10021

Diagrams 1282-3 & 1283-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. WH-20-4-82

Office No. H-10021

LOCALITY

State Texas

General Locality Gulf of Mexico

Locality Approaches to San Luis Pass

1982

CHIEF OF PARTY
CDR R.K. Matsushige

LIBRARY & ARCHIVES

DATE October 25, 1984

☆U.S. GOV. PRINTING OFFICE: 1980—766-230

10021

Area 11
CH74
11321 50 ✓
11322
11323 250,000 ✓
11300 For Giving of ✓
113225-A Record of Application
4u - RC

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-10021

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. WH-20-4-82

State Texas

General locality Gulf of Mexico

Locality ~~San Luis Pass, Texas~~ Approaches to San Luis Pass

Scale 1:20,000 Date of survey 3 June - 11 June 1982

Instructions dated 22 December 1982 Project No. OPR-K104-WH-82

Vessel NOAA Ship WHITING (EDP #2930) S-329

Chief of party CDR Roy K. Matsushige, Commanding Officer

Surveyed by A. N. Flior, V. N. Shaffer, M. E. Henderson, E. A. Steigerwald, P. J. Ruiz, T. A. Wolf, P. M. Kenul

Soundings taken by echo sounder, ~~[illegible]~~ Ross Model 5000

Graphic record scaled by WHITING personnel

Graphic record checked by VNS, MEH, EAS, PJR, TAW, PMK, frc, rwb, ms, mf, sp, ejt, jeo, rsf, jh, ljm, jwl

Protracted by _____ Automated plot by Hydroplot XYNETICS 1201 Plotter (AMC)

Verification by _____

Soundings in ~~[illegible]~~ feet at ~~[illegible]~~ MLLW

REMARKS: All times are Coordinated Universal Time.

Notes in the Descriptive Report were made in red during office processing.

STANDARDS CK'D 10-29-84
C. Loy

AWOIS + SURF ✓ RWD 4/85

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. G.P.O. 1972-769-565/519 REG. #6

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* Removed from the Original Descriptive Report and filed with the survey records.

DESCRIPTIVE REPORT

TO ACCOMPANY

BASIC HYDROGRAPHIC SURVEY

WH-20-4-82

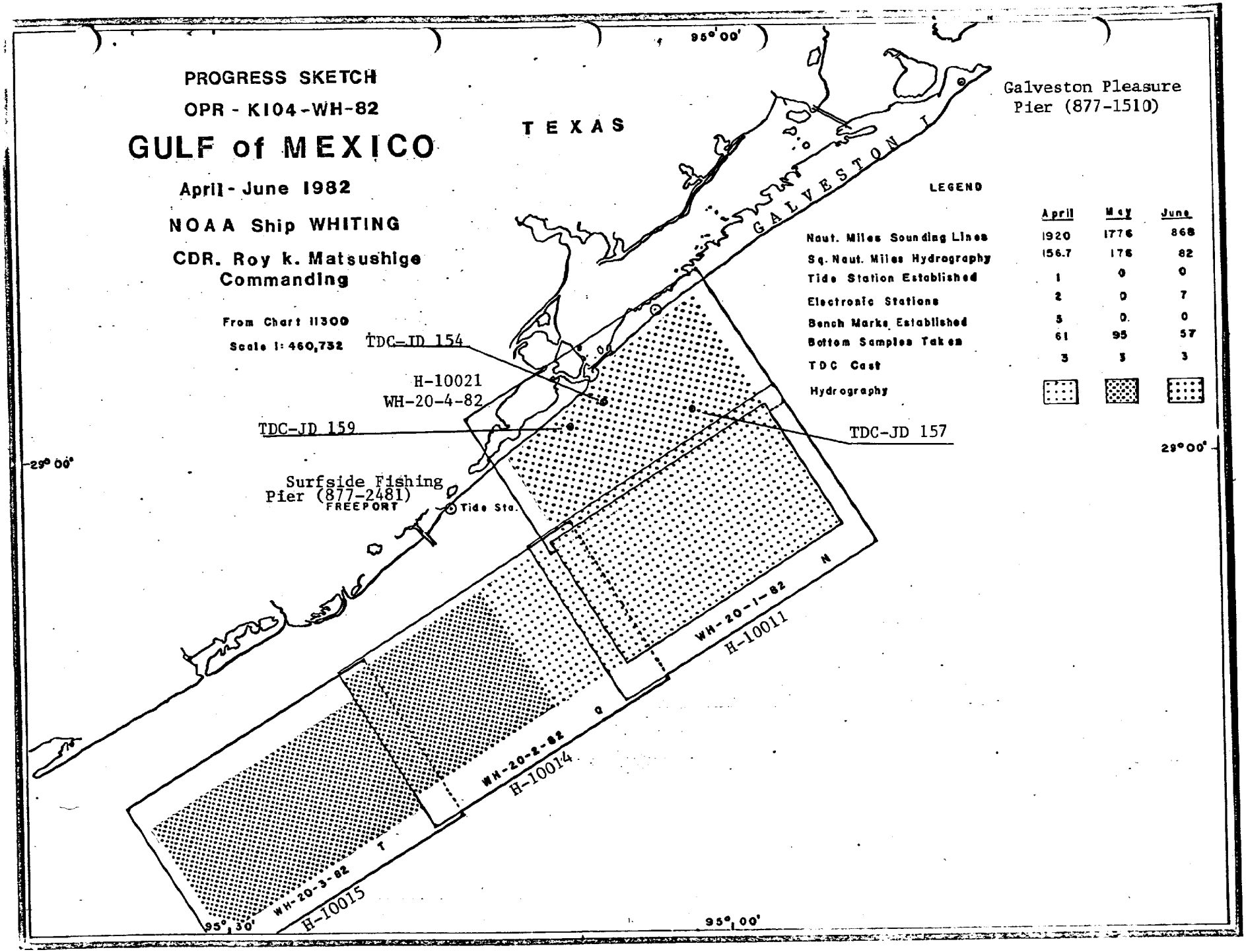
SCALE: 1:20,000

SURVEYED JUNE 3 - JUNE 11, 1982

BY NOAA SHIP WHITING (S-329)

CDR ROY K. MATSUSHIGE

COMMANDING OFFICER


PROGRESS SKETCH
OPR - K104-WH-82
GULF of MEXICO
April - June 1982
NOAA Ship WHITING
CDR. Roy k. Matsushige
Commanding
From Chart 11300
Scale 1: 460,732
TEXAS
GALVESTON I.
Galveston Pleasure Pier (877-1510)
LEGEND
April May June
Naut. Miles Sounding Lines 1920 1776 868
Sq. Naut. Miles Hydrography 156.7 176 82
Tide Station Established 1 0 0
Electronic Stations 2 0 7
Bench Marks Established 5 0 0
Bottom Samples Taken 61 95 57
TDC Cast 3 3 3
Hydrography
TDC-JD 154
H-10021
WH-20-4-82
TDC-JD 159
TDC-JD 157
Surfside Fishing Pier (877-2481)
FREEPORT
Tide Sta.
WH-20-1-82
H-10011
WH-20-2-82
H-10014
WH-20-3-82
H-10015
95° 00'
95° 30'
29° 00'

A. PROJECT

Hydrographic Survey H-10021 was performed in accordance with Project Instructions OPR-K104-WH-82, Gulf of Mexico, dated 22 December 1981, as amended by Change No. 1 dated 17 February 1982.

B. AREA SURVEYED

The area surveyed was in the Gulf of Mexico, general locality east southeast of Freeport, Texas. The sheet was laid out parallel to the shoreline and bounded by the following points:

029° 09' 42" N	095° 01' ~~42~~ 30" W
029° 02' ~~12~~" N 48"	094° ~~56' 00~~" W ~~57~~' 18"
028° ~~54' 12~~" N ~~55~~' 48"	095° 10' 00" W
029° ~~02' 39~~" N ~~00~~' ~~00~~"	095° ~~16~~ 13' 00" W

The area surveyed was characterized by generally gently sloping sandy or muddy bottom with no irregular features.

This survey was conducted from 3 June to 11 June 1982, Julian Days 154-162.

The WHITING surveyed the region from the 30-foot contour to the offshore limit of this sheet. Launch 1015 completed the inshore region from the 30-foot contour to the limit of safe navigation along the shoreline. The entrance to San Luis Pass was not surveyed as per Project Instructions.

C. SOUNDING VESSEL

The sounding vessels used throughout this survey were the NOAA Ship WHITING S-329, EDP number 2930 and WHITING Launch 1015, EDP number 2931. The WHITING and Launch 1015 were equipped with standard hydrographic equipment, including the Ross 5000 Echo Sounder and the Del Norte positioning system. No unusual sounding vessel configuration was used.

D. SOUNDING EQUIPMENT & CORRECTIONS TO ECHO SOUNDINGS

The sounding equipment used throughout this survey was a Ross 5000 Fineline Echo Sounder, for both the WHITING and Launch 1015. Echo Sounder serial number 1053 was used on Julian Days 154-162 aboard the WHITING, and Echo Sounder serial number 1052 was used on Julian Days 154-161 in the launch.

During ship operations, the blanking was left on at either 20 or 30 feet in order to ensure that the phase and initial were adjusted correctly. For

launch operation, the blanking was left on either 5 or 10 feet to serve as a check. Phase checks were recorded occasionally to double-check the initial setting.

The following procedures were used to determine the corrections to echo soundings:

Velocity Corrections:

TDC casts were taken from the WHITING on JD's 154, 157, and 159 using a Martek TDC Model 167 (s/n 127), calibrated February 1982. Velocity correctors determined from these three TDC casts were used for all WHITING data. The velocity correctors for all Launch 1015 data were derived from a combined plot of bar checks done on JD's 155, 156, and 158 and TDC casts from JD's 154 and 159 computed using a draft of 1.5 feet. Positions of the three TDC casts are indicated on the enclosed progress sketch.

TRA Corrections:

Fore and aft draft readings for the ship were recorded at the beginning and end of the 3-11 June period. These readings were averaged to obtain the mean draft for the working period. Two sets of leadline measurements were taken on JD's 071 and 074 during OPR-J217 to determine the instrument error. As a result of these two tests, the instrument error is considered to be insignificant for the depths surveyed. The launch draft was measured at 1.5 feet and no instrument error was apparent from the bar checks.

Settlement and squat trials for the WHITING were run on 26 April (JD116) in approximately 65 feet of water near the southern limit of H-10014 (WH-20-2-82), using a Ross 5000 Echo Sounder (s/n 1053). Trials for Launch 1015 were conducted on 14 June (JD165) off the U.S. Army Corps of Engineers Pier in Galveston in approximately 35 feet of water, using a Ross 5000 Echo Sounder (s/n 1052).

All data is included in Appendix IV.

Predicted Tides:

The smooth field sheets for this project were plotted using predicted tides from the reference gage at Galveston Pleasure Pier (877-1510), Latitude 029° 17.2' N, Longitude 094° 47.4'W. Logger tapes were provided by Processing Division, AMC, and were converted to predicted tide tapes by WHITING personnel using AM500 (Predicted Tide Generator).

All TRA corrections will be applied during final processing by OA/CAM3, Processing Division via TC/TI tapes.

E. HYDROGRAPHIC SHEETS

All field sheets were prepared on board by the WHITING by ship personnel using a Houston Instrument DP-3 Roll Plotter. This survey was divided into three sheets: east, central and west, each with a skew of 122° and with the following origins:

East	Central	West
029° 02' 30" N	029° 00' 12" N	028° 57' 54" N
094° 57' 00" W	095° 01' 06" W	095° 05' 12" W

A total of nine plotted sheets were submitted with this survey: 5 boatsheets with mainscheme, crosslines, bottom samples and developments; 3 smooth sheets with mainscheme, crosslines, bottom samples and developments and 1 position plot generated by CAM3 on 25 June. There was a discrepancy in line spacings on the west sheet noted when the smooth field sheets were plotted on the WHITING's plotters. All the printouts were checked for possible incorrectly steered line spacing during the collection of the sounding data, but there was no evidence that the field data was incorrect. It was suspected that the plotters were in error. CAM3 constructed a position plot of all ship's data, which showed no problem with the line spacing of the collected data.

Data from the investigation of PSR item #80 was not plotted on the smooth sheet as no trace of the wreck was found. The depths determined on the development lines for this item agreed with the mainscheme and crossline soundings.

All plotter sheets and field records have been submitted to OA/CAM3, Processing Division for verification.

F. CONTROL STATIONS

The following signals were used for either electronic positioning control stations, or visual calibration signals, or both. Signal ϕ13 was used for the initial for range/azimuth hydrography on year day 157.

Signal #	Name	Year Established
001	Sea Isle	1982
002	Terramar	1982
004	Kim ~~77~~	~~1977~~ 1979
ϕ13	G 46ϕ RESET 1955	1978
015	Bay Harbor	1982

Signal #	Name	Year Established
016	San	1982
017	Luis USE	1978
018	H-67-TX	1979
019	Bench Mark F 1255	1979
021	Christmas	1982
022	Churchill	1982
023	SL-10-USE	~~1979~~ 1978
024	Drum	1982
101	Sea Isle Ec~~centric~~	1982
102	Terramar Ec~~centric~~	1982

Station numbers 002, 015, 016, 021, 022, and 024 were established to Third Order Class I standards by Mr. Gary Fredrick, AMC Operations Division, between 28 March and 10 April 1982. Station number 001 was established to Third Order, Class I standards by WHITING personnel on 1 June 1982. The horizontal control data has been submitted to CAM1 and a copy is included in Appendix VI.

Positions for the other stations with the exception of 101 and 102 were obtained from NGS published data. Stations 1Φ1 and 1Φ2 are unmonumented and are not considered triangulation stations.
Stations 001, 004, and 024 were solely used as electronic control sites. Stations 015, 017, 018, 021, 022 and 023 were used as visual signals for sextant calibration; and stations 002, 016 and 019 were used as both electronic control and as visual calibration stations. Stations 101 and 102 were eccentric points used during range/azimuth hydrography with Launch 1015 on JD 157 and 158. The theodolite was set over these points since the Del Norte towers were set over the actual third-order stations. Computations of these eccentric points are included in Appendix VI.

G. HYDROGRAPHIC POSITION CONTROL

Range/range control was used for this survey, except for inshore hydrography completed by Launch 1015 using the range/azimuth method (JD 157 and 158). The Del Norte positioning system was utilized for all mainscheme, cross-line and development soundings and for bottom sample positions. Numerous problems were experienced with the Del Norte equipment, most notable of which were the failures of the ship's master (s/n 278 and s/n 1068) and DMU (s/n 189 and s/n 230) units.

The following Del Norte components and serial numbers were used aboard the WHITING.

JD	DMU	Master (s/n)	L. Remote (s/n)	R. Remote (s/n)
153	189	278 (lower mast)	1065 (180)	1317 (180)
154	189	278	1065 (87)	1317 (87)
154	189	278 (upper mast)	262	1322
155	189	1068 (uncalibrated)	1065	1322
156	189	1068	1065	1322
157	189	1068	1065	1322
157	189	1068	1065	1137
158	189	1068	1065	1137
159	189	1068	1065	1137
159	189	1068	1137	1322
160	230 unc	1068	1137	1322
162	172	1068	262	1322

Notes: Masters s/n 278 would not function consistently at either of the upper or lower ship's antenna positions; s/n 1068 failed for 2 hours at 2130 on JD 159. DMU s/n 189 failed at 1300 on JD 160; s/n 230 failed at 1300 on JD 162.

The following Del Norte equipment and serial numbers were used aboard Launch 1015:

JD	DMU	MASTER (s/n)	L. REMOTE (s/n)	R. REMOTE (s/n)
154	172	159	1322	262
155	172	159	1322	262
156	172	159	1322	262
157	172	159	1322	262
158	172	159	1322	262
158	172	159	1317	n/a
159	172	159	1065	1322
160	172	159	1137	262
161	172	159	1137	262
161	172	159	1137	1065
161	172	159	1065	262
161	172	159	262	1322
161	172	159	1137	262
162	172	159	1137	262

The location of the remotes on the shore station were as follows:

s/n 1065	code 72	Station Kim 77	JD 154-162	
s/n 1317	code 76	Station Terramar	JD 154-157	(failed JD 157)
s/n 1137	code 76M	Station Terramar	JD 157-159	(converted to code 76 from code 74 on JD 157)
s/n 1137	code 76M	Station Drum	JD 159-162	
s/n 262	code 74	Station San	JD 154-158	
s/n 262	code 74	Station Christmas	JD 158-162	
s/n 1322	code 78	Station Sea Isle	JD 154-158	
s/n 1322	code 78	Station BM F 1255	JD 158-162	

Slave unit stations were chosen so that intersections of rates were greater than 30° and no more than 150°. All range/range data for this survey was recorded in real time using RK 112 with the exception of the data collected by Launch 1015 on JD 161 and 162. Due to computer problems on these days, the data, which consisted of shoreline soundings, bottom samples, and a development on the west plotter sheet, was hand-logged. The range/azimuth data collected by Launch 1015 on JD's 157 and 158 were recorded in real time using RK 116.

Calibrations for the Del Norte system were computed in accordance with the Hydrographic Manual. All Del Norte equipment was calibrated over a measured baseline before being used on the survey. On 29 May 1982 (JD 149), a baseline was established between the Corps of Engineers Pier, Galveston and Bolivar Island, Texas at a distance of 3883.84 meters. WHITING personnel used Hewlett Packard EDMI (s/n 1929A00355) to measure the baseline. Problems with DMU s/n 180 and master s/n 1068 required an additional day (31 May, JD 151) of calibration. DMU s/n 180 was never operational. Field calibrations were recorded daily by the WHITING, and twice daily for Launch 1015 (when possible). Correctors were determined by visual three-point sextant fixes with a check angle and were computed using RK 561. The morning and afternoon correctors for Launch 1015 were averaged to produce daily correctors and these were applied during off-line processing. Baseline calibration correctors were not applied due to the equipment failures which precluded a closing calibration. It was felt that the daily correctors were more indicative of the operational state of the system than the baseline calibration data.

An ANDIST corrector of zero (0) was used during all visual calibrations, since the angle observers were able to stand beside the Del Norte master units on both the ship and launch.

All calibration data for this survey is considered adequate, and no problems were encountered which would have degraded positional accuracy. All values are shown on the Electronic Corrector Abstract, Appendix V.

The Del Norte system, when operable, is an adequate system. The major problem encountered by the WHITING was not positioning inaccuracy, but erratic operation of the equipment. The Del Norte units aboard Launch 1015 were more reliable than the ones used on the ship. Master unit s/n 278 was extremely erratic. DMU s/n 230 and DMU s/n 189 failed with no apparent reason. Master s/n 1068 went off the air for two hours, then returned to operation just as suddenly, as did remote s/n 262.

Computer malfunctions on Launch 1015 caused delays in the survey. See the equipment failures section of WHITING's Monthly Activities Report for June 1982, a copy of which is enclosed.

H. SHORELINE

Shoreline for this survey was obtained from manuscripts TP-00225 and TP-00226. The field edit was performed on these sheets in July 1979 and the final review

was performed in January 1981. No field edit was done during survey H-10021. No changes to the shoreline manuscripts were found during this survey.

I. CROSSLINES

Thirty-seven nautical miles of crosslines were run by the ship, which is 6% of the mainscheme. Fourteen and a half nautical miles of crosslines were run by Launch 1015, which is 9% of the mainscheme. Agreement with the mainscheme was excellent. Ninety-eight percent agreed within one foot of the mainscheme soundings, and one hundred percent agreed within two feet.

J. JUNCTIONS See section 5 of the Evaluation Report

The survey junctioned with H-10011 to the southeast, H-9843 to the east and H-9050 to the north. H-10011 was a 1:20,000 scale survey completed in 1982, H-9843 was a 1:20,000 scale survey completed in 1979, and H-9050 was a 1:20,000 scale survey completed in 1969. The junctions with these three surveys were very good, all depths agreeing within one foot. This meets the criterion stated in section 1.1.2 of the Hydrographic Manual.

K. COMPARISON WITH PRIOR SURVEYS - See section 6 of the Evaluation Report.

Prior survey H-6253, a 1:40,000 scale survey completed in 1937, was compared to survey H-10021. Agreement with H-6253 was good, with approximately 95% of the depths agreeing within 1-2 feet. The remaining five percent agreed within 2-3 feet, the depths of H-10021 being consistently deeper than those of H-6253. This difference is within the acceptable limits suggested in Section 1.1.2 of the Hydrographic Manual.

The following six PSR items were investigated during this survey:

Item Number	Description	Charted Position	Source
80	Wreck, PA Full investigation	Latitude 28°59.0' N Longitude 95°12.0' W	LNM 56, 1972
82	Wreck, ~~PA~~ Full investigation	Latitude 29°01.7' N Longitude 95°10.6' W	H-5521, 1934
278	Wreck, PA Full investigation	Latitude 29°01.6' N Longitude 95°10.5' W	LNM 30, 1981
83	Wreck; limited investigation	Latitude 29°02.6' N Longitude 95°09.6' W	unknown: appears on H-9050, 1969
84	Wreck; information item	Latitude 29°04.0' N Longitude 95°01.0' W	NM 35, 1968
275	Wreck; limited investigation	Latitude 29°03.0' N Longitude 95°08.0' W	LNM 11, 1977

Item #80 was reported to be a fishing vessel sunk "PODUNK QUEEN" in approximately thirty feet of water. This area was investigated both by WHITING divers and by Launch 1015. On 10 June (JD 161), two WHITING divers used a circle sweep with a 90-foot radius, but with negative results, as no trace of any vessel debris was located. On this same date, Launch 1015 placed a temporary buoy over the wreck site, and proceeded to run sixteen one-half mile lines originating from the buoy, using the cardinal points for base courses. No indication of a wreck was found on the echo-sounder records, ~~and the hydrographer recommends that the symbol be revised from PA, position approximate, to ED, existence doubtful.~~ See section 7.a of the Evaluation Report

Item #82 was reported to be a submerged wreck with a visible stack, eight feet of which was bare at MHW. Throughout the survey period, visual investigation was done by Launch 1015. On 10 June (JD 161), Launch 1015 positioned a reference buoy at the site given in the Project Instructions, using Del Norte rates. Two WHITING divers then made an investigative dive, using a circle sweep of 140-foot radius with negative findings. A second dive and circle sweep of 200-foot radius was done, again with no indication of a wreck. ~~It is recommended that the PA, position approximate, be revised to ED, existence doubtful~~. See section 7.a of the Evaluation Report.

Item #278 was described as a partially visible, wrecked shrimping vessel "DONNA MARIE" located in approximately twelve feet of water. Throughout the survey period, visual investigation was done by Launch 1015. On 10 June (JD 161), Launch 1015 positioned a reference buoy at the site give in the Project Instructions, using Del Norte rates. Two WHITING divers then made an investigative dive, using a 100-foot radius circle sweep with no positive results. No indication of the wreck was discovered, ~~and it is the hydrographer's recommendation that the PA, position approximate, be revised to ED, existence doubtful~~. See section 7.a of the Evaluation Report.

Item #83 was a limted investigation item described as a wreck, not visible. Since Item #83 was within the area of prior survey H-9050, no hydrography was run in the area. On 10 June (JD 161), the approximate area of the wreck was investigated visually by Launch 1015, with no indication of a mast or other debris found. Because the area was so far inshore, and since depths were only one to two feet, the wreck is considered no longer there. ~~The hydrographer recommends that the PA, position approximate, be revised to ED, existence doubtful.~~ See section 7.a of the Evaluation Report

Item #84 was an information item that was investigated on JD 158 by the WHITING using reduced line spacing of ninety meters. Positions 1577-1601 were used to develop the area, with no unusual profile or other factors to indicate a wreck. ~~The hydrographer recommends that the PA, position approximate, be revised to ED, existence doubtful.~~ See section 7.a of the Evaluation Report.

Item #275 was a limited investigation requiring only visual inspection. On JD 161 the WHITING's MonArk investigated the area, finding no indication of a wreck or related debris. ~~It is recommended by the hydrographer that the PA, position approximate, be revised to ED, existence doubtful.~~ See section 7.a of the Evaluation Report.

L. COMPARISON WITH THE CHART – See section 7 of the Evaluation Report.

Survey H-10021 was compared with NOS chart 11321, 20th edition, April 1980, 1:80,000 scale. Agreement with the charted depths was very good. Seventy-five percent of the charted depths agreed within one foot of the present

survey, ninety-five percent within two feet, and the remaining five percent within three feet. Charted depths were consistently shoaler than the depths obtained by this survey. Differences may be attributed to the difference in scale between the chart and that of the survey, and to changes in the sandy bottom due to natural causes.

M. ADEQUACY OF SURVEY

This survey is sufficiently complete and adequate to supercede prior surveys for charting purposes. The following areas are the only ones in which the hydrography is below standards set in the Hydrographic Manual:

Two soundings at Latitude 29°07'36"N and Longitude 95°03'18"W were missed, causing a small hole in the 8-foot curve inshore. Six soundings were missed in the 6-foot curve of the same area, causing another small hole. In both cases the gaps were due to interruption of lines when the range-azimuth observer could no ~~olnger~~ longer see Launch 1015.

A 0.02 square mile area on the west sheet at Latitude 29°00.3'N and Longitude 95°12.9'W was not surveyed, because originally it was not within the region of adequate geometry for the shore stations used, and was overlooked afterward. No significant on overall survey results

N. AIDS TO NAVIGATION

There were no fixed or floating aids to navigation within the limits of this survey.

O. STATISTICS

	VESNO 2930	VESNO 2931	TOTAL
Number of Positions	2299	661	2960
Nautical Miles of Hydrography	680	188	868
Square Miles of Hydrography	51	17	68
Bottom Samples	43	14	57
Tide Stations	n/a	n/a	4
TDC Casts	3	0	3

P. MISCELLANEOUS

The ship data was spooled onto magnetic tape by CAM 3, Processing Division, to produce the position plot referenced in Section E. After the final review of the data on the WHITING, the positions of several soundings were adjusted where the Del Norte readings were erratic. Time and course (T&C) adjustments for these soundings were noted on the master tape printouts and corrector tape printouts, but were not changed on the tapes. Additionally, positions 1435 (+3)--1436 (+6) and 1447 (+2)--1449 (+2) on JD 158 are not to be smooth plotted.

Q. RECOMMENDATIONS

Survey H-10021 is adequate and no further field work is recommended. See recommendations in Section K (comparison to prior surveys). See section 7.a of the Evaluation Report.

R. AUTOMATED DATA PROCESSING

Program Number	Description	Version Date
RK 112	Range/Range Real-Time Hydroplot	08/04/81
RK 116	Range/Azimuth Real-Time Plot	08/24/81
RK 201	Grid, Signal & Lattice Plot	04/18/81
RK 211	Range/Range Non-Real Time Plot	02/02/81
RK 212	Visual Station Table Load	04/01/74
RK 216	Range/Azimuth Non-Real Time Plot	02/09/81
RK 300	Utility Computations	10/21/80
RK 330	Data Reformat & Check	05/04/76
AM 500	Predicted Tide Generator	11/10/72
AM 530	Layer Corrector for Velocities	05/10/76
RK 561	Range/Range Geodetic Calibration	05/26/81
RK 602	Extended Line Oriented Editor	05/21/75
RK 612	Line Printer Listing	03/22/78

S. REFERRAL TO REPORTS

Tide Station Report submitted to OA/C321 Tidal Requirements and Acquisitions Branch, 23 June 1982.

Recovery Notes, horizontal control, submitted to OA/CAM 1, Operations Division, 19 April 1982.

DR abstracts for Loran-C comparison, submitted to OA/CAM 1, Operations Division, 12 June 1982.

Monthly Activities Report for June 1982 submitted OA/CAM 1, Operations Division, 25 June 1982.

Horizontal Control Report submitted to OA/CAM 1, Operations Division, 30 June 1982.

Respectfully submitted,

Michael E. Henderson

Michael E. Henderson
Lieutenant, NOAA

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

NOAA SHIP WHITING
GALVESTON, TEXAS 77553

2 April 1982

Commander
Eighth Coast Guard District
Hale Boggs Federal Building
500 Camp Street
New Orleans, LA. 70130

Dear Sir:

The NOAA Ship WHITING will conduct a routine hydrographic survey operation at Galveston and vicinity from 8 April to 23 June 1982 particularly within the area covered by the following coordinates:

29° 09' 00" N	95° 00' 36" W
28° 55' 36" N	94° 51' 00" W
28° 34' 00" N	95° 30' 00" W
28° 45' 00" N	95° 38' 00" W

Please include this notice in all pertinent publications and announcements within the stated time frame for the information of the mariners regularly plying the area.

Sincerely,

Virginia N. Shaffer

Virginia N. Shaffer, LT., NOAA
Field Operation Officer

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

NOAA SHIP WHITING
GALVESTON, TEXAS 77553

2 April 1982

Commanding Officer
Coast Guard Vessel Traffic Service Unit
Houston / Galveston
P.O. Box 501
Galena Park, Texas 77547

Dear Sir:

The NOAA Ship WHITING will conduct a routine hydrographic survey operation at Galveston and vicinity from 8 April to 23 June 1982 particularly within the area covered by the following coordinates:

29° 09' 00" N	95° 00' 36" W
28° 55' 36" N	94° 51' 00" W
28° 34' 00" N	95° 30' 00" W
28° 45' 00" N	95° 38' 00" W

Please include this information in all pertinent publications and announcements within the stated time frame for dissemination to mariners regularly plying the area.

Sincerely,

Virginia N. Shaffer

Virginia N. Shaffer, LT., NOAA
Field Operation Officer

F. SAFETY

Fire and Abandon Ship drills were held on 24 May, 2, 9, 17, 21 June. Watertight and Fire Screen Doors were tested on the same dates. The VHF/UHF emergency lifeboat radio and four (4) EPIRBS were tested on 21 June. All tests were satisfactory.

Educational demonstrations for all hands were held following the fire drills. To date, the use of mechanical foam and emergency signaling devices (hand-held, floating and rocket type) have been demonstrated.

A new medical supply locker was designed and built in D-4 (Chiefs lounge) and was completely re-stocked. A Trauma/EMT portable kit was designed and stocked. All ship's first aid kits were refurbished.

One crew member sustained a minor cut on a big toe while wearing shower thongs (off duty). All hands were cautioned about the use of proper footwear (see Safety Committee Meeting Report).

G. SCUBA

Divers E.J. Tylutki and P.J. Ruiz made three working dives to a maximum depth of ten feet on 10 June. The dives totaling approximately 60 minutes, were made to investigate a possible wreck identified in the Pre-Survey Review. A second dive team consisting of divers A.N. Flior and R.C. Brewington made a thirty-three foot dive for 30 minutes on another possible wreck site. Circle searches were accomplished without finding any obstacles. All dives were completed without incident.

H. CHART CORRECTIONS

Four charted buoys which no longer exist were reported to the Coast Guard. (Chart 11321 Rev. 19 April 1980) See copy of message attached.

I. SHIP CAPABILITIES

Due to the failure of the Universal Graphic Recorder (see Equipment Failures) no deep water hydrography is possible.

J. EQUIPMENT FAILURES

1. (1) Master Gyro on the WHITING
   (2) 2 hours on 24 May
   (3) Erratic readings
   (4) repaired by Sperry representative

2. (1) Ships On-Line Computer
   (2) 1 hr. on 26 May
   (3) bad card
   (4) card changed from spare parts on board.

3. (1) Hydrotrac Positioning System at TERRAMAR 1982 site
   (2) 5 hours on 27 May
   (3) power cut off from residence and back-up batteries were subsequently drained.
   (4) replaced batteries at site for duration of project.

4. (1) Del Norte DMU Master antenna S/N 278
   (2) 32 hours downtime between 1 and 3 June before the problem was diagnosed.
   (3) signal strength was erratic
   (4) replaced by another master antenna, Ship personnel were unable to repair the unit

5. (1) Del Norte DMU S/N 180 inoperative upon receipt from AMC. Unable to repair on board due to lack of spare parts.

6. (1) Del Norte Remote Unit Code 76 S/N 1317
   (2) 3 hours on June 4
   (3) unit failed
   (4) replaced by another remote. Ships personnel were unable to repair the unit.

7. (1) Del Norte Remote Code 74 S/N 262
   (2) 2 hours on 5 June
   (3) Unit failed. One hour later it resumed operation by itself. Batteries were well charged and no further problem was observed.
   (4) no maintenance was attempted.

8. (1) Computer in Launch 1015
   (2) 3 hours on 7 June, 2½ hours on 8 June
   (3) Teletype printed NAVERR 01 repeatedly and continued to print out irrelevant characters.
   (4) cable to parallel buffer replaced

9. (1) Del Norte Master Antenna S/N 1068
   (2) 1 hour
   (3) unit failed - one hour later, it resumed operation with no explanation for the downtime.
   (4) no maintenance attempted

10. (1) Computer in Launch 1015
    (2) 3½ hours on 9 June
    (3) computer would not continue normal sequence in Program RK 112
    (4) cable was replaced

11. (1) Ross Fathometer S/N 1052 in Launch 1015
    (2) 3 hours on 10 June
    (3) the trace was too dark
    (4) card was changed

12. (1) Del Norte, Ship DMU S/N 230
    (2) 1 hour on 11 June
    (3) unit failed
    (4) replaced DMU with unit from Launch 1015

13. (1) Fresh water hose to engine in Launch 1015
    (2) 1½ hours
    (3) hose came off the intake and most of the cooling water was lost
    (4) launch returned to the ship and the engine coolant was replaced.

K. PUBLIC AFFAIRS

A new Public Information Officer shipboard assignment was created in preparation for the New York Project. Contact was made with Mr. Norman Banks (C3- Rockville) in preparation for U.S. Coast Guard Auxiliary / U.S. Power Squadron Chart Up-dating workshops planned for New York.

L. FUEL CONSERVATION

Hours main engines on line	431.0
Hours at standard speed	0.0
Hours at reduced standard speed	282.5
Hours at less than reduced standard speed	114.0
Hours at idle	7.5
Hours at one engine operation	0.0
Average gallons per sea day for reporting period	1185.0

M. ATTACHMENTS

1. Safety Meeting Minutes
2. EMCC Meeting Minutes
3. EEO Meeting Minutes
4. Ship's Schedule
5. Chart Correction Message

X. APPROVAL SHEET

Supervision of all field and office work on this hydrographic survey was continuous and on a day to day basis to ensure completeness. All work was done in accordance with the Project Instructions and the Hydrographic Manual. This survey is complete and adequate for charting purposes.

Approval/forwarded

Roy K. Matsushige

Roy K. Matsushige, CDR, NOAA
Commanding Officer
NOAA Ship WHITING (S-329)

VI. LIST OF STATIONS

SIGNAL TAPE LISTING

OPR K104-WH-82

H-10021
WH-20-4-82

STATION NUMBER	OCTANT PLOTTING POS.	LATITUDE	LONGITUDE	CARTO CODE	ANTENNA ELEVATION	FREQUENCY	STATION NAME AND YEAR ESTABLISHED
001	6	29 09 00644	095 01 31625	250	0003	000000	Sea Isle 1982
002	6	29 07 34403	095 03 43158	250	0001	000000	Terramar 1982
004	6	29 01 11742	095 11 47960	250	0003	000000	Kim 1977
015	6	29 07 23911	095 04 02512	139	0000	000000	Bay Harbor 1982
016	6	29 06 45039	095 04 56231	250	0003	000000	San 1982
017	6	29 05 31887	095 06 40403	139	0006	000000	Luis USE 1978
018	6	29 03 45126	095 08 10588	139	0002	000000	H-67-TX 1979
019	6	29 02 53962	095 09 23079	250	0002	000000	Bench Mark F 1255 1979
021	6	29 02 04363	095 10 38995	139	0000	000000	Christmas 1982
022	6	29 02 18510	095 10 11581	139	0000	000000	Churchill 1982
023	6	29 01 05750	095 11 59602	139	0002	000000	SL-10-USE 1979
024	6	29 00 38272	095 12 40146	250	0002	000000	Drum 1982
1[illegible]	[illegible]	29 09 03629	095 01 31657	139	0003	000000	Sea Isle, Eccentric 1982
1[illegible]	6	29 07 34373	095 03 43120	139	0001	000000	Terramar, Eccentric 1982

IX. LANDMARKS FOR CHARTS

There were no landmarks or aids to navigation within the limits of this survey.

DATE: September 1, 1982

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 877-2481 Surfside Fishing Pier, TX

Period: June 3-11, 1982

HYDROGRAPHIC SHEET: H-10021

OPR: K104

Locality: Offshore Freeport, Texas, Gulf of Mexico

Plane of reference (mean lower low water): 5.05 ft.

Height of Mean High Water above Plane of Reference is 1.83 ft.

REMARKS: Recommended Zoning:

Zone Direct.

Chief, Tidal Datums and Information Branch

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10021

Name on Survey	A ON CHART NO. 1132 and 1323	B ON PREVIOUS SURVEY NO. TP-00226	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
BAY HARBOR (locality)		X								1
FOLLETS ISLAND	X									2
GALVESTON ISLAND	X									3
GULF OF MEXICO (title)	X									4
SAN LUIS ISLAND	X									5
SAN LUIS PASS	X									6
SEA ISLE (locality)		X								7
TERRAMAR BEACH (locality)		X								8
TEXAS (title)	X									9
WEST BEACH		X								10
										11
										12
										13
										14
										15
										16
										17
					Approved:					18
										19
					Charles E. Harrington					20
					Chief Geographer		N/CG2x5			21
						JUL 31 1984				22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: H-10021

Number of positions	2746
Number of soundings	17876
Number of control stations	14

	TIME-HOURS	DATE COMPLETED
Preprocessing Examination	22	15 AUG 1982
Verification of Field Data	206	15 APR 1984
Quality Control Checks	71	
Evaluation and Analysis	76	17 SEP 1984
Final Inspection	8	14 SEP 1984
TOTAL TIME	383	

Marine Center Approval 17 SEP 1984

Transmittal letter of survey and survey records will be included in the Descriptive Report to identify the records accompanying the survey.

ATLANTIC MARINE CENTER
EVALUATION REPORT

REGISTRY NO.: H-10021 FIELD NO.: WH 20-4-82

Texas, Gulf of Mexico, Approaches to San Luis Pass

SURVEYED: 3 June through 11 June 1982

SCALE: 1:20,000 PROJECT NO.: OPR-K104-WH-82

SOUNDINGS: Ross Digital Echo Sounder CONTROL: Del Norte (Range/Range), Del Norte/Theodolite (Range/Azimuth)

Chief of Party.....R. K. Matsushige

Surveyed by.....A. N. Flior
.....V. N. Shaffer
.....M. E. Henderson
.....E. A. Steigerwald
.....P. M. Kenul
.....T. A. Wolf
.....P. J. Ruiz

Automated Plot by.....Xynetics 1201 Plotter (AMC)

1. INTRODUCTION

a. During office processing of this survey, discrepancies of approximately one-foot between ship and launch hydrography wwere discovered along lines running from Latitude 29°58'45"N, Longitude 95°12'00"W to Latitude 29°01'00"N, Longitude 95°08'30"W and from Latitude 29°05'00"N, Longitude 95°03'30"W to Latitude 29°07'00"N, Longitude 95°00'15"W. A quantitative analysis of differences in depth between the ship and launch determined that the mean difference was one and one-tenth (1.1) feet. An extensive analysis of possible causes of the discrepancy revealed no apparent cause. The observational data supporting the survey depth corrections appeared thorough and consistent. At this point a decision was made to suspend any further data analysis and complete the processing of the survey.

b. Notes in the Descriptive Report were made in red during office processing.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections F, G, and S of the Descriptive Report.

b. Shoreline originates with final reviewed Class I Photogrammetric Manuscripts TP-00225 and TP-00226 of 1977-79.

3. HYDROGRAPHY

a. Soundings at crossings agree within the limits prescribed in sections 4.6.1 and 6.3.4.3 of the Hydrographic Manual and section 6.6 of the Project Instructions.

b. The standard depth curves could be drawn in their entirety within the limits of the hydrography. The zero (0) curve was not delineated because it was outside the limits of safe navigation for the survey launch. Dashed and brown curves were drawn to show additional bottom relief.

c. Development of the bottom configuration and determination of least depths is considered adequate except the area along the shoreline where the lines of hydrography are run parallel to the depth curve making it extremely difficult to determine the location of the six (6) foot depth curve.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the following exceptions:

a. Twice daily bar checks were not taken as required by section 1.4.2 of the Hydrographic Manual. Four (4) out of a possible eighteen (18) bar checks were taken.

b. The hydrographer did not submit a report on currents or a negative report as required by section 8.2 of the Project Instructions.

c. The hydrographer did not submit dive reports for the dives performed within the survey area, nor describe in detail the method used to search for the items in question as required by section 7.13 of the Project Instructions.

d. The hydrographer did not obtain the minimum of two (2) vertical casts to determine instrument error for the ship in an area where ship and launch hydrography join as required by section 4.9.5.1.2 of the Hydrographic Manual. A vertical cast was taken during operations in Florida in 1982. Section 1.a of this report discusses discrepancies between ship and launch hydrography run on this survey.

e. The hydrographer did not make a comparison between the present survey and prior surveys H-5489 (1933-34), H-5521 (1934), and H-6389a (1938).

f. An Oceanographic Log Sheet-M was not prepared by the hydrographer for fourteen (14) bottom samples. A Log Sheet-M was prepared for the survey records and inserted during office processing.

g. The hydrographer did not include all of the signals required to process the Range/Azimuth hydrography. Station G 470 Reset 1955, 1978 was inserted into the control file during office processing.

h. Stations Terramar Ecc and Sea Isle Ecc are unmonumented but were labeled as triangulation stations on the signal list and the final field sheet.

i. Settlement and squat for the ship WHITING was performed with both Jensen launches in the davits. Hydrography was conducted for five (5) days with only one (1) launch in the davits. This is not an acceptable procedure.

j. The hydrographer failed to indicate whether any effort was made to contact local salvors, the U. S. Army Corps of Engineers or other organizations to obtain additional information concerning the six (6) Presurvey Review items investigated. Section 6.11 of the Project Instructions recommends contact with these organizations and others which would provide additional information not available from NOS Headquarters.

k. The hydrographer failed to make correct recommendations for three (3) of the six (6) Presurvey Review items. Only three (3) of the Presurvey Review items are "PA"; the hydrographer made the recommendation that all six (6) items "...be revised to ED, existence doubtful." It is incumbent upon the hydrographer to properly address each item appropriately and make correct recommendations on an item-by-item basis.

l. The hydrographer ran a portion of a line in an area of poor control intersections, Latitude 29°01'30"N, Longitude 95°11'00"W. The hydrography was not consistent with the surrounding data and was rejected during office processing.

5. JUNCTIONS

H-9843 (1979) to the east
H-10011 (1981) to the south

A comparison of soundings in the junctional area between H-9843 (1979) and the present survey shows that the present survey is consistently one (1) to two (2) feet deeper than H-9843 (1979) offshore of the thirty (30) foot curve. Inshore of the thirty (30) foot curve agreement is excellent. Since H-9843 (1979) is archived at Headquarters in Rockville, Maryland, final adjustments of junctional curves will have to be done there. The junction between H-10011 (1981) and the present survey is in excellent agreement.

There are no contemporary junctional surveys to the west or to the north at the entrance to San Luis Pass. Charted soundings to the west are generally two (2) to three (3) feet shoaler than present survey soundings. To the north at the entrance to San Luis Pass charted hydrography and the present survey are in harmony except as noted in section 6 of this report in the comparison with survey H-9050 (1969).

6. COMPARISON WITH PRIOR SURVEYS

H-5489 (1933-34)	1:20,000
H-5521 (1934)	1:20,000
H-6253 (1937)	1:40,000
H-6398a (1938)	1:40,000
H-9050 (1969)	1:20,000

The above prior surveys taken together cover the present survey area in its entirety.

H-5489 (1933-34) shows that the shoreline has receded from forty (40) to sixty (60) from Latitude 29°06'42"N, Longitude 95°04'48"W to Latitude 29°08'54"N, Longitude 95°01'30"W.

A general deepening trend is noted from the shoreline to the twelve (12) foot curve and seaward of the twelve (12) foot curve, depths vary one (1) to two (2) feet with present survey depths being the deeper.

H-5521 (1934) shows shoreline recession of approximately one hundred (100) meters in the vicinity of Latitude 29°15'00"N, Longitude 95°09'00"W. Inshore of the eighteen (18) foot curve there is a general deepening trend. Seaward of the eighteen (18) foot curve there is some deepening on th present survey. For a discussion of the wreck, bare eight (8) feet at MHW in Latitude 29°01'46.1", Longitude 95°10'37.2" (Presurvey Review Item #82) see section 7.a. of this report. The wreck was brought forward as a sunken wreck to supplement the present survey.

H-6253 (1937) covers the majority of the present survey from the thirty (30) foot curve seaward and is generally two (2) to three (3) feet shoaler than the present survey.

H-6398a (1938) covers only a small portion of the present survey and is generally one (1) to four (4) feet shoaler than the present survey depths of thirty (30) to fifty-four (54) feet.

H-9050 (1960) abuts the present survey in the vicinity of San Luis Pass and is in fair general agreement with present survey soundings. Present survey depths vary from agreement to three (3) foot differences in depths from three (3) to thirty-five (35) feet on the present survey. The present survey is generally deeper where differences occur. For a discussion of the wreck, bare four (4) feet in Latitude 29°02'39.5", Longitude 95°09'35.7" (Presurvey Review Item #83) see Section 7.a. of this report.

The general deepening trends found in comparisons with the prior surveys can be attributed to natural erosion of the barrier islands along the coast and in deeper areas may be attributable to the withdrawal of oil and gas in the area.

The present survey is adequate to supersede the charted hydrography within the common area.

7. COMPARISON WITH CHARTS 11321 (21st Edition, MAR 13/82)
11323 (44th Edition, APR 25/81)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys.

The charted submerged pipeline traversing the southwestern corner of the present survey area should remain as charted.

Five (5) Presurvey Review items fell within the limits of the present survey. A sixth item fell outside the limits of the survey; however, the hydrographer was required to investigate the item.

Item 80, F/V PODUNK QUEEN, originates with LNM 56/1972, charted as a sunken, dangerous wreck, with mast visible, PA in Latitude 28°59'N, Longitude 95°12'W was searched for by the hydrographer with negative results. Considering the equipment used and the extent and types of search conducted, it is recommended that the wreck remain as charted with the notation "MAST" removed. AWOIS #308

Item 82, dangerous, sunken wreck, with stack visible, charted in Latitude 29°01.7'N, Longitude 95°10.6'W originating with H-5521 (1934) was searched for with negative results. A U.S. Power Squadron investigation reported the wreck still exists with only the stack visible in 1975 (Chart Letter 1687 of 1975). The extent of the survey and the data submitted for the investigation was not sufficient to disprove the existence of a sunken, dangerous wreck. It is recommended that the wreck remain as charted with the notation "STACK" removed. AWOIS #314

Item 278, a 55-foot shrimp vessel DONNA MARIE, charted sunken wreck, masts, PA, located in Latitude 29°01.6'N, Longitude 95°10.5'W, originating with LNM 30/81, was also searched for with negative results. The extent of the hydrographer's investigation was not sufficient to disprove the existence of the wreck; it is recommended that the wreck be charted as a dangerous sunken wreck, PA. logged ok

Item 83, a limited investigation item, charted in Latitude 29°02.6'N, Longitude 95°09.6'W as a dangerous, sunken wreck, was searched for with negative results. Considering the location of the wreck by H-9050 (1969) Latitude 29°02'39.5", Longitude 95°09'35.7", and the wreck's elevation at that time, four (4) feet above Mean High Water, it is most probable that the wreck no longer exists and should be deleted from the chart. A U.S. Power Squadron investigation in 1975 (Chart Letter 1687 of 1975) reported the wreck not visible. It is recommended that the wreck be deleted from the chart. #316

Item 84, a dangerous, sunken wreck, PA, in Latitude 29°04'N, Longitude 95°01'W, originating with NM 35/68, was searched for by the hydrographer with reduced line spacing, ninety (90) meters, with negative results. Considering the beam width of the sounding system used at ninety (90) meters, bottom coverage was not sufficient to verify or disprove the wreck. It is recommended that the wreck remain as #325

charted and a wire drag/side scan sonar investigation be conducted to verify or disprove its existence.

Item 275, a charted visible wreck in Latitude 29°03'N, Longitude 95°08'W, originating with LNM 11/77, falls outside the limits of hydrography but was a required item for investigation. The hydrographer did not find the wreck; it is recommended that the wreck be charted in the above location as a dangerous, sunken wreck, PA. A wire drag/side scan sonar search is recommended at some later date to verify or disprove the wreck's existence. AWOIS #320

The present survey is adequate to supersede the charted hydrography within the common area except as noted above.

b. Aids to Navigation

There are no fixed or floating aids to navigation within the present survey area.

8. COMPLIANCE WITH PROJECT INSTRUCTIONS

This survey adequately complies with the Project Instructions except as noted in section 4 of this report.

9. ADDITIONAL FIELD WORK

This is an adequate basic survey; recommendations for additional field work can be found in section 7.a of this report.

Maurice W. Holloway
Cartographic Technician
Verification of Field Data

Robert G. Roberson
Senior Cartographer
Evaluation and Analysis

Guy F. Trefethen
Senior Cartographic Technician
Verification Check

Inspection Report
H-10021

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey complies with National Ocean Service requirements except as noted in the Evaluation Report. The survey records comply with NOS requirements except where noted in the Evaluation Report.

Inspected

R. D. Sanocki

Rudolph D. Sanocki
Acting Chief, Hydrographic Surveys Branch

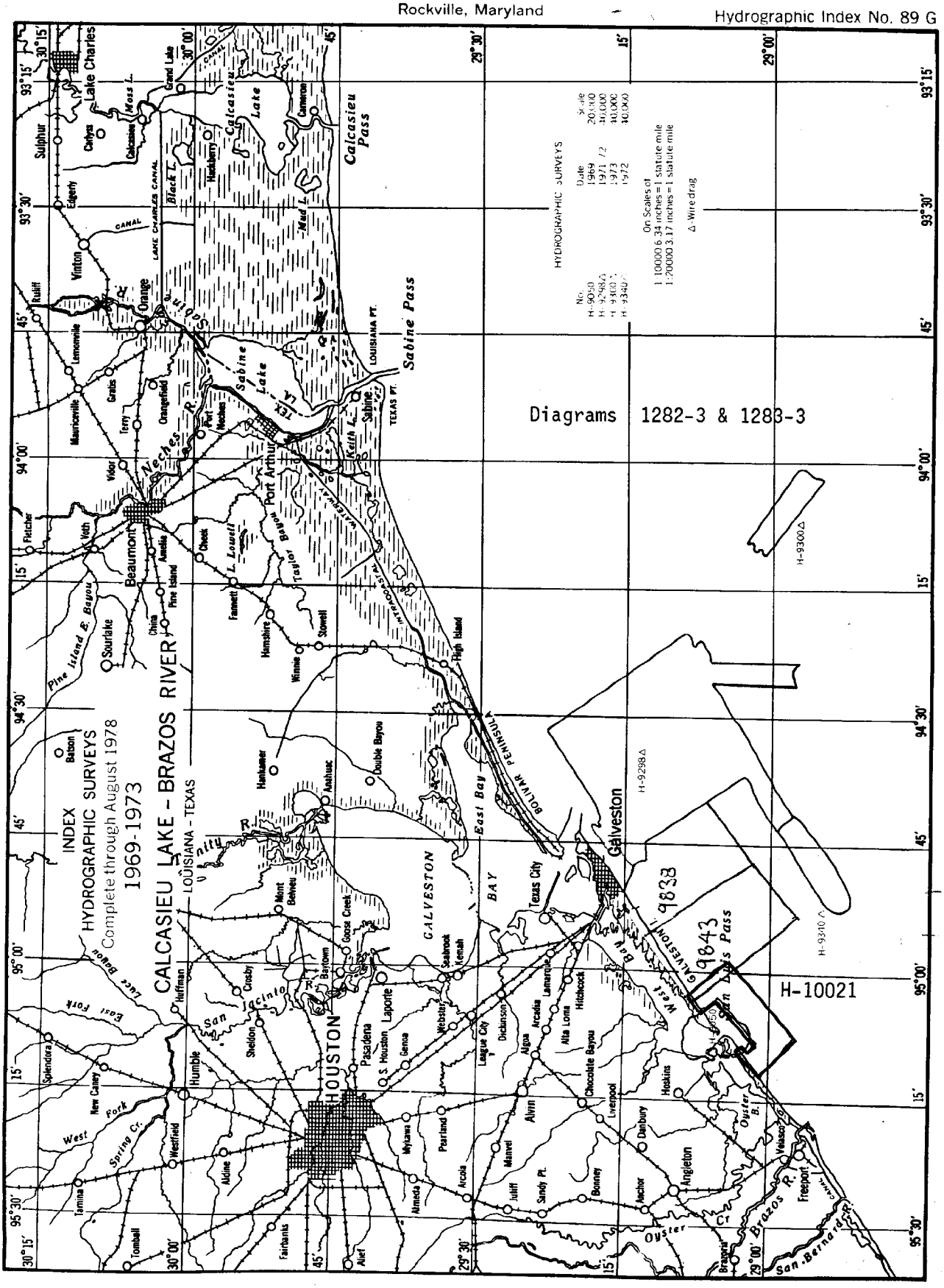
Approved September 17, 1984

Wesley V. Hull

Wesley V. Hull, RADM, NOAA
Director, Atlantic Marine Center

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

Hydrographic Index No. 89 G



FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10021

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
11321	6-28-85	M. Herrick	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 30
11330	6-29-85	M. Herrick	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 2
11300	6-29-85	M. Herrick	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 40
11322"A"	6-6-89	Ernest V. Morte	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 20 Exam, No Corr.
11323	9-13-90	William Hayden	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 69, APPLIED IN FULL PT THRU 11321
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P83