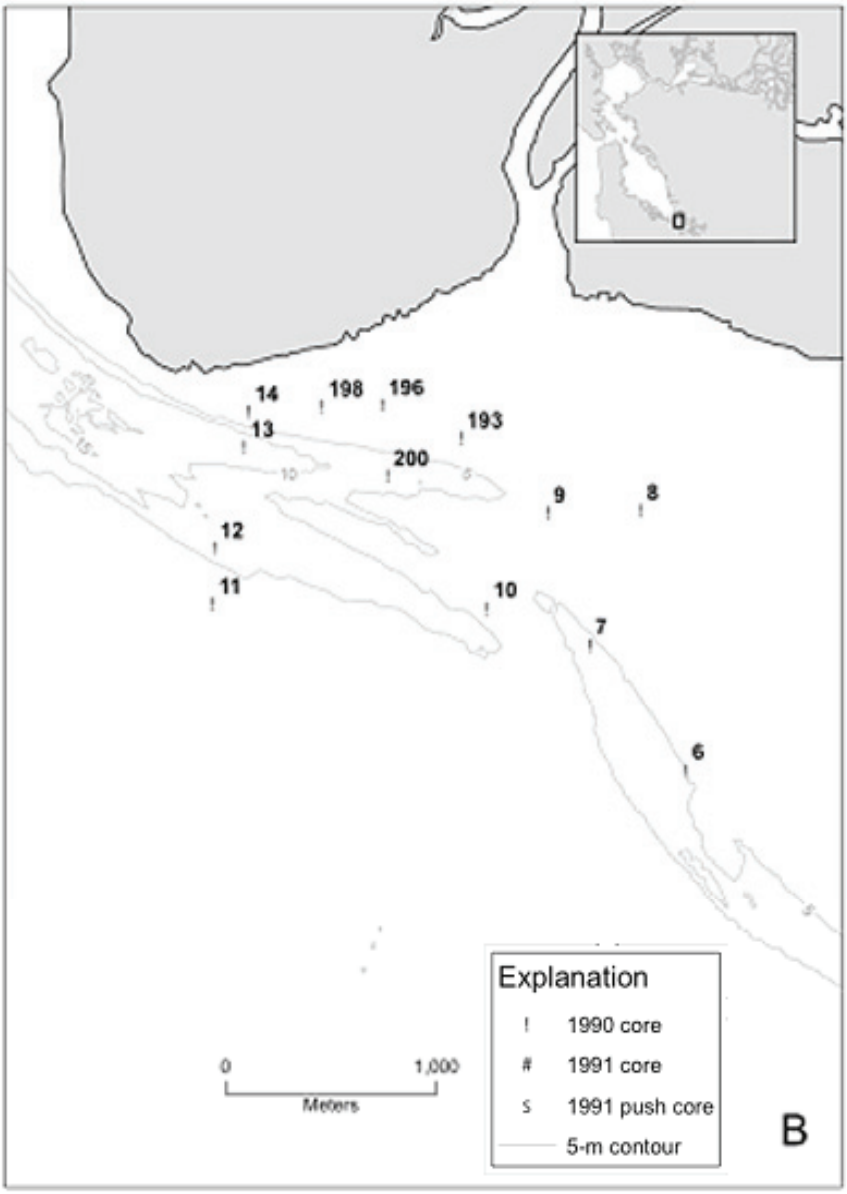


Figure 3 Detailed map of Area B showing locations of cores collected South of the Dumbarton Bridge near the mouth of Newark Slough.

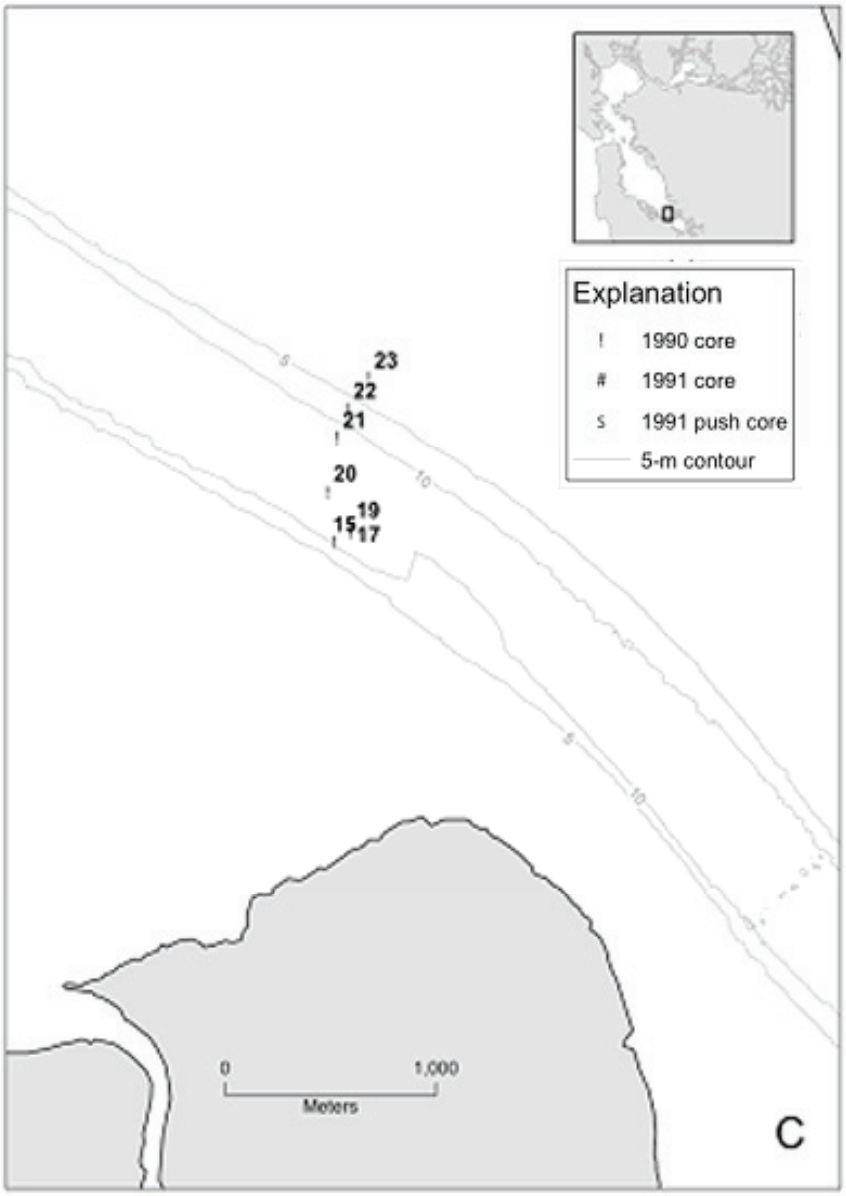

Figure 4 Detailed map of Area C showing locations of cores collected north of the Dumbarton Bridge across the main channel.

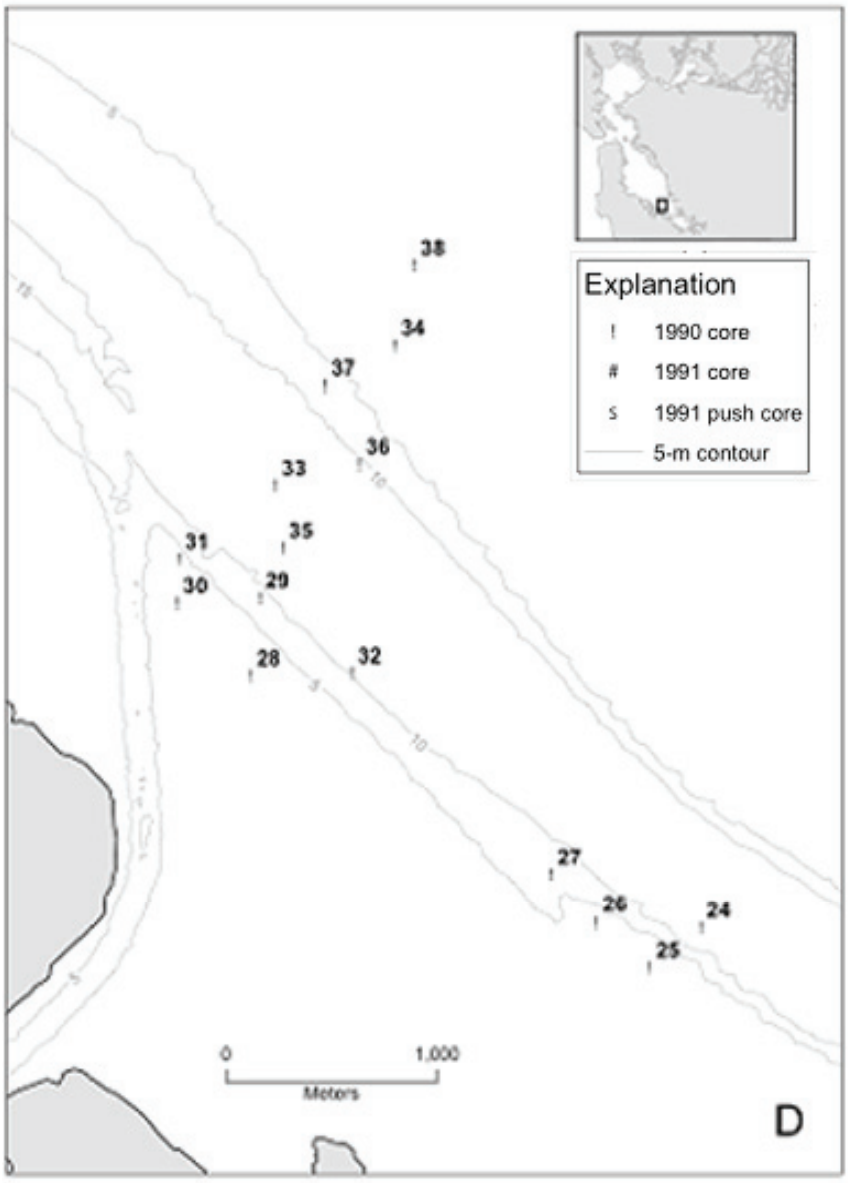


Figure 5 Detailed map of Area D showing locations of cores collected north and south of the mouth of Redwood Creek, across the main channel and subtidal flats.

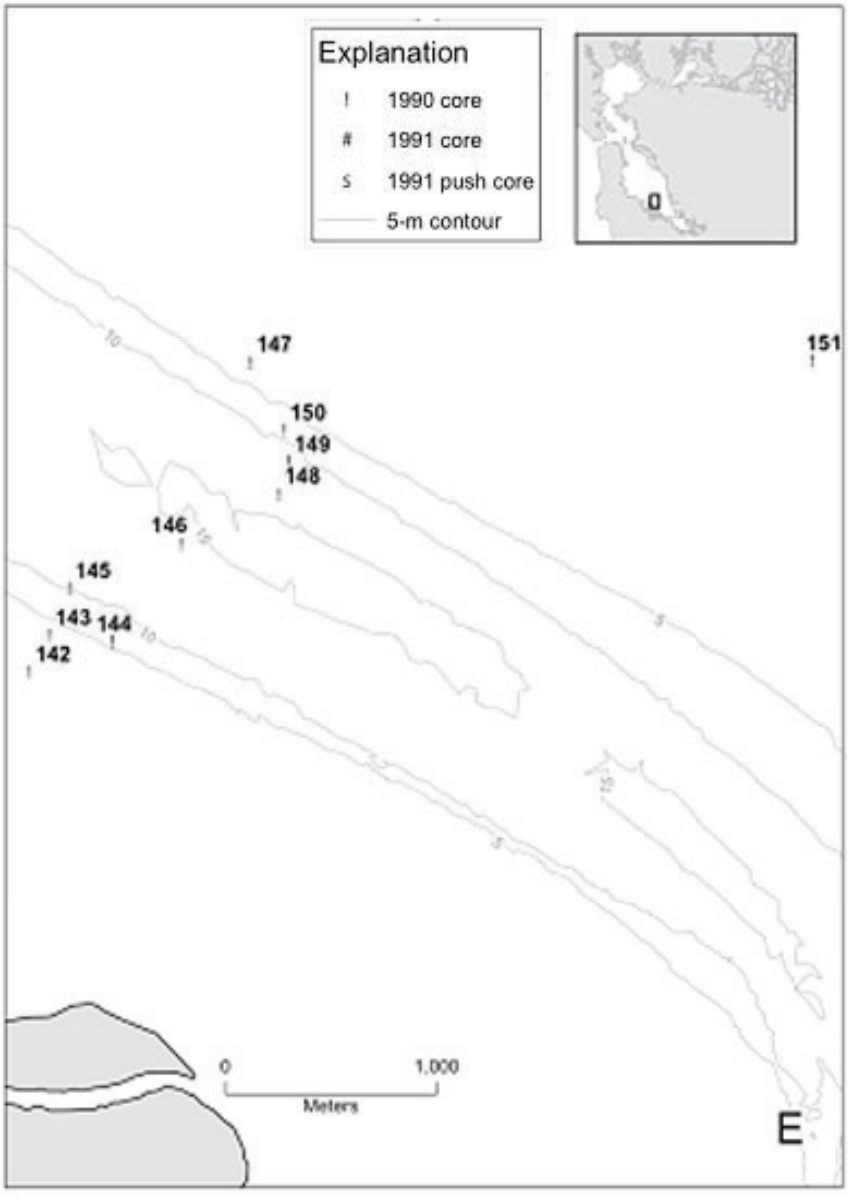


Figure 6 Detailed map of Area E showing locations of cores collected south of the San Mateo Bridge across the main channel.

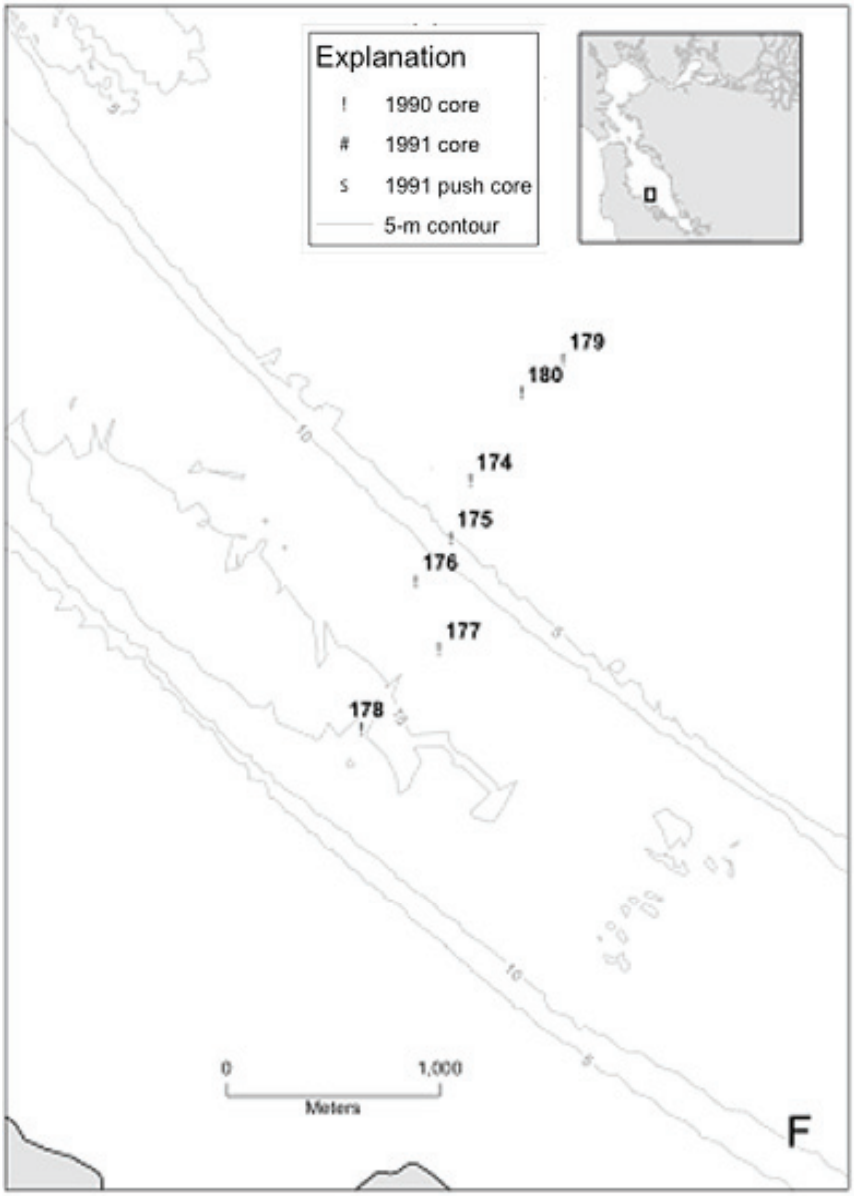

Figure 7 Detailed map of Area F showing locations of cores collected in South San Francisco Bay across the main channel and subtidal flats.

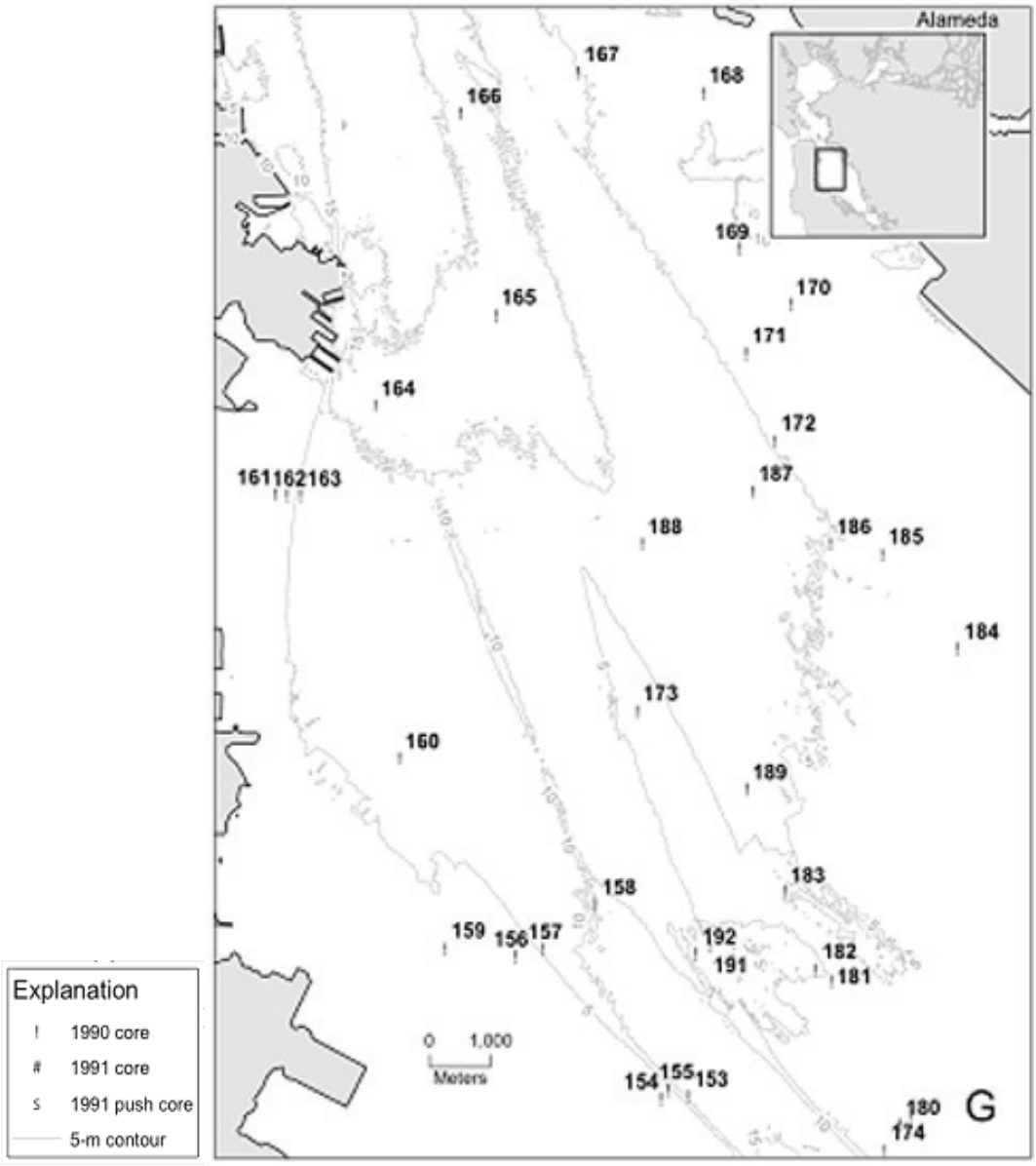


Figure 8 Detailed map of Area G showing locations of cores collected in South-central San Francisco Bay between the San Francisco-Oakland Bay Bridge and San Mateo Bridge.

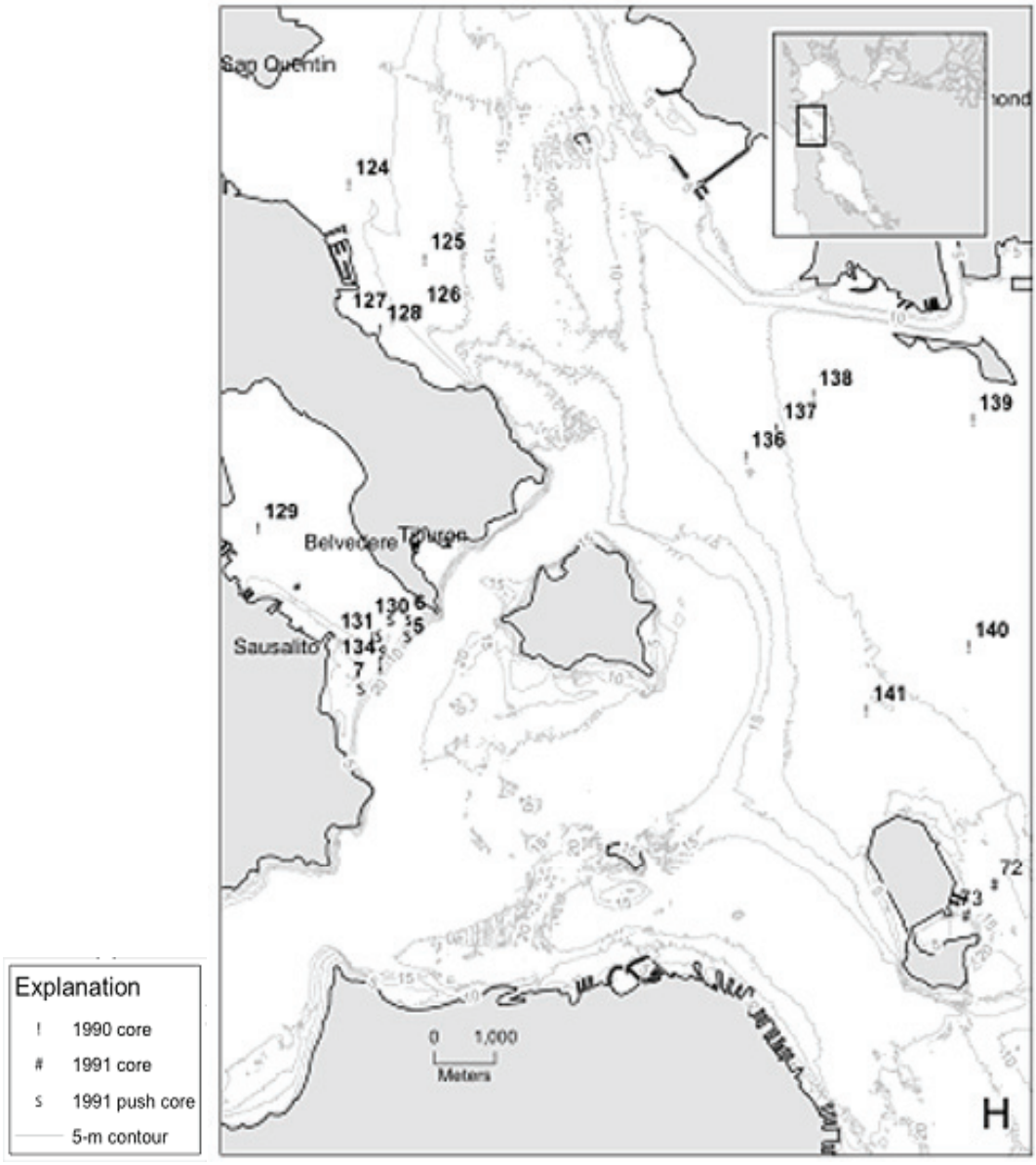


Figure 9 Detailed map of Area H showing locations of cores collected in central San Francisco Bay. Note detailed area I at the mouth of Richardson Bay.

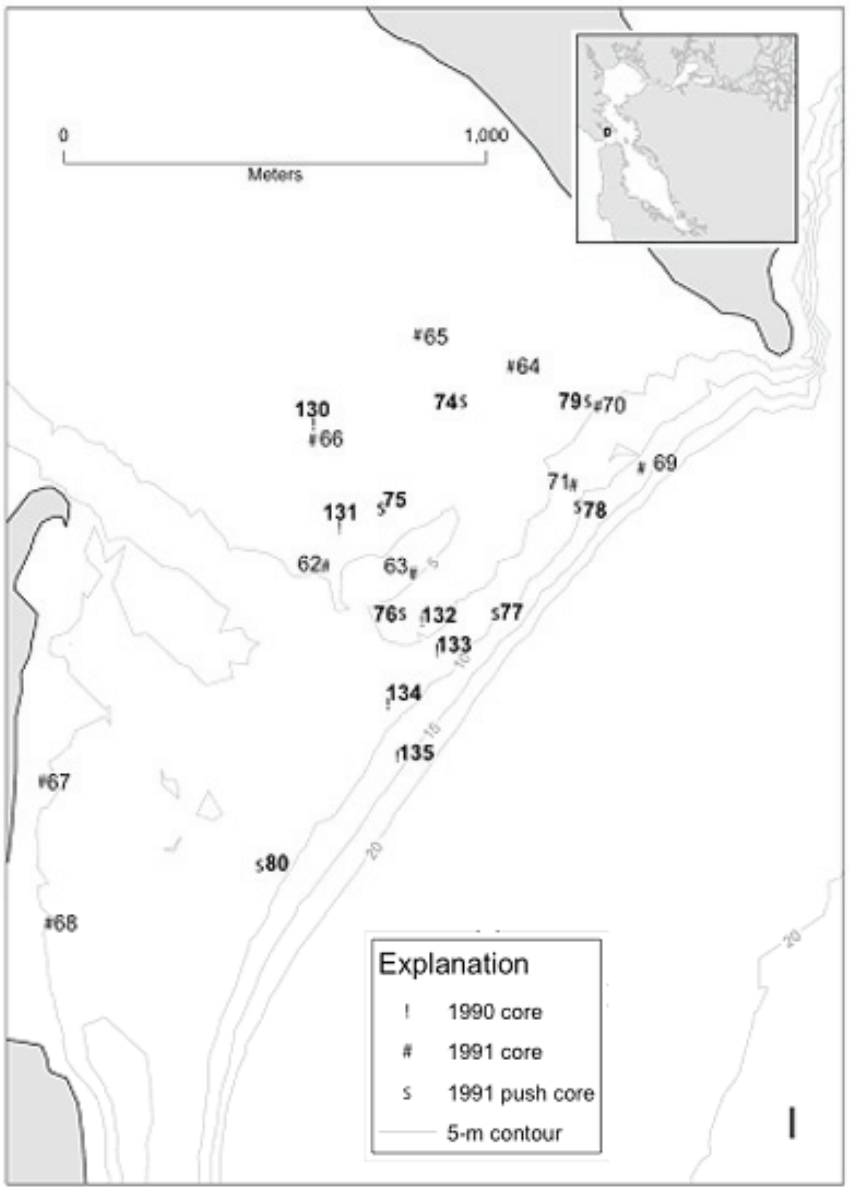


Figure 10 Detailed map of Area I showing locations of cores collected at the mouth of Richardson Bay on the slope of the main tidal channel and upper sub tidal flats.

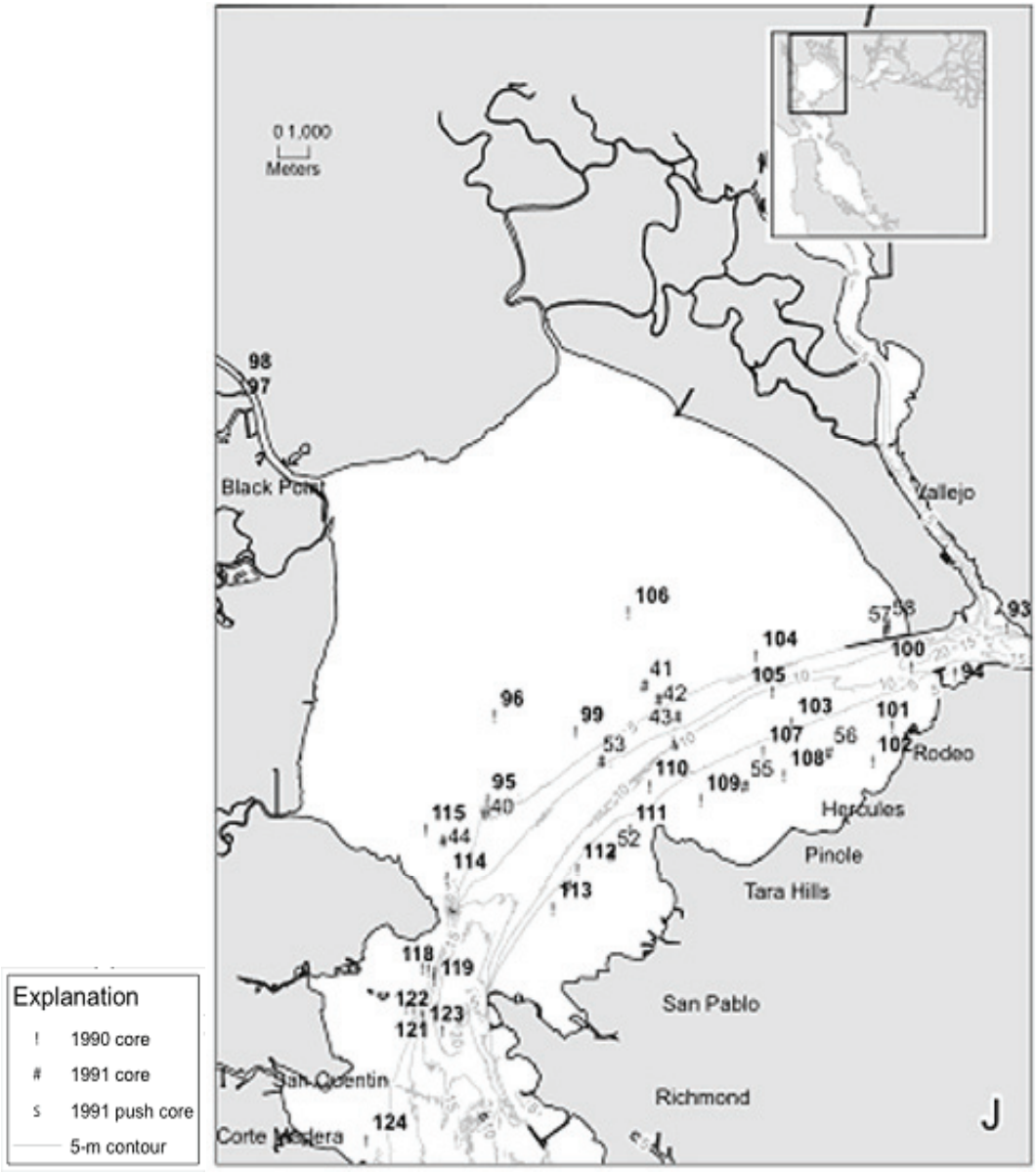


Figure 12 Detailed map of Area J showing locations of cores collected in San Rafael and San Pablo Bays, the Petaluma River to the Carquinez Bridge.

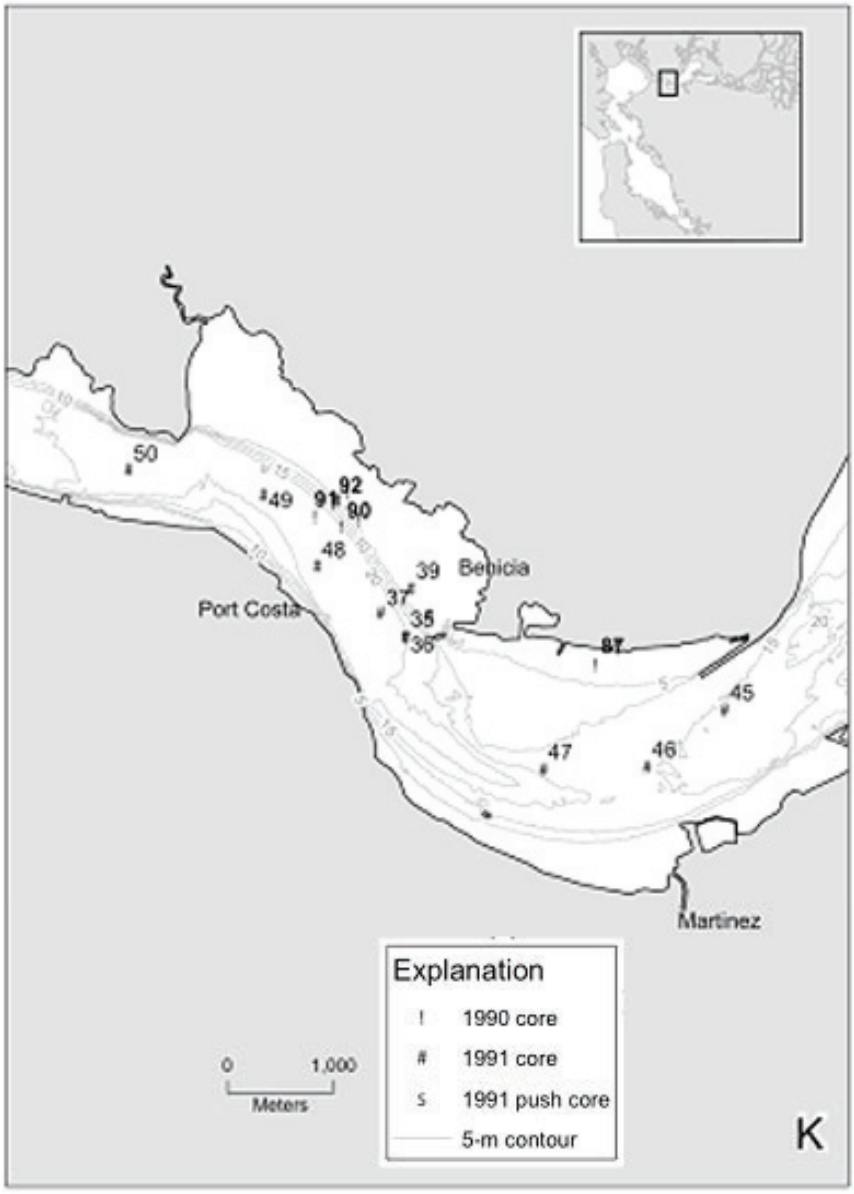


Figure 13 Detailed map of Area K showing locations of cores collected in Carquinez Strait. Note detailed map adjacent to Southampton Bay.

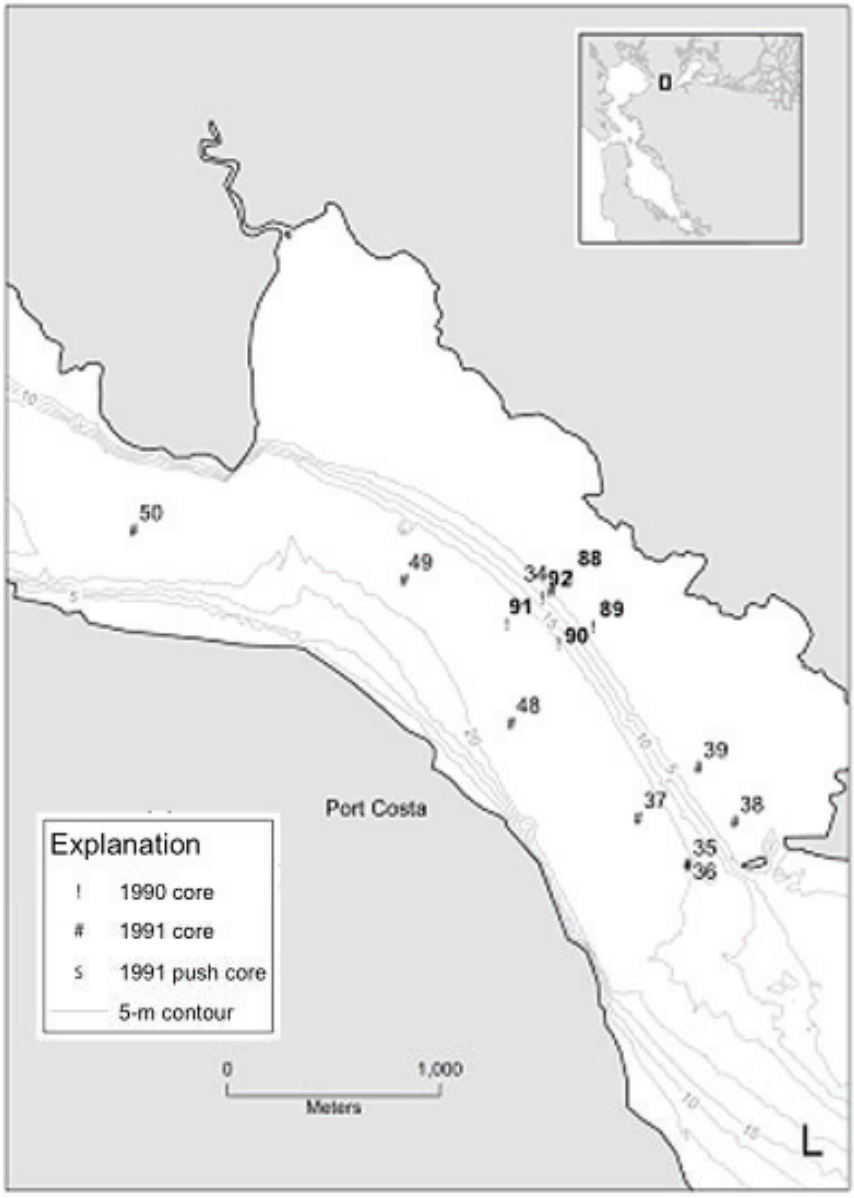


Figure 14 Detailed map of Area L showing locations of cores collected between Dillon Point and the city wharf at Benicia.

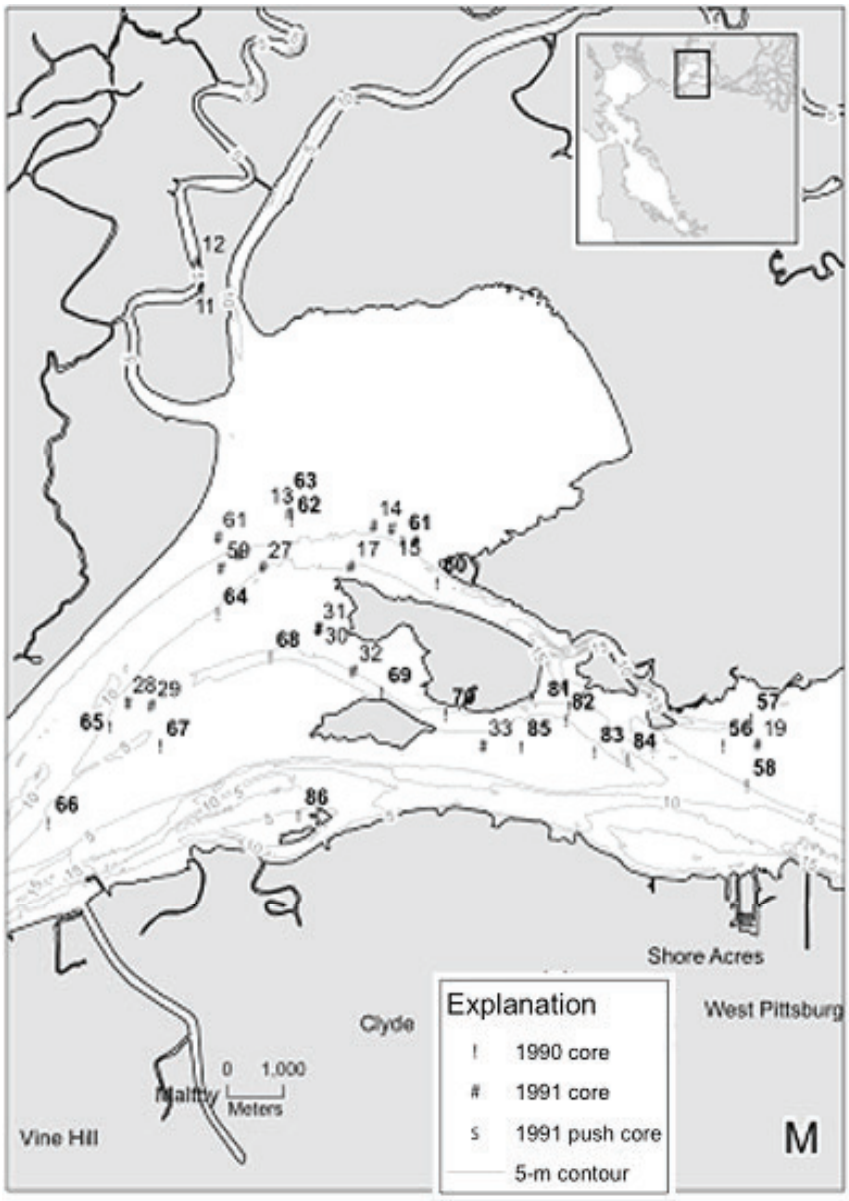


Figure 15 Detailed map of Area M showing locations of cores collected in Suisun Bay east of the Martinez-Benicia Bridge and Chipps Island, and in Suisun Slough. Note Ryer and Roe Islands in the center of the figure.

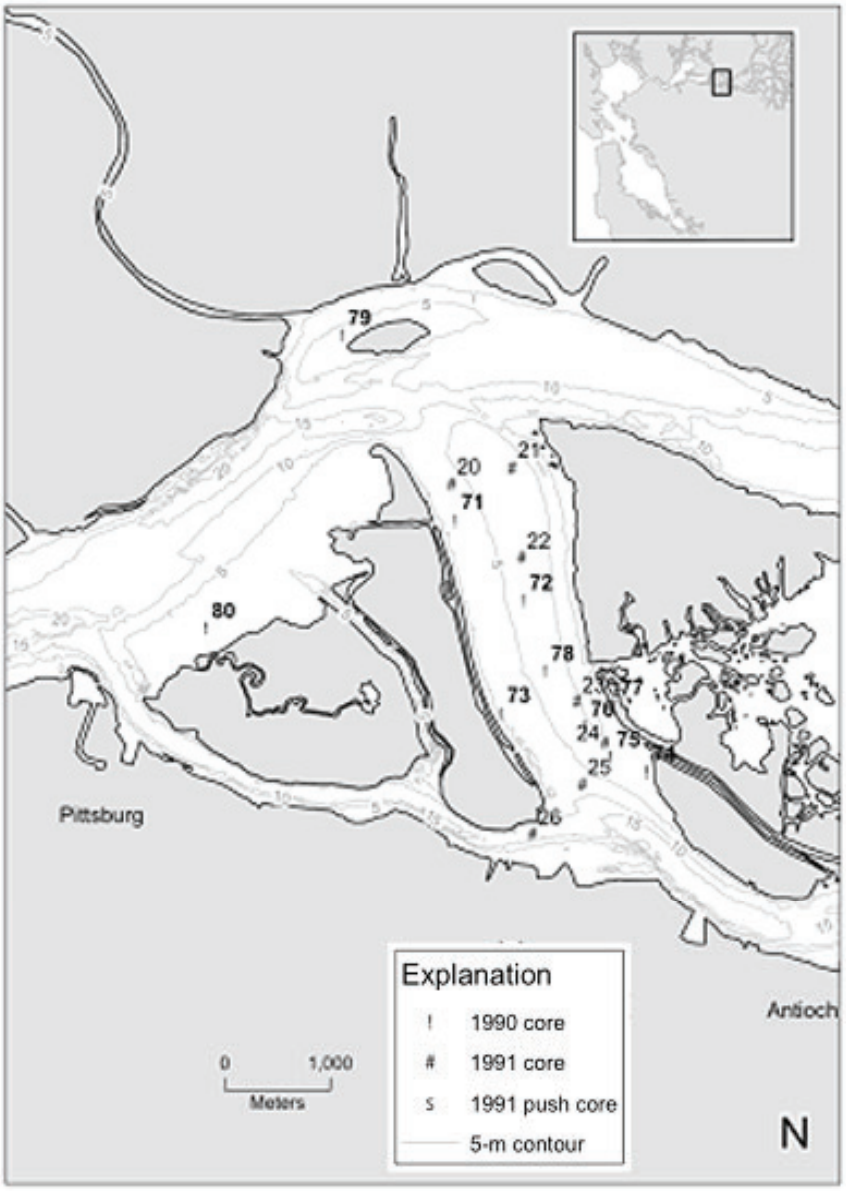


Figure 16 Detailed map of Area N showing locations of cores collected along the confluence of the Sacramento and San Joaquin Rivers. Note from left center to right center of the figure; Browns, Winter and Sherman Islands.

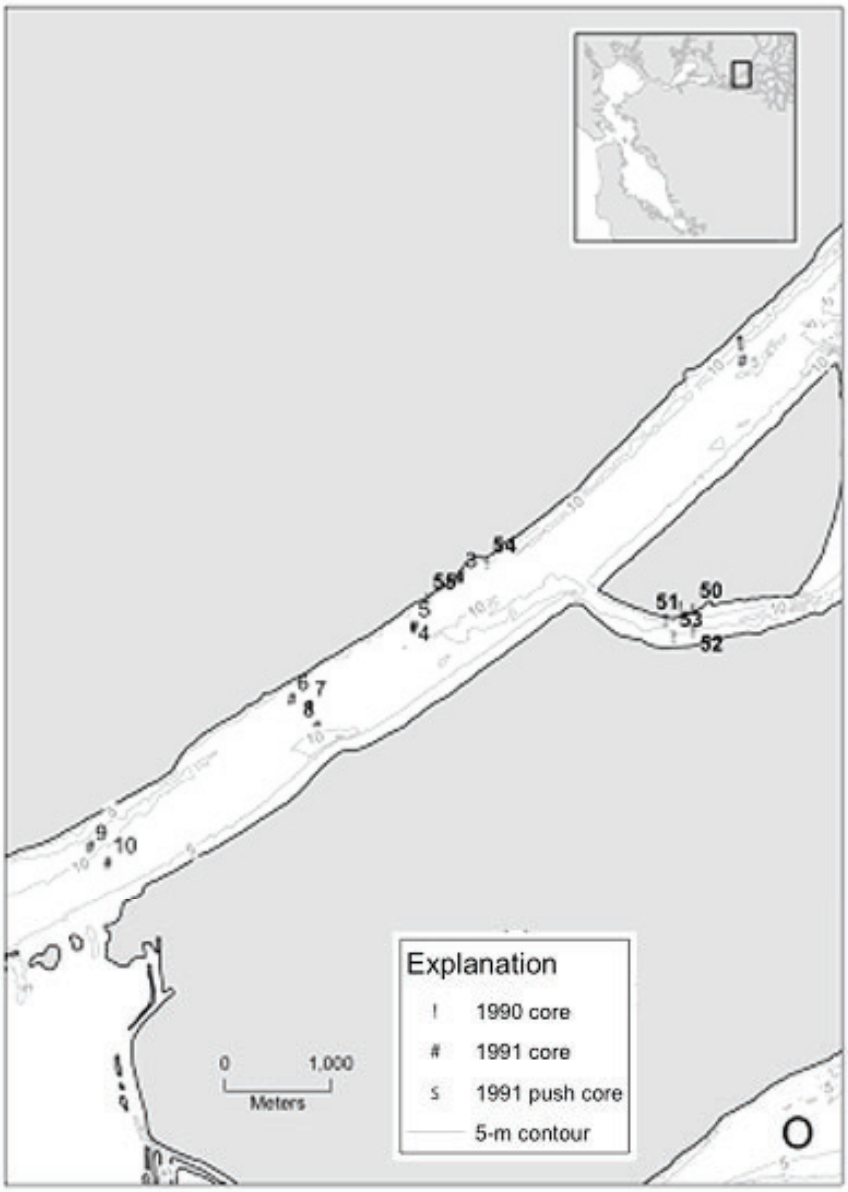

Figure 17 Detailed map of Area O showing locations of cores collected along the Sacramento River from Sherman to Decker Islands.

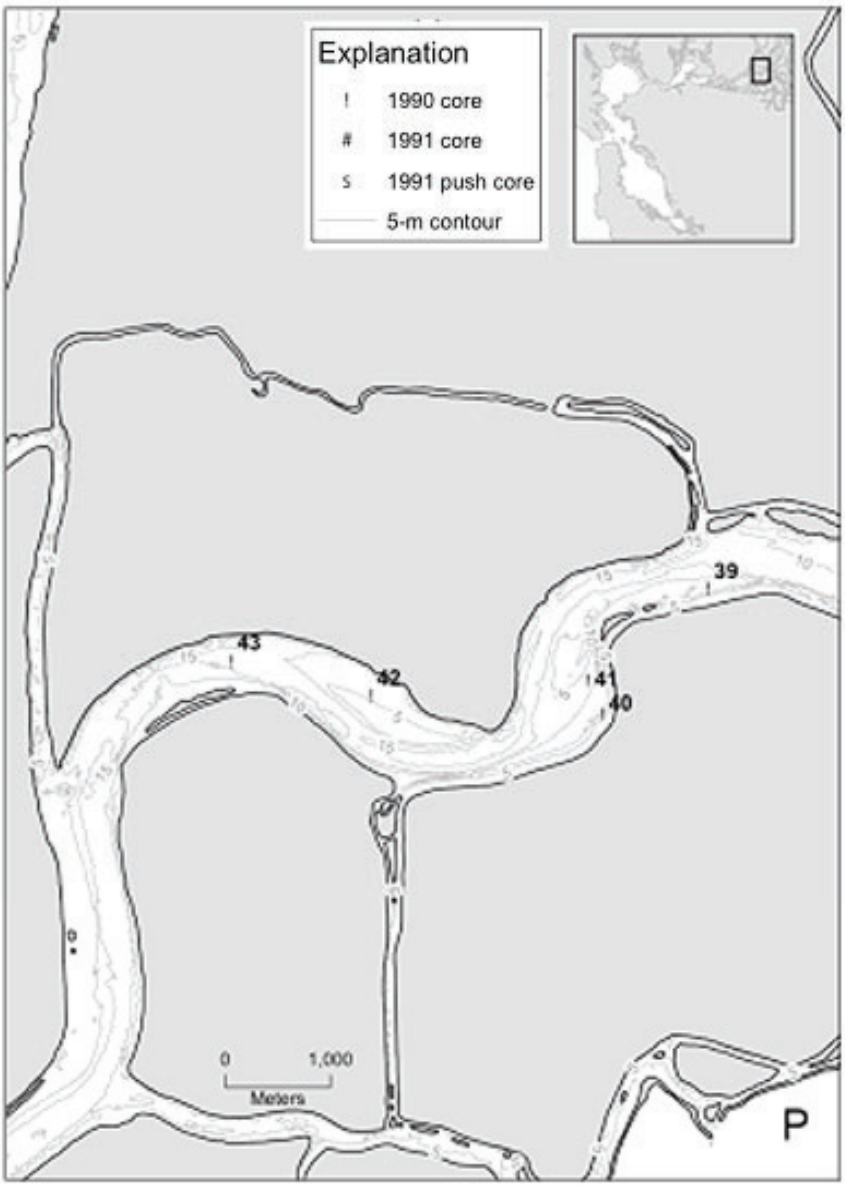


Figure 18 Detailed map of Area P showing locations of cores collected along the San Joaquin River between Three Mile Slough and Seven mile Slough.

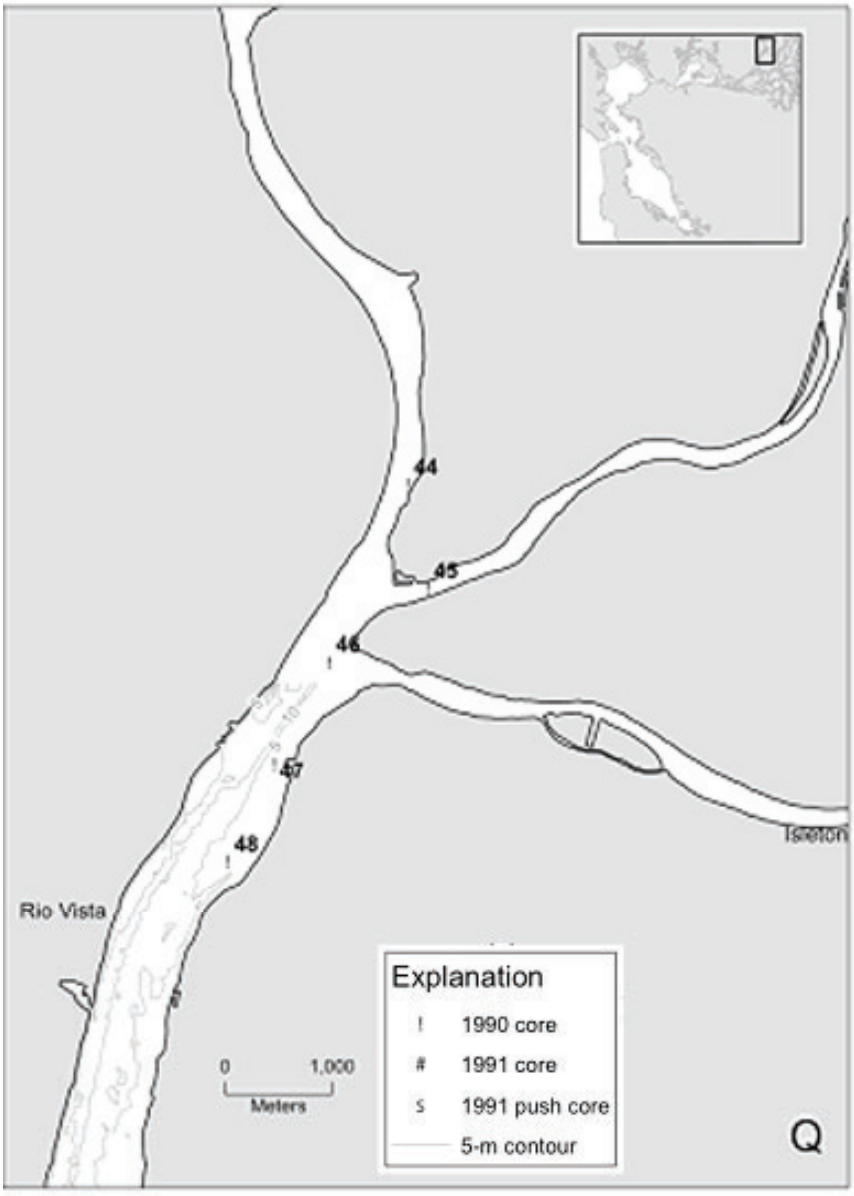


Figure 19 Detailed map of Area Q showing locations of cores collected on the Sacramento River northeast of Rio Vista to Steamboat and Cache Sloughs.

# CORE TABLES

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|

## J-1-90-SF
## 1990 Cores
### Map A & B

**South San Francisco Bay, South of the Dumbarton Bridge**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 1-G-23 | Coyote Crk. mouth N. Bank | 37° 27.65' -122° 2.83' | 4.4 | 200 lb 3.0 m barrel (G) | 1.34 | faintly stiff mud |
| 2 | 2-G-23 | Coyote Crk. mouth up slope | 37° 27.65' -122° 2.83' | 2 | 200 lb 3.0 m barrel (G) | 1.19 | Less cohesive mud at the surface |
| 3 | 3-G-23 | Coyote Crk mouth E. of #2 N. bank | 37° 27.70' -122° 2.68' | 2 | 3.0 m barrel (G) | 2.10 | probable compaction shelly mud |
| 4 | 4-G-23 | Btwn Coyote Crk & Guadalupe Slough in the Thalweg | 37° 27.57' -122° 3.17' | 3.25 | 3.0 m barrel (G) | 1.50 | lower slowly, shell hash at top |
| 5 | 5-G-23 | Upper subtidal flats NW of Calaveras Pt. | 37° 28.10' -122° 3.34' | 2.7 | 3.0 m barrel (G) | 1.53 | lower slowly, shell hash at top |
| 6 | 6-G-23 | Channel Slope N. of Marker #17 | 37° 28.92' -122° 4.58' | 7.5 | 3.0 m barrel (G) | 1.37 | free fall, some shelly material at the top |
| 7 | 7-G-23 | South of Marker #17 on shoal area | 37° 29.23' -122° 4.89' | 5 | 3.0 m barrel (G) | 1.06 | free fall, shell lag at top and bottom |
| 8 | 1-G-24 | Mouth of Mowry Slough N. side | 37° 29.57' -122° 4.72' | 3.75 | 3.0 m barrel (G) | 2.06 | compacting sediment buried head layer of coarse material ≅ 50 cm below the top |
| 9 | 2-G-24 | Down slope from #8 at mouth of Mowry Slough NE Mkr #16 | 37° 29.57' -122° 5.02' | 6 | 1.75 m barrel (G) | 2.03 | top disturbed free fall |
| 10 | 3-G-24 | West of Marker #16 on shoal area across from mouth of Newark Slough | 37° 29.33' -122° 5.21' | 6.25 | 3.0 m barrel (G) | 1.97 | coarse layer ≅ 25 cm from top |
| 11 | 4-G-24 | West of Marker #16 across channel from Newark Slough at top of channel bank | 37° 29.35' -122° 6.10' | 4.3 | 3.0 m barrel (G) | 2.19 | top disturbed worm tubes near the top |
| 12 | 5-G-24 | Thalweg down slope from #11 | 37° 29.49' -122° 6.09' | 8.3 | 3.0 m barrel (G) | 1.72 | shell lag and stiff mud at the bottom, shell fragments on top |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 13 | 6-G-24 | On channel slope near mouth of Newark Slough | 37° 29.74' -122° 5.99' | 5 | 3.0 m barrel (G) | 1.67 | faintly stiff mud at bottom |
| 14 | 7-BC-24 | Mouth of Newark Slough down slope from #13 | 37° 29.83' -122° 5.97' | 5.5 | (B) box core | | had 3 to 4 cm of mud above box-disturbed upper layer. |

**J-1-90-SF**

**South San Francisco Bay, Between the San Mateo and Dumbarton Bridge**

**Map B, C, & D**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 15 | 8-BC-24 | S. Bay just N. of Dumbarton Bridge, on west side of the main channel near top of channel bank | 37° 31.18' -122° 8.56' | 5.6 | (B) | | shell at the top worm tubes w/worms |
| 16 | 9-BC-24 | Same area as #15 down slope on same bank | 37° 31.18' -122° 8.56' | 8.25 | (B) | | big worms and tubes cores are aligned to each other with a line to long end of box core |
| 17 | 10-G-24 | Same area as #15 & 16 down slope near the thalweg | 37° 31.20' -122° 8.51' | 9 | 3.0 m barrel (G) | .40 | |
| 18 | 11-G-24 | Same area as #16 & 17 in the thalweg | 37° 31.20' -122° 8.51' | 9 | 3.0 m barrel (G) | 1.20 | free fall, sand, shell bed oysters in core catcher |
| 19 | 12-G-24 | North side of channel in line with #18 along the thalweg | 37° 31.22' -122° 8.51' | 11 | 3.0 m barrel (G) | 1.01 | free fall |
| 20 | 1-G-25 | North of #19 along thalweg | 37° 31.31' -122° 8.58' | 18 | 2.5 m barrel (G) | 1.34 | Oyster shells in core catcher, shell with sandy silt on bottom, top has shells, tube worms, silt |
| 21 | 2-G-25 | Along the break in slope in line with #20 | 37° 31.45' -122° 8.55' | 14.7 | 2.5 m barrel (G) | .65 | shells and sand at the bottom |
| 22 | 3-G-25 | Up slope from # 21 north side of main channel | 37° 31.52' -122° 8.51' | 5.2 | 3.0 m barrel (G) | 2.15 | free fall, buried the head, bottom: fairly clean mud, top: real clean mud, a few burrows |
| 23 | 4-G-25 | Up slope of #22 on the subtidal flat | 37° 31.59' -122° 8.44' | 7.2 | 2.5 m barrel (G) | 1.76 | buried head, clean mud at the bottom, top: clean mud, a few burrows |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 24 | 5-G-25 | Along the break in slope just above the thalweg south of the mouth of Redwood Creek | 37° 31.82' -122° 9.74' | 6.2 | 3.0 m barrel (G) | 1.51 | let down slowly, shells at the bottom, shells at the top |
| 25 | 6-G-25 | South of the mouth of Redwood Creek in line with #24 in 4.7 m of water, south of # 26 | 37° 31.72' -122° 9.90' | 4.7 | 2.5 m barrel (G) | .75 | two attempts, shell on bottom: slightly sandy silt, top: shells |
| 26 | 7-G-25 | South of the mouth of Redwood Creek north of #25 along the channel slope | 37° 31.83' -122° 10.07' | 6 | 2.5 m barrel (G) | 2.01 | free fall, sandy silt, top: worm tubes, shells |
| 27 | 8-G-25 | South of the mouth of Redwood Creek north of #26 along the channel slope in deeper water | 37° 31.96' -122° 10.21' | 7.5 | 2.5 m barrel (G) | 2.11 | free fall, bottom: firm mud, top: small shell fragments worm tubes, sand |
| 28 | 9-G-25 | Adjacent to the mouth of Redwood Creek south of the shoals. | 37° 32.47' -122° 11.18' | 3.25 | 3.0 m barrel (G) | 1.08 | bottom - shells top: shells |
| 29 | 10-G-25 | Down slope of #28 near the Redwood Creek mouth shoals | 37° 32.67' -122° 11.15' | 6.1 | 3.0 m barrel (G) | 1.80 | bottom: stiff mud, no shells, top: firm mud, shells |
| 30 | 11-G-25 | On top of the Redwood Creek mouth shoals south of the mouth | 37° 32.66' -122° 11.41' | 3.9 | 3.0 m barrel (G) | 2.85 | buried head, bottom: firm mud, top: mud, shells |
| 31 | 12-G-25 | Down slope of #30 south of the mouth of Redwood Ck. | 37° 32.77' -122° 11.40' | 11.2 | 3.0 m barrel (G) | 1.63 | bottom: firm mud, top: firm mud, shells |
| 32 | 13-G-25 | South of the mouth of Redwood Ck.,south of #28 near the thalweg | 37° 32.47' -122° 10.85' | 12.5 | 3.0 m barrel (G) | .40 | problems: short take, bottom: clay with shell material, top: worms, shell, not sure core went in vertically |
| 33 | 14-G-25 | Down slope of #31 adjacent to the mouth of Redwood Ck. | 37° 32.95' -122° 11.09' | 4.2 | 3.0 m barrel (G) | .62 | let down slowly, bottom: shell hash top: shell, |
| 34 | 1-G-26 | Along Northeast side of the main channel on the slope of the channel in line with #30,31, &33 | 37° 33.31' -122° 10.70' | 9.2 | 2.5 m barrel (G) | 2.14 | bottom: cohesive stiff clay mud top: shell hash, worm tubes |
| 35 | 2-G-26 | Near the thalweg of the main channel in-line with #28, & 29. | 37° 32.79' -122° 11.07' | 10.5 | 2.5 m barrel (G) | 2.20 + .25 | lost about 20 cm of bottom of the core: cohesive mud, top: some shelly material |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 36 | 3-G-26 | Near the Thalweg along northeast side of the channel in-line with #35 | 37° 33.01' -122° 10.82' | 14 | 3.0 m barrel (G) | 2.03 | free fall, bottom: sand fairly well sorted |
| 37 | 4-G-26 | Upslope and north of #36 | 37° 33.21' -122° 10.93' | 10.5 | 3.0 m barrel (G) | 1.88 | free fall, bottom: shelly mud, top: silt? with some shell fragments |
| 38 | 5-G-26 | Near the top of the Northeast channel margin upslope of #34 | 37° 33.51' -122° 10.64' | 5.5 | 3.0 m barrel (G) | 2.20 | free fall, bottom: mud, some shells |
| | | | **J-2-90-SF** | | | | |
| | | | **San Joaquin River** | | | | |
| | | | Map P | | | | |
| 39 | SFB013090-1 | San Joaquin River from Marker #39 shallow water on bank of point bar | 38° 6.06' -121° 36.70' | 4.0-4.5 | 2.5 m barrel (G) | 1.50 | silty sand |
| 40 | SFB013090-2 | South west of core #39 in 6.5 m water no core penetration | 38° 5.43' -121° 37.40' | | 2.5 m barrel (G) | | sample consist of bag sample no penetration with both box and gravity core fine silty sand on bottom. |
| 41 | SFB013090-3 | Station south of Marker #38 | 38° 5.61' -121° 37.49' | 6.0 | 2.5 m barrel (G) | 1.50 | sandy in top 30 cm, muddy below |
| 42 | SFB013090-4 | On channel bank | 38° 5.55' -121° 38.90' | 4.2 | 2.5 m barrel (G) | | |
| 43 | SFB013090-5 | Point bar upstream end | 38° 5.73' -121° 39.80' | 4.0 | 2.5 m barrel (G) | | at edge of tules |
| | | | **J-2-90-SF** | | | | |
| | | | **Sacramento River from Northeast of Rio Vista to the San Joaquin River** | | | | |
| | | | **Map O, P & Q** | | | | |
| 44 | SFB013190-1 | Sacramento River from up-stream of Marker #41 near dredged channel | 38° 11.49' -121° 39.36' | 13.5 | 1.0 m barrel (G) | ~.25 | stiff mud overlain by mud |
| 45 | SFB013190-2 | Up Steam Boat slough, in sand waves | 38° 10.97' -121° 39.25' | 1.8 | 1.0 m barrel (G) | bagged sample | coarse sand |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 46 | SFB013190-3 | Upper part of small bar, very steep bank | 38° 10.60' -121° 39.88' | 1.5 | 1.0 m barrel (G) | very little penetration | core much disturbed |
| 47 | SFB013190-4 | From N. bank | 38° 10.09' -121° 40.25' | 2.8 | 1.0 m barrel (G) | .50 | good core |
| 48 | SFB013190-5 | On the upper part of a bank protected from upstream flow | 38° 9.61' -121° 40.55' | 2.3 | 1.0 m barrel (G) | .30 | badly disturbed sample fairly coarse sand |
| 49 | SFB013190-6 | Decker Island on the S. side of the island | 38° 4.99' -121° 43.56' | 2.5 | 1.5 m barrel (G) | 1.50 | fine densely packed sand |
| 50 | SFB013190-7 | Same site as #49 | 38° 4.98' -121° 43.48' | 2.5 | l.5 m barrel (G) | 2.50 | soupy top |
| 51 | SFB013190-8 | Same site as #50 | 38° 4.93' -121° 43.66' | 4.5 | 2.5 m barrel (G) | | |
| 52 | SFB013190-9 | Base of slope below #50, and 51 | 38° 4.87' -121° 43.48' | 7.2 | 2.5 m barrel (G) | 1.5 | filled core barrel, losing the top 15-20 cm |
| 53 | SFB013190-10 | In thalweg vicinity of #51, 52, & 53 | 38° 4.84' -121° 43.61' | 8.5 | 2.5 m barrel (G) | .80 | disturbed coarse sand at the top, mud then coarse sand at the base |
| 54 | SFB013190-11 | Flat bottom, no sand waves near N. bank of Sacramento. R. | 38° 5.23' -121° 44.81' | 7.3 | 1.5 m barrel (G) | 1.5 | buried head found mud |
| 55 | SFB013190-12 | Same location as #54 | 38° 5.05' -121° 45.20' | 7.3 | 2.5 m barrel (G) | 2.5 | peat (wood detritus) in bottom of both cores loss in the top of the short barrel. |

## J-2-90-SF

**Suisun Bay in the vicinity of Roe and Ryer Island**

**Map M**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 56 | SFB020190-1 | SE of Dutton Island in Honker Bay | 38° 4.10' -121° 57.72' | 3 | 3.0 m barrel (G) | 1.55 | free fall, flat smooth bottom |
| 57 | SFB020190-2 | Further up Honker Bay | 38° 4.35' -121° 57.38' | 2.7 | 3.0 m barrel (G) | 1.63 | flat surface above smooth sloping muddy bank |
| 58 | SFB020190-3 | Margin of Honker Bay between sites #56 & 58 | 38° 3.73' -121° 57.43' | 2.8 | 3.0 m barrel (G) | 1.94 | between sites 1 & 3 |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 59 | SFB020190-4 | Channel floor E. of Snag Island. Sand waves on fathometer | 38° 4.57' -121° 59.42' | 5.5 | 1.75 m barrel (G) | .60 | smooth floor below platform w/sand waves |
| 60 | SFB020190-5 | Channel of Pt. Buckler feeding into Grizzly Bay. | 38° 5.67' -122° 1.16' | 9 | 2.5 m barrel, (G) | 1.30 | sand at top |
| 61 | SFB020190-6 | On sloping bank midway in Grizzly Bay mouth | 38° 6.06' -122° 1.58' | 3.6 | 2.5 m barrel, (G) | 2.05 | wood detritus in bottom, bagged sample |
| 62 | SFB020190-7 | Between mouth of Suisun Slough & Garnet Pt. on Ryer Island, on high in channel center | 38° 6.27' -122° 2.93' | 3 | 2.5 m barrel, (G) | 2.01 | 18 cm sand at top |
| 63 | SFB020190-8 | Inshore in Grizzly Bay | 38° 6.47' -122° 2.97' | 2 | 3.0 m barrel (G) | 3.05 | filled the 3.0 m barrel (G), mud 10 - 20 cm ? loss of the top of core |
| 64 | SFB020190-9 | On ridge extending SW into main Suisun Bay channel (shoal extension of Garnet Pt. | 38° 5.39' -122° 3.83' | 2.3 | 1.75 m barrel (G) | .76 | |
| 65 | SFB020190-10 | At the tip of shoal in the middle of Susiun Bay south of the Mothball fleet | 38° 4.35' -122° 5.16' | 3.3 | 2.5 m barrel, (G) | 1.69 | sand in upper part of core (liquidized) organic detritus in base |
| 66 | SFB020190-11 | Old geochemical site., Sand waves seen on fathometer | 38° 3.45' -122° 5.91' | 3.5 | 2.5 m barrel, (G) | N/C | bag sample much washing not enough stratigraphic coherence to keep |
| 67 | SFB020190-12 | Southeast of #65 on sand shoals | 38° 4.16' -122° 4.54' | 3.2 | 2.5 m barrel, (G) | 2.30 | |
| 68 | SFB020190-13 | Just North over divide into channel between Roe & Ryer Islands | 38° 4.99' -122° 3.20' | 4.5 | | | |
| 69 | SFB020190-14 | N. of Roe Island on bank | 38° 4.64' -122° 1.85' | 4.0 | 2.5 m barrel, (G) | .35 | poor penetration, sand waves on fathometer |
| 70 | SFB020190-15 | S. side Ryer Island base of channel | 38° 4.43' -122° 1.07' | 5.5 | 1.75 m barrel (G) | 1.07 | sand with some wood at the base |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| | | | **J-2-90-SF**<br>**San Joaquin River near the confluence with the Sacramento River**<br>**area of Fraser Shoal**<br>**Map N** | | | | |
| 71 | SFB020290-1 | W.bank (steep bank of broad slough., Nose of boat almost on bank | 38° 3.25'<br>-121° 50.76' | 1.1 | 2.5 m barrel, (G) | 1.52 | mostly organic hash |
| 72 | SFB020290-2 | On W. side of Medial shoal in Broad Slough ~ 1/2 up slough smooth bottom gradual incline | 38° 2.84'<br>-121° 50.33' | 2.75 | 1.75 m barrel (G) | 1.70 | head partly buried in mud, sandy at top, sandy silt at base. |
| 73 | SFB020290-3 | W. bank of Broad Slough on steep slope | 38° 2.27'<br>-121° 50.48' | 3.5 | 2.5 m barrel, (G) | 1.04 | organic rich top and bottom |
| 74 | SFB020290-4 | NW bank of Kimball Island | 38° 1.97'<br>-121° 49.54' | 2.5 | 2.5 m barrel, (G) | .60 | sand and mud |
| 75 | SFB020290-5 | E channel of Broad Slough, S. end sand waves | 38° 2.04'<br>-121° 49.78' | 4.7 | 2.5 m barrel, (G) | .20 | sand |
| 76 | SFB02029--6 | Channel floor E. channel of Broad Slough | 38° 2.20'<br>-121° 49.94' | 7.4 | 2.5 m barrel, (G) | 1.03 | 7 cm sand at top sharply/mud |
| 77 | SFB020290-7 | E. bank of channel at location of # 77 upper bank | 38° 2.30'<br>-121° 49.75' | 2.2 | 2.5 m barrel, (G) | 1.90 | base of head buried/mud |
| 78 | SFB020290-8 | W.bank of channel (Fraser shoal side) | 38° 2.48'<br>-121° 50.19' | 3.2 | 2.5 m barrel, (G) | 1.98 | organics at base good core |
| 79 | SFB020290-9 | W bank of channel behind Chain Island | 38° 4.18'<br>-121° 51.49' | | 2.5 m barrel, (G) | 2.26 | mud/ penetration |
| 80 | SFB020290-10 | NW side of Browns Island- lee on depositional slope irregular bathymetry slumps? sand waves? (slumps? on side scan record) | 38° 2.72'<br>-121° 52.39' | 3.4 | 2.5 m barrel, (G) | N/C | No penetration no core sandy on core bottom bagged sand |
| | | | **J-2-90-SF**<br>**Suisun Bay, South of Ryer Island to Seal Island**<br>**Map M** | | | | |
| 81 | SFB020590-1 | On S. side of shoal extending SE from Ryer Island in ~ 3 m | 38° 4.48'<br>-121° 59.58' | 2.75 | 2.5 m barrel, (G) | 2.15 | good penetration head partly buried in mud |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 82 | SFB020590-2 | Channel floor | 38° 4.37' -121° 59.63' | 6.6 | 1.25 m barrel (G) | .22 | sand/sand mud |
| 83 | SFB020590-3 | On N. bank of Middle Ground S of SE end of Ryer Island v. irregular bottom-excavation? | 38° 4.06' -121° 59.28' | 3 | 2.5 m barrel, (G) | 1.13 | 38 cm sand, sand waves ebb oriented 5 m depth channel off NE end Middle Ground |
| 84 | SFB020590-4 | NE end of Middle Ground | 38° 3.99' -121° 58.88' | 3.5 | 1.75 m barrel (G) | ~.30 | sand/mud |
| 85 | SFB020590-5 | S bank Middle Shoal between #17 & # 19 | 38° 4.12' -122° 0.16' | 2.2 | 1.75 m barrel (G) | N/C | no penetration shells separated valves disarticulated in both 4' & 2.5 m barrel (G) cast (bag sample) |
| 86 | SFB020590-6 | Shoal area W. of Seal Island smooth bottom sloping bank | 38° 3.50' -122° 2.87' | 2.5 | 2.5 m barrel, (G) | 1.00 | decent penetration sand on outside of core barrel |
| | | **J-2-90-SF**<br>**Carquinez Straits**<br>**Map K & L** | | | | | |
| 87 | SFB020690-1 | On bank N. side of channel at Benicia bend | 38° 2.45' -122° 8.91' | 3 | 1.75 m barrel (G) | .96 | gravel at the top |
| 88 | SFB020690-2 | On bank SE of South Hampton Bay - off Commodore Jones Point | 38° 3.32' -122° 10.49' | 2.25 | 2.5 m barrel, (G) | 2.30 | core nearly full |
| 89 | SFB020690-3 | On bank just off site 2 off Commodore Jones Pt. | 38° 3.20' -122° 10.42' | 5.4 | 2.5 m barrel, (G) | 2.05 | bury 5' core & head top 15 cm looks like detrital mud clasts shells |
| 90 | SFB020690-4 | Slightly deeper >3 | 38° 3.16' -122° 10.53' | 7.5 | 2.5 m barrel, (G) | 1.99 | less penetration shells at top |
| 91 | SFB020690-5 | Deeper than #90 | 38° 3.21' -122° 10.70' | 10.7 | 1.5 m barrel (G) | .90 | barrel partly full |
| 92 | SFB020690-06 | Near base of slope smooth bottom to 18 m | 38° 3.27' -122° 10.59' | 12.75 | 1.5 m barrel (G) | .63 | some sand |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

## J-2-90-SF

**San Pablo Bay from the mouth of the Napa River to Sisters Rocks and Petaluma River**

**Map J**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 93 | SFB020690-7 | On sediment build up in front of dike #9, Mare Island Strait | 38° 4.11' -122° 14.14' | 4.75 | 2.5 m barrel, (G) | 1.89 | sand and mud |
| 94 | SFB020690-8 | E. side of build up around pier S.side | 38° 3.32' -122° 15.29' | 5 | | 1.68 | 52 cm of sand at top/mud |
| 95 | SFB020690-9 | Entrance to the Petaluma River from San Pablo Bay-channel floor | 38° 1.23' -122° 25.68' | 3 | 2.5 m barrel, (G) | 2.21 | |
| 96 | SFB020690-10 | W bank of Petaluma channel mouth actually just beyond bank top | 38° 2.66' -122° 25.49' | 2.5 | 2.5 m barrel, (G) | 2.50 | slowly dropped, buried head at 2.5 m barrel (G) really soupy mud |
| 97 | SFB020690-11 | Petaluma River off bend with towers Black John slough, accretionary bank-channel floor is at 4.5 m | 38° 8.35' -122° 31.06' | 3.5 | 3.0 m barrel (G) | 2.84 | buried barrel and head, mud no shells at base |
| 98 | SFB020690-12 | W. margin of channel just above base of channel | 38° 8.44' -122° 31.04' | 4 | 3.0 m barrel (G) | 2.38 | |
| 99 | SFB020690-13 | Central San Pablo Bay N of ship channel | 38° 2.38' -122° 23.72' | 2.5 | 3.0 m barrel (G) | 2.89 | smooth bottom full 10' core but not extruded at top |
| 100 | SFB020790-1 | San Pablo Bay | 38° 3.45' -122° 16.26' | 13 | 2.5 m barrel, (G) | .39 | sandy clean sand/mud |
| 101 | SFB020790-2 | On bank (upper part) sand waves at base | 38° 2.41' -122° 16.71' | 6.5 | 2.5 m barrel, (G) | 1.90 | good core |
| 102 | SFB020790-3 | On old geochemical sample site #39 SW of Lone Tree Pt. smooth bottom | 38° 1.83' -122° 17.15' | | 2.5 m barrel, (G) | 2.55 | shell at top |
| 103 | SFB020790-4 | Pinole shoal | 38° 2.50' -122° 18.92' | 10 | 2.5 m barrel, (G) | .97 | disturbed sand/mud |
| 104 | SFB020790-5 | N. side of ship channel San Pablo Bay on platform | 38° 3.65' -122° 19.69' | 4 | 2.5 m barrel (G) | 2.03 | buried head, mud all the way |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 105 | SFB020790-6 | In ~ 5.5 m to test sand mud interface 5.5 to 6 m sand waves | 38° 3.03' -122° 19.35' | 5.5-6 | 2.5 m barrel, (G) | 2.10 | buried head no sand mud throughout core split in barrel |
| 106 | SFB020790-7 | Old geochemical site #45 in shallow area N central San Pablo Bay | 38° 4.40' -122° 22.51' | 3.2 | 3.0 m barrel (G) | | undisturbed top oxidized mud at surface |
| 107 | SFB020790-8 | S of ship channel, Pinole Shoal middle part | 38° 2.02' -122° 19.57' | 4.5 | 2.5 m barrel, (G) | 2.38 | smooth bottom |
| 108 | SFB020790-9 | Shallow central Pinole Shoal | 38° 1.61' -122° 19.10' | 3 | 3.0 m barrel (G) | 2.53 | |
| 109 | SFB020790-10 | W end of Pinole Shoal (Shallow) | 38° 1.19' -122° 20.96' | 3.5 | 2.5 m barrel, (G) | 2.71 | shell lag |
| 110 | SFB020790-11 | Off Pinole Pt, sloping bank | 38° 1.44' -122° 22.09' | 6 | 2.5 m barrel, (G) | 1.79 | sand waves on furrows on fathometer |
| 111 | SFB020790-12 | W. of Pinole Pt. irregular bottom | 38° 0.69' -122° 22.53' | 2 | 2.5 m barrel, (G) | 2.49 | filled barrel |
| 112 | SFB020790-13 | Deeper water on slope between Pt San Pablo at Pinole Pt, sand waves | 38° 0.03' -122° 23.70' | ~5.2 | 2.5 m barrel, (G) | 2.03 | no sand waves |
| 113 | SFB020790-14 | Near bank top, NW of Pt San Pablo (just on bank top) | 37° 59.35' -122° 24.24' | 3 | 2.5 m barrel, (G) | 1.99 | sandy mud |
| 114 | SFB020790-15 | N. of Pt San Pedro in small trough, very irregular bottom 1 m relief, ~ 3' penetration | 37° 59.89' -122° 26.58' | 5 | 1.75 m barrel (G) | .93 | |
| 115 | SFB020790-16 | Old geochemical sample site #75, platform N. of Pt San Pedro too shallow to reach | 38° 0.72' -122° 27.04' | | 3.0 m barrel (G) | 2.60 | good upper 65 cm shelly at top |

**J-2-90-SF**
**Richmond San Rafael Bay from Pt. San Pedro to South of Paradise Cay**
**Map J & H**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 116 | SFB020890-1 | Top of steep bank N of San Rafael Bay | 37° 58.35' -122° 27.14' | 2 | 2.5 m barrel, (G) | 1.83 | |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 117 | SFB020890-2 | Mid bank down from #116 | 37° 58.32' -122° 27.00' | 6.5 | 2.5 m barrel, (G) | 2.10 | partly buried head |
| 118 | SFB020890-3 | Lower bank down from sites 115 & 116 | 37° 58.29' -122° 26.86' | 12/5 | 2.5 m barrel, (G) | 1.90 | good core not buried |
| 119 | SFB020890-4 | Channel floor down from 115 & 116 bottom flattens at ~ 16.5 m | 37° 58.17' -122° 26.87' | 16.5 | 2.5 m barrel, (G) | 1.47 | sandy at top |
| 120 | SFB020890-5 | Upper bank where it is more gentle, S of the San Rafael boat channel, smooth bottom | 37° 57.69' -122° 27.50' | 2.5 | 3.0 m barrel (G) | 2.33 | buried head |
| 121 | SFB020890-6 | Down slope from #120 ~ 5 m depth | 37° 57.61' -122° 27.33' | 5 | 3.0 m barrel (G) | 2.32 | buried head |
| 122 | SFB020890-7 | Lower most slope below #119 & 120 | 37° 57.54' -122° 27.15' | 13 | 2.5 m barrel, (G) | 1.51 | |
| 123 | SFB020890--8 | Channel floor out from sites #119 -121, not quite flat | 37° 57.28' -122° 26.68' | 19 | 2.5 m barrel, (G) | 2.17 | sand/mud |
| 124 | SFB020890-9 | S. San Rafael Bridge or San Quentin Bay platform at 4 m | 37° 55.43' -122° 28.39' | 4 | 3.0 m barrel (G) | 2.45 | 3.0 m barrel (G) buried |
| 125 | SFB020890-10 | On irregular bottom | 37° 54.78' -122° 27.55' | 7 | 2.5 m barrel, (G) | 2.45 | buried |
| 126 | SFB020890-11 | Channel floor SE from Paradise Cay | 37° 54.33' -122° 27.60' | 9 | 2.5 m barrel, (G) | 1.45 | |
| 127 | SFB020890-12 | Inshore-up bank from depth 5.5m | 37° 54.28' -122° 27.91' | 5.5 | 2.5 m barrel, (G) | 1.90 | buried head |
| 128 | SFB020890-13 | Top of bank between Paradise Cay and Pt Chauncey smooth gently sloping bottom | 37° 54.17' -122° 28.04' | 2 | 2.5 m barrel, (G) | 2.49 | really buried head |
| | | | **J-2-90-SF** **Richardson Bay Map H & I** | | | | |
| 129 | SFB020990-1 | Richardson Bay Center | 37° 52.46' -122° 29.42' | 2 | 3.0 m barrel (G) | 2.93 | mud |
| 130 | SFB020990-2 | Mouth of Richardson Bay midway up gentle slope from 4 - 2 m, Upper part of a fairly abrupt drop mud bottom | 37° 51.64' -122° 28.19' | 5 | 2.5 m barrel, (G) | 1.98 | lost a bit of the top of the core |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 131 | SFB020990-3 | Mouth of Richardson Bay, top of steep slope into central bay | 37° 51.51' -122° 28.15' | 6 | 2.5 m barrel, (G) | 2.40 | sand waves, mud, buried 8' core and head, shell in bottom, sandy at the top |
| 132 | SFB020990-4 | Slope into Richardson Bay ± mid slope | 37° 51.40' -122° 28.02' | 18.5 | 2.5 m barrel, (G) | 2.08 | mud buried to head double reflector soupy top of core transparent fluid layer. |
| 133 | SFB020990-5 | Same location as #131 | 37° 51.36' -122° 28.00' | 18.5 | 1.75 m barrel (G) | | upper part of sedimentary column good core yogurt like mud at top, potters clay at base |
| 134 | SFB020990-6 | Still further down slope from #131 and 132 1 m above the base of the slope | 37° 51.29' -122° 28.08' | 29 | 2.5 m barrel, (G) | 2.50 | mud buried head full 8' core intact top |

**J-2-90-SF**

**Central Bay Off Richmond and Berkeley Marinas**

**Map I & H**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 135 | SFB020990-7 | A few meters down slope from #133 to sample area below break in slope | 37° 51.22' -122° 28.06' | 30 | 2.5 m barrel, (G) | N/C | Muddy shell sand, gravel bag sample sand/gravel/soft mud slight penetration |
| 136 | SFB020990-8 | Crest of South Hampton Shoal ± irregular bottom with flank ± smooth top | 37° 53.05' -122° 24.00' | 7 | 1.75 m barrel (G) | .20 | some penetration sand |
| 137 | SFB020990-9 | Trough floor E of South Hampton Shoal | 37° 53.30' -122° 23.65' | 8 | 2.5 m barrel, (G) | 1.30 | sandy mud |
| 138 | SFB020990-10 | Sloping bank WSW of Brooks Island | 37° 53.59' -122° 23.25' | 4 | | | |
| 139 | SFB020990-11 | Shallow subtidal flats S. of Richmond | 37° 53.37' -122° 21.47' | 2 | 3.0 m barrel (G) | filled | |
| 140 | SFB020990-12 | Platform N of Berkeley Pier distinct bottom irregular sand waves | 37° 51.41' -122° 21.54' | 4.5 | 3.0 m barrel (G) | 2.04 | mud |
| 141 | SFB020990-13 | On platform N of Treasure Island | 37° 50.87' -122° 22.67' | 9.5 | 3.0 m barrel (G) | | poor penetration sticky sand |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**J-2-90-SF**
**South San Francisco Bay**
**South and adjacent to the San Mateo Bridge**
**Map E**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 142 | SFB021290-1 | Above top of bank ~ 1.2 m S of San Mateo Bridge | 37° 34.03' -122° 14.10' | 3 | 3.0 m barrel (G) | 2.34 | shell on top |
| 143 | SFB021290-2 | Top of bank just above break in slope | 37° 34.12' -122° 14.03' | | 3.0 m barrel (G) | 2.06 | shell at top and bottom |
| 144 | SFB021290-3 | Bank slope | 37° 34.11' -122° 13.83' | 6.65 | 3.0 m barrel (G) | 1.57 | shell at top and bottom |
| 145 | SFB021290-4 | Base of slope | 37° 34.24' -122° 13.96' | 10.5 | 3.0 m barrel (G) | 1.38 | |
| 146 | SFB021290-5 | Mid channel | 37° 34.35' -122° 13.60' | 14.5 | 3.0 m barrel (G) | 1.18 | Shell at surface sand at depth |
| 147 | SFB021290-6 | Above slope top | 37° 34.80' -122° 13.38' | 4 | 3.0 m barrel (G) | 1.49 | shell at top |
| 148 | SFB021290-7 | Upper mid-bank slope | 37° 34.47' -122° 13.29' | 5.75 | 3.0 m barrel (G) | 2.21 | |
| 149 | SFB021290-8 | Base of slope | 37° 34.55' -122° 13.26' | 16 | 3.0 m barrel (G) | 1.76 | stiff mud at bottom |
| 150 | SFB021290-9 | Lower slope bank | 37° 34.63' -122° 13.27' | 10.5 | 3.0 m barrel (G) | | Stiff mud at base |
| 151 | SFB021290-10 | Shallow subtidal flats SE of San Mateo Bridge | 37° 34.80' -122° 11.57' | 3.5 | 3.0 m barrel (G) | | |

**J-2-90-SF**
**South San Francisco Bay North of the San Mateo Bridge**
**to Potrero Point and Alameda outer harbor**
**Map G, F & B**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 152 | SFB021290-11 | Shallow subtidal flats off Coyote Pt. | 37° 35.63' -122° 18.94' | 3.5 | 3.0 m barrel (G) | | buried head |
| 153 | SFB021290-12 | Base of slope N of #8 Marker at or near the slope base | 37° 36.63' -122° 17.67' | 16 | 3.0 m barrel (G) | | |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 154 | SFB021590-1 | Top of slope just N of #8 N of San Mateo Bridge | 37° 36.61' -122° 17.96' | 3.25 | 2.5 m barrel (G) | 1.95 | shelly at surface, shell layer at bottom |
| 155 | SFB021590-2 | Mid-slope N of #8 | 37° 36.69' -122° 17.89' | 7 | 2.5 m barrel (G) | 2.51 | penetrate to core top shell at top and bottom of core |
| 156 | SFB021590-3 | W. bank top off SFO ship channel | 37° 37.83' -122° 19.56' | 3.8 | 2.5 m barrel (G) | 2.25 | bury head |
| 157 | SFB021590-4 | Base of slope E of #3 | 37° 37.90' -122° 19.26' | 8 | 2.5 m barrel (G) | 2.35 | bury head shell layers in bottom |
| 158 | SFB021590-5 | Mid channel S of ship channel furrow field | 37° 38.28' -122° 18.67' | 10.5 | 2.5 m barrel (G) | 2.13 | shelly at base |
| 159 | SFB021590-6 | Subtidal flats off SFO, flat bottom | 37° 37.91' -122° 20.33' | 4 | | 2.48 | shell at top |
| 160 | SFB021590-7 | Channel floor off Oyster Pt. | 37° 39.55' -122° 20.82' | 6 | 2.5 m barrel (G) | | sink head |
| 161 | SFB021590-8 | Top of bank S of Hunters Point | 37° 41.83' -122° 22.16' | 1.8 | 3.0 m barrel (G) | 2.69 | |
| 162 | SFB021590-9 | Mid-bank E of #8 | 37° 41.82' -122° 22.03' | 4.5 | 3.0 m barrel (G) | 2.55 | buried barrel and head |
| 163 | SFB021590-10 | Base of slope E of #160 and 161 | 37° 41.82' -122° 21.88' | 6.25 | | 2.63 | |
| 164 | SFB021590-11 | Channel floor off Hunter s Point | 37° 42.59' -122° 21.06' | 13 | 3.0 m barrel (G) | | full penetration lost of shell on anchor |
| 165 | SFB021590-12 | Channel off Pt Advisadero | 37° 43.36' -122° 19.73' | | 1.75 m barrel (G) | 1.17 | |
| 166 | SFB021590-13 | Channel off Potrero point | 37° 45.09' -122° 20.09' | 14 | 1.75 m barrel (G) | | very short core sand |
| 167 | SFB021590-14 | S. of Alameda evenly gently sloping bottom 30' - 6' in general transition of sand and mud | 37° 45.44' -122° 18.79' | 6 | 2.5 m barrel (G) | 2.52 | filled with sandy mud, shell at top |
| 168 | SFB021590-15 | Shoal area S of Alameda smooth bottom | 37° 45.25' -122° 17.42' | 2.5 | 2.5 m barrel (G) | 2.68 | shell at top and bottom of core |
| 169 | SFB021590-16 | In burrow areas in bottom of one of the excavations normal depth 3.5 | 37° 43.91' -122° 17.02' | 10 | 2.5 m barrel (G) | 1.90 | bury barrel and head stiff mud in core cutter |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 170 | SFB021590-17 | Subtidal flat off N. tip of Oakland Airport | 37° 43.43' -122° 16.48' | 4 | 2.5 m barrel (G) | 2.91 | |
| 171 | SFB021590-18 | Just S. of patch of sand waves on smooth bottom | 37° 43.01' -122° 16.97' | 4 | 2.5 m barrel (G) | .65 | shell/ mud |
| 172 | SFB021590-19 | Near base of gentle slope off NW end Oakland Airport | 37° 42.26' -122° 16.65' | | 2.5 m barrel (G) | 2.52 | |
| 173 | SFB021590-20 | Crest of San Bruno shoal | 37° 39.94' -122° 18.20' | 4 | 1.75 m barrel (G) | | some penetration, sandy w/shells |
| 174 | SFB022090-1 | Area on E. side of channel N. of San Mateo Bridge up to South Hampton Shoal bank top, flat bottom | 37° 36.15' -122° 15.51' | 4.5 | 3.0 m barrel (G) | 2.58 | core bottoms in mixed clean sand, mud penetrates to barrel top |
| 175 | SFB022090-2 | In topographically irregular area | 37° 36.01' -122° 15.57' | 5 | 3.0 m barrel (G) | 2.63 | hint of shell layer in bottom |
| 176 | SFB022090-3 | Mid-slope of bank E. side of channel | 37° 35.90' -122° 15.68' | 10 | 3.0 m barrel (G) | 2.44 | stiff green clay at base |
| 177 | SFB022090-4 | Lower slope of E. bank | 37° 35.73' -122° 15.61' | 14 | 3.0 m barrel (G) | 2.14 | green-yellow stiff clay at core base, shelly at top. |
| 178 | SFB022090-5 | Channel floor in furrow field | 37° 35.53' -122° 15.86' | 17 | 3.0 m barrel (G) | 2.17 | furrows evident good stratification |
| 179 | SFB022090-6 | Above abrupt scarp (dredge) N. of bridge | 37° 36.45' -122° 15.21' | 3.5 | 3.0 m barrel (G) | 2.50 | lots of shells on anchor |
| 180 | SFB022090-7 | Below break in slope | 37° 36.37' -122° 15.34' | | 3.0 m barrel (G) | | buried 3.0 m barrel (G) and head, bag the material from the core cutter.? |
| 181 | SFB022090-8A | In area w/ topographic irregularities on bottom ~ 0.5 m relief | 37° 37.61' -122° 16.08' | 5.5 | 1.75 m barrel (G) | filled barrel | filled 1.75 m barrel (G) |
| 182 | SFB022090-8 | In same area as #180 | 37° 37.70' -122° 16.24' | 5.5 | 2.5 m barrel (G) | 1.81 | shelly at top over mud |
| 183 | SFB022090-9 | Mound structure SE from S. crest of San Bruno Shoal | 37° 38.37' -122° 16.59' | 5.5 | 3.0 m barrel (G) | 2.43 | |
| 184 | SFB022090-10 | Subtidal flats W of San Lorenzo Creek | 37° 40.46' -122° 14.66' | 3.5 | 3.0 m barrel (G) | 2.65 | |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 185 | SFB022090-11 | 1st appearance of bottom irregularities on shallow subtidal flat E of S. Lorenzo | 37° 41.28' -122° 15.48' | | 3.0 m barrel (G) | | Pipeline area - core in flat bottom just beyond dredged material |
| 186 | SFB022090-12 | Bottom irregularities neutral | 37° 41.37' -122° 16.05' | 4.5 | 3.0 m barrel (G) | | |
| 187 | SFB022090-13 | Low ridge w/sand waves | 37° 41.82' -122° 16.91' | 4.5 | 3.0 m barrel (G) | | not likely sand waves/ bury 1.25 m barrel (G)s |
| 188 | SFB022090-14 | Trough of E of N end San Bruno Shoal | 37° 41.38' -122° 18.13' | 9.25 | 3.0 m barrel (G) | short core | sand at bottom |
| 189 | SFB022090-15 | Trough E of San Bruno Shoals upper end | 37° 39.27' -122° 17.00' | 5.5 | 3.0 m barrel (G) | 2.32 | |
| 190 | SFB022090-16 | In mined area at S. end of San Bruno Shoal- on natural flay (finger that protrudes N in the middle of dredged hole) | 37° 37.80' -122° 17.17' | 3 | 3.0 m barrel (G) | 2.64 | sandy mud |
| 191 | SFB022090-17 | On bench at 6.5 m within excavation | 37° 37.91' -122° 17.41' | 6.5 | 3.0 m barrel (G) | | shell at bottom of core |
| 192 | SFB022090-18 | At bottom of excavation | 37° 37.84' -122° 17.57' | 10 | 3.0 m barrel (G) | 2.21 | all mud |
| 193 | SFB02190-1MH | Slump area off Newark Slough., On slope in evacuated zone of slump | 37° 29.76' -122° 5.29' | 5 | 1.75 m barrel (G) | 1.27 | Core for geotechnical analysis |
| 194 | SFB02190-1A | Same area as #192 | 37° 29.76' -122° 5.29' | 5 | 1.75 m barrel (G) | 1.19 | |
| 195 | SFB022190-1 | Free fall in same area of cores 192-193 | 37° 29.76' -122° 5.29' | 5 | 3.0 m barrel (G) | 1.80 | free fall |
| 196 | SFB022190-2MH | Above slump mass | 37° 29.84' -122° 5.55' | 3.25-3.5 | 2.5 m barrel (G) | 1.71 | Core for geotechnical analysis 1st free fall |
| 197 | SFB022190-2 | Same area as 195 | 37° 29.84' -122° 5.55' | 3.25-3.50 | 2.5 m barrel (G) | 1.73 | |
| 198 | SFB022190-3MH | North edge of irregular bottom, down slope from 194 and 195 in slump mass | 37° 29.84' -122° 5.74' | 7.5 | 2.5 m barrel (G) | 1.58 | Core for geotechnical analysis free fall, upper 1.5' probably disturbed |
| 199 | SFB0221903A | Same area as 197 | 37° 29.84' -122° 5.74' | 7.5 | 1.75 m barrel (G) | 1.40 | power down full |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 200 | SFB022190-4 | Base of slope, toe of slump | 37° 29.66' -122° 5.53' | 10 | 2.5 m barrel (G) | 2.05 | power down all the way to bottom |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|

## J-1-91-SF
**1991 Cores, January and February 1991**
**Gravity and Drill Cores**

**Sacramento to the mouth of the San Joaquin River**

**Map O**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 012391-1 | N. side Sac. River above (N) on Dredged channel | 38° 6.23' -121° 43.14' | 3.5 | 1.25 m barrel (G) | .53 m | sandy in upper part live bivalves at top |
| 2 | 012391-2 | Sac. River under E most power line relocation of site 15(1/31/90) | 38° 5.15' -121° 44.98' | 6 | 1.25 m barrel (G) | 1.3 m | has organic detritus layer lose at least 5cm at the top |
| 3 | 012391-3 | Sac. River same site as #2 | 38° 5.15' -121° 44.98' | 6 | 2.5 m barrel (G) | 2.10 | peaty detrital layer , sandy at base sample |
| 4 | 012391-4 | Sac. River at 9 m $H_2O$ N. side of shipping channel bank 0.11->N bank, under E line of double power line | 38° 4.90' -121° 45.29' | 9 | 2.5 m barrel (G) | 1.08 | get partial core sandy mud no organics at the base |
| 5 | 012391-5 | Sac. River slightly shallower than site 50.06-> N bank. | 38° 4.91' -121° 45.29' | 7.9 | 2.5 m barrel (G) | 2.20 | peat at base sample collected |
| 6 | 012391-6 | Sac. River N. bank of channel above dredged channel | 38° 4.55' -121° 46.08' | 6.8 | 2.5 m barrel (G) | 2.25 | bury 1.25 m barrel (G) lose top try again w/10' detrital peat at base again-sample |
| 7 | 012391-7 | Sac. River just down slope into channel 0.15-> n. bank, .29->#131. 23->#12 | 38° 4.52' -121° 45.97' | 9.3 | 2.5 m barrel (G) | .70 | sand on core barrel |
| 8 | 012391-8 | Sac. River split difference between 11 & 12 since they were so different. | 38° 4.41' -121° 45.92' | 8 | 2.5 m barrel (G) | 1.78 | peat at the base |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 9 | 012391-9 | San Joaquin River try to core on isolated sand ridges east of#12 core attempt on high feature | 38° 3.82' -121° 47.40' | 6.0 | 2.5 m barrel (G) | .72 | coarse clean sand/mud |
| 10 | 012391-10 | San Joaquin River 1.12->#2, .86->#1, .06->E. Bank | 38° 3.74' -121° 47.29' | - | 2.5 m barrel (G) | .22 | Coarse sand |
| | | | **J-1-91-SF** | | | | |
| | | | **Suisun Bay to Benicia Bridge** | | | | |
| | | | **Map M** | | | | |
| 11 | 012491-1 | Suisun Slough near mouth flat, smooth bottom in channel axis | 38° 8.47' -122° 4.00' | 5.4 | 2.5 m barrel (G) | 1.95 | wood detritus at base |
| 12 | 012491-2 | Suisun Slough along bank next to mouth | 38° 8.71' -122° 4.05' | 2.5 | 2.5 m barrel (G) | 2.10 | upper part really disturbed |
| 13 | 012491-3 | Suisun Bay near sites 9 & 10 at Grizzly Bay mouth (2/1/90) | 38° 6.33' -122° 2.95' | | 2.5 m barrel (G) | .33 | eased in filled to win 5 in. |
| 14 | 012491-4 | Suisun Bay in thalweg, .87 -> #9, .84->dol., .49->Garnett Pt .99->Pt Buckley | 38° 6.20' -122° 1.93' | 3.5 | 2.5 m barrel (G) | 1.17 | sand in lower part |
| 15 | 012491-5 | Suisun Bay on slope more like site 8 last yr., .97->#9, .86->dol., .87->pt. Buckley. .51->Garnett Pt. | 38° 6.17' -122° 1.71' | 3.4 | 2.5 m barrel (G) | 2.08 | no wood at base |
| 16 | 012491-6 | nearer to 8, .72->Pt. Buckley .92->dol. 1.13->#9 | 38° 6.05' -122° 1.42' | 3.4 | 2.5 m barrel (G) | 2.41 | no wood at base |
| 17 | 012491-7 | NE of N end of Ryer Island, 1.20->#90, .40->shore , 2.38->#6 | 38° 5.82' -122° 2.21' | 3.5 | 2.5 m barrel (G) | .90 | organics, shells |
| 18 | 012491-8 | Next to SW corner of Ryer Island, .84->platform, .6->shore, 1.09->R20, 2.00->25 | 38° 4.67' -121° 59.64' | ~2 | 2.5 m barrel (G) | 1.31 | ~40 cm penetration eased, dropped good core sand/mud |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 19 | 012491-9 | Suisun Bay SW corner of Ryer Island.42->dolphin NW of Honker Bay, .57->Pt. Palo Alto, .88->#24A, 1.10->#21 | 38° 4.10' -121° 57.30' | - | 2.5 m barrel (G) | 1.01 | - |

## J-1-91-SF

**San Joaquin River to the confluence with the Sacramento**

**Map N**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 | 012591-1 | Zigzag structures, .49->#1 Sac. R., 1.57->#  Broad Slough .06->W. Bank | 38° 3.43' -121° 50.79' | 7 | 2.5 m barrel (G) | .95 | Sand/ mud |
| 21 | 012591-2 | N.side of Fraser Shoal, .49->#1 Sac..R., .67->#5 Sac. R., 1.57->#1 Broad Slough | 38° 3.50' -121° 50.39' | 3 | Grab | bag | |
| 22 | 012591-3 | W. side Fraser Shoal.75->#3 Sac. R.1.26->#1 Broad Slough.32->W. Bank | 38° 3.05' -121° 50.34' | 3 | 2.5 m barrel (G) | 1.13 | Sand at top |
| 23 | 012591-4 | San Joaquin River grab W. side of Fraser Shoal, .3->N#1, .28->E.bank, .31->#1 | 38° 2.32' -121° 49.99' | 3 | Grab | - | sand |
| 24 | 012591-5 | San Joaquin River grab sand waves just off #1 in channel, .16->#1, .62->#4, .31->#2 | 38° 2.11' -121° 49.81' | 5.5 | Grab | - | sand well sorted |
| 25 | 012591-6 | San Joaquin River off Beener Pt in sand wave field in Broad Slough, .19->#1, .55->#4 | 38° 1.90' -121° 49.96' | 7.5-8.09 | Grab | - | sand waves |
| 26 | 012591-7 | Main San Joaquin Channel big sand waves; .47->#4, .43->#1, .18->#11 | 38° 1.66' -121° 50.29' | 13 | Grab | - | coarse sand |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| | | | **J-1-91-SF** | | | | |
| | | | **Suisun Bay** | | | | |
| | | | **Map M** | | | | |
| 27 | 013191-1 | Suisun Bay at end of side scan run; .67->#9, 1.52->#6, .87->N. Dol, .68->N bank .96->Garnett pt. | 38° 5.82' -122° 3.28' | 7.5 | 2.5 m barrel (G) | 1.11m | |
| 28 | 013191-2 | Suisun Bay vicinity of site 12 (2/1/90) to look for wood layer in areas of similar depth nearby- follow 10' isobath S.W. of #6 to ~.3 nm from #6 .39->#6, .77->#4, .67->S dolphin, 1.37->N. dolphin | 38° 4.57' -122° 4.93' | 4.5 | 2.5 m barrel (G) | 1.14 | sand at top |
| 29 | 013191-3 | Suisun Bay just up channel from; #1, 2.49->#6, .73->#4, 1.37->N.dolphin | 38° 4.54' -122° 4.65' | 2.8 | 2.5 m barrel (G) | 1.29 | Sand/mud |
| 30 | 013191-4 | Suisun Bay off N.W. end Ryer Island; .34 nm->each of the two points on Ryer Isl., .32-> S most Pt., 1.32->#9, .86->Dolphin | 38° 5.24' -122° 2.60' | 2.0 | 2.5 m barrel (G) | 1.30 | buried the head |
| 31 | 013191-5 | Suisun Bay same locality as #31 use 3.0 m barrel (G) | 38° 5.24' -122° 2.62' | 2.0 | 2.5 m barrel (G) | 2.21 | organics at base |
| 32 | 013191-6 | Suisun Bay channel bank S.W. of Ryer Island; .45->platform, .98->N. dolphin 1.96->#9 | 38° 4.84' -122° 2.19' | 4.5 | 2.5 m barrel (G) | 1.73 | |
| 33 | 013191-7 | Suisun Bay off E. end Roe Is. (Gillespie Pt.) mud slope | 38° 4.12' -122° 0.62' | 4.5 | 2.5 m barrel (G) | .38 | 1.25 m barrel (G) dropped good penetration did not bury head. |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| | | | **J-2-91-SF**<br>**Carquinez Straits**<br>**Map L** | | | | |
| 34 | 020191-1 | Carquinez Straits off Commodore Jones Pt.; .93->21 Dillon Pt .21->Commodore Jones Pt. .50->#22 | 38° 3.29'<br>-122° 10.55' | .4m | 2.5 m barrel (G) | 1.33 | 1.25 m barrel (G) eased in full |
| 35 | 020191-2 | Carquinez Straits West of #23 Benicia Pt .21->#23 .74->#22, 1.14->T cross | 38° 2.60'<br>-122° 10.12' | 2.6 | 2.5 m barrel (G) | 1.39 | 1.25 m barrel (G) eased in full barrel |
| 36 | 020191-3 | Same location as #35 used 3.0 m barrel (G) | 38° 2.60'<br>-122° 10.12' | 2.6 | 3.0 m barrel (G) | 2.55 | used 3.0 m barrel (G) |
| 37 | 020191-4 | Carquinez Straits 1/2 of the way down bank .12->#23 .75->#22, 1.04-> T. cross | 38° 2.72'<br>-122° 10.28' | 10.5 | 2.5 m barrel (G) | | 1.25 m barrel (G) eased in, full, organics at base in well defined layers |
| 38 | 020191-5 | Carquinez Straits same location as #37 | 38° 2.70'<br>-122° 9.97' | 10.5 | 2.5 m barrel (G) | 2.40 | 3.0 m barrel (G) dropped |
| 39 | 020191-6 | Carquinez Straits East of Ozol Dock on mud bank; .54->T-cross, .52-> w. end jetty Marina, .16-> shore | 38° 2.84'<br>-122° 10.09' | 1.75 | 2.5 m barrel (G) | 2.27 | 3.0 m barrel (G) buried head |
| | | | **J-2-91-SF**<br>**San Pablo Bay**<br>**Map J** | | | | |
| 40 | 020691-1 | Central San Pablo Bay;.18->#1 .31->#2 | 38° 0.99'<br>-122° 25.71' | 2.5 | 2.5 m barrel (G) | 1.33 | 1.25 m barrel (G) eased in |
| 41 | 020691-2 | N.E. central San Pablo Bay; .84->#9, 1.36->#7, 1.61->#11 | 38° 3.14'<br>-122° 22.18' | 2.1 | 2.5 m barrel (G) | 2.42 | 3.0 m barrel (G) short drop kept upright plugged top |
| 42 | 020691-3 | San Pablo Bay mid bank N. side Pinole channel .49->#9, 1.41->#1 | 38° 2.91'<br>-122° 21.87' | 5.1 | 2.5 m barrel (G) | 2.42 | - |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 43 | 020691-4 | San Pablo Bay lower bank N. side of Pinole channel near #9, irregular bottom; .14->#9, 1.20->#7, 1.27->#11 | 38° 2.62' -122° 21.45' | - | 2.5 m barrel (G) | 1.89 | Interbedded clean sand/mud top 50cm |
| 44 | 020691-5 | San Pablo Bay, .96->#5, 2.00->#1, 1.49->Sisters | 38° 0.51' -122° 26.65' | 3.9 | 3.0 m barrel (G) | 2.54 | mud sandy upper 40-50 cm. |
| | | | **J-2-91-SF** **Carquinez Straits** **Map K & L** | | | | |
| 45 | 020791-1g | Carquinez Straits; .16-> Army dock., 47->bridge | 38° 2.22' -122° 8.08' | 10 | Grab | - | sand dunes clean sand |
| 46 | 020791-1g | Carquinez Straits; .43->w. end Army, dock, .40-> W.end jetty | 38° 1.93' -122° 8.58' | 15 | Grab | - | Coarse sand w/ pebbles shell lag/clay |
| 47 | 020791-3g | Carquinez Straits Ozol dunes, .54->#2, 1.41-> T-cross | 38° 1.93' -122° 9.25' | 12 | Grab | - | dunes sand |
| 48 | 020791-4g | Carquinez Straits, .90->#23, .27->#20 | 38° 2.96' -122° 10.69' | 27 | Grab | | |
| 49 | 020791-5g | Carquinez Straits, .42->#22 | 38° 3.32' -122° 11.03' | 2.4 | Grab | - | small sample, sand, mud clast |
| 50 | 020791-6g | Carquinez Straits, .14->#21, .35->#20 | 38° 3.45' -122° 11.90' | 37.5 | Grab | - | small sample mud |
| | | | **J-2-91-SF** **San Pablo Bay** **Map J** | | | | |
| 51 | 020791-1 | San Pablo Bay between #13 & #14, 1.21->#5, 1.00->#4, 1.00->#E | 37° 59.72' -122° 23.90' | 3.6 | 2.5 m barrel (G) | 1.36 | 1.25 m barrel (G) |
| 52 | 020791-2 | San Pablo Bay 1.67->#8, 2.00->#4, 1.35->#5 | 38° 0.26' -122° 22.92' | 2.3 | 2.5 m barrel (G) | 1.35 | 1.25 m barrel (G) eased in- full organics in catcher |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 53 | 020791-3 | San Pablo Bay on grooved bottom main channel N.E., of "E", .6-> "E", 1.50->"P", .91->#5, 1.39->#7 | 38° 1.85' -122° 23.14' | 11.3 | 3.0 m barrel (G) | 2.79 | 3.0 m barrel (G) dropped long coarse sand layers at top. |
| 54 | 020791-4 | San Pablo Bay attempt to core crest of ridge between dune filled furrows .71->#9, .52->#7, 1.82->"p" | 38° 2.15' -122° 21.50' | 8.2 | 2.5 m barrel (G) | .94 | sand/mud |
| 55 | 020791-5 | San Pablo Bay on bank E. of Pinole Pt., 1.39->#9, 2.00->#11 1.70->#7, 1.30->#6 | 38° 1.42' -122° 19.97' | 2.2 | 2.5 m barrel (G) | 1.35 | full barrel mud |
| 56 | 020791-6 | San Pablo Bay bank off Hercules, 1.52->#13 3.13->#7, 1.90->#15 2.21->#9, 1.70->#11 | 38° 1.99' -122° 18.10' | 2.1 | 2.5 m barrel (G) | 1.36 | 1.25 m barrel (G) eased in mud Ostrea lurida layer at top |
| 57 | 020791-7 | San Pablo Bay inside end of Dike #12, .24-> west end dike, .59->#15, .71->#13, 1.64->#9 | 38° 4.06' -122° 16.81' | 1.7 | 3.0 m barrel (G) | 2.97 | full 3.0 m barrel (G), tilted so top is possibly mixed. |
| 58 | 020791-7a | San Pablo Bay same location as #57 | 38° 4.16' -122° 16.79' | 1.7 | 1.25 m barrel (G | | 1.25 m barrel (G) eased in to preserve top full 4', can see where mud fell in to top ~7cm |

**J-2-91-SF**

**Suisun Bay**

**Map M**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 59 | 020891-1 | Suisun Bay coring furrow field S.W. of Suisun slough ~ end of furrow field, .92->#9, .41->N. bank | 38° 5.82' -122° 3.79' | 8.3 | 1.25 m barrel (G | .88 | 1.25 m barrel (G) dropped reasonable penetration shells at top sand layers |
| 60 | 020891-2 | Suisun Bay field where furrows are smaller, .74->#9, .32->N.bank | 38° 5.94' -122° 3.57' | 5 | 3.0 m barrel (G) | 1.81 | 10' core dropped pushed the inner barrel in too far may have disturbed top a bit. |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 61 | 020891-3 | Suisun Bay area of good furrows seen 1/31/91-1141, .51->#9, .23->N.bank | 38° 6.11' -122° 3.81' | ~.5 | 2.5 m barrel (G) | 2.08 | 4m $H_2O$ seems to have dropped core on crest 10' dropped reasonable penetration partial core (but buried head) |
| | | | **J-2-91-SF Richardson Bay Map I** | | | | |
| 62 | 022591-1 | Richardson Bay near drill site #3.44->Cone Rock, .05->#2, .60->#3 | 37° 51.46' -122° 28.24' | 4 | 2.5 m barrel (G) | 1.90 | eased in 3.0 m barrel (G) (geotech core), mud |
| 63 | 022591-2 | Richardson Bay on drill site 4, .13->#2, .48->Cone Rock | 37° 51.45' -122° 28.10' | 8 | 2.5 m barrel (G) | 1.95 | Geotech core mud sample |
| 64 | 022691-1 | Richardson Bay 60 m from drill site 6.35->#3, .29->Cone Rock .38->#2RB | 37° 51.71' -122° 27.94' | 5 | 3.0 m barrel (G) | 2.72 | Geotech core all 10' dropped |
| 65 | 022691-2 | Richardson Bay on drill site #1, .58->#3, .20->Cone Rock .29->#2 | 37° 51.75' -122° 28.09' | 4 | 2.5 m barrel (G) | 1.90 | Geotech core |
| 66 | 022691-3 | Richardson Bay on drill sites #2 & 5, .57->#3, .29->Cone Rock .20->#2 | 37° 51.62' -122° 28.26' | 5.5 | 2.5 m barrel (G) | 1.75 | Geotech core |
| 67 | 022691-4 | Richardson Bay ~on drill hole #7 1.09->#1, .35->#2, .98->#3 | 37° 51.19' -122° 28.70' | 7 | 2.5 m barrel (G) | 1.90 | - |
| 68 | 022691-5 | Richardson Bay on slope west of the mouth, .47->#2, 1.00->#1, .93->Cone Rock | 37° 51.01' -122° 28.69' | 11.7 | 2.5 m barrel (G) | - | - |
| 69 | 022691-6 | Richardson Bay mid-slope NE end of bay, .19->#3, .50->Cone Rock, .45->#2RB, .78->#2SFB | 37° 51.58' -122° 27.73' | 24.5 | 2.5 m barrel (G) | 2.08 | mud sample |

| Map # | Core Number | Setting | Lat. Long. | Water Depth (m) | Type Core (G) (B) | Core length (m) | General Description |
|---|---|---|---|---|---|---|---|
| 70 | 022691-7 | Richardson Bay 6.5m back end of D.J. just above platform, .25->#3, .41->Cone Rock .42->#2RB1 .10->#2SFB | 37° 51.66' -122° 27.80' | 7 | 2.5 m barrel (G) | 2.02 | - |
| 71 | 022691-8 | Richardson Bay just down slope from # 7, 1.23->#3, .44->#2RB, .43->Cone Rock .99->#2SFB | 37° 51.56' -122° 27.84' | 8.5 | 2.5 m barrel (G) | 1.83 | - |
| | | | **Oakland Area** | | | | |
| 72 | 022691-9 | Yerba Buena Island East side of Island on top of platform, .45->G"3" S. of, bridge, .20->#4, .29-> end of Davy, dock | 37° 49.35' -122° 21.27' | 11.5 | 2.5 m barrel (G) | 1.48 | 3.0 m barrel (G) worms at top mud |
| 73 | 022691-10 | Yerba Buena Island on bank, .45->G"3", .34->#4, .17->W.end of Navy, dock | 37° 49.09' -122° 21.58' | 14.5 | 2.5 m barrel (G) | ~ | Stiff green mud stuck to base of barrel sandy, limited penetration |

**J-2-91-SF**

**Push Cores**

**Collected at the Mouth of Richardson Bay**

**Map Number:** 74
**Date** 2/19/91

**Beginning Depth:** 35' **Ending Depth:** 40'

**$H_2O$ Depth:** 9'

**Hole #:** 1

**Lat.:** 37º51'40" N **Long.:** 122º28'10" W

| Shelby tube # | Depth interval |
|---|---|
| 1 | 15'9" |
| 2 | 20'9" |
| 3 | 20'9"-23'3" |
| 4 | 23'3"-25'9" |
| 5 | 25'9"-28'3" |
| 6 | 28'3"-30'9" |
| 7 | 36'9"-39'3" |
| 8 | 42'2" |

**Map Number:** 75
**Date** 2/20/91

**Beginning Depth:** 13'2" **Ending Depth:** 38'2"

**$H_2O$ Depth:** 14'

**Hole #:** 2

**Site:** 2

**Lat.:** 37º51'32"N **Long.:** 122º28'09"W

| Shelby tube | Depth interval |
|---|---|
| 1 | 13' |
| 2"-15'8"2 | 15'11"-18'0" |
| 3 | 18'7"-20'8" |
| 4 | 21'6"-23'2" |
| 5 | 23'10"-25'8" |
| 6 | 24'0"-28'2" |
| 7 | 28'4"-30'8" |
| 8 | 30'10"-33'2" |
| 9 | 33'4"-35'8" |
| 10 | 35'10"-38'2" |

**Map Number:** 76

**Date** 2/21/91

**Beginning Depth:** 14'9" **Ending Depth:** 36'10"

**$H_2O$ Depth:** 16'10"

**Hole #:** 3

**Lat.:** 37º51'24"N **Long.:** 122º28'07"W

| Shelby tube # | Depth interval |
|---|---|
| 1 | 14'9"-16'10" |
| 2 | 17'4"-19'4" |
| 3 | 19'6.5"-21'10" |
| 4 | 21'10"-24'4" |
| 5 | 24'6"-26'10" |
| 6 | 26'10"-29'4" |
| 7 | 29'6.5"-31'10" |
| 8 | 32'2"-34'4" |
| 9 | 34'8"36'10" |

**Map Number:** 77

**Date** 2/22/91

**Beginning Depth:** 19'4" **Ending Depth:** 54'2"

**$H_2O$ Depth:** 19'6"

**Hole #:** 4

**Lat.:** 37º51'24" **Long.:** 122º27'58"

| **Shelby tube #** | **Depth interval** |
|---|---|
| 1 | 16'10"-19'4" |
| 2 | 21'10"-24'2" |
| 3 | 26'8"-29'2" |
| 4 | 31'8"-34'2" |
| 5 | 36'8"-39'2" |
| 6 | 41'8"-44'2" |
| 7 | 46'8"-49'2" |
| 8 | 51'8"-54'2" |

**Map Number:** 78

**Date** 2/25/91

**Beginning Depth:** 35'0" **Ending Depth:** 52'6"

**$H_2O$ Depth:** 19'4"

**Hole #:** 5

**Lat.:** 37º51'32"N **Long.:** 122º27'50"W

| **Shelby tube #** | **Depth interval** |
|---|---|
| 1 | 35'0"-37'6" |
| 2 | 47'6"-50'0" |
| 3 | 50'0"-52'6" |

**Map Number:** 79

**Date** 2/26/91

**Beginning Depth:** 17'5" **Ending Depth:** 64'11"

**$H_2O$ Depth:** 18'

**Hole #:** 6

**Lat.:** 37º51'40" **Long.:** 122º27'42"

| **Shelby tube #** | **Depth interval** |
|---|---|
| 1 | 17'5"-19'11" |
| 2 | 22'5"-24'11" |
| 3 | 27'5"-29'11" |
| 4 | 32'5"-34'11" |
| 5 | 37'5"-39'11" |
| 6 | 42'5"-44'11" |
| 7 | 47'5"-49'11" |
| 8 | 52'5"-54'11" |
| 9 | 57'5"-59'11" |
| 10 | 62'5"-64'11" |

**Map Number:** 80

**Date** 2/27/91

**Beginning Depth:** 16'6"(+5')

**Ending Depth:** 47'6"(+5')

**$H_2O$ Depth:** 18'5"

**Hole #:** 7

**Lat.:** 37º51'05" **Long.:** 122º28'21"

| **Shelby tube #** | **Depth interval** |
|---|---|
| 1 | 16'6"-19'0"(+5') |
| 2 | 21'6"-24'0"(+5') |
| 3 | 26'6"-29'0"(+5') |
| 4 | 31'6"-34'0"(+5') |
| 5 | 36'6"-39'0"(+5') |
| 6 | 41'6"-44'0"(+5') |
| 7 | 46'6"-47'6"(+5') |