

10298

10298

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-10-2-89

Registry No. H-10298

LOCALITY

State California

General Locality .. Grizzly Island

Sublocality Denverton Slough to SE Portion
..... of Montezuma Slough

1989

CHIEF OF PARTY

..... LT F.R. Diaz

LIBRARY & ARCHIVES

DATE May 23, 1990

☆U.S. GOV. PRINTING OFFICE: 1985-566-054

Charts

18656

18652 E, D

18659 NC

501 NC

18622 NC

18030 NC

HYDROGRAPHIC TITLE SHEET

H-10298

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 10-2-89

State California

General locality Grizzly Island

Locality Denverton Slough to SE Portion of Montezuma Slough

Scale 1:10,000

Date of survey April 3 to April 21, 1989

Instructions dated December 2, 1988

Project No. OPR-L202-PHP-88

Vessel Launch 1101

Chief of party LT. Federico R. Diaz, NOAA

Surveyed by LCDR M.J. Bradley, LTJG T.K. Porta, ST L.J. Lindly, ET E.O. Wernicke, ST M.E. Bigelow

Soundings taken by ~~echo sounder, hand lead, pole~~ echo sounder, hand lead, pole Ross Finline

Graphic record scaled by PHP Personnel

Graphic record checked by PHP Personnel

Verification by: R.N. Mihailov

Automated plot by PMC Xynetics Plotter

Evaluation by: C.R. Davies

Soundings in ~~fathoms~~ feet at ~~MEW~~ MLLW

REMARKS: All times recorded in UTC. Marginal notes in black ^{in the Descriptive Report} were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

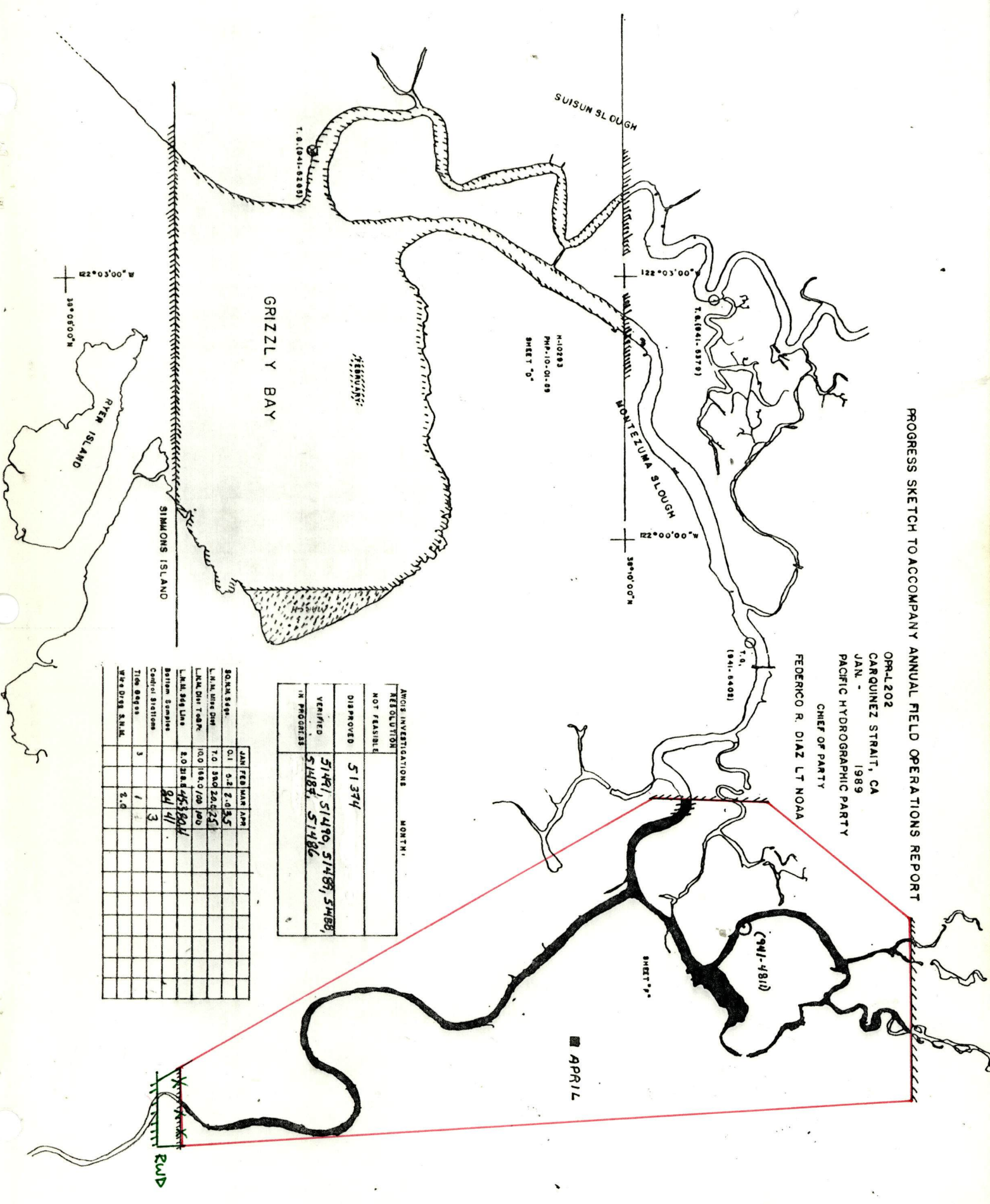
AWOLs + SREF ✓ 6/90 RUD

XWW: 5/1/90

PROGRESS SKETCH TO ACCOMPANY ANNUAL FIELD OPERATIONS REPORT

ORL-202
 CARQUINEZ STRAIT, CA
 JAN - 1989
 PACIFIC HYDROGRAPHIC PARTY
 CHIEF OF PARTY

FEDERICO R. DIAZ LT NOAA



N-10283
 PM-10-01-89
 SHEET "0"

T. 6. (941-8379)

T. 6. (941-8408)

(941-4811)

SHEET "9"

APRIL

GRIZZLY BAY

122°00'00" W
 38°05'00" N

RIVER ISLAND

SIMMONS ISLAND

AMCS INVESTIGATIONS MONTH:

RESOLUTION	MONTH:
NOT FEASIBLE	
DISPROVED	51374
VERIFIED	51491, 51490, 51488, 51489, 51486, 51487, 51482
IN PROGRESS	

	JAN	FEB	MAR	APR
SOAK Sigs.	0.1	2.2	2.4	5.5
L.M. DIVE DIR	7.0	350	24	25
L.M. DIVE TDR	10.0	18.0	100	100
L.M. DIVE LINE	2.0	318	453	804
Bottom Samples				94141
Control Stations				3
Tide Gages	3	1	2	
Who Digs S.M.M.			2.0	

DESCRIPTIVE REPORT
To Accompany
Hydrographic Survey H-10298
(Field No. PHP-10-2-89)
Scale: 1:10,000
Year: 1989
Pacific Hydrographic Party
Chief of Party: Lt. F. R. Diaz, NOAA

A. PROJECT ✓

This basic hydrographic survey, Sheet "F", was conducted by the Pacific Hydrographic Party (PHP) under Project Instructions DPR-L202-PHP, dated December 2, 1988, Change 1, dated December 8, 1988, Change 2, dated January 11, 1989, and Change 3, dated March 27, 1989.

The purpose of the survey was to obtain data for maintenance of existing nautical charts, compilation of a new series of 1:12,500-scale charts, and to aid in updating the U.S. Army Corps of Engineers bay model.

The survey was performed and field-processed in a restricted time period between completion of survey H-10293 on April 3, 1989, and installation of PHP's new Hydrographic Data Acquisition and Processing System (HDAPS) equipment on May 1, 1989.

B. AREA SURVEYED ✓

The survey was conducted in the eastern portion of Montezuma Slough, California, and also includes portions of Nurse Slough, Denverton Slough, Luco Slough, and all of Little Honker Bay. The approximate limits of the survey were:

<u>Latitude</u>	<u>Longitude</u>
38/05/00 N	121/53/00 W
38/13/00 N	121/57/00 W

The inclusive dates of hydrography were April 3, 1989 (DN 93), to April 21, 1989 (DN 111).

C. SOUNDING VESSEL ✓

PHP's Launch 1101 (EDP 0651), a 29-foot aluminum Jensen with a turbo Caterpillar diesel and Hamilton jet drive, was used for all sounding acquisition. No unusual sounding vessel configurations were used, and no problems were encountered with Launch 1101 during the survey. Launch 1101 was hauled out on May 1, 1989 for installation of PHP's new HDAPS equipment.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS ✓

Sounding Equipment: Launch 1101 is equipped with a standard Ross Fineline 5000 echo sounder and digitizing system which uses a centerline mounted, 7.5-degree, 100 KHz transducer. The Ross system on Launch 1101 consisted of the following components throughout the survey:

<u>Component</u>	<u>Model No.</u>	<u>S/N</u>
Power Inverter	2000	1071
Transceiver	4000	1081
Analog Recorder	5000	1046
Digitizer	6000	3787

Launch 1101 is also equipped with two side-looking digital transducers which are used exclusively for navigation.

There were no faults in the equipment that affected the accuracy of the soundings on this survey.

Corrections to Echo Soundings: ✓

Velocity of sound through water was determined from AML velocity profiler (S/N 03042) casts conducted on each day of hydrography. The AML cast data was transferred to an IBM PC, and velocity correction tables were generated using the NOS program "Velocity Version 1.00". The correctors in Velocity Table 1 are from the AML cast on DN 94, and apply from DN 94 through DN 95. The correctors in Velocity Table 2 are from the AML cast on DN 107, and apply from DN 107 through DN 110. AML cast data and analyses are included in Appendix IV. Sounding Correction Abstract. *Filed w/ hydrographic data.*

Velocity Casts were performed in the deepest part of the survey area. In the case of velocity tables, the deepest cast was used for a block of hydrography.

Variations in the instrument initial were monitored during survey operations, and the trace alignment was adjusted as required. Any depths scaled from echograms with initial errors were corrected before being applied to the survey.

Belt tension in the analog recorder was checked at the beginning and end of each day of hydrography. Simulated depths (10', 20', 30', etc.) were introduced into the analog recorder through the phase calibration mode on the digitizer. The resulting analog trace was compared to the simulated digital depths, and the belt tension was adjusted as necessary. In this way phase errors due to stylus belt stretching or improper adjustment were avoided, and no correctors were required.

Other instrument corrections were not required on this survey. However, certain soundings were corrected by the

hydrographer when the digitized depth could be seen to have been triggered by a source other than the bottom, such as sea weed, fish, instrument-generated side echoes, or--a common problem on this survey--a secondary trace from a harder layer underlying the actual bottom which is very soft.

Bar checks to 5 and 10 feet were performed once daily as a system check. An 11 x 1 foot aluminum bar was suspended on 1/4 inch steel chains with wire-tied and painted markings at 5-foot intervals. Chain markings were checked before the start of the survey and found to be accurate. The launch has an 11-ft. beam, obviating the need for line angle corrections. Bar checks were abstracted using a measured static transducer draft of 1.6 feet. The abstracts are included in Appendix IV, *Sounding Correction Abstract. The hydrographer determined from this data that the sounding system was operating correctly, and there was no need for **corrections determined from direct comparisons.**

** Filed w/ hydrographic data.*

The **static transducer draft** value for the hull-mounted transducer on Launch 1101 was 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 painted black line on the hull above the waterline 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 and crew complement on board: the distance between the bottom of the painted black line and the actual waterline was measured with a steel tape. The actual static transducer depth (the distance measured in Part 1 minus the distance measured in Part 2) was determined to be 1.63 feet.

Measurements for **settlement and squat correctors** for PHP's Launch 1101 (EDP 0651), were observed on September 9, 1988, during project OPR-L202-PHP. The correctors apply to all sounding data acquired on this survey (DN 93 - DN 111 1989). Settlement and squat corrections are not applied to the field sheet, but are incorporated on the TC/TI tape.

Settlement and squat correctors for Launch 1101 were determined in relation to vessel speed through the water as measured by a hull-mounted digital speed log. Since 1984, with PMC's approval, PHP has operated Launch 1101 at constant speeds through the water as measured by the speed log, as opposed to constant engine RPM's, and all sounding records are annotated accordingly. This was first undertaken as a way to eliminate the need for ground effect correctors, and has now become a standard operating procedure for this vessel.

Normal equipment and crew were on the launch during settlement and squat observations. The observations were

conducted within the geographic limits of project OPR-L202-PHP, at the south end of First Street, Benicia, California, in the vicinity of Benicia Point, near the city wharf and nearby islets. The launch ran in water depths of 12 to 20 feet in the lee of the small offshore islands; winds were 10 to 15 knots, seas were 0.2 feet, and the current was slack. A level was set up on the bank of the shoreline at the south end of First Street, and a level rod was held on the starboard gunwale in line with the position of the hull-mounted transducer. The launch was navigated toward the leveling instrument at speeds ranging from 3 kts to 12 kts, as measured by the digital speed log, and was stopped for dead-in-the-water (DIW) measurements before and after each run. The mean of the two DIW readings accounted for tidal changes on each run. Point values were plotted and connected to yield continuous speed versus draft correction curves.

PHP used predicted **tide correctors** to reduce the soundings in the sounding volume to MLLW to establish correct cartographic codes. The field plots at ~~PME~~^{PMS} were plotted with tidal zoning correctors applied to raw tidal data from reference station San Francisco, California (941-4290). See Appendix II ^{*}Field Tide Note for further information. ^{*} Attached to this report.

E. HYDROGRAPHIC SHEETS ✓

Field records were forwarded to the Pacific ~~Marine Center~~^{Hydrographic Section}, ~~Nautical Chart Branch~~, Seattle, Washington, for preliminary plotting, verification and smooth plotting. The raw field data was transferred to ~~PME~~^{PMS} via modem. The plots, and FSPool listings were returned to PHP for corrections, analysis, and review of the completeness and quality of the survey.

Final field sheets were generated at ~~PME~~^{PMS}, as arranged by PHP and ~~PME~~^{PMS} as part of an ongoing experiment in data transfer. ^{See attached Notes to Hydrographer}

F. CONTROL STATIONS ✓

The horizontal datum for this survey was the North American Datum of 1927. Control stations are listed in the following table:

<u>STATUS</u>	<u>STATION</u>	<u>LOCATION METHOD</u>
VERIFIED	MT DIABLO 1876	TRAVERSE
"	THOMASSON 1922	"
"	SUISUN HILL 2 1922	"
"	GOODYEAR 2 1979	"
"	KIRBY 1922	"
"	DENVERTON 1922	"
"	POTRERO (AVA 1941)	"

All horizontal control stations used on this survey were originally established by geodetic traverse, and were verified before use by PHP. Further information is provided in the Horizontal Control Report, OPR-L202-PHP, Carquinez Strait, CA, March 1988 to April 1989, submitted to the Pacific Marine Center, ~~Nautical Chart Branch,~~
Hydrographic Section.

No unconventional survey methods were used to establish control stations. There were no anomalies in control adjustment, and no known photogrammetric problems that could contribute to position inaccuracies. There were also no positioning anomalies attributable to the elevation of control stations used.

G. HYDROGRAPHIC POSITION CONTROL ✓

Most sounding position control was accomplished with a Motorola Mini-Ranger III ultrahigh frequency transponder system in range-range configuration. Range-azimuth control was used in areas where range-range was not feasible, and range-visual control was used to check several detached positions (DP's). With the following exceptions, all DP's have check positions, with calculated inverse distances of 5 meters (0.5mm at the scale of the survey) or less: Pos 300, 349, & 360 have slightly larger inverses, and Pos 356 has no check point because it was not timely or cost effective to achieve better control for this point. DP's were all carefully verified on the field sheet.

Control Equipment ✓

All positions were verified to be adequate when compared to the surrounding data.

The following positioning equipment was used on this survey:

Sextant, Tamaya & Co. LTD., S/N T3725

Theodolite, Wild T-2, S/N 276812

Motorola Mini-Ranger III Mobile Station

Mini-Ranger Console S/N 713165

Transceiver (RT Console) S/N B1419

Shore station transponders are listed in Appendix V.

Calibration Methods ✓

Hydrographic data are plotted with the baseline correctors (BLC) obtained from the opening baseline calibration performed on March 13, 1989. No adjustment was required because correctors from the closing calibration (May 3, 1989) agreed within 4 meters with correctors from the opening calibration, as required at the scale of this survey.

The following tables show opening and closing correctors/minimum signal strengths, and differences for each transponder code:

Opening Calibration, March 13, 1989

Codes:	A	B	C	1	2	7	*9
BLC/Min SS:	-1/5	-1/5	-2/4	-2/5	-1/5	0/5	0/5

*Code 9 opening calibration carried forward from November 29, 1988.

Closing Calibration, May 3, 1989

Codes:	A	B	C	1	2	7	9
BLC/Min SS:	0/5	-2/5	-2/5	-2/4	-2/5	-1/5	+3/6

Base-Line Differences:

Codes:	A	B	C	1	2	7	9
Differences:	+1m	-1m	0m	0m	-1m	-1m	+3m

Daily System Checks ✓

Daily critical systems checks confirmed the correctors determined from the opening baseline calibration. Critical system checks were performed daily at geodetic stations. All daily system checks resulted in variances of less than 5 meters, within the acceptable limit for surveys at this scale.

Methods of Operation ✓

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.

Signal strengths were annotated frequently on the raw data printout during sounding acquisition. Some data with less than minimum signal strength has been used on this survey because of the difficulty of achieving better control stations in the limited time available. In all cases where weaker signal strengths were used, the data was carefully examined and the hydrographer is satisfied that the resulting positions meet the accuracy requirements for surveys at this scale. *See Exam Report section 2*

In the vicinity of 38/09/00 N, 121/55/00 W, in a 2/3 NM section of Montezuma Slough, a combination of terrain features, including hills, levees, and a 1.5-mile line of eucalyptus trees, interfered with the Mini-Ranger signals from all available stations. Due to time constraints on this survey, PHP was unable to establish additional control, and on DN 109 the strongest signals were selected and closely monitored as PHP conducted range-azimuth/range-range hydrography to fill in the gap (DN 109, Pos. 625-672).

Data was checked during office processing and is consistent with the surrounding hydrography.

There were no other unusual methods of electronic control operation, and no unusual atmospheric conditions were encountered on this survey.

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

ANDIST correctors are zero for all positions on this survey.

Further information on electronic calibrations is included in Appendix V, *Abstracts of Corrections to Electronic Position Control. * Filed w/ hydrographic data

H. SHORELINE See Eumc Report Section 2

Shoreline details on the final field sheet are from stable-base copies (enlarged to 1:10,000) of 1-20,000 Shoreline Manuscripts TP-01058 (CM-7823), and TP-01053 (chart compilation).

Shoreline details were verified by the hydrographer and the results are shown on the ~~final field~~ ^{smooth} sheet.

Numerous islets ^{and islands} were positioned by PHP personnel and results noted on the smooth field sheet. These islets ^{and islands} are drawn in red and dashed red on the smooth sheet.

At Meins Landing (38/08/24 N, 121/54/24 W) a new channel, approximately 25 meters wide, has been cut behind a point of land, thus creating an islet with a pier extending into Montezuma Slough (DN 97, Pos 329-333). The owner is Mr. John Ward, telephone 415-673-2878 or 415-474-7174. ^{Chart according to the smooth sheet.}

I. CROSSLINES ✓

Crossline soundings were acquired to check mainscheme sounding lines. Crosslines were 8% of the mainscheme. 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 See Eumc Report Section 5

This project will junction with surveys of project OPR-L208 to be completed at a later date.

K. COMPARISON WITH PRIOR SURVEYS

See ERM Report section 5

Data from this project was compared to data from the following surveys:

<u>Registry Number</u>	<u>Scale</u>	<u>Year Surveyed</u>
H-905	1:20,000	1866-67
H-1785	1:20,000	1886-87

No AWOIS items on this survey originate from the above prior surveys.

Cross Slough, shown as navigable in H-1785, has been blocked near the east and west ends and cannot be accessed by boat. From Meins Landing to approximately 1.3 nm. south, Montezuma Slough has been leveed, drained, and now occupies the western 1/4 of what is depicted in H-1785. Grizzly Creek, shown in H-905, does not exist. Chart 18656 shoreline is correct.

COMPARISON OF SOUNDINGS ✓

The soundings in Nurse Slough, the northern portion of Denverton Slough, and the northwestern portion of Montezuma Slough are generally unchanged. In Montezuma Slough south of latitude 38/09/00 N, soundings in the channel are deeper by 2 to 10 feet, probably because of dredging to build up the levees or because of general erosion.

L. COMPARISON WITH THE CHART *See ERM Report Section 7*

This survey was compared to

<u>Chart Number</u>	<u>Edition</u>	<u>Edition Date</u>
18652 SC	25th	June 20, 1987
18656	47th	March 7, 1987

DANGERS TO NAVIGATION ✓

Two Dangers to Navigation letters were written to the Commander, Eleventh Coast Guard District. Copies of these letters are included in Appendix XI, * DANGERS TO NAVIGATION. Copies of these letters were sent to the Nautical Data Section, N/CG221, and ^{PHS} ~~PHC~~ (N/CG221). The letters were dated May 17 and 19, 1989. The dangers to navigation are listed as follows: ** Attached to this report.*

DESCRIPTION	LATITUDE N	LONGITUDE W	FT MLLW	POS
✓ pipe outfall	38/07/19.63	121/53/13.66	-7.2 -3.0	8
✓ snag	38/07/15.07	121/54/01.20	0.50	293
✓ pipe (obstr.)	38/08/18.34	121/54/30.72	-2.0 -3.0	324
✓ piles	38/08/19.73	121/54/27.90	-3.2 -4.0	328 -local limits
✓ wrecked barge	38/09/35.41	121/55/35.15	-2.4 -4.0	340 wreck #51803
✓ pier in ruins	38/09/48.29	121/55/45.60	-2.4 -4.0	341 ruins AWOIS
✓ pile	38/10/00.77	121/56/12.79	-6.2 -3.0	344 MHW
✓ piles	38/10/00.12	121/56/25.00	-4.2 -5.0	348
✓ piles	38/10/00.64	121/56/28.75	-5.2 -6.0	350 MHW
✓ piles	38/10/00.95	121/56/30.31	-5.20	362 ruins

200m

The pipeline area charted in the vicinity of Lat 38/07/12N
Lon 121/54/39 needs to be expanded on the west to include:

Position	to	Position
309		310
Lat 38/07/18.63N		Lat 38/07/21.06N
Lon 121/54/47.29W		Lon 121/54/45.23W

extend to the southeast to include:

Position	to	Position
14		15
Lat 38/07/09.89N		Lat 38/07/06.88N
Lon 121/54/17.15W		Lon 121/54/19.23W

and

Position
13
Lat 38/07/07.17N
Lon 121/54/16.05W

200m

COMPARISON OF SOUNDINGS ✓

Charted soundings from prior surveys are discussed in Section K. This section covers charted soundings originating from blueprints and other sources. No anomalous soundings were found.

AWOIS ITEMS

COMPARISON OF SOUNDING FEATURES

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

AWOIS: 51374

ITEM DESCRIPTION: Shoaling rep 1985

SOURCE: CL1232/85--USPS

DATE	DN	POSITIONS	TIME	VESNO
4/19/89	109	673-705	202634-205501	0651

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted: 24-ft	38/10/14.00	121/56/43.00	
Observed: 32-ft	38/10/14.27	121/56/43.75	690 (excess)

POSITION DETERMINED BY:

Range-range mainscheme and development.

METHOD OF INVESTIGATION:

The narrow channel was developed with 50-m spaced sounding lines in an East-West direction for ¹⁰⁰250 meters NW and SE of the charted position. These lines were crossed with three channel lines. No Evidence of shoaling was observed. The 18 foot depth curve has migrated off the eastern HWL approximately 100 meters at

CHARTING RECOMMENDATION latitude 38°10'20"N, longitude 121°56'45"W and latitude 38°10'07"N, longitude 121°56'39"W.

Chart the survey depths to supersede the charted depths. Delete "Shoaling rep 1985" from the chart. *concur*

200M

COMPARISON OF NON SOUNDING FEATURES

There is no evidence of the charted pipeline crossing in the vicinity of Lat 38/10/25N, Lon 121/55/33W. Delete from chart. *Do not concur*
Retain as charted

There is no evidence of the charted cable crossing in the vicinity of Lat 38/09/10N Lon 121/55/06W. Delete from chart. *Do not concur*
Retain as charted

The chart should be revised to include the small boat ramp and floating wood pier located by position number 3 at Lat 38/06/17.34N Lon 121/53/18.66W. *floating pier shown on Smooth sheet* *concur*
COM *GKM 6/19/90*

AWOIS ITEMS

CHART: 18656 47TH ED. MAR. 7, 1987 AWOIS: 51486

ITEM DESCRIPTION: OBSTRUCTION (Piles)

SOURCE: CL279/78--CAS 18656(1977)

DATE	DN	POSITIONS	TIME	VESNO
4/06/89	96	304	1903	0651
4/13/89	103	392	1812	"

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted:	38/06/15.80	121/53/19.30	
Observed:			
N-most Pilings (-6.0)	38/06/16.14	121/53/19.29	304 (excessed)
S-most Pilings (-5.0)	38/06/16.18	121/53/19.47	392 (excessed)

POSITION DETERMINED BY:

3 LOP range-range.

METHOD OF INVESTIGATION:

A group of pilings (covers/uncovers) in a N-S configuration were observed at the above geographic positions.

CHARTING RECOMMENDATION

Revise the chart to show the group of pilings as observed. *concur*

500m piles
COM

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

AWOIS: 51487

ITEM DESCRIPTION: OBSTRUCTION (Row of Piles)

SOURCE: CL279/78--CAS 18656(1977)

DATE	DN	POSITIONS	TIME	VESNO
4/03/89	93	09	2000	0651
4/06/89	96	295	1808	"

GEODETTIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted:	38/07/21.00	121/53/13.50	
Observed:			

(South) Inshore end (Pile).	38/07/21.68	121/53/14.60	09	bare 4 ft at MHW
(North) Offshore end (Piles)	38/07/22.83	121/53/14.78	295	uncovered 5 ft at MLLW

POSITION DETERMINED BY:

3 LOP Range-range.

METHOD OF INVESTIGATION:

A group of piles were observed (uncover/cover) at the above positions.

CHARTING RECOMMENDATION

Revise the "OBSTRUCTION" to a ^{row} ~~group~~ of piles, ^{bare 4 ft at MHW} at the above geographic positions.

*Survey Piles
Edm.*

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

AWOIS: 51488

ITEM DESCRIPTION: OBSTRUCTION (Piles)

SOURCE: CL279/78--CAS 18656(1977)

DATE	DN	POSITIONS	TIME	VESNO
4/06/89	96	311	2016	0651

GEODETTIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted:	38/07/30.90	121/54/48.50	
Observed: Pile	38/07/30.09	121/54/48.25	311 (-7.0)
NW corner, 4 Piles	38/07/30.87	121/54/48.46	312 (-3.0)

POSITION DETERMINED BY:

3 LOP range-range.

METHOD OF INVESTIGATION:

A pile (pos.# 311) was observed to cover/uncover at the above geographic position.

NW corner of four piles (pos.#312) were observed to uncover at ~~MMW~~.

CHARTING RECOMMENDATION

Chart the row of piles (pos. #311 and 312) at the above observed positions.

✓
Subm piles
Edm

concur

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

AWOIS: 51489

ITEM DESCRIPTION: OBSTRUCTION (Pile PA)

SOURCE: CL1631--USPS

DATE	DN	POSITIONS	TIME	VESNO
4/07/89	97	337	2050	0651

GEODETIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted:	38/08/42.00	121/54/28.00	
Observed: Pile (65)	38/08/41.32	121/54/27.90	337

POSITION DETERMINED BY:

3 LOP range-range w/ range-azimuth check.

METHOD OF INVESTIGATION:

A pile was observed to ~~cover~~/^{5 feet mclw}uncover[^] at the above geographic position.

CHARTING RECOMMENDATION

Chart the pile at the above observed position. *cancel*

Delta checked pile (PA)

*Subm piles
SAM*

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

AWOIS: 51490

ITEM DESCRIPTION: OBSTRUCTION (Piles PA)

SOURCE: CL1631/67--USPS

DATE	DN	POSITIONS	TIME	VESNO
4/12/89	102	366	1725	0651
GEODETTIC POSITION		LATITUDE N	LONGITUDE W	POS
Charted:		38/09/33.00	121/55/33.00	
Observed: Pipes (6.1 inch diameter)		38/09/33.51	121/55/31.34	366

POSITION DETERMINED BY:

3 LOP range-range.

METHOD OF INVESTIGATION:

A visual inspection at the chart datum resulted in the observation of an iron pipes to ^{5ft}uncover_{bare} at ^{MHHW}MHW.

CHARTING RECOMMENDATION

Revise the charted obstruction to the ^{row of}pipes at the above ^{do not concern}observed position.

See Envr Report section 7

Chart row of pipes and retain the piles PA as Submerged piles PA.

eam

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

AWOIS: 51491

ITEM DESCRIPTION: OBSTRUCTION (Subm tree stump)

SOURCE: CL768--84

DATE	DN	POSITIONS	TIME	VESNO
4/11/89	101	363	2152	0651

GEODETTIC POSITION	LATITUDE N	LONGITUDE W	POS
Charted:	38/10/25.00	121/55/40.00	
Observed: Snag (3)	38/10/23.05	121/55/38.80	363

POSITION DETERMINED BY:

3 LOP range-range w/ range-azimuth check.

METHOD OF INVESTIGATION:

A visual inspection of the area at the chart datum resulted in the observation of a snag (~~covers~~/uncovers) ^{3 ft at MLLW} at the above observed position.

CHARTING RECOMMENDATION

Chart the snag at the above observed position.

comant

*Snag
Edu*

M. ADEQUACY OF SURVEY *See Encl Report section 7*

The survey is complete and adequate to supersede prior surveys.

N. AIDS TO NAVIGATION ✓

No fixed or floating aids to navigation are maintained within the limits of this survey.

The charted cable crossings are tabulated under Section L. COMPARISON WITH THE CHART.

There were no overhead cables, or overhead pipelines, and no ferry routes within the limits of this survey.

A small two-car-lane bridge located at Lat. 38/11/03.80 N, Lon. 121/54/06.20 W has an overhead clearance of ~~8.4~~ ^{MMSL} ~~4.4~~ feet at MMSL:

O. STATISTICS ✓

Vessel: Launch 1101 (EDP 0651)

Total Number of Positions:	939
Linear NM of Sounding Lines:	80.35
Square NM of Hydrography:	8.96
Days of Production:	15
Number of Bottom Samples:	41
Number of Tide Stations:	1 (See Field Tide Note)
Number of Current Stations:	0
Number of Velocity Casts:	6
Number of Magnetic Stations:	0
Number of Detached Positions:	106

F. MISCELLANEOUS ✓

No anomalous tides, currents or magnetic anomalies were observed during the survey.

Bottom samples were acquired on DN 111, Pos. 899 - 939 and sent to the Smithsonian Institute.

Q. RECOMMENDATIONS

Dredging operations were underway in Nurse Slough at approximate position 38/11/30 N, 121/55/45 W on DN 108 and 109. The dredge company involved is DELTA DREDGING, Telephone (415) 758-3871. The dredge operator informed PHP that dredging was scheduled to continue in Nurse Slough, the entrance to Denverton Slough, and in Montezuma Slough. The dredge being used is the large clamshell type, and the trailings are being deposited on the adjacent shore to build up the levy. Because only small recreational craft generally navigate in the sloughs, PHP does not recommend additional field work in these areas at this time. *Concur*

On 18 April (Day 108) while performing sounding operations in Denverton, Luco and Nurse Sloughs, the Ross echo sounder recorder trace was intermittent throughout the day (see echogram for Day 108). Initial daily systems check verified proper operation of echosounder. Bottom samples verified ooze-like bottom (soft mud). It is recommended to use this data for processing. *Concur*

The homes and hunting/fishing clubs in Montezuma Slough are served by roads not usable in the winter. The slough serves as a transportation route for these residents and tenants.

Refer to Sections K, L and M for individual recommendations.

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
RK226	Range-Azimuth Non-Real Time Plot	
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

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
1.00	Velocity	9/01/88

No nonstandard automated acquisition or processing methods were used.

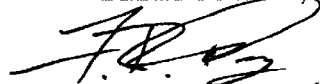
S. REFERRAL TO REPORTS ✓

The following reports will be submitted shortly after the completion of DPR-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, DPR-L202-PHP-88, Carguinez Strait, California, March 1988 - April 1989.
- 2) Coast Pilot Report, PHP, DPR-L202-PHP-88, Carguinez Strait and Grizzly Bay, California, March - April 1989.
- 3) User Evaluation Report, DPR-L202-PHP-88, Carguinez Strait and Grizzly Bay, California.

Submitted by,



Lt. F.R. Diaz, NOAA
Chief, Pacific Hydrographic Party

SIGNAL LIST
H-10298
FHP-10-2-89
QPR-L202-PHP

601	0	37	52	54387	121	54	47107	250	1177	000000	MOUNT DIABLO 1876
607	0	38	13	02154	122	06	52321	250	0107 ^{OK 2 OK}	000000	THOMASSON 1922
608	0	38	12	53098	122	01	07724	250	0063 ^{SB}	000000	SUISUN HILL 2 1922
609	0	38	06	29681	122	03	18420	250	0003	000000	SUISUN SLOUGH ENT LT 9
610	0	38	07	08925	122	03	39820	250	0003	000000	SUISUN SLOUGH ENT LT 10
611	0	38	06	22023	122	06	12491	250	0065	000000	GOODYEAR 2 1979
612	0	38	10	03336	121	55	10801	250	0110	000000	KIRBY 1922
613	0	38	12	06946	121	54	18636	250	0007	000000	DENVERTON 1922
614	0	38	12	09604	121	57	16301	250	0125 ^{OK 1}	000000	POTRERO (AVA 1941)

FIELD TIDE NOTE

OPR-L202-PHP-88

PHP 10-2-89, (H-10298)

EASTERN PORTION OF MONTEZUMA SLOUGH,
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-PHP-88, dated 02 December 1988.

Change No. 3, eliminated the requirements for Montezuma Slough (941-5205), and Meins Landing (941-5307). The only stations required were Bradmoor Island (941-4811) and Montezuma Slough Bridge (941-5402). Joice Island (941-5379) and Suisun Slough Entrance (941-5265) were also operating during this survey.

The correctors used for this survey are as follows:

+ 3 hr 30 min High Water
+ 4 hr 15 min Low Water
X 0.95 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:

Bradmoor Island, Nurse Slough (941-4811)

Gage Type: Fischer-Porter ADR
Geographic Locale: 38/11.0 N
121/55.4 W
Installation Date: 3/29/89
Removal Date: 5/2/89
Staff zero on Analog: 16.1
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

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

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
16.7 from 2/6 to 4/14
Record's Time Meridian: 000

INSTALLATION, LEVELS AND OPERATION

Bradmoor Island, Nurse Slough (941-4811)

The gage was installed at the historical site.

Bench marks 4811 C and 4811 D 1978 were recovered as described. Bench marks 4811 F, G, and H were set in concrete monuments by the Pacific Hydrographic Party.

Third order levels were acquired 3/29/89 and 5/2/89. The levels closed to within the tolerances required for third order levels. The difference in elevation between the levels of historical marks 4811 C and 4811 D were constant.

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.

Suisun Slough Entrance, Grizzly Bay (941-5265)

The gage was installed on a floodgate about 150 meters west of the historical site.

Bench marks 5265 B 1977, and V 552 RESET 1980 were recovered as described. Bench marks 5265 A, C and D 1977 were not recovered. Evidence indicates that 5265 C was 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.

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 not recovered. A GPS station mark S 42, 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.

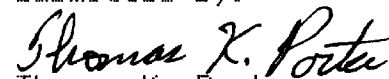
There were no unusual currents or tidal conditions.

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

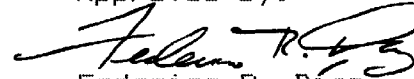
Tidal data was acquired from all three gages for all times of hydrography.

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

Submitted By:


Thomas K. Forta
Assistant Chief, PHP

Approved By:


Federico R. Diaz
Chief, PHP



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

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

May 17, 1989

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

Dear Sir:

During field review of hydrographic survey H-10298, California, Montezuma Slough, dangers to navigation affecting chart 18656 (47th ed., March 7, 1987; datum: NAD 27) and chart 18652 (25th ed., June 20, 1987; datum: NAD 27) were 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,

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



REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Pipe Outfall

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depths indicate the object ~~bare~~ ^{uncovers} at MLLW.

CHART NUMBER	EDITION		REPORTED DEPTH	CHART	GEOGRAPHIC POSITION	
	NO.	DATE		HORIZ. DATUM	LATITUDE	LONGITUDE
18656	47	Mar. 7, 1987	7.0 ^{3.0} feet	NAD 27	38/07/19.63	121/53/13.66
18652	25	June 20, 1987	7.0 ^{3.0} feet	NAD 27	38/07/19.63	121/53/13.66

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

EDM

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Snag

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depth indicate the object ~~bares~~ at MLLW.
is awash

CHART NUMBER	EDITION NO. DATE	REPORTED DEPTH	CHART		GEOGRAPHIC POSITION	
			HORIZ. DATUM		LATITUDE	LONGITUDE
18656	47 Mar. 7, 1987	0.8 feet	NAD 27		38/07/15.07	121/54/01.20
18652	25 June 20, 1987	0.8 feet	NAD 27		38/07/15.07	121/54/01.20

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

Eam

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Pipe

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depths indicate the object ~~bare~~^{was} at MLLW.

CHART NUMBER	EDITION NO. DATE	REPORTED DEPTH	CHART	GEOGRAPHIC POSITION	
			HORIZ. DATUM	LATITUDE	LONGITUDE
18656	47 Mar. 7, 1987	³ -2.0 feet	NAD 27	38/08/18.34	121/54/30.72
18652	25 June 20, 1987	³ -2.0 feet	NAD 27	38/08/18.34	121/54/30.72

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

EDM

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following items were discovered during hydrographic survey operations:

Object Discovered: Piles ✓

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depths indicate the object ^{uncovered} ~~is~~ at MLLW.

CHART NUMBER	EDITION		REPORTED DEPTH	CHART		
	NO.	DATE		HORIZ. DATUM	GEOGRAPHIC POSITION	
				LATITUDE	LONGITUDE	
18656	47	Mar. 7, 1987	3.2 -4.0 feet	NAD 27	38/08/19.73 121/54/27.90	
18656	47	Mar. 7, 1987	4.2 -5.0 feet	NAD 27	38/10/00.12 121/56/25.00	
18656	47	Mar. 7, 1987	5.2 -6.0 feet	NAD 27	38/10/00.64 121/56/28.75	
18656	47	Mar. 7, 1987	6.2 -7.0 feet	NAD 27	38/10/00.95 121/56/30.31	
18652	25	June 20, 1987	3.2 -2.0 feet	NAD 27	38/08/19.74 121/54/27.90	
18652	25	June 20, 1987	4.2 -3.0 feet	NAD 27	38/10/00.12 121/56/25.00	
18652	25	June 20, 1987	5.2 -4.0 feet	NAD 27	38/10/00.64 121/56/28.75	
18652	25	June 20, 1987	6.2 -5.0 feet	NAD 27	38/10/00.95 121/56/30.31	

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

32M

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Wrecked Barge

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depth indicate the object ~~bares~~ ^{is} at MLLW.
uncovers

CHART NUMBER	EDITION		REPORTED DEPTH	CHART HORIZ. DATUM	GEOGRAPHIC POSITION	
	NO.	DATE			LATITUDE	LONGITUDE
18656	47	Mar. 7, 1987	-2.7 ^{-4.9} feet	NAD 27	38/09/35.41	121/55/35.15
18652	25	June 20, 1987	-2.7 ^{-4.9} feet	NAD 27	38/09/35.41	121/55/35.15

AWOIS
51803

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

2004

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: DPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: Pier in Ruins

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depth indicate the object ~~is at~~ ^{was at} MLLW.

CHART NUMBER	EDITION		REPORTED DEPTH	CHART HORIZ. DATUM	GEOGRAPHIC POSITION	
	NO.	DATE			LATITUDE	LONGITUDE
18656	47	Mar. 7, 1987	⁻⁴⁰ -2.4 feet	NAD 27	38/09/48.29	121/55/45.60
18652	25	June 20, 1987	⁻⁴⁰ -2.4 feet	NAD 27	38/09/48.29	121/55/45.60

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-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: DPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

Object Discovered: File

Corrected to Mean Lower Low Water (MLLW) using predicted tides. Negative depth indicate the object ~~bare~~ ^{bare} at MLLW.
bare at MLLW

CHART NUMBER	EDITION NO. DATE	REPORTED DEPTH	CHART	
			HORIZ. DATUM	GEOGRAPHIC POSITION LATITUDE LONGITUDE
18656	47 Mar. 7, 1987	-3.0 -6.2 feet	NAD 27	38/10/00.77 121/56/12.79
18652	25 June 20, 1987	-3.0 -6.2 feet	NAD 27	38/10/00.77 121/56/12.79

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

LOW

I. L. S.

NOAA NAUTICAL CHART No. 18656

297

Luco Hill

109
Bradmoor I.

Marsh

PILES

PIER IN RUINS
PIPE

WRECKED BARGE

PILES
Moine Landing
PIPE

Marsh

Birds Ldg.

Molene

PIPE OUTFALL

TABULATED FROM

CONTROLLING DEPTHS FROM SEA

NAME OF CHANNEL

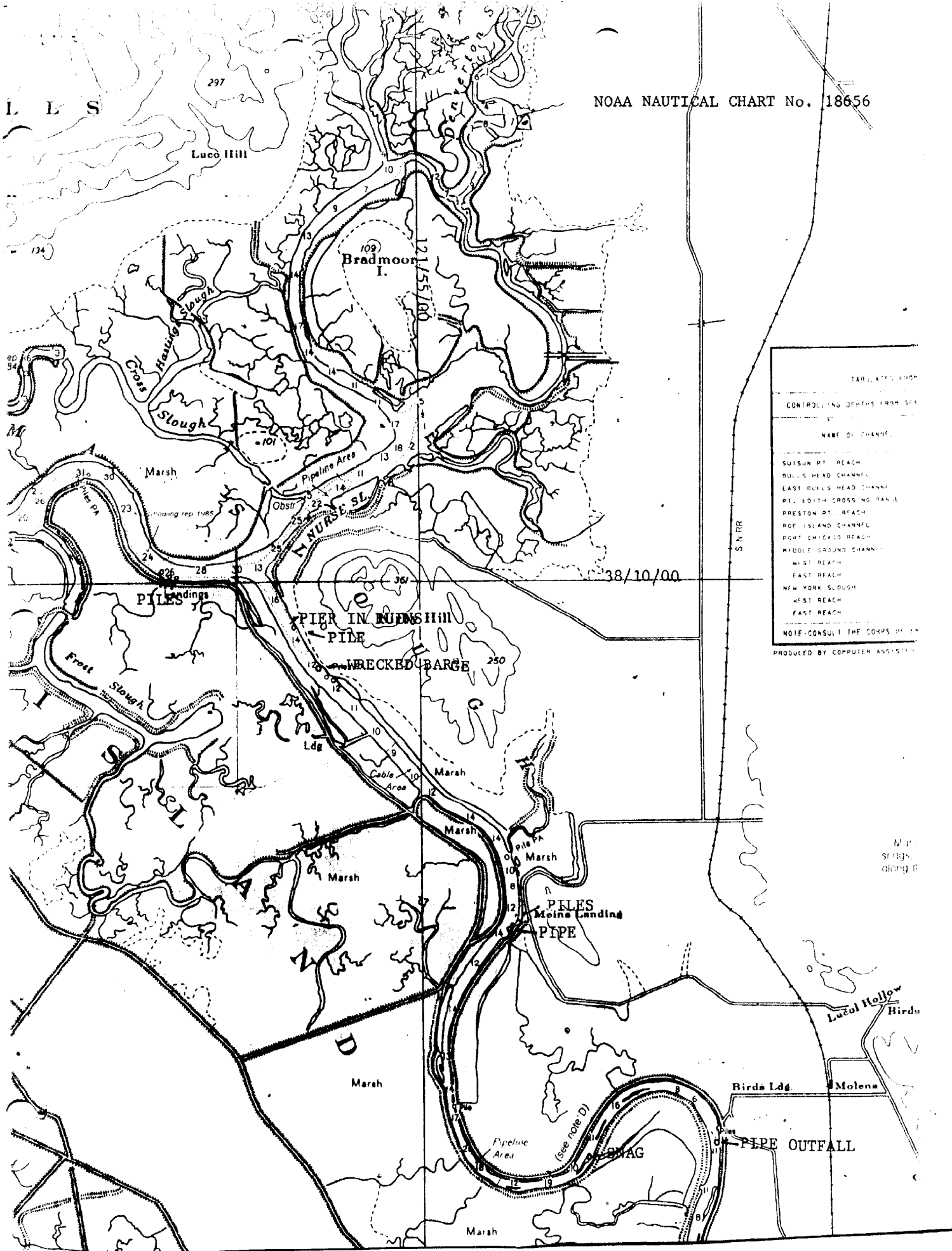
- SUISUN PT. REACH
- BULLS HEAD CHANNEL
- EAST BULLS HEAD CHANNEL
- PT. EDITH CROSSING CHANNEL
- PRESTON PT. REACH
- ROE ISLAND CHANNEL
- PORT CHICAGO REACH
- MIDDLE GROUND CHANNEL
- WEST REACH
- EAST REACH
- NEW YORK SLOUGH
- WEST REACH
- EAST REACH

NOTE-CONSULT THE CORPS OF EN

PRODUCED BY COMPUTER ASSISTANCE

Marsh
Sloughs
along it

Lucol Hollow
Birds





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

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

May 19, 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-10298, California, Montezuma Slough, 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. Diaz".

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



REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10298
Survey Title: Grizzly Bay State: California
General Locality: Suisun Bay
Sublocality: Montezuma Slough

Project Number: OPR-L202-PHP-88
Field Party: Pacific Hydrographic Party

The following item was discovered during hydrographic survey operations:

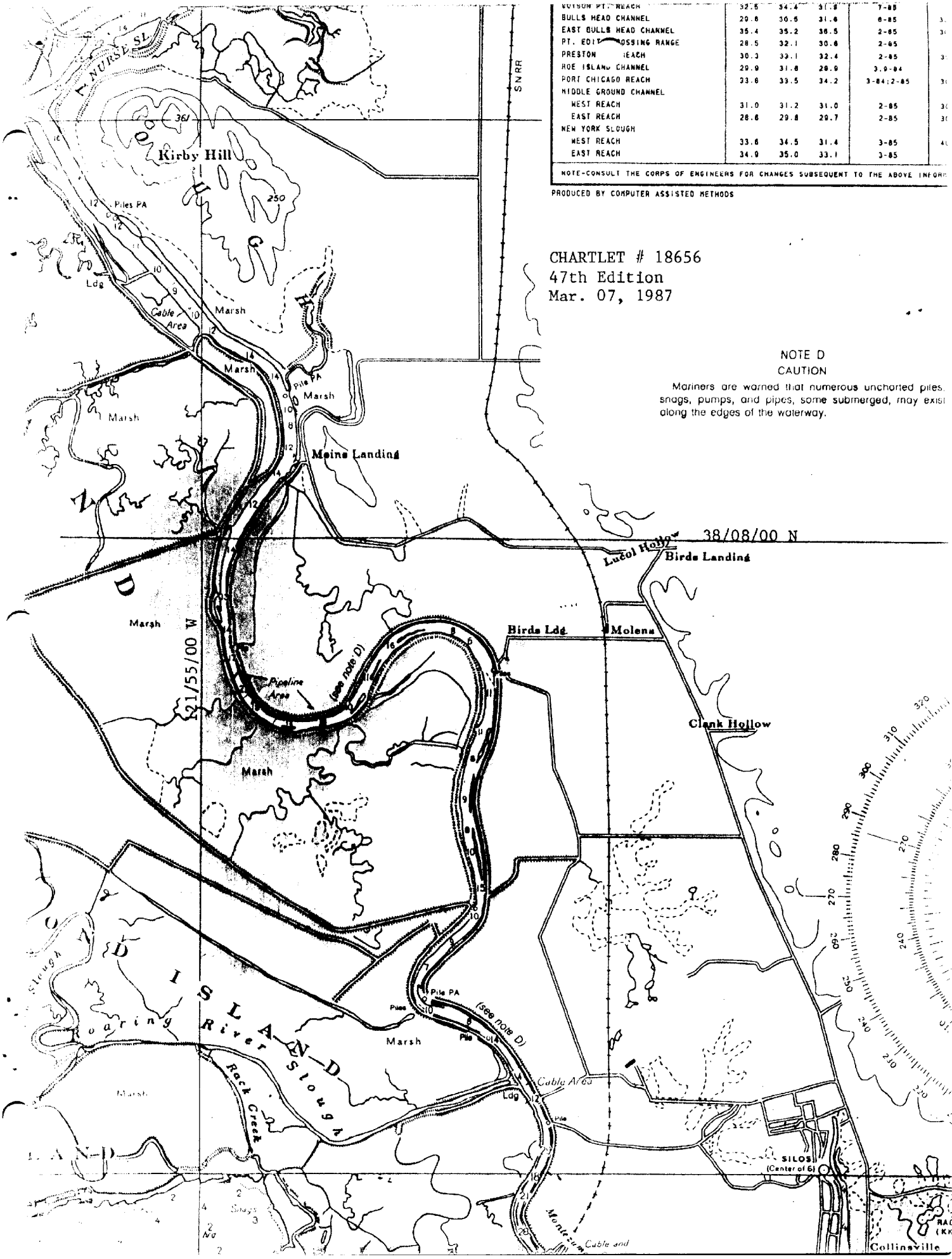
Object Discovered: Pipeline area

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

CHART NUMBER	EDITION NO.	DATE	REPORTED DEPTH	HORIZ. DATUM	GEOGRAPHIC POSITION LATITUDE	LONGITUDE
18656	47	Mar. 7, 1987		NAD 27	38/07/18.6N	121/54/47.3W
18656	47	Mar. 7, 1987		NAD 27	38/07/21.1N	121/54/45.2W
18656	47	Mar. 7, 1987		NAD 27	38/07/09.9N	121/54/17.2W
18656	47	Mar. 7, 1987		NAD 27	38/07/06.9N	121/54/19.2W
18652	25	June 20, 1987		NAD 27	38/07/18.6N	121/54/47.3W
18652	25	June 20, 1987		NAD 27	38/07/21.1N	121/54/45.2W
18652	25	June 20, 1987		NAD 27	38/07/09.9N	121/54/17.2W
18652	25	June 20, 1987		NAD 27	38/07/06.9N	121/54/19.2W

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

ccm



VOTUM PT. REACH	32.8	34.4	31.9	7-85	
BULLS HEAD CHANNEL	20.8	30.5	31.6	8-85	31
EAST BULLS HEAD CHANNEL	35.4	35.2	36.5	2-85	31
PT. EDY CROSSING RANGE	28.5	32.1	30.8	2-85	
PRESTON REACH	30.3	33.1	32.4	2-85	31
ROE ISLAND CHANNEL	29.9	31.8	28.0	3-84	
PORT CHICAGO REACH	33.8	33.5	34.2	3-84; 2-85	31
MIDDLE GROUND CHANNEL					
WEST REACH	31.0	31.2	31.0	2-85	31
EAST REACH	28.8	29.8	29.7	2-85	31
NEW YORK SLOUGH					
WEST REACH	33.8	34.5	31.4	3-85	41
EAST REACH	34.9	35.0	33.1	3-85	

NOTE-CONSULT THE CORPS OF ENGINEERS FOR CHANGES SUBSEQUENT TO THE ABOVE INFO:

PRODUCED BY COMPUTER ASSISTED METHODS

CHARTLET # 18656
 47th Edition
 Mar. 07, 1987

NOTE D
 CAUTION

Mariners are warned that numerous uncharted piles, snags, pumps, and pipes, some submerged, may exist along the edges of the waterway.



Notes To Hydrographers

June 29, 1988

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

The PMC OPORDER 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 OPORDER). 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 OPORDER.

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

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.

APPENDIX XII

Approval Sheet

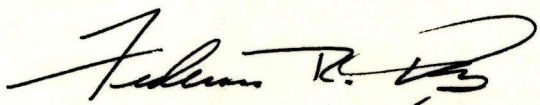
OPR-L202-PHP

H-10298

Basic Hydrographic Survey
MONTEZUMA SLOUGH, 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.

Approved by:



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

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 3, 1990

MARINE CENTER: Pacific

OPR: L-202

HYDROGRAPHIC SHEET: H-10298

LOCALITY: Nurse Slough to Hammond Island, Montezuma Slough, CA.

TIME PERIOD: April 3 - 20, 1989

TIDE STATION USED: 941 4811 Bradmoor Island, CA.

PLANE OF REFERENCE (MEAN LOWER LOW WATER): = 3.87 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: = 4.9 ft.

REMARKS: RECOMMENDED ZONING

1. North of 38 08.0'N zone direct.
2. South of 38 8.0'N, apply a x0.91 range ratio to all heights, and a +0 hr 10 min time correction.


CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

GEOGRAPHIC NAMES

Name on Survey	Source of Name										No.	
	A	B	C	D	E	F	G	H	I	J		
	1885-1889 CHART NO.	ON PREVIOUS SURVEY	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
CALIFORNIA, GRIZZLY I. DENVERTON SLOUGH TO SE PORTION OF MONTEZUMA SLOUGH												
BIRDS ISLAND LANDING*	X	X										1
BRADMOOR ISLAND	X	X							X			2
CALIFORNIA (title)	X	X										3
DENVERTON SLOUGH	X	X							X			4
GRIZZLY ISLAND	X	X							X			5
LINGOS LANDING			X									6
LITTLE HONKER BAY		X							X			7
LUCO SLOUGH	X	X							X			8
MEINS LANDING	X	X										9
MONTEZUMA SLOUGH	X	X							X			10
NURSE SLOUGH	X	X							X			11
* Per phone call 2/2/90 between B.A. Christal and Charles Harrington												12
												13
												14
												15
												16
												17
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												19
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												22
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												24
												25

Approved:

Charles Harrington

Chief Geographer - N/CG 2x5

JUL - 7 1989

HYDROGRAPHIC SURVEY STATISTICS

H-10298

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		7
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		2
DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	1				
ENVELOPES					
VOLUMES	1				
CAHIERS					
BOXES					

SHORELINE DATA

- SHORELINE MAPS (List):
- PHOTOBATHYMETRIC MAPS (List):
- NOTES TO THE HYDROGRAPHER (List):
- SPECIAL REPORTS (List):
- NAUTICAL CHARTS (List):

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET			864	
POSITIONS REVISED				
SOUNDINGS REVISED				
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS	39		39	
VERIFICATION OF SOUNDINGS	180		180	
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	55		55	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		6	6	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		50	50	
GEOGRAPHIC NAMES				
OTHER*				
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	274	56	330

Pre-processing Examination by M. Bradley	Beginning Date 4/5/89	Ending Date 5/31/89
Verification of Field Data by R.N. Mihailov	Time (Hours) 274	Ending Date 4/13/90
Verification Check by J.L. Stringham	Time (Hours) 58	Ending Date 2/16/90
Evaluation and Analysis by C.R. Davies	Time (Hours) 50	Ending Date 4/17/90
Inspection by B.A. Olmstead	Time (Hours) 4	Ending Date 5-11-90



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE
 OFFICE OF CHARTING AND GEODETIC SERVICES
 ROCKVILLE, MARYLAND 20852

JUN 29 1990

MEMORANDUM FOR: Commander Dean R. Seidel, NOAA *JRS 7/5/90*
 Chief, Hydrographic Surveys Branch
 FROM: *George K. Myers, Jr.*
 George K. Myers, Jr.
 Chief, Standards Section
 SUBJECT: Examination of Hydrographic Survey H-10298
 (1989), California, Grizzly Island, Denverton
 Slough to SE Portion of Montezuma Slough

Chief of Party F. R. Diaz
 Field Unit Pacific Hydrographic
 Field Party
 Processed by Pacific Marine Center
 Examined by G. K. Myers

An examination of hydrographic survey H-10298 (1989) was accomplished to monitor the survey for adequacy with respect to data acquisition and conformance with applicable project instructions, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions made and actions taken by the evaluator, and the cartographic presentation of data.

Cartographic deficiencies and constructive comments are noted on a 1/2-scale copy of the survey smooth sheet which will be forwarded to the Pacific Hydrographic Section.

In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Evaluation Report.

Attachment

cc:
 N/CG245 - Chelgren-Koterba



EVALUATION REPORT
H-10298

1. INTRODUCTION

Survey H-10298 is a basic hydrographic survey accomplished by the Pacific Hydrographic Party under the following Project Instructions.

OPR-L202-PHP, dated December 2, 1988
CHANGE NO. 1, dated December 8, 1988
CHANGE NO. 2, dated January 11, 1989
CHANGE NO. 3, dated March 27, 1989

This survey occurred in California and covers the area of Montezuma, Nurse, Denverton, Luco Sloughs and Little Honker Bay. The surveyed area extends from latitude 38°05'48"N to latitude 38°12'52"N, longitude 121°53'15"W to longitude 121°57'27"W. The survey area is located in what is called the Delta region. It is comprised of feeder rivers, sloughs and canals. Small boats use this area for recreation and hunting. The various waterways are surrounded by high levees and are dredged regularly to maintain the height and grade of the levees. The bottom consists of mud and silt. Depths range from zero to 43 feet.

The Pacific Hydrographic Section initiated a test process in June 1988. During survey H-10298 data acquisition, 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. The intent of this modified process was to provide assistance to the hydrographer during a period of a temporary personnel shortage. As a result of this assistance PHP was able to continue surveying without a significant disruption in the project schedule.

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 in a Xynetics, Model 1100, 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.

Predicted tides for San Francisco, California were used for the reduction of soundings during field processing. Approved hourly heights zoned from Bradmoor Island, California, gage 941-4811, were used during office processing.

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. The TRA, velocity and electronic correctors are adequate. An accompanying computer printout contains the parameters and the correctors.

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 and the Horizontal Control Report for OPR-L202-PHP, 1988-89 contain adequate discussions of horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are 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: 0.304 seconds (9.4 meters)
Longitude: -3.856 seconds (-93.9 meters).

The year of establishment of control stations shown on the smooth sheet originates with the hydrographer's signal list.

There are four weak fixes, angles of intersection less than 30 degrees or more than 150 degrees, noted in this survey. Two of these fixes were used to control a danger to navigation, position 362, and AWOIS Item 51486, position 392. The remaining two fixes are non-soundings, floating piers. Each position has a check angle which confirms the position. These fixes are considered acceptable.

The following shoreline maps apply to this survey.

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

The following shoreline changes are depicted in red on the smooth sheet and are supported with positional information. They are adequate to supersede the common photogrammetrically delineated shoreline.

<u>Feature</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Island	38°08'23"	121°54'46"
Island	38°12'16"	121°54'31"
HWL	38°07'45"	121°54'54"
HWL	38°08'23"	121°54'25"
HWL	38°12'01"	121°55'05"
HWL	38°07'38"	121°54'53"
HWL	38°08'18"	121°54'28"
HWL	38°08'35"	121°54'26"
Floating pier	38°10'01"	121°56'34"
Floating pier	38°10'01"	121°56'29"
Floating pier	38°10'02"	121°56'32"
Floating pier	38°10'01"	121°56'14"
Floating pier	38°06'17"	121°53'19"
Bulkhead	38°08'32"	121°54'25"
Pier	38°10'02"	121°56'32"
Pier	38°07'20"	121°53'14"
Pier	38°08'18"	121°54'30"

The following shoreline changes are depicted in dashed red without supporting positional information. These revisions are considered adequate to supersede the common photogrammetrically delineated shoreline.

<u>Feature</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
HWL from	38°10'21"	121°56'50"
to	38°10'17"	121°56'49"
HWL from	38°08'53"	121°54'46"
to	38°08'04"	121°54'52"
HWL from	38°09'48"	121°55'51"
to	38°09'27"	121°55'31"
HWL from	38°09'19"	121°55'13"
to	38°09'06"	121°54'58"
HWL from	38°09'06"	121°55'07"
to	38°09'00"	121°54'59"
HWL	38°12'01"	121°55'06"
HWL from	38°07'06"	121°53'15"
to	38°06'27"	121°53'19"
HWL from	38°06'36"	121°53'20"
to	38°06'27"	121°53'18"

3. HYDROGRAPHY

Except for insufficient sounding data in various portions of the the main channel (see below) 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.

Channel development in Montezuma and Nurse Sloughs is insufficient in the following areas.

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
from	38°10'50"	121°54'21"
to	38°10'52"	121°54'29"
from	38°10'29"	121°55'24"
to	38°10'21"	121°55'41"
from	38°10'09"	121°55'54"
to	38°10'07"	121°56'12"
from	38°09'19"	121°55'22"
to	38°09'03"	121°55'00"
from	38°08'42"	121°54'30"
to	38°08'23"	121°54'30"

Edm

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, except for the following.

Several channels in the survey area were not defined, see section 3 of this report. Additional lines to fill holidays and some diagonal crosslines to confirm along channel soundings should have been accomplished.

Differences were not reconciled and explained between the shoreline maps and survey H-10298.

The correct terminology when reducing features to the chart datum were not used i.e., features bare at MHW and uncover at MLLW.

A visual inspection of a feature that is possibly submerged is not sufficient for disproval and removal from the chart.

Edm

5. JUNCTIONS

Survey H-10298 junctions with the following survey.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10303	1989	10,000	west

The junction is complete.

There are no contemporary surveys to the north, south, and east. A comparison with the charted depths reveals good agreement.

6. COMPARISON WITH PRIOR SURVEYS

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

Surveys H-905 and H-1785 cover the entire area of the present survey. A considerable amount of change has taken place in the survey area. Denverton Slough has changed its configuration while the depths have remained unchanged. Nurse Slough channel has shifted to the west side of the slough between latitude 38°10'30"N and latitude 38°12'00"N. Shoaling in Montezuma Slough has taken place on the north side and the channel has shifted to the south side between latitude 38°10'00"N and latitude 38°10'30"N. Also in Montezuma Slough between latitude 38°07'00"N and latitude 38°08'30"N, the slough has migrated 200 meters to the west and the depths differ between 3 to 13 feet. Additional discussion can be found in the hydrographer's report section K.

There are no AWOIS items originating from the prior surveys applicable to the present survey.

Survey H-10298 is adequate to supersede the prior surveys within the common area.

7. COMPARISON WITH CHART

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

a. Hydrography

Charted hydrography originates with survey H-1785 and miscellaneous sources and requires no further discussion. There has been no change between the old and new editions of charts 18652 and 18656.

Survey H-10298 is adequate to supersede charted hydrography within the common area, except for the charted pipeline area and

charted cable crossing at latitude 38°10'25"N, longitude 121°55'33"W and latitude 38°09'10"N, longitude 121°55'06"W and the piles PA discussed as AWOIS Item 51490 (see below). These features should be retained as charted. sam

b. AWOIS

AWOIS Items 51374, 51486, 51487, 51488, 51489 and 51491 originate with miscellaneous sources. They are adequately discussed in section L of the hydrographer's report except for AWOIS Item 51490.

The investigation of AWOIS Item 51490, piles PA charted at latitude 38°09'33"N and longitude 121°55'33"W, was not complete. The visual disproval of these piles which are located in 6 to 12 feet of water is not adequate for removal. The piles PA should be retained as submerged piles PA. sam

c. Controlling Depths

There are no charted channels with controlling depths within the area of this survey.

d. Aids to Navigation

There are no fixed or floating aids located within the area 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 twelve features to the USCG and N/CG221. Copies of the messages and reports are attached. No additional dangers were discovered during office processing. 12?

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10298 adequately complies with the Project Instructions except as noted in sections 3 and 4 of this report.

9. ADDITIONAL FIELD WORK

This is an adequate hydrographic survey. Additional field work is recommended on a low priority basis on AWOIS Item 51490 and to determine channel limits in the areas mentioned in section 3 of this report.

Charles R. Davies

C. R. Davies
Cartographer

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

Dennis Hill

Dennis Hill
Chief, Hydrographic Section

APPROVALS

I have reviewed the smooth sheet, accompanying data, and reports associated with hydrographic survey H-10298. This survey meets or exceeds Charting and Geodetic Services' standards for products in support of nautical charting.

for *Pamela Koterba* 5-11-90
Commander Pamela Chelgren-Koterba, NOAA (Date)
Chief, Pacific Hydrographic Section

Approved: *Wesley V. Hull* 5-25-90
for 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

INDEX
 HYDROGRAPHIC SURVEYS
 Complete through November 1978
 1971-1976
 SAN FRANCISCO BAY AND VICINITY

Diagram No. 8834-2



H-10298

HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-10298	1971	5000
H-10260	1976	20000

