

# 10293

10293

Diagram No. 5534-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

## DESCRIPTIVE REPORT

Type of Survey .. Hydrographic ..  
Field No. .... PHP-10-1-89 ..  
Registry No. ... H-10293 ..

### LOCALITY

State ..... California ..  
General Locality Grizzly Bay ..  
Sublocality ... Suisun Slough to ..  
..... Simmons Island ..  
..... 19 89 ..  
CHIEF OF PARTY  
LT F. Diaz ..

### LIBRARY & ARCHIVES

DATE ..... February 13, 1990 ..

**HYDROGRAPHIC TITLE SHEET**

H-10293

**INSTRUCTIONS** - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

PHP 10-1-89

State California

General locality Grizzly Bay

Locality Suisun Slough to Simmons Island

Scale 1:10,000 Date of survey January 26 to April 3, 1989

Instructions dated December 2, 1988 Project No. OPR-L202-PHP

Vessel Launch 1101, Skiff

Chief of party Lieutenant Federico R. Diaz, NOAA

Surveyed by LCDR Marcella Bradley, LTJG Thomas K. Porta, ST Lowell J. Lindly  
ET Edmund O. Wernicke

Soundings taken by echo sounder, ~~and lead pole~~ Ross Fineline 5000 and Raytheon 719B

Graphic record scaled by PHP Personnel

Graphic record checked by F.R. Diaz, T.K. Porta

Evaluation by: Gordon E. Kay Automated plot by Xynetics Plotter

Verification by Robert N. Mihailov

Soundings in ~~feet~~ feet at ~~MLLW~~ MLLW

REMARKS: All times are UTC. Revisions and marginal notes in black were  
generated during office processing. All separates are filed with  
the hydrographic data, as a result page numbering may be interrupted  
or non-sequential.

*RWD* AWOIS + SURF - 2/90

PROGRESS SKETCH TO ACCOMPANY ANNUAL FIELD OPERATIONS REPORT

OPR-L202

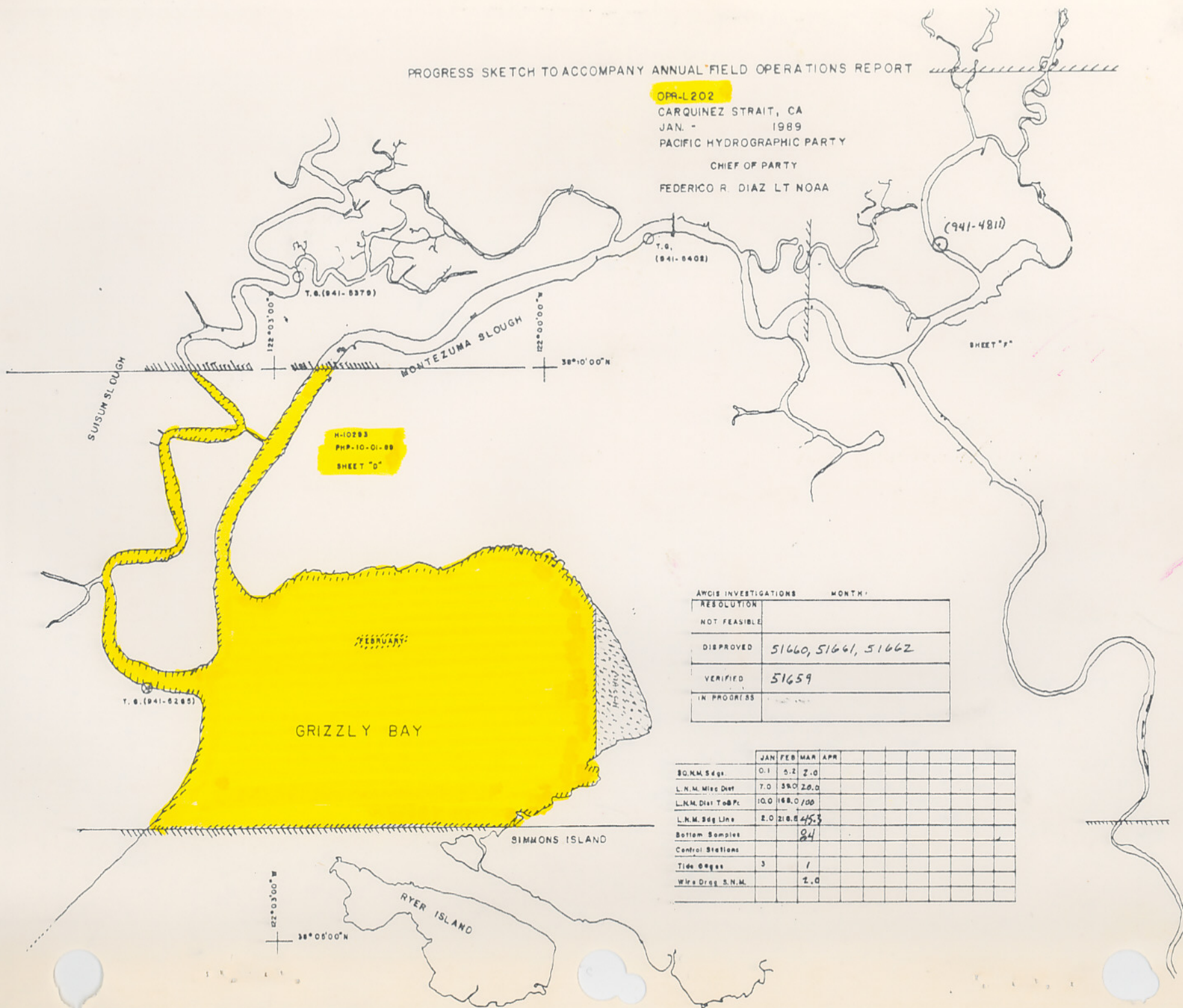
CARQUINEZ STRAIT, CA

JAN. - 1989

PACIFIC HYDROGRAPHIC PARTY

CHIEF OF PARTY

FEDERICO R. DIAZ LT NOAA



H-10283  
PHP-10-01-89  
SHEET "D"

SHEET "P"

AWCIS INVESTIGATIONS	MONTH
RESOLUTION	
NOT FEASIBLE	
DISPROVED	51660, 51661, 51662
VERIFIED	51659
IN PROGRESS	

	JAN	FEB	MAR	APR				
30.M. Sdg.	0.1	5.2	2.0					
L.N.M. Misc. Dist.	7.0	39.0	20.0					
L.N.M. Dist. To B.Pc.	10.0	168.0	100					
L.N.M. Sdg. Line	2.0	218.8	45.3					
Bottom Samples		24						
Control Stations								
Tide Gages	3	1						
Wire Drag S.N.M.			2.0					

**A. PROJECT**

A basic hydrographic survey, H-10293, was performed in accordance with Project Instructions OPR-L202-PHP, dated December 2 1988, CHANGE NO. 1, dated December 8, 1988 and CHANGE NO. 2, dated January 11, 1989, *Change No. 3, dated MARCH 27, 1989.*

The purpose of this survey is to obtain data for reconstruction of existing charts 18656 and 18652.

**B. AREA SURVEYED**

The survey was conducted in Grizzly Bay, and the southern portions of Montezuma and Suisun Sloughs, CA. The limits of the survey are as follows.

<u>Latitude</u>	<u>Longitude</u>
38/06/05 N	122/ <sup>05/00</sup> <del>05/30</del> W
38/10/ <del>00</del> <sub>12</sub> N	121/59/00 W

The inclusive dates of hydrography were from ~~February~~ <sup>JANUARY</sup> 26, 1989 (DN 26) to April 3, 1989 (DN 93).

**C. SOUNDING VESSEL**

PHP's Launch 1101 (EDP 0651), a 29-foot aluminum Jensen, equipped with a turbo Caterpillar diesel and a Hamilton jet drive, was used to position bottom drags, and sounding acquisition.

There were no unusual problems encountered with Launch 1101 during the survey. Launch 1101 was hauled out to repair the intake grate from March 16, 1989 to March 17, 1989 (DN 75 - DN 76).

Some of the detached positions were acquired by PHP personnel from vessel 0650 (PHP Skiff). This vessel was also used for bottom drags, only after Launch 1101 positioned the center buoy.

**D. SOUNDING EQUIPMENT**

Launch 1101 is equipped with a standard Ross Fineline 5000 echo sounder and digitizing system which utilizes a center line mounted, 7.5 degree, 100 KHz transducer. Launch 1101 is also equipped with two side-looking digital transducers for navigational use in sloughs, narrow channels, and creeks. The Ross system on Launch 1101 consists of the following instruments.

Component	Model No.	S/N
Power Inverter	2000	1071
Transceiver	4000	1081
Analog Recorder	5000	1080 (DN 26 - DN 55)
"	"	1046 (DN 59 - DN 82)
Digitizer	6000	3787

The Analog recorder was switched on DN 55 because it was not possible to obtain an ending phase calibration. The recorder had functioned properly all day, the digitizer was also working properly. The problem occurred when the echo sounder was placed in calibration mode. There were no faults in the equipment that affected the accuracy of the soundings.

### Sounding Instrument Accuracy and Adjustments

The Ross echo sounding system simultaneously produces an analog echogram and a digitized depth value. Digitized soundings sampled by the logging system at predetermined time intervals are the primary source of sounding line data on the field sheet, but these are supplemented by depths scaled from the analog record in areas where digitized depths were incorrect or lacking. The digitized depths are sometimes triggered by a source other than the bottom (sea weeds, fish, etc.) or from an instrument generated source such as side echoes. In these instances the digitized depths were replaced by values scaled from the echogram.

Initial error occurs when the echo sounder's transmit pulse trace is not adjusted to coincide with the zero on the echogram paper. The initial trace alignment was monitored and adjusted during survey operations. Any depths scaled from echograms with initial error were corrected before being applied to the survey.

Phase errors are caused by faulty stylus belt timing in the analog recorder due to belt stretching or improper internal adjustment. The system was checked for phase error at the beginning of each survey day and, with few exceptions, at the end of each survey day (or whenever the recorder paper was changed) by introducing simulated depths (e.g. 10', 20', 30', etc.) into the analog recorder via the digitizer phase calibration mode. The analog trace was then compared to the simulated digital depth and the equipment was adjusted as necessary.

The analog's speed slowed on several occasions on DN 45, but this had no effect on the accuracy of the soundings and no significant effect on the resolution of the bottom trace.

### Static Transducer Draft

The static transducer draft values for the hull mounted transducer on Launch 1101 was physically measured in two parts. The first part was done while the launch was out of the water. The distance between the transducer face and the bottom of a black line painted on the hull above the water line was measured using a surveying level (Lietz B-1, S/N 214303) and rod. The second part was done with the launch in the water with a normal fuel load on board. The distance between the bottom of the painted black line and the actual water line was measured with a steel tape. ✓

The actual static transducer depth is the distance obtained in part 1 minus the distance measured in part 2. The actual static draft was measured at 1.63 feet. ✓

### Sound Velocity Correctors

Velocity correctors were determined by AML velocity casts and validated by bar checks at 5 and 10 feet. The trend in the correctors was from negative to positive as the water warmed. ✓

Table 1 is from the correctors on DN 39. It was extended from 24.3 to 47.0 feet and was used from DN 26 to DN 47. The extension was necessary to correct approximately 1030 soundings at the mouth of Montezuma Slough, + HUNTER CUT. ✓

The corrector table from DN 39 was extended instead of applying a later table because the later table would reflect the change in water temperature. The correctors would have become positive and resulted in deeper than actual depths. ✓

See the AML data and analysis in Appendix IV. Sounding Correction Abstract. *Filed with the hydrographic Records* ✓

Bar checks were performed once daily, along with an AML Velocity Cast, when wind and sea conditions permitted. Most days the wind is too strong in the afternoon for the keel-less jet launch to obtain usable bar check data. ✓

An 11 x 1 foot aluminum bar suspended on 1/4 inch steel chains with wire-tied and painted markings at 5-foot intervals was used to obtain bar check data. Chain markings were checked for accuracy prior to beginning the survey and were found to be accurate. The launch's beam is 11 ft, therefore no line correctors to correct for line angle were applied. Bar checks were abstracted daily using a measured static draft value of 1.6 feet. The calculated correctors for each bar depth are on these abstracts. The bar check abstracts contain the position of the stations and the dates of velocity correction observations. For more information ✓

see Appendix IV. Sounding Correction Abstract. *Filed with the HYDROGRAPHIC Records*

The following table is appropriate for the dates shown.

Velocity Table	Inclusive Dates (Days/Years)
I	26/89 - 47/89
II	53/89 - 81/89

All days of hydrography had accurate bar checks.

#### Settlement and Squat Corrections

The digital speed log for Launch 1101 was originally acquired in April, 1984 to correct for ground effect, which is the change in speed when moving to and from shallow water (see Ground Effect Report, May, 1984). It was determined that one method to help reduce the need for ground effect correctors was to operate the launch with constant speed through the water instead of fixed rpm. This decision was cleared through PMC and the speed log was permanently mounted in the hull of Launch 1101. All soundings collected with Launch 1101 were annotated as to speed through the water, not rpm. Speed through the water was likewise used during the settlement and squat measurements.

Settlement and squat measurements were observed for the Pacific Hydrographic Party's Launch 1101 (EDP 0651), on September 9, 1988 (Day 253). This test was conducted during survey operations on project OPR-L202-PHP-88. The settlement and squat correctors apply to all data acquired with Launch 1101 on this survey (DN 228-DN 351 1988).

Equipment on the launch at the time of the test consisted of normal electronic positioning and depth finding gear (Mini-Ranger, HDL system, Ross echo sounder). The launch is equipped with a Caterpillar Diesel engine coupled to a Hamilton jet pump. Two people and a simulated third person (three 50-pound bags of cement) were on board the launch at the time of the test (a normal crew for surveying).

The test was conducted on the south end of First Street in the vicinity of Benicia Point near the city wharf and nearby islets off Benicia.. The test was within the geographic limits of project OPR-L202-PHP-88. The launch went from depths of 12 to 20 feet of water. The weather during the test was calm, with winds 10 to 15 knots (kts), seas were 0.2 feet and the current was slack. The launch was getting a lee from the small offshore islets during this test.

The level was set up on the bank of the shoreline at the

south end of First Street in Benicia. A level rod was held on the starboard gunwale in line with the position of the hull mounted transducer. The launch made runs ranging from 3 kts to 12 kts by going towards the leveling instrument and stopping for dead in the water (DIW) measurements before and after each run. The mean of these two readings accounted for the tidal correction for each run. These point values were plotted and connected to yield continuous speed versus draft correction curves. ✓

Settlement and squat corrections are applied to the smooth field sheet, and are incorporated on the TC/TI tape. ✓

### Tide Correctors

Predicted tides were used to reduce the soundings in the sounding volume to MLLW by PHP in order to determine the proper cartographic code. The field plots generated by PMC were plotted with the tide correctors applied to the predicted tides at Fort Point, San Francisco. See Appendix *Attached* ✓  
~~III.~~ Field Tide Note for further information.

### E. HYDROGRAPHIC SHEETS

Field records were forwarded to the Pacific ~~Marine Center,~~ <sup>HYDROGRAPHIC SECTION (PHS)</sup> ~~Nautical Chart Branch,~~ Seattle, Washington, for preliminary plotting, verification and smooth plotting. The raw field data was transferred to PMC via modem. The plots, and FSPool listings were returned to PHP for corrections, analysis and for review of the completeness and quality of the survey work. ✓

Final field sheets were generated at <sup>PHS</sup> ~~PMC,~~ as arranged by both PHP and PMC due to the unique experimental data transfer process. ✓

### F. CONTROL STATIONS

Control stations used on the survey are as indicated in the following table.

STATUS	STATION	LOCATION METHOD
VERIFIED	EXXON REFINERY STK 1977	INTERSECTION
VERIFIED	MOUNT DIABLO 1876	TRAVERSE
VERIFIED	THOMASSON 1922	TRAVERSE
VERIFIED	SUISUN HILL 2	TRAVERSE
VERIFIED	GOODYEAR 2 1979	TRAVERSE

 ✓

Refer to the Horizontal Control Report, Carguinez Strait, CA., OPR-L202-PHP-88, March 1988 to April, 1989 which will be submitted to ~~the Pacific Marine Center, Nautical Chart~~ <sup>PHS</sup>



~~Branch~~, for further information.

There were no unconventional survey methods used or anomalies in the control adjustment. ✓

There were no known photogrammetric problems that could contribute to position inaccuracies. SEE EVALUATION REPORT SECTION 2

**G. HYDROGRAPHIC POSITION CONTROL**

Electronic position control on the launch and skiff were accomplished with a Motorola Mini-Ranger III ultra-high frequency transponder system in the range-range configuration. ✓

Range-visual control was used to obtain checks on several detached positions. ✓

The detached positions have check positions. The inverse distances from the detached positions to the checks were calculated and were required to be within 0.5 millimeters at the scale of the survey. ✓

**Electronic Control Equipment**

The following electronic positioning equipment were used on this survey. ✓

<b>Motorola Mini-Ranger III Mobile Station</b>	
<b>Launch 1101</b>	
DN 26 - 81.	
Mini-Ranger Console	S/N 713165
Transceiver (RT Console)	S/N B1419

<b>Motorola Mini-Ranger III Mobile Station</b>	
<b>Skiff 0650</b>	
DN 55 - 75.	
Mini-Ranger Console	S/N 701
Transceiver (RT Console)	S/N C1680

<b>Motorola Mini-Ranger III Mobile Station</b>	
<b>Skiff 0650</b>	
DN 83 - 93.	
Mini-Ranger Console	S/N 713165
Transceiver (RT Console)	S/N B1419

**Position Control Equipment Operation**

Baseline correctors (BLC) applied to Mini-Ranger data collected on this survey were calculated from the calibrations shown below.

Corrector/Minimum Signal Strength						
Console 713165, RT B1419						
Date of BLC	Code A	Code B	Code C	Code 7	Code 9	Applicable Dates
Nov. 29, 1988	-1/5	-1/4	-2/4	-4/6	0/5	26-73
March 13, 1989	-1/5	-1/5	-2/4	0/5	0/5	79-93
Differences	0	*-9	0	-4	0	

Corrector/Minimum Signal Strength						
Console 701, RT C1680						
Date of BLC	Code A	Code B	Code C	Code 7	Code 9	Applicable Dates
Nov. 29, 1988	-1/3	0/3	+2/4	0/4	-3/4	55-73
March 13, 1989	-2/5	+1/5	+2/4	0/4	-3/5	79-93
Differences	-1	*-8	0	0	0	

\* The potentiometer in Code B was reset. The final correctors are listed.

The difference in correctors is within the  $\pm 4$  meters required for the scale of the survey with the exception of Code B. The large variance in code B is inconsequential since it was not used from DN 55-73.

The reason for the difference in correctors of code B was due to repair on the unit at PMC in February.

Daily critical systems checks confirm the validity of the baseline calibrations. The next Baseline calibration will be performed in May, 1989.

On DN 079 (March 20), Mini Ranger Console 701 malfunctioned and was sent to PMC for repair. The unit was not sent back to PHP during this project, and therefore, not baselined out. Console 701 and R/T C1680 pair were used on DN 074-075. AM and PM critical systems checks on each day verified the baseline correctors. Retain the data collected on those two days.

## Daily System Checks

Critical system checks were performed daily at geodetic stations. All daily system checks on the Mini-Rangers and console/RT unit during this time period resulted in a variance of less than 5 meters with the exception of Code 7 DN 4<sup>5</sup>. The variance was 6.4<sup>0</sup> meters. This anomaly did not affect the accuracy of the soundings acquired that day since the variance was less than 5 meters the day before and the day after. ✓

PHP considers these system checks a confirmation of the BLC and proper Mini-Ranger operation as specified in the Hydrographic Field Procedures Manual. ✓

The geometric configuration of the electronic control stations and the signal strengths for all positions were good. Angles of intersection for all electronic survey data were between 30 and 150 degrees. SEE EVALUATION REPORT SECTION 2 ✓

Signal strength was annotated on the raw data printout frequently during sounding acquisition. No data was submitted with less than minimum signal strength. ✓

There were no unusual methods of electronic control operations, and no unusual atmospheric conditions on this survey. ✓

Several of the detached positions were flagged by the HELHFX data processing program from PMC as weak positions. No additional field work was warranted because these positions were checked and are within 0.5 millimeters at the scale of the survey. ✓

ANDIST correctors were zero for all positions on this survey. ✓

The sextant used was Tamaya & Co. LTD. S/N T3725. The sextant were checked for errors with each days use. The index error was set to zero. ✓

For further information on electronic calibrations see Appendix V, Abstracts of Corrections to Electronic Position Control. Filed with the HYDROGRAPHIC RECORDS ✓

## Equipment Failures

There were no equipment failures that affected the accuracy of the positions acquired. ✓

However, for further information on equipment failures that did not effect positions acquired see the failogs in Appendix V, Abstracts of Corrections to Electronic Position Control. Filed with the HYDROGRAPHIC RECORDS ✓

**H. SHORELINE**

Stable-base enlargement copies at 1:10,000 scale of each of the following registered shoreline maps were provided: ✓

Job CM-7823

<u>Shoreline Map</u>	<u>Scale</u>
TP-01057	1:20,000
TP-01058	1:20,000
TP-01053	1:20,000

Shoreline verification was conducted by the hydrographer for all shoreline within sheet limits and the results are shown on the final field sheet. ✓

Reference numbers (RN), if not AWOIS Items, are labeled on a field sheet overlay\* to indicate deletions and revisions of charted features and shoreline maps. This was discussed by representatives of N/MOP<sup>215</sup> and PHP to help limit the duplication of the vast number of geographic positions that have been recorded in previous descriptive reports. ✓  
 Position data (field descriptions, latitudes, longitudes, computations and position numbers) used to describe an RN are filed in its respective day in the cahier file.

\* Final Field Sheet Overlay Reference Number Plot.

Some soundings plotted on the shoreline in Montezuma and Suisun Sloughs. This is due to the vessel being 5 meters from the high water line when the sounding was acquired. The areas where soundings plotted on the high water line were where the deepest depths were along that bank. It could also be due to erosion of the steep banks. The shoreline should not be changed in these areas. *SEE EVALUATION REPORT SECTION 2*  
*DO NOT CONCUR*

The following recommendations are based on observations by the hydrographer. The features found on this survey which were previously uncharted are shown on the smooth sheet. ✓

Revise the charted piers to depict the current structure. These piers now have floating piers attached. Photographs *(Attached)* and field sketches are filed with the raw data. *CONCUR*

<u>RN</u>	<u>DN</u>	<u>POS</u>	<u>TIME</u>	<u>VESNO</u>
11	80	2666-2670	184334	0651
<b>GEODETIC POSITION</b>				
		<b>LATITUDE N</b>	<b>LONGITUDE W</b>	<b>POS</b>
	Charted: pier	38/08/11.61 ✓	122/04/54.73 ✓	2665
	Observed: floating pier	38/08/12.44 ✓	122/04/55.69 ✓	2666
	Charted: pier	38/08/15.74 ✓	122/04/54.00 ✓	2667
	Observed: floating pier	38/08/16.29 ✓	122/04/53.82 ✓	2668

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted: pier	38/08/17.50 ✓	122/04/53.63 ✓	2670
Observed: floating pier	38/08/17.08 ✓	122/04/54.29 ✓	2669

<u>RN</u>	<u>DN</u>	<u>POS</u>	<u>TIME</u>	<u>VESNO</u>
12	"	2673-2674	1930-1933	"

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted: pier	38/08/26.12 ✓	122/04/00.63 ✓	2674
Observed: pier (boat house)	38/08/25.63 ✓	122/04/00.98 ✓	2673

Revise the pile shown on TP-01057 to a snag which covers at *CONCUR* mean high water (-4.7/MLLW).

<u>RN</u>	<u>DN</u>	<u>POS</u>	<u>TIME</u>	<u>VESNO</u>
13	55	3	2134	0650

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted: pile	38/08/00.92 ✓	122/03/40.11 ✓	3
Observed: snag	38/08/00.92 ✓	122/03/40.11 ✓	3

#### I. CROSSLINES

Crossline soundings were acquired to check mainscheme sounding lines. Crosslines were 20% of the sounding lines. Overall, comparison of the crosslines to the main scheme is good. In the areas of regular bottom, discrepancies do not exceed 1 ft. Discrepancies seldom reach 2 ft in areas of sloping bottom. ✓

#### J. JUNCTIONS

This project will junction with surveys of project OPR-L208 to be completed at a later date. *SEE EVALUATION REPORT SECTION 5.*

#### K. COMPARISON WITH PRIOR SURVEYS

The data from this project were compared to the following surveys.

<u>Registry Number</u>	<u>Scale</u>	<u>Year Surveyed</u>	<i>SEE EVALUATION REPORT SECTION 6</i>
H-905	1:20,000	1866-67	
H-1785	1:20,000	1886-87	
H-8088	1:10,000	1954	
* @ BP24405		1926	

\* The quality, equipment, scale, and methods of the COE survey were not known to the hydrographer, but the soundings from this survey were charted according to the "chart markup" for this project. Features from this survey are discussed in Section L.

@ *COMPARISON WAS NOT REQUIRED BY THE PROJECT INSTRUCTIONS OPR-L202-PHP SECTION 6.10.*

The survey is complete and adequate to supersede prior surveys. ✓

#### COMPARISON OF SOUNDINGS

On the west side of Grizzly Bay the 6 and 12-ft contours have moved to the south. There has been significant change also in the MHWL and the zero foot curve. An overall deepening has occurred throughout Grizzly Bay. The natural channel in both sloughs is very similar to the prior survey. Some erosion was noticed on the banks close to the deep part of the channel. It appeared that the shallow side of the channel had filled in some areas. ✓

The entrance to Montezuma Slough has deepened, since the 6-ft curve has moved further south. \* The controlling depth for the entrance is now 6-ft instead of 4-ft. In general, the contours agree with H-1785 Survey. \* A charted controlling depth does not exist for the entrance of Montezuma Slough. See smooth sheet for depths at the entrance of Montezuma Slough. ✓

The natural entrance of Suisun Slough agrees with H-1785 to within ± 1 ft near the mud banks and ±3ft in the channel. The contours in Suisun Slough also agree with the prior survey. ✓

#### L. COMPARISON WITH THE CHART

The survey is complete and adequate to supersede all charted features. Extensive investigation of features on the bottom of Hunters Cut was not completed. This does not affect the adequacy of the survey for reasons discussed in the comparison of soundings. ✓

This survey was compared to

<u>Chart Number</u>	<u>Edition</u>	<u>Edition Date</u>	<u>Scale</u>	
18652 SC	25th	June 20, 1987	1:40,000	SEE EVALUATION
18656	47th	March 7, 1987	1:40,000	REBRT section 7

#### Dangers to Navigation

A Dangers to Navigation letter was written to the Commander, Eleventh Coast Guard District. Copies of these letters are ~~included in Appendix XI, Dangers To Navigation.~~ Attached ✓  
Copies of these letters were also sent to the Nautical Data Section, N/CG221, and PMS (N/MOP-21). The letter was dated April 13, 1989. PAS CG 245

DESCRIPTION	LATITUDE N	LONGITUDE W	FT MLLW	POS
snag	38/08/14.4 <sup>f</sup>	122/00/28.27	-4.1-3.0	22
"	38/07/12.70	122/04/05.25	-3.80	47
"	38/09/03.75 <sup>f</sup>	122/03/07.11	-7.1-2.0	57
row of piles	38/06/41.70	121/59/17.98	-4.2-3.0 MHW	15

 ✓

DESCRIPTION	LATITUDE N	LONGITUDE W	FT MLLW	POS
<i>Row of Piles</i> " " "	38/08/14.31 <i>18</i>	122/01/12.69 <i>1.44</i>	-4.80	25, 26, 28 (mHw)
" " "	38/07/14.03 ✓	122/04/25.69 ✓	-4.80	44
" " "	38/07/13.38 <i>4</i>	122/04/26.78 ✓	-3.70	49
<del>" " "</del> <i>RLE</i>	38/08/10.92 <i>89</i>	122/04/58.77 <i>39</i>	-7.8	2663-2664*-5.0
" " "	38/08/16.08 <i>7</i>	122/00/23.53 ✓	-5.80	18-21 (mHw)
" " "	38/06/05.19 ✓	122/00/20.89 ✓	-5.20	39-40
" " "	38/06/04.20 ✓	122/00/21.15 ✓	-4.20-5.0	41-42
<del>pile stake</del> <i>Pile</i>	38/08/33.38 <i>4</i>	122/03/27.74 ✓	-4.4-6.0	64
<del>submarine</del> <i>sign</i>	38/08/13.17 <i>7</i>	122/04/55.77 <i>85</i>		55 (Submerged cable crossing)
<del>sign</del> <i>cable</i>	38/08/14.74 ✓	122/04/49.66 ✓		66 (Submerged cable crossing)
shoal	38/06/47.00 ✓	122/03/29.01 ✓	8.88.0	97*

\* Vessel 0651. All other positions listed above were acquired with vessel 0650.

### COMPARISON OF SOUNDINGS

The charted soundings from the prior surveys have been discussed in section K. These soundings are soundings which have not been charted, or charted soundings originating from blueprints. Only significant items that are anomalous are discussed. ✓

The eastern portion of Grizzly Bay is one to three feet deeper than the BP24405 survey. The zero-foot curve is approximately 600 m further east. The zero-foot curve extends about 300m from the HWL on the east shore. ✓

On the north shore of the bay, revise the zero-foot curve to extend, at most, about 50 m from the HWL. *Chart area as shown on Smooth Sheet*

The mud flats in the center of Grizzly Bay (38/07/00 N, 122/02/00 W) should be deleted. Current depths are 3 ft. *4-5*

Revise the contours in Suisun Slough to show the course of the natural channel between the banks. *Concur*

Chart the least depth in Hunters Cut.

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted: pier	38/07/15	122/04/27	
Observed:			
Least depth in center of channel	38/09/23.35 ✓	122/03/11.82 ✓	2652/6
29.8 ft			
30.5			

The features on the echogram which extend up to 4 ft. off the bottom in Hunters Cut were inserted on the data tapes but were not investigated further. The reason for not investigating these features were; ✓

- (1) the features are 10 % or less of the depth,
- (2) the depth of Hunters Cut is over 30 ft while the ✓

controlling depth from seaward is 6 ft., and  
(3) vessels using Hunters Cut are less than 4 ft  
draft. ✓

Revise the charted contours to show the natural channel  
close to the west shore of Montezuma Slough.

CONCUR

#### COMPARISON OF NON SOUNDING FEATURES

Revise the charted pier to row<sup>42.9</sup> of piles described below.  
The charted pier is about 100 m east of this position. The  
area was observed at chart datum, ~~the charted pier no longer~~  
~~exists.~~ *RUINS ARE SHOWN ON THE SMOOTH SHEET. CHART AREA AS SHOWN ON SMOOTH SHEET.*  
*Remove charted pier at the below position.*

<u>RN</u>	<u>DN</u>	<u>POS</u>	<u>TIME</u>	<u>VESNO</u>
28	75	50	2144	0650

<u>GEODETTIC POSITION</u>	<u>LATITUDE N</u>	<u>LONGITUDE W</u>	<u>POS</u>
Charted: pier	38/07/15	122/04/27	
Observed:			
<del>Row of Piles</del>	38/07/14.74 ✓	122/04/28.73 ✓	50
Ruins (3)			



AWOIS ITEMS

CHART: 18656 47TH ED. MAR. 7, 1987

AWOIS: 51659

ITEM DESCRIPTION: 8 ft depth

SOURCE: BP131900

DATE	DN	POSITIONS	TIME	VESNO
02/06/89	37	59-187	190143-222825	0651
02/22/89	53	1503-1642	182229-214115	0651

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted: 7.5 ft	38/07/01	122/03/37	
Observed: <sup>7.8</sup>			
Left QTR <del>6.3</del> ft	38/06/47.00 ✓	122/03/29.01 ✓	97
Mid Half <del>6.6</del> ft <sup>8.1</sup>	38/06/50.15 ✓	122/03/29.87 ✓	97/2
Right QTR <del>6.3</del> ft <sup>7.8</sup>	38/06/53.33 ✓	122/03/30.81 ✓	98

POSITION DETERMINED BY:

Range-range. ✓

METHOD OF INVESTIGATION:

The channel was developed with 90 m sounding lines in an East-West direction. These lines were crossed with three channel lines. Soundings were also acquired with 90 m spacing in a north-south direction. ✓

The least depths of the channel are listed above.

CHARTING RECOMMENDATION

~~Chart~~ the <sup>7</sup> six foot <sup>controlling</sup> depth. <sub>CHART</sub>

concur. See Eval Report  
Section 7.6. & 7.c.

AWOIS ITEMS

CHART: 18656 47TH ED. MAR. 7, 1987

AWOIS: 51660

ITEM DESCRIPTION: Pile (PA)

SOURCE: CL1505/71-USPS

DATE	DN	POSITIONS	TIME	VESNO
3/23/89	82	2951 @	<del>192108</del> 123300	0651
GEODETTIC POSITION		LATITUDE N	LONGITUDE W	POS
Charted:				
Pile		38/08/20	122/03/38	

POSITION DETERMINED BY:

3 ranges.

METHOD OF INVESTIGATION:

A 75-m<sup>Radius</sup> bottom drag was performed with 200% coverage. For a description of the bottom drag configuration see ~~Appendix Attached~~ *Appendix Attached* ~~XII Supplemental Information~~. There was an insignificant hang on a snag which was rejected. The snag was determined to be insignificant by divers who investigated the hang. There were no significant hangs.

CHARTING RECOMMENDATION

Delete the pile. *CONCUR* A pile was located approx. 200m to the south.

@ Position Number 2951 Latitude 38°08'19.88"N Longitude 122°03'38.26"W

CHART: 18656 47TH ED. MAR. 7, 1987

AWOIS: 51661 ✓

ITEM DESCRIPTION: Piles (PA)

SOURCE: CL555/82-USPS

<u>DATE</u>	<u>DN</u>	<u>POSITIONS</u>	<u>TIME</u>	<u>VESNO</u>
3/23/89	82	2952 *	202828	0651

<u>GEODETTIC POSITION</u>	<u>LATITUDE N</u>	<u>LONGITUDE W</u>	<u>POS</u>
Charted:			
Pile	38/08/28	122/03/32	

POSITION DETERMINED BY:

3 Ranges.

METHOD OF INVESTIGATION:

A 75-m<sup>RADIUS</sup> bottom drag was performed with 200% coverage.

There were no hangs.

CHARTING RECOMMENDATION

Delete the piles. *CONCUR* Pile and stakes were located approx 200m to the north.

\* Position Number 2952 Latitude 38°08'27.85"N, Longitude 122°03'32.23"W

CHART: 18656 47TH ED. MAR. 7, 1987

AWOIS: 51662

ITEM DESCRIPTION: Piles (PA)

SOURCE: CL555/82-USPS

DATE	DN	POSITIONS	TIME	VESNO
3/23/89	82	2953 *	202828	0651
* Latitude 38°08'42.51"N, Longitude 122°04'05.14"W				
GEODETTIC POSITION		LATITUDE N	LONGITUDE W	POS
Charted:				
Pile		38/08/44	122/04/07	

POSITION DETERMINED BY:

3 Ranges.

METHOD OF INVESTIGATION:

A 75-m <sup>Radius</sup> bottom drag was performed with 200% coverage.

There were no hangs. The position scaled from the chart was on the beach, so the drag was centered further offshore.

The area was searched at chart datum, and no piles were observed.

CHARTING RECOMMENDATION

Delete the piles. *do NOT CONCUR SEE EVALUATION REPORT SECTION 7.6.*

M. ADEQUACY OF SURVEY

The survey is complete and adequate to supersede prior surveys and all charted features. *SEE EVALUATION REPORT SECTION 8*

N. AIDS TO NAVIGATION

Comparisons of positions, from the field to the U. S. Coast Guard Light List volume VI, 1989, and the January 24, 1987 DIPFILE Listing for fixed aids to navigation are shown below. The variance from the field position to the DIPFILE position is listed under variance. These positions are based on the North American Datum of 1927 (NAD 27).

Fixed Aid	Non Floating Aids to Navigation			Light List #
	Field Position	Chart	Variance	
	Lat. (N)	Lat. (N)	(m)	Lat. (N)
	Long. (W)	Long. (W)		Long. (W)
	NAD 27	NAD 27		NAD 27

SUISUN SLOUGH ENT LT 9 *Light List Number 6345*  
 Third Order Class I 0.0 6345  
     38/06/29.68101      38/06/29.680      GP not  
     122/03/18.42020      122/03/18.420      listed

SUISUN SLOUGH ENT LT 10 *Light List Number 6350*  
 Third Order Class I 0.14 6350  
     38/07/08.92469      38/07/08.920      38/07.2  
     122/03/39.82002      122/03/39.820      122/03.7

An azimuth check confirmed the location of the SUISUN SLOUGH ENT LT 9, and SUISUN SLOUGH ENT LT 10. Further information on the position of the rest of the lights may be obtained from the Horizontal Control Report mentioned in Section S. \* *THERE ARE NO OTHER Aids LOCATED WITHIN THE LIMITS OF SURVEY H-10290.*

The positions, characteristics, and descriptions of the above lighted aids to navigation were accurately described in the Light List. ✓

The aids adequately serve their intended purpose. ✓

Uncharted submarine cables are tabulated under Dangers to Navigation. ✓

There were no ferry routes or pipelines within the limits of this survey. ✓

**O. STATISTICS**

	Launch 1101	Skiff	<u>Total</u>
Vessel:	EDP 0651	0650	
Number of Positions:	<del>2954</del> 2765	<del>66</del> 66	<del>3020</del> 2821
N. miles of Sounding Lines:	260	0	260
Square nm of Hydrography:	9	0	9
N. miles of Bottom Drag:	0	0.1	0.1
Square nm of Bottom Drag:	0	0.01	0.01
Number of Bottom Samples:	84	0	84
Number of Tide Gages:	3		3
(See Field Tide Note)			
Number of Current Stations:	0	0	0
Number of Velocity Casts:	15	0	15
Number of Magnetic Stations:	0	0	0
Vessel Days	21	6	27

**P. MISCELLANEOUS**

Bottom samples were acquired and sent to the Smithsonian Institute. The position numbers and day numbers are tabulated below. ✓

<u>POS</u>	<u>DN</u>
2215 - 2234	62
2235 - 2242	65
2421 - 2441	67
2523 - 2541	73

There were no magnetic anomalies observed during the survey. ✓

Positions 1 - 66 acquired by the skiff are detached positions located in sounding volume #1. ✓

**Q. RECOMMENDATIONS**

Grizzly Bay and the Sloughs are used by small craft only. The waterways are used for fishing and pleasure boating. ✓

The homes in Suisun Slough adjacent to the charted piers are not served by roads, or the roads are not usable in the winter. The sloughs serve as transportation routes for these residents. ✓

It is recommended that PHP use the AML Sound Velocity Profiler weekly to determine velocity corrections and perform a daily bar check at 10 ft to check the sounding equipment. *The AML Sound Velocity Profiler is being used for PHP SURVEYS* ✓

**R. AUTOMATED DATA PROCESSING**

**DEC PDP 8/e Computer**

<u>Number</u>	<u>Name</u>	<u>Version Date</u>
RK201	Grid, Signal, and Lattice Plot	4/18/75
RK221	Range-Range Non-Real Time Plot	2/13/84
RK300	Utility Computations	10/21/80
RK362	Reformat and Data Check and Elinore-Line Oriented Generator	8/20/84 ✓
RK407	Geodetic Inverse Direct Comp.	9/25/87
AM500	Predicted Tide Generator	11/10/72
RK561	H/R Geodetic Calibration	12/01/82
version 1.0	Velocity	09/01/88

**Hewlett Packard 9815A Calculator.**

<u>Number</u>	<u>Name</u>	<u>Version Date</u>
811101	Geodetic Package	Feb. 1985 ✓

**IBM PC**

<u>Number</u>	<u>Name</u>	<u>Version Date</u>
MTEN	Micro - Terminal Entry Command	Nov. 1984 ✓

**S. REFERRAL TO REPORTS**

The following reports will be submitted shortly after the completion of OPR-L202 since it was extended to include sheets "D" and "F" (H-10293 and H-10298). ✓

Other reports covering this survey area are:

- 1) Horizontal Control Report, PHP, OPR-L202-PHP-88, Carquinez Strait, California, March 1988 - April 1989.
- 2) Coast Pilot Report, PHP, OPR-L202-PHP-88, Carquinez Strait and Grizzly Bay, California, March 1988 - April 1989. ✓
- 3) User Evaluation Report, OPR-L202-PHP-88, Carquinez Strait and Grizzly Bay, California.

Submitted by,

*Thomas K. Porta*

Lieutenant (jg) Thomas K. Porta, NOAA  
Assistant Chief PHP ✓

FIELD TIDE NOTE

OPR-L202-PHF-88

FHP 10-1-89, (H-10293)

GRIZZLY BAY, CALIFORNIA

REDUCTIONS

Soundings on the field sheet were reduced on the basis of predicted tides for San Francisco, Golden Gate, Presidio, Fort Point, CA, (941-4290). Tide correctors were generated at 0.2-ft intervals using the DIGITAL PDP-8e computer system and program AM 500 "Predicted Tide Generator".

TIDE\_ZONE\_CORRECTORS

Predicted tides from the San Francisco, Fort Point, California tide gage (941-4290), were adjusted by the application of correctors supplied by NOAA, Office of Oceanography and Marine Assessment, Sea and Lake Levels Branch, Rockville, MD (N/OMA121). The correctors accompany project instructions OPR-L202-PHF-88, dated 02 December 1988.

The correctors used for this survey are as follows:

South of Latitude 38/09/00 N

+ 2 hr 45 min High Water  
+ 3 hr 30 min Low Water  
X 0.85 Height Ratio

North of Latitude 38/09/00 N

Montezuma Slough

+ 3 hr 00 min High Water  
+ 3 hr 45 min Low Water  
X 0.85 Height Ratio

Suisun Slough

+ 3 hr 00 min High Water  
+ 3 hr 45 min Low Water  
X 0.90 Height Ratio

---



## STATIONS

Two permanent tide stations bracket the survey area. These two stations are operated by NOAA, Pacific Operations Group (POG), N/OMA1214. The gage at San Francisco, Fort Point (941-4290) is to the southwest of the survey area and Port Chicago (951-5144), Concord, CA is to the south. Frequent checks with POG confirmed that there were no significant breaks in the data from these stations (latest levels performed in November 1988). These gages were operated using Pacific Standard Time.

Tide stations operated by PHP during this survey are:

Suisun Slough Entrance, Grizzly Bay (941-5265)  
Gage Type: Fischer-Porter ADR  
Geographic Locale: 38/07.3 N  
122/04.4 W  
Installation Date: 1/12/89  
Removal Date: after completion of sheet "C"  
Staff zero on Analog: 20.1  
Record's Time Meridian: 000

Montezuma Slough Bridge (941-5402)  
Gage Type: Fischer-Porter ADR  
Geographic Locale: 38/11.2 N  
121/58.8 W  
Installation Date: 12/12/88  
Removal Date: after completion of sheet "E"  
Staff zero on Analog: 9.1 from 1/25 to present  
Record's Time Meridian: 000

Joice Island, Suisun Slough (941-5379)  
Gage Type: Fischer-Porter ADR  
gage changed on 4/14  
Geographic Locale: 38/10.8 N  
122/02.7 W  
Installation Date: 1/10/89  
Removal Date: after completion of sheet "E"  
Staff zero on Analog: 17.1 from 1/23 to 2/1  
16.9 from 2/6 to 4/14

Record's Time Meridian: 000

## INSTALLATION, LEVELS AND OPERATION

### Suisun Slough Entrance, Grizzly Bay (941-5265)

The gage was installed at the historical site.

Bench marks 5265 B 1977, and V552 1980 were recovered as described. Bench marks 5265 A, C and D 1977 were destroyed. Bench marks 5265 F, G, and H 1988 were set in concrete monuments by the Pacific Hydrographic Party.

Third order levels were acquired on 1/12/89. The levels closed to within the required tolerance between levels. There were no historical differences to compare since V552 was reset in 1980.

### Montezuma Slough Bridge (941-5402)

The gage occupies the historical site.

Data acquired from this gage before 2230 UTC on 1/25/89 should be rejected. Before 1/25/89, the orifice was in the mud and the float wire was kinked which caused the difference between the staff and the gage to change.

Bench marks 5402 A, B, D, E, 1977 were recovered as described. Bench mark 5402 C 1977 was searched for but not recovered. Bench mark 5402 F 1988 was installed. The mark was set in a concrete monument by the Pacific Hydrographic Party.

Third Order levels were acquired on 1/5/89. The closure between the runs meets the tolerance limits.

Comparison with historical levels shows that bench mark A has moved 0.1 meters closure to the level of the rest of the bench marks. The mark was scratched and gouged on the top. It appeared as if some work had taken place in the vicinity.

### Joice Island, Suisun Slough (941-5379)

The gage was installed across the pier from the historical site. The California Water Resources ADR gage occupies the historical site.

The gage was changed on 4/14/89 because of a bad connection between the battery and the motor. The data from 4/10/89 to 4/14/89 should be rejected. The break in data does not affect any soundings on sheet "D", H-10293, since it was completed before this date.

Bench marks 5379 A, and D 1977 were recovered as described. Bench marks 5379 B, C, and E 1977 were destroyed. GPS S42, set by California Water Resources, was used for levels.

Bench marks 5379 F, and G 1988 were set in concrete monuments by the Pacific Hydrographic Party.

Third Order levels were acquired on 1/10/89 and 2/10/89. The levels on 2/10/89 were acquired because the scales which were screwed into the staff were moved. The location of the rod stop was not changed. The graduation corresponding to the top of the rod stop was recorded on the Tide Station Report and the Level Book dated 2/10/89. The levels on 2/10/89 included 3 bench marks only.

The closure between the runs for 1/10/89 and 2/10/89 meets the tolerance limits.

Comparison to historical levels shows that the difference from marks A to D is 0.006 meters greater than it was in 1977.

There were no unusual fluctuations between adjacent gages other than those described above.

There were no unusual currents or tidal conditions.

The zoning on the tidal zoning chart is accurate for this survey.

Tidal data was acquired from all three gages for all times of hydrography.

Request for smooth tides will come from Pacific Hydrographic Party, N/MOP223.

Submitted By:



Thomas K. Porta  
Assistant Chief, PHP

Approved By:



Federico R. Diaz  
Chief, PHP

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 15, 1989

MARINE CENTER: Pacific

OPR: L-202

HYDROGRAPHIC SHEET: H-10293

LOCALITY: Carquinez Strait, Grizzly Bay, CA.

TIME PERIOD: January 26 - March 24, 1989

TIDE STATIONS USED: 941 5265 Suisun Slough Entrance, CA.

PLANE OF REFERENCE (MEAN LOWER LOW WATER): = 2.86 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: = 4.4 ft.

REMARKS: RECOMMENDED ZONING

1. South of 38 9.0'N and for all of Montezuma Slough on this sheet zone direct.
2. On Suisun Slough north of 38 9.0'N, apply a X1.04 range ratio to all heights, and a +0 hr 07 min time correction.

  
CHIEF, TIDAL DATUM QUALITY  
ASSURANCE SECTION

SIGNAL LIST  
PHP-10-2-1989  
H-10293

<del>408</del>	<del>0</del>	<del>38</del>	<del>04</del>	<del>19548</del>	<del>122</del>	<del>08</del>	<del>13083</del>	<del>139</del>	<del>0000</del>	<del>000000</del>	<del>EXXON REFINERY STACK 1977</del>
601	0	37	52	54387	121	54	47107	250	1177	000000	MOUNT DIABLO 1876
607	0	38	13	02154	122	06	52321	250	0107	000000	THOMASSON 1922
608	0	38	12	53098	122	01	07724	250	0003	000000	SUISUN HILL 2 1922
609	0	38	06	29681	122	03	18420	250	0003	000000	SUISUN SLOUGH ENT LT 9, 1979
610	0	38	07	08925	122	03	39820	250	0003	000000	SUISUN SLOUGH ENT LT 10, 1979
611	0	38	06	22023	122	06	12491	250	0065	000000	GOODYEAR 2 1979



RESPONSIBLE PERSONNEL		
TYPE OF ACTION	NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD	Fred Diaz Tom Porta Lowell J. Lindley	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	Gary Fredrick, Richard Minton	FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE
INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION' (Consult Photogrammetric Instructions No. 64.)		
<p><b>OFFICE</b></p> <p><b>I. OFFICE IDENTIFIED AND LOCATED OBJECTS</b> Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object. EXAMPLE: 75E(C)6042 8-12-75</p> <p><b>FIELD</b></p> <p><b>I. NEW POSITION DETERMINED OR VERIFIED</b> Enter the applicable data by symbols as follows: F - Field                      P - Photogrammetric L - Located                    Vis - Visually V - Verified 1 - Triangulation      5 - Field identified 2 - Traverse                6 - Theodolite 3 - Intersection        7 - Planetable 4 - Resection              8 - Sextant</p> <p><b>A. Field positions* require entry of method of location and date of field work.</b> EXAMPLE: F-2-6-L 8-12-75</p> <p>*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.</p>	<p><b>FIELD (Cont'd)</b></p> <p><b>B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.</b> EXAMPLE: P-8-V 8-12-75 74L(C)2982</p> <p><b>II. TRIANGULATION STATION RECOVERED</b> When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery. EXAMPLE: Triang. Rec. 8-12-75</p> <p><b>III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH</b> Enter 'V-Vis.' and date. EXAMPLE: V-Vis. 8-12-75</p> <p>**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.</p>	



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SERVICE

Pacific Hydrographic Party  
614-A East 5th St.  
Benicia, California 94510

April 13, 1989

Commander (OAN)  
Eleventh Coast Guard District  
400 Ocean Gate Blvd.  
Union Bank Building  
Long Beach, California 90822

Dear Sir:

During field review of hydrographic survey H-10293, California, Grizzly Bay, a danger to navigation affecting chart 18656 (47th ed., March 7, 1987; datum: NAD 27) and chart 18652 (25th ed., June 20, 1987; datum: NAD 27) was found..

It is recommended that the enclosed Report of Danger to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Party at (707) 746-8189.

Sincerely,

A handwritten signature in dark ink, appearing to read "Federico R. Díaz".

Federico R. Díaz  
Lieutenant, NOAA  
Chief, Pacific Hydrographic  
Party





REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10293  
Survey Title: Grizzly Bay State: California  
General Locality: Grizzly Bay  
Sublocality: Entrance to Suisun Slough

Project Number: DPR-L202-PHP  
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Shoal

Covered ~~6~~<sub>8</sub> feet corrected to MLLW using ~~predicted~~<sub>REAL</sub> tides.

CHART NUMBER	EDITION		REPORTED DEPTH	CHART HORIZ. DATUM	GEOGRAPHIC POSITION		Position Number
	NO.	DATE			LATITUDE	LONGITUDE	
18656	47	Mar. 7, 1987	8.4 feet	NAD 27	38/06/47.0N	122/03/29.0W	97
18652	25	June 20, 1987	8.4 feet	NAD 27	38/06/47.0N	122/03/29.0W	97

Questions concerning this report should be directed to the Pacific Hydrographic Party at (707) 746-8189.

The predicted tides that were applied to the final field sheet were incorrect. Correct approved tides were applied to the smooth sheet. Soundings in the area are 8 feet at MLLW. Chart according to the smooth sheet.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10293  
 Survey Title: Grizzly Bay State: California  
 General Locality: Grizzly Bay  
 Sublocality: Suisun Slough

Project Number: DPR-L202-PHP  
 Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Submerged Cable

~~Corrected to MLLW using predicted tides. Negative soundings indicate that the object bares at MLLW.~~

CHART NUMBER	EDITION		REPORTED DEPTH	CHART	GEOGRAPHIC POSITION		Position Number
	NO.	DATE		HORIZ. DATUM	LATITUDE	LONGITUDE	
18656	47	Mar. 7, 1987		NAD 27	38/08/13.12	122/04/55.77	55
18656	47	Mar. 7, 1987		NAD 27	38/08/14.74	122/04/49.66	66
18652	25	June 20, 1987		NAD 27	38/08/13.12	122/04/55.77	55
18652	25	June 20, 1987		NAD 27	38/08/14.74	122/04/49.66	66

Questions concerning this report should be directed to the Pacific Hydrographic Party at (707) 746-8189.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10293  
 Survey Title: Grizzly Bay State: California  
 General Locality: Grizzly Bay  
 Sublocality: Grizzly Bay and  
 Entrance to Suisun  
 Slough

Project Number: OPR-L202-PHF  
 Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Row of Piles

Corrected to MLLW using <sup>observed</sup> ~~predicted~~ tides. Negative soundings indicate that the object bares at MLLW.

CHART NUMBER	EDITION NO.	DATE	REPORTED DEPTH	CHART		<u>Position Number</u>
				HORIZ. DATUM	GEOGRAPHIC POSITION LATITUDE LONGITUDE	
18656	47	Mar. 7, 1987	<del>3.0</del> 4.2 feet	NAD 27	38/06/41.70 121/59/17.98	15
18656	47	Mar. 7, 1987	<del>3.0</del> 4.6 feet	NAD 27	38/08/14.31 122/01/12.69	25
18656	47	Mar. 7, 1987	-4.5 <sup>0</sup> feet	NAD 27	38/07/14.03 122/04/25.69	44
18656	47	Mar. 7, 1987	-3.4 <sup>0</sup> feet	NAD 27	38/07/13.384 122/04/26.78	49
18656	47	Mar. 7, 1987	<del>4.0</del> 3.5 feet	NAD 27	38/08/10.92 122/04/58.77	2664
18656	47	Mar. 7, 1987	-5.8 <sup>0</sup> feet	NAD 27	38/08/16.007 122/00/23.53	18
18656	47	Mar. 7, 1987	-5.2 <sup>0</sup> feet	NAD 27	38/06/05.19 122/00/20.29	40
18656	47	Mar. 7, 1987	-4.2 <sup>0</sup> feet	NAD 27	38/06/04.20 122/00/21.15	41
18652	25	June 20, 1987	<del>3.0</del> 4.2 feet	NAD 27	38/06/41.70 121/59/17.98	
18652	25	June 20, 1987	<del>3.0</del> 4.6 feet	NAD 27	38/08/14.31 122/01/12.69	
18652	25	June 20, 1987	-4.5 <sup>0</sup> feet	NAD 27	38/07/14.03 122/04/25.69	
18652	25	June 20, 1987	-3.4 <sup>0</sup> feet	NAD 27	38/07/13.33 122/04/26.78	
18652	25	June 20, 1987	<del>4.0</del> 3.5 feet	NAD 27	38/08/10.92 122/04/58.77	
18652	25	June 20, 1987	-5.8 <sup>0</sup> feet	NAD 27	38/08/16.08 122/00/23.53	
18652	25	June 20, 1987	-5.2 <sup>0</sup> feet	NAD 27	38/06/05.19 122/00/20.29	
18652	25	June 20, 1987	-4.2 <sup>0</sup> feet	NAD 27	38/06/04.20 122/00/21.15	

Questions concerning this report should be directed to the Pacific Hydrographic Party at (707) 746-8189.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10293  
 Survey Title: Grizzly Bay State: California  
 General Locality: Grizzly Bay  
 Sublocality: Suisun Slough  
 Montezuma Slough  
 Grizzly Bay

Project Number: OPR-L202-PHP  
 Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Snag

Corrected to MLLW using <sup>observed</sup> ~~predicted~~ tides. Negative soundings indicate that the object bares at MLLW.

CHART NUMBER	EDITION NO.	DATE	REPORTED DEPTH	CHART HORIZ. DATUM	GEOGRAPHIC POSITION		<i>Position Number</i>
					LATITUDE	LONGITUDE	
18656	47	Mar. 7, 1987	<del>3.0</del> <sup>-1.7</sup> feet	NAD 27	38/08/14.48	122/00/28.27	22
18656	47	Mar. 7, 1987	-3.8 <sup>0</sup> feet	NAD 27	38/07/12.7N	122/04/05.25	47
18656	47	Mar. 7, 1987	-2.0- <sup>1.1</sup> feet	NAD 27	38/09/03.78	122/03/07.11	57
18652	25	June 20, 1987	<sup>-3.0</sup> <del>1.3</del> feet	NAD 27	38/08/14.45	122/00/28.27	
18652	25	June 20, 1987	-3.8 <sup>0</sup> feet	NAD 27	38/07/12.7N	122/04/05.25	
18652	25	June 20, 1987	<del>1.1</del> <sup>-2.0</sup> feet	NAD 27	38/09/03.75	122/03/07.11	

Questions concerning this report should be directed to the Pacific Hydrographic Party at (707) 746-8189.

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10293  
Survey Title: Grizzly Bay State: California  
General Locality: Grizzly Bay  
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP  
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: File

Corrected to MLLW using predicted tides. Negative soundings indicate that the object bares at MLLW.

CHART NUMBER	EDITION NO. DATE	REPORTED DEPTH	CHART		GEOGRAPHIC POSITION	<u>Position Number</u>
			HORIZ. DATUM	LATITUDE		
18656	47 Mar. 7, 1987	<del>-4.4</del> feet -6.0	NAD 27	38/08/33.384	122/03/27.74	64
18652	25 June 20, 1987	<del>-4.4</del> feet -6.0	NAD 27	38/08/33.35	122/03/27.74	

Questions concerning this report should be directed to the Pacific Hydrographic Party at (707) 746-8189.

18656

38/10/00N

122/05/00W

122/00/00W

Submerged Cable

Row of Piles

Snag

Pile

Row of Piles

Row of Piles

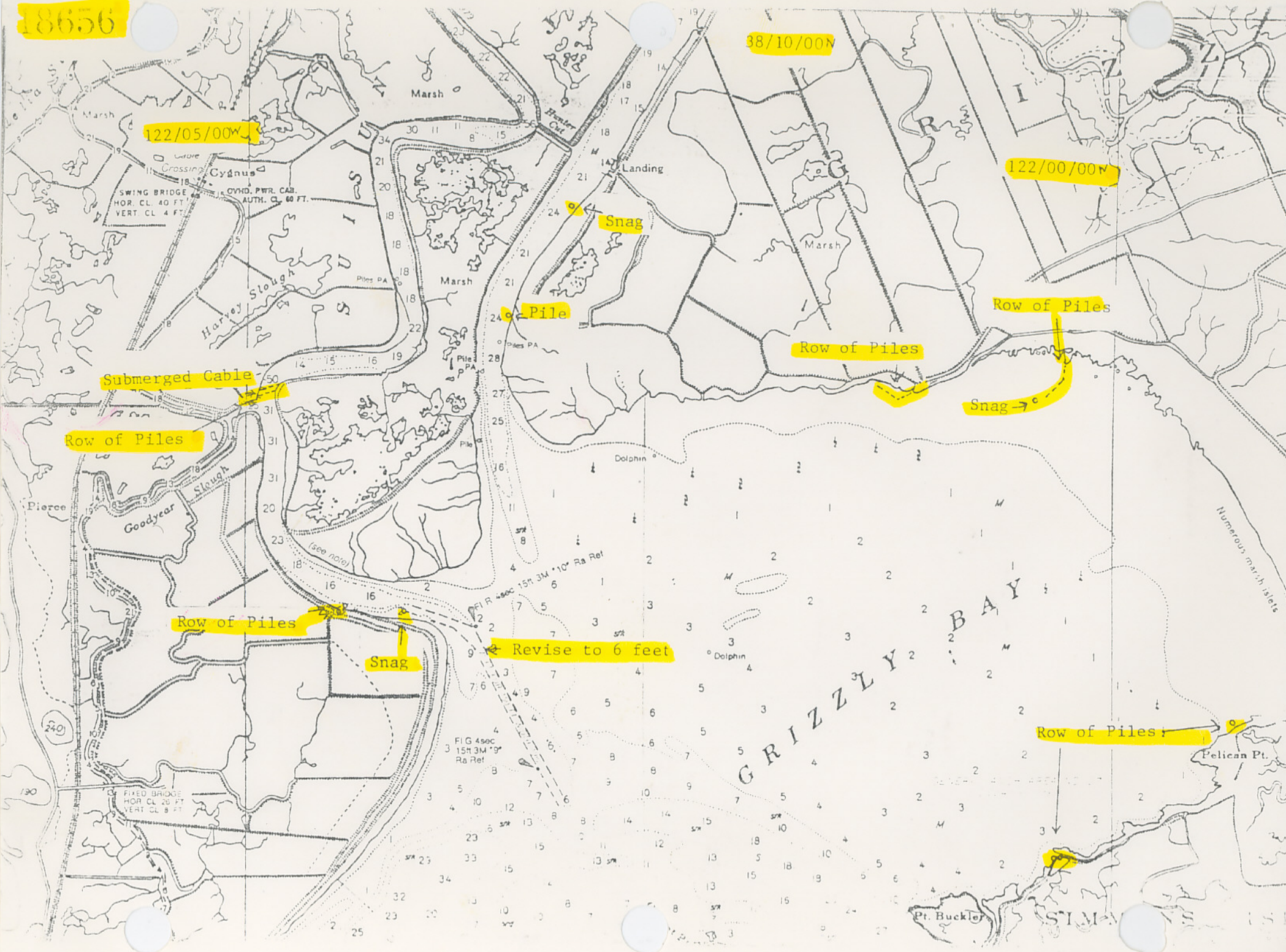
Snag →

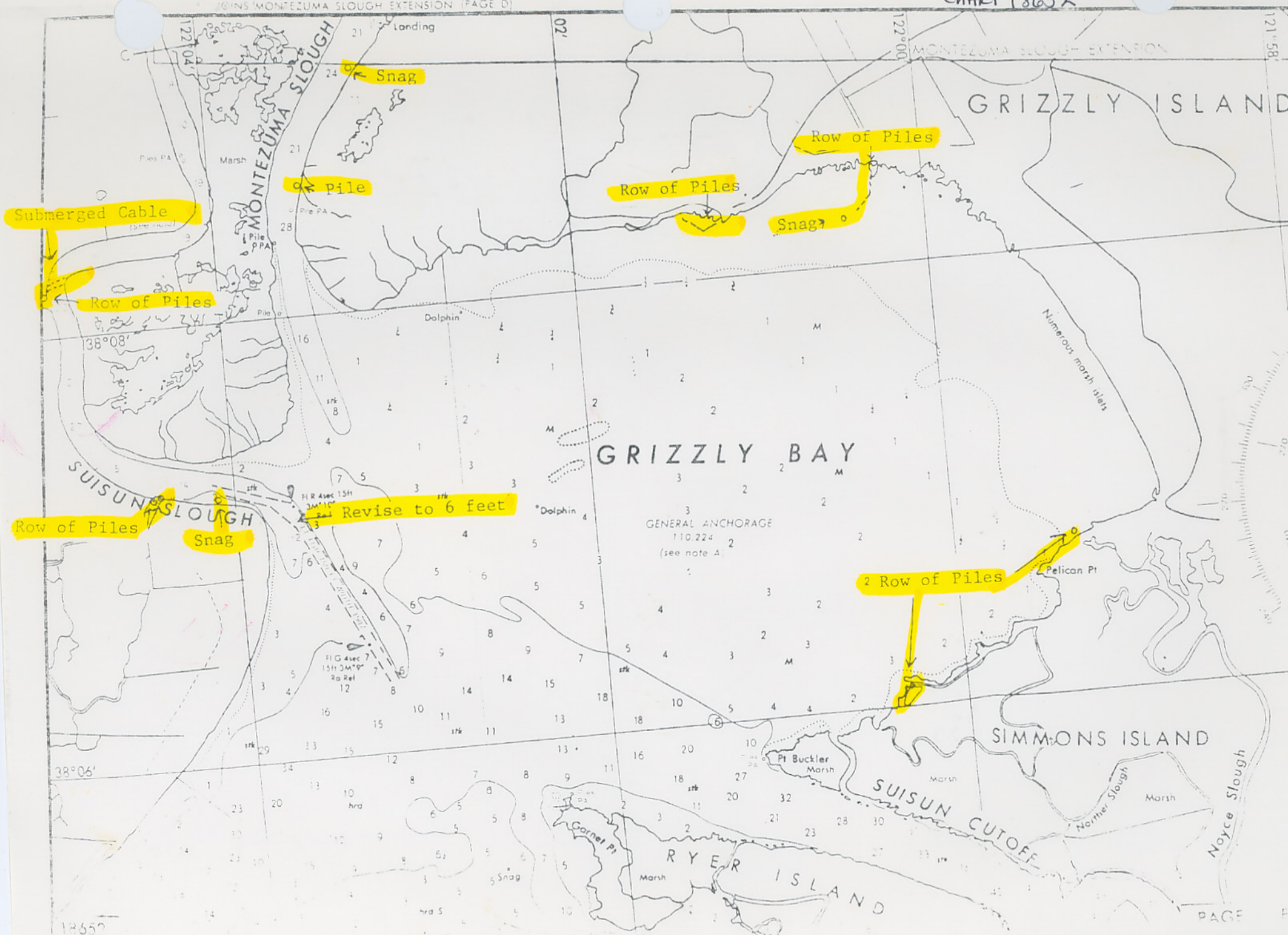
Row of Piles

Snag

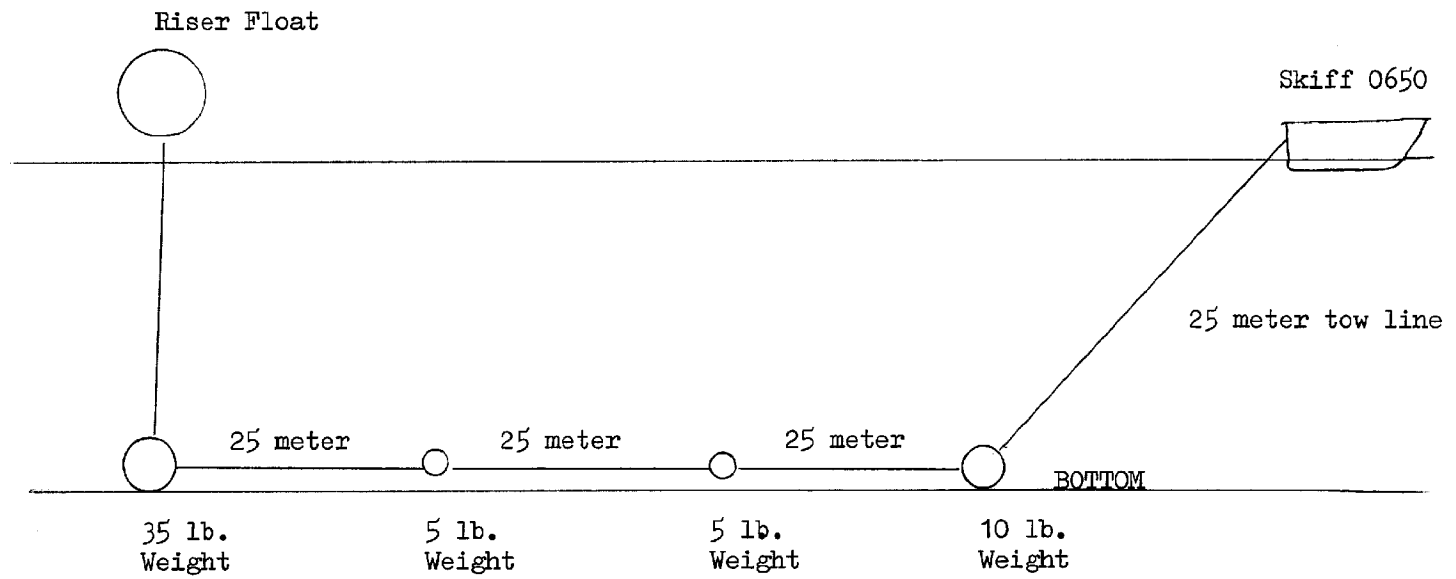
← Revise to 6 feet

Row of Piles





75-METER RADIUS BOTTOM CIRCLE DRAG







# Notes To Hydrographers

June 29, 1988

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## DATA TRANSFER BREAKTHROUGH

THE PACIFIC HYDROGRAPHIC PARTY TALKS TO THE NAUTICAL CHART BRANCH! The preceding statement doesn't sound all that unusual - after all, they should be talking to us. However, it is the way they are communicating - by IBM PC via a phone modem. Beginning the first week of June PHP has been routinely transmitting hydrographic survey data via the phone to an IBM PC here at NCB, which is then transferred to the large Harris computer for processing. This relatively simple step in computer communications hopefully has opened the door to faster processing of PHP's field data, resulting in a shorter completion time for a PMC smooth sheet.

Transmitting hydrographic data over the phone has been long in coming. Several hurdles had to be overcome first. The major obstacle was to take the paper tapes generated by the PDP-8 computer and read them into the IBM. This required some hardware and software modifications. PHP

personnel then loaded all of the data tapes onto a Bernoulli cartridge, storing each day's data under a filename that describes the data and the day number. Example: RAZCOR.157 for range/azimuth corrector data, day 157. Now the data can be edited without handling the paper tapes. At this early stage PHP has not yet edited any data on the IBM, but it has been suggested that the EDIT program, or perhaps WORD, might be used.

Once edited, the data may be sent via the phone to the Nautical Chart Branch. The receiving IBM computer is linked to the Harris computer, which receives the data and stores it on nine-track tape. The data is then processed in a normal fashion.

Text files generated with the word processing program WORD have also been transmitted, restricted so far to position abstract documents. This additional data greatly facilitates the office identification of features since it includes cartographic codes.

The exciting part of this communications link is that PHP is transferring data during the course of their current survey, before completion of the survey. This is being conducted under an experimental basis, partly due to PHP's loss of survey technicians. NCB is processing the survey data and generating a PPO (position plot) and PSS (sounding plot). These plots are on mylar copies of the shoreline maps of the survey area, another experimental first. The position and sounding plots, color coded for ease in contouring, may eliminate the need for PHP to produce a final field sheet. Instead, they will examine the plots on the shoreline maps throughout the course of the survey, check and approve a final plot, and add descriptive notes and correct cartographic symbols. This will then be sent back to NCB, along with all records, through the mails.

By the time PHP has ended the survey and approved the final sheet, NCB will have greatly progressed in the processing of the survey. All data will have been spooled, the processor working with PHP's data will be familiar with the area and the data, and many of the "bugs" will have been worked out, with the result that perhaps one to

two months of office processing time may be saved.

PHP is in a unique situation, in that they are land based and are only a phone call away from NCB. The above experiment would not be feasible with the ships. It is envisioned, however, that the ships will load all data onto a disk or a Bernoulli cartridge and submit the disk or cartridge, instead of paper tapes. NCB's computer section is working on that option now, but there are problems to be worked out (please keep sending paper tapes, as usual!).

The Pacific Hydrographic Party has also recently acquired a Zenith Z-183 laptop computer. This lightweight computer runs on batteries or on AC power, and has 20 MB of internal memory, the same as a Bernoulli box. PHP has loaded MTEN into the Z-183, allowing them to take the computer into the field. This gives them the capability of entering geodetic observations into MTEN before leaving a station. The Z-183 is also carried on the launch, to compute sextant fixes and calibrations "on the spot", using the MTEN utility programs.

PHP has also loaded WORD and other programs into the laptop. LT Diaz, the Chief

of PHP, has informed me that he has taken the Z-183 home with him to work on the Descriptive Reports or official correspondence. The Zenith Z-183 is proving to be a useful tool for surveying.

- John Miller

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The PMC OPODER requires that hydrographic survey data be mailed to NCB in four separate groups, to help insure against the loss of a complete survey (page 3.5-2 of the OPODER). It would be more efficient for our processing system if the field units would mail the computer tapes, along with a copy of the Descriptive Report, before the other data. This will give the processors a chance to build the parameter file, spool the tapes, and make preliminary plots, all of which are time-consuming and do not require the other survey data. This change in procedure will appear in the next revision of the OPODER.

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Headquarters personnel are rapidly proceeding toward the completion of the new consolidated "C & GS OPODER". This document combines the best of the PMC and AMC OPODERs into a single set of instructions. Two major sections have already been reviewed at the Marine Center and it looks like the new OPODER will largely resemble the existing PMC document. Discussions with headquarters indicates that this is a result of the present high quality of the PMC document which required little revision.

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Did you know that "DIP" as in DIPFILE stands for Discrete Independent Point? This file contains valuable information about fixed and floating aids and landmarks. It is compiled by nautical chart cartographers and was the very first attempt to automate charting. Despite the many high tech advances in automated cartography this file remains as one of the oldest and most valuable sources of critical information.

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Approval Sheet

OPR-L202-PHP

Basic Hydrographic Survey

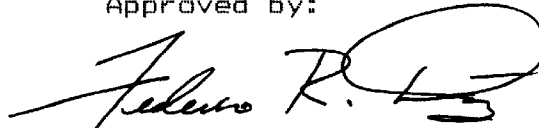
GRIZZLY BAY, CALIFORNIA

Supervision of the field and office work on this hydrographic survey was continuous on a day to day basis to ensure completeness of the survey and that all work was done in accordance with the project instructions. The survey is complete and adequate.

For a detailed description of PHP's experimental method of data processing, field sheet compilation and transferring hydrographic survey data via modem to FMC, see the Nautical Chart Branch Publication, "Notes To Hydrographer", dated 29 June 1988, in Supplemental Information (Appendix XII); and the paper, "Productivity Improvements Involving an NOS Hydrographic Field Party", to be published in the proceedings of the 1989 Canadian Hydrographic Conference.

PHP sent a draft descriptive report of Survey H-10293 to FMC, via modem, to have it laser printed for letter quality. Mr. James Green (N/MOP21) submitted helpful comments and suggestions to aid in the verification/evaluation process with the draft descriptive report. PHP followed PMC's recommendations and suggestions for the final draft of the descriptive report. The "comments" are located in Appendix XII. Supplemental Information.

Approved by:



LT Federico R. Díaz, NOAA  
CHIEF  
PACIFIC HYDROGRAPHIC PARTY  
NATIONAL OCEAN SERVICE (NOS)

GEOGRAPHIC NAMES

H-10293

Name on Survey	18650 ON CHART NO.		18652 ON PREVIOUS SURVEY NO.		CON U.S. QUADRANGLE MAPS		D FROM LOCAL INFORMATION		E ON LOCAL MAPS		F P.O. GUIDE OR MAP ATLAS		G GRAND MCNALLY		H U.S. LIGHT LIST		K	
CALIFORNIA (title)	X	X																1
CORDELIA SLOUGH	X	X																2
GRIZZLY BAY	X	X																3
GRIZZLY ISLAND	X	X																4
HUNTER CUT	X	X																5
JOICE ISLAND	X	X																6
MONTEZUMA SLOUGH	X	X																7
PÉLICAN POINT	X	X																8
SIMMONS ISLAND	X	X																9
SUISUN SLOUGH	X	X																10
																		11
																		12
																		13
																		14
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																		25

Approved:

*Chas. E. Harrington*

Chief Geographer - N/CG 2x5

JUL - 7 1989

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER		
<b>HYDROGRAPHIC SURVEY STATISTICS</b>				H-10293		
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.						
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION		
SMOOTH SHEET		1		SMOOTH OVERLAYS: POS., ARC, EXCESS		
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS		
DESCRIP- TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR- GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES						
ENVELOPES						
VOLUMES	1					
CAHIERS	2					
BOXES						
SHORELINE DATA						
SHORELINE MAPS (List): TP-01053, TP-01057, TP-01058						
PHOTOBATHYMETRIC MAPS (List): None						
NOTES TO THE HYDROGRAPHER (List): None						
SPECIAL REPORTS (List): None						
NAUTICAL CHARTS (List): 18652 SC 26th Ed. 12/3/89, 18656 47th Ed., 3/7/87						
OFFICE PROCESSING ACTIVITIES						
<i>The following statistics will be submitted with the cartographer's report on the survey</i>						
PROCESSING ACTIVITY				AMOUNTS		
				VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET						2821
POSITIONS REVISED						10
SOUNDINGS REVISED						132
CONTROL STATIONS REVISED						
				TIME-HOURS		
				VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION						
VERIFICATION OF CONTROL						
VERIFICATION OF POSITIONS				23		23
VERIFICATION OF SOUNDINGS				102		102
VERIFICATION OF JUNCTIONS						
APPLICATION OF PHOTOBATHYMETRY						
SHORELINE APPLICATION/VERIFICATION						
COMPILATION OF SMOOTH SHEET				45		45
COMPARISON WITH PRIOR SURVEYS AND CHARTS					12.5	12.5
EVALUATION OF SIDE SCAN SONAR RECORDS						
EVALUATION OF WIRE DRAGS AND SWEEPS						
EVALUATION REPORT					37.5	37.5
GEOGRAPHIC NAMES						
OTHER*						
*USE OTHER SIDE OF FORM FOR REMARKS			TOTALS	170	50.0	220
Pre-processing Examination by <b>James Stringham</b>				Beginning Date 5/11/89	Ending Date 5/31/89	
Verification of Field Data by <b>Robert N. Mihailov, Richard Shipley</b>				Time (Hours) 170	Ending Date 10/17/89	
Verification Check by <b>James Stringham</b>				Time (Hours) 60	Ending Date 10/20/89	
Evaluation and Analysis by <b>Gordon E. Kay</b>				Time (Hours) 50.0	Ending Date 11/13/89	
Inspection by <b>Dennis J. Hill, B.A. Olmstead</b>				Time (Hours) 11	Ending Date 1/19/90	

## EVALUATION REPORT

H-10293

### 1. INTRODUCTION

Survey H-10293 is a basic hydrographic survey accomplished by the Pacific Hydrographic Party under the following Project Instructions.

OPR-L202-PHP, dated December 2, 1988

CHANGE 1, dated December 8, 1988

CHANGE 2, dated January 11, 1989

CHANGE 3, dated March 27, 1989

This survey occurred in California, and covers an area in the northern portion of Grizzly Bay and portions of Suisun and Montezuma Sloughs. The survey extends from latitude 38°06'05"N northward along Montezuma Slough to latitude 38°10'12"N. The surveyed area extends from the western limits in Cordelia Slough at longitude 122°05'00"W to the eastern limit at longitude 121°59'00"W. The bottom consists of mud. Depths range from zero to 54 feet.

Predicted hourly heights and zoning for this survey were provided by N/CMA121 for the San Francisco, California, gage 941-4290 for the reduction of soundings during field processing. Approved hourly heights zoned from Suisun Slough Entrance, gage 941-5265, were used during office processing.

The Pacific Hydrographic Section initiated a test process where the Pacific Hydrographic Party periodically sent digital data subsets to the Seattle office via telecommunications. Following office processing, plotted data and a quality analysis were returned to the hydrographer via express mail. Refer to Notes to Hydrographers, dated June 29, 1988, attached to the hydrographer's report, for a description of this process.

The final field sheet was compiled from a 3-mil mylar mosaic of the registered shoreline maps, photographically reproduced on mylar. This composite shoreline map was accurately positioned by the Pacific Hydrographic Section's Xynetics flatbed plotter utilizing the latitude-longitude projection for registry. Soundings and positions were plotted directly onto the map. The plotted sheet was returned to the hydrographer who manually supplemented the soundings with field notes as he considered appropriate.

The TRA and electronic control correctors are adequate. The sound velocity correctors were originally submitted in error. The hydrographer was notified and a correction submitted. An accompanying computer printout contains the parameters and the corrections.

A digital file has been generated for this survey as required by N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, September 7, 1983. The file, however, is incomplete. Certain feature descriptive information, all line type data and miscellaneous isolated features are not in the digital record due to the present lack of digitizing resources.

The user should refer to the smooth sheet for complete depiction of survey data.

## 2. CONTROL AND SHORELINE

Sections F and G of the hydrographer's report, the Horizontal Control Report for OPR-L202-PHP, 1988, and the "Abstract of Corrections to Electronic Position Control", contain adequate discussions of the horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are field and published values based on NAD 27. These values were used during office processing for the computation of positions. The smooth sheet and accompanying overlays are annotated with NAD 83 adjustment ticks based on values determined by N/CG121. Geographic positions based on NAD 83 may be plotted on the smooth sheet utilizing the NAD 27 projection by applying the following corrections.

Latitude: 0.294 seconds (9.1 meters)  
Longitude: -3.870 seconds (-94.3 meters)

The year of establishment of control stations shown on the smooth sheet originates with published NGS data.

There is one weak fix, with an angle of intersection less than 30 degrees or more than 150 degrees, noted in this survey. However, there is no significant plotting difference between the sounding located by this fix and those in the adjacent area. This fix was not used to position a danger to navigation. The fix is considered acceptable.

The following registered shoreline maps (Job CM-7823) apply to this survey.

	<u>Photo Date</u>	<u>Class</u>
TP-01053	April 1979	III
TP-01057	April 1979	III
TP-01058	April 1979	III

Hydrographic revisions to the shoreline are shown in dashed red ink at the following locations.

	<u>Smooth Sheet</u>	
	<u>Latitude N</u>	<u>Longitude W</u>
shoreline change from:	38°07'15"	122°04'30"
to:	38°08'26"	122°04'15"
shoreline change from:	38°07'23"	122°04'18"
to:	38°07'24"	122°03'54"
shoreline change from:	38°07'26"	122°03'48"
to:	38°07'33"	122°03'40"
shoreline change from:	38°07'52"	122°03'39"
to:	38°07'56"	122°03'09"



shoreline change from:	38°08'06"	122°03'42"
to:	38°10'14"	122°02'21"
shoreline change from:	38°09'27"	122°04'15"
to:	38°09'42"	122°03'36"
shoreline change from:	38°08'12"	122°02'46"
to:	38°08'15"	122°02'41"
shoreline change from:	38°06'08"	122°00'05"
to:	38°06'10"	122°00'01"
shoreline change from:	38°06'14"	121°59'55"
to:	38°06'20"	121°59'36"
shoreline change from:	38°06'41"	121°59'19"
to:	38°06'45"	121°59'12"

These changes were made because the hydrographic positions in the sloughs and bay plotted above the photogrammetric shoreline. The photogrammetric high waterline appears to have been compiled using the grasses along the shoreline as the high water line.

The following features were transferred to the smooth sheet from the field sheet, or from the raw records, without supporting positional information.

	Approximate	
	<u>Latitude N</u>	<u>Longitude W</u>
pier	38°06'20"	121°59'35"
piers	38°06'39"	121°59'19"
stakes (dashed foul area)	38°07'00"	122°00'00"
piles (dashed foul area)	38°07'35"	122°00'37"

### 3. HYDROGRAPHY

Except for insufficient sounding data in the western junction area in Cordelia Slough (see section 5 of this report) and along the abrupt sides of the sloughs where the zero curve could not be adequately drawn, hydrography is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the standard depth curves.
- b. reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. show the survey was properly controlled and soundings are correctly plotted.

### 4. CONDITION OF SURVEY

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3; the Hydrographic Survey Guidelines; and the Field Procedures Manual.

## 5. JUNCTIONS

Survey H-10293 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10303	1989	1:10,000	North
H-10306	1989	1:10,000	Southwest

The junctions with surveys H-10303 and H-10306 (OPR-208) have not yet been made. The discussion of these junctions will be made in the Evaluation Report upon final office processing of these surveys.

There are no contemporary surveys to the southeast into Grizzly Bay. This area is designated as "sheet G" in the project instructions for OPR-L208. A comparison was made to chart 18656, 48th edition, dated May 27, 1989. Present survey soundings and depths curves in this southeast junction area agree with the charted hydrography.

There are no contemporary surveys to the west into Cordelia Slough. A comparison was made to chart 18656, 48th edition, dated May 27, 1989. This survey does not agree with the charted hydrography. The present survey ends at the entrance to Cordelia Slough. There is a charted 25-foot sounding at the entrance to Cordelia Slough (source unknown). This sounding affects the portrayal of the 18 foot depth curve. The present survey did not acquire sufficient sounding data to adequately portray the channel and to verify or disprove the 25-foot depth.

## 6. COMPARISON WITH PRIOR SURVEYS

H-905 (1866-67) 1:20,000  
H-1785 (1886-87) 1:20,000  
H-8088 (1954) 1:10,000

Survey H-905 has been superseded by H-1785 (1886-87).

Survey H-1785 covers the entire area of survey H-10293. Present survey soundings are 2 to 3 feet deeper than this prior survey. The high waterline has changed significantly in Grizzly Bay and at the entrance to Suisun Slough.

Survey H-8088 covers the southwest area of survey H-10293. Survey depths range up to thirteen feet shoaler than the prior survey. Differences are attributed to the effects of the accretion of bottom sediments produced by tidal and water transportation action in the sloughs.

Discrepancies are also noted between the priors and present surveys in the hydrographer's report, section K, pages 10-11.

There are no AWOIS items originating from prior surveys H-905, H-1785 and H-8088 applicable to this survey.

Taking into consideration the differences in the scales of the prior surveys, age, methods of surveying, and the encroachment of the shoreline in Grizzly Bay, survey H-10293 is adequate to supersede these prior surveys within the common area.

#### 7. COMPARISON WITH CHART

Chart 18652, 25th edition, dated June 20, 1987; scale 1:40,000 (NAD 27)  
Chart 18652, 26th edition, dated December 3, 1988; scale 1:40,000 (NAD 83)  
Chart 18656, 47th edition, dated March 7, 1987; scale 1:40,000 (NAD 27)  
Chart 18656, 48th edition, dated May 27, 1989; scale 1:40,000 (NAD 83)

##### a. Hydrography

Charted hydrography originates with surveys H-1785, H-8088 and miscellaneous sources. Chart 18656, 48th edition, has shoaler soundings in Suisun Slough than the previous edition. These newer charted shoaler soundings are from unknown sources. The newer edition chart 18656 also contain additional snags and piles. These features are from the Local Notice to Mariners 17/89, dated April 24, 1989, submitted as a Dangers to Navigation Report by the field party, and have been verified by the features located on the smooth sheet.

The present survey soundings in Grizzly Bay are deeper than the charted hydrography. The eastern shoreline of Grizzly Bay has moved outward into the bay. This could be attributed to increased levels of alluvium dropping out of the tidal waters. The latest chart editions contain soundings in the sloughs that are in agreement with the present survey.

~~There is a~~ charted pier centered at approximate latitude 38°07'24"N, longitude 122°04'45"W, ~~whose existence~~ was neither verified or disproven during the course of this survey. The pier should remain as charted, see section 9.

# 51787

Except for the charted pier discussed above and piles (PA) discussed as AWOIS item 51662, survey H-10293 is adequate to supersede charted hydrography within the common area.

##### b. AWOIS

The following AWOIS items originate with miscellaneous sources: 51659, 51660, 51661 and 51662. AWOIS items are adequately discussed in the hydrographer's report, section K, pages 15-17, supplemented as follows.

AWOIS item 51659, is a controlling depth in a delimited channel, at latitude 38°06'20"N and longitude 122°03'10"W. Present survey data reveal that the upper reach has shifted northward, however, this upper reach is no longer charted on the 1989 chart edition of chart 18656. This chart also shows the lower reach with a controlling depth of 6 feet. The 6-foot controlling depth shown on chart 18656 originates from Local Notice to Mariners, 17/89, April 24, 1989, a Dangers to Navigation report submitted by the field party. The minimum depth found during this survey is 7 feet. The controlling depth should be updated to 7 feet.

AWOIS item 51662 are piles (PA) charted at latitude 38°08'44"N, longitude 122°04'07"W. The hydrographer states in his report, section L, page 17, that the position of the piles scaled from the chart locates these piles on the beach. However, the chart distinctly shows the two piles (PA) as existing in the slough. The hydrographer performed a 75-meter radius bottom drag search with 200% coverage. The center of the investigation was position number 2953, at latitude 38°08'42.51"N and longitude 122°05'05.14"W. This position is 65.6 meters south of the reported piles (PA). Based upon the information provided by the hydrographer in the survey records, it appears that the piles (PA) are located farther north than where the investigation took place. Therefore, the AWOIS investigation is not adequate to disprove the existence of the piles. The piles (PA) should be charted as submerged at the above AWOIS location.

c. Controlling Depths

There is one channel with a charted controlling depth on this survey. This channel, at latitude 38°06'20"N and longitude 122°03'10"W, has been discussed as AWOIS item 51659. Chart 18656, 48th edition, dated May 27, 1989, depicts the delimited channel as 6 feet for 150 feet width in 1989. This depth and note originates from a danger to navigation report submitted by the field party. After the application of observed tides the smooth sheet shows depths deeper than 6 feet. The middle half, and the left and right quarter depths are as follows.

	<u>Depth</u>	<u>Position Number</u>	<u>Latitude N</u>	<u>Longitude W</u>
Left Quarter	8.2 feet	150/2	38°06'25.02"	122°03'14.70"
Middle Half	7.6 feet	1528	38°06'53.86"	122°03'31.48"
Right Quarter	7.3 feet	98/1	38°06'54.81"	122°03'31.28"

d. Aids to Navigation

All fixed aids were located and serve their intended purpose. For added discussion see hydrographer's report, section N, pages 17-18, and the attached NOAA Form 76-40. There are no floating aids within the limits of this survey.

e. Geographic Names

Names appearing on the smooth sheet and in the survey title have been approved by the Chief Geographer.

f. Dangers to Navigation

The hydrographer reported fifteen dangers to the USCG. The dangers consisted of a shoal, a pile, rows of piles, snags, and a submarine cable. A copy of the message is attached. No additional dangers were discovered during office processing.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10293 adequately complies with the Project Instruction.

9. ADDITIONAL FIELD WORK

This is an adequate hydrographic survey. Additional field work is recommended on a time available basis to investigate the following.

<u>Feature</u>	<u>Latitude N</u>	<u>Longitude W</u>
charted pier	38°07'24"	122°04'45" # 51787
charted piles (PA) AWOIS item 51662	38°08'44"	122°04'07"

*Charles R. Davis*  
for Gordon E. Kay  
Cartographer

This survey H-10293 has been examined and it meets Charting and Geodetic Services' standards and requirements for use in nautical charting. Approval is recommended.

*Dennis J. Hill*  
Dennis J. Hill  
Chief, Hydrographic Unit

APPROVALS

I have reviewed the smooth sheet, accompanying data, and reports associated with hydrographic survey H-10293. This survey meets or exceeds Charting and Geodetic Services' standards for products in support of nautical charting.



1/24/90

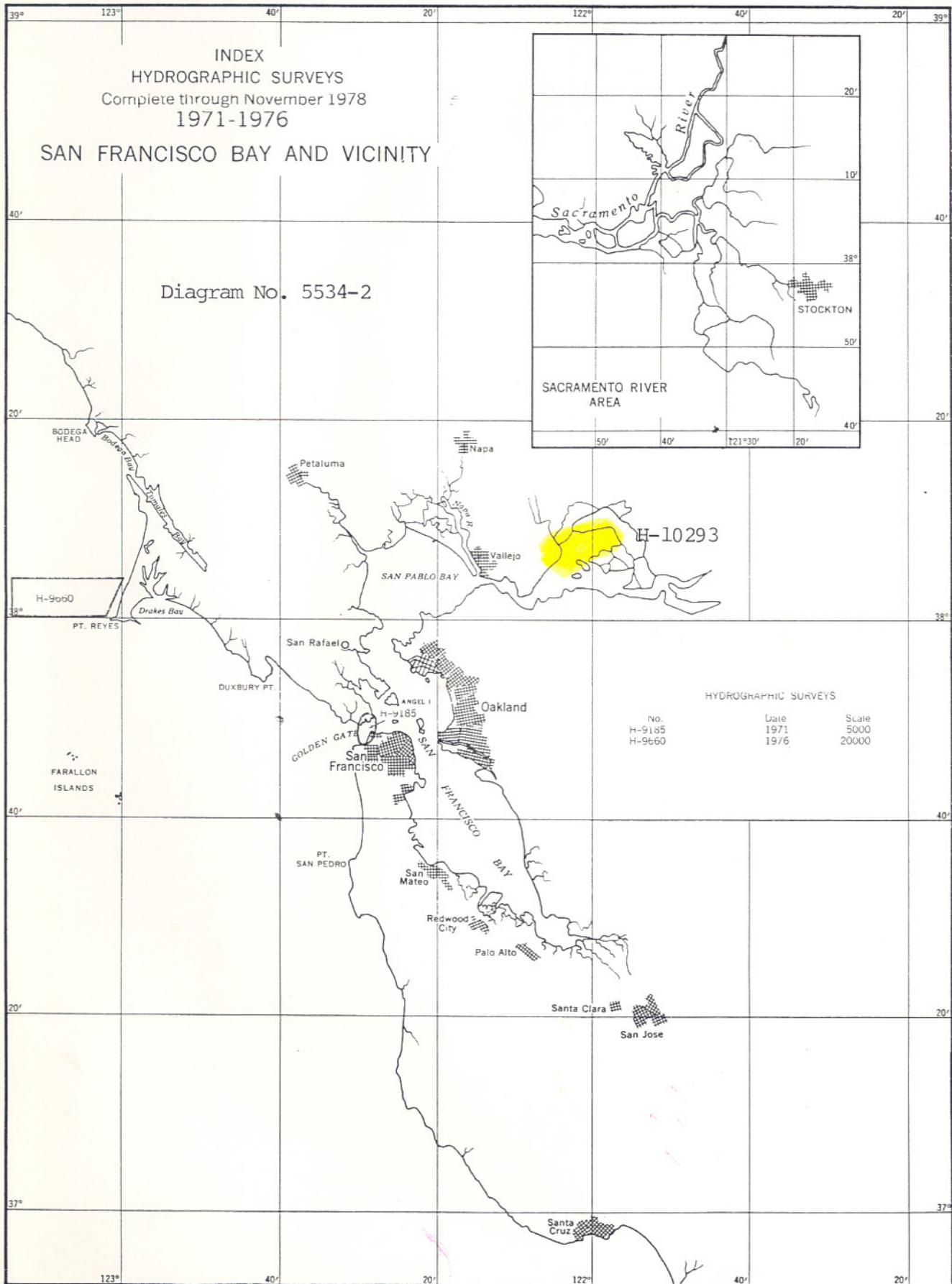
Commander Pamela Chelgren-Koterba, NOAA (Date)  
Chief, Pacific Hydrographic Section

Approved:

RADM Wesley V. Hull, NOAA (Date)  
Director, Charting and Geodetic Services

DEPARTMENT OF COMMERCE  
 National Oceanic and Atmospheric Administration  
 National Ocean Survey  
 Rockville, Maryland

Hydrographic Index No. 96M



MARINE CHART BRANCH  
**RECORD OF APPLICATION TO CHARTS**

**EXAMINED FOR NM  
GDBU**

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10293

*CJ 4/11/90*  
*RE*

**INSTRUCTIONS**

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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