10399

Diagram No. 1117-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Side Scan Sonar

Field No. WH-10-2-91

Registry No. H-10399

LOCALITY

State Texas

General Locality Gulf of Mexico

Sublocality 9 NM ESE of Port Aransas

1991

CHIEF OF PARTY
CDR R.P. Floyd

LIBRARY & ARCHIVES

DATE September 2, 1993

☆U.S. GOV. PRINTING OFFICE: 1987—756-980

10399

A/G
PRODUCTS
11307
11313
11300
411
CPS

NOAA FORM 77-28 (11-72)

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

REGISTER NOS.

HYDROGRAPHIC TITLE SHEET

H-10399

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

FIELD NO.
WH-10-02-91

State: TEXAS

General locality: GULF OF MEXICO

Locality: 9 NM ~~EAST~~ ESE ~~SOUTHEAST~~ OF PORT ARANSAS, ~~TEXAS~~

Scale: 1:20,000 Date of Survey: Aug. 12 - Nov. 16, 1991

Instructions dated: May 28, 1991 Project No.: OPR-K220-WH-91

Vessel: NOAA Ship WHITING S-329 EDP # 2930

Chief of party: Commander Richard P. Floyd

Suveyed by: R. Floyd, B. Greenawalt, N. Crews, R. Fletcher, K. McNitt, K. Taggart
D. Bixby, E. Berkowitz, J. Seitz, F. Cruz, A. Myers, R. Harris

Soundings taken by echo sounder: DSF 6000N

Graphic record scaled by: WHITING survey personnel

Graphic record checked by: WHITING survey personnel

Protracted by: N/A Automated plot by: HP 7959B, Bruning (FIELD) XYNETICS 1201 PLOTTER (AHS)

Verification by: ATLANTIC HYDROGRAPHIC SECTION PERSONNEL

Soundings in MLLW: Meters

REMARKS: Change No. 1 dated August 23, 1991

Change No. 2 dated October 1, 1991

Surveyed by 1:20,000-scale standards, plotted at 1:10,000

Field number erroneously indicates 1:10,000 survey

Junctions with H-10392, H-10400, H-10401, and H-10402

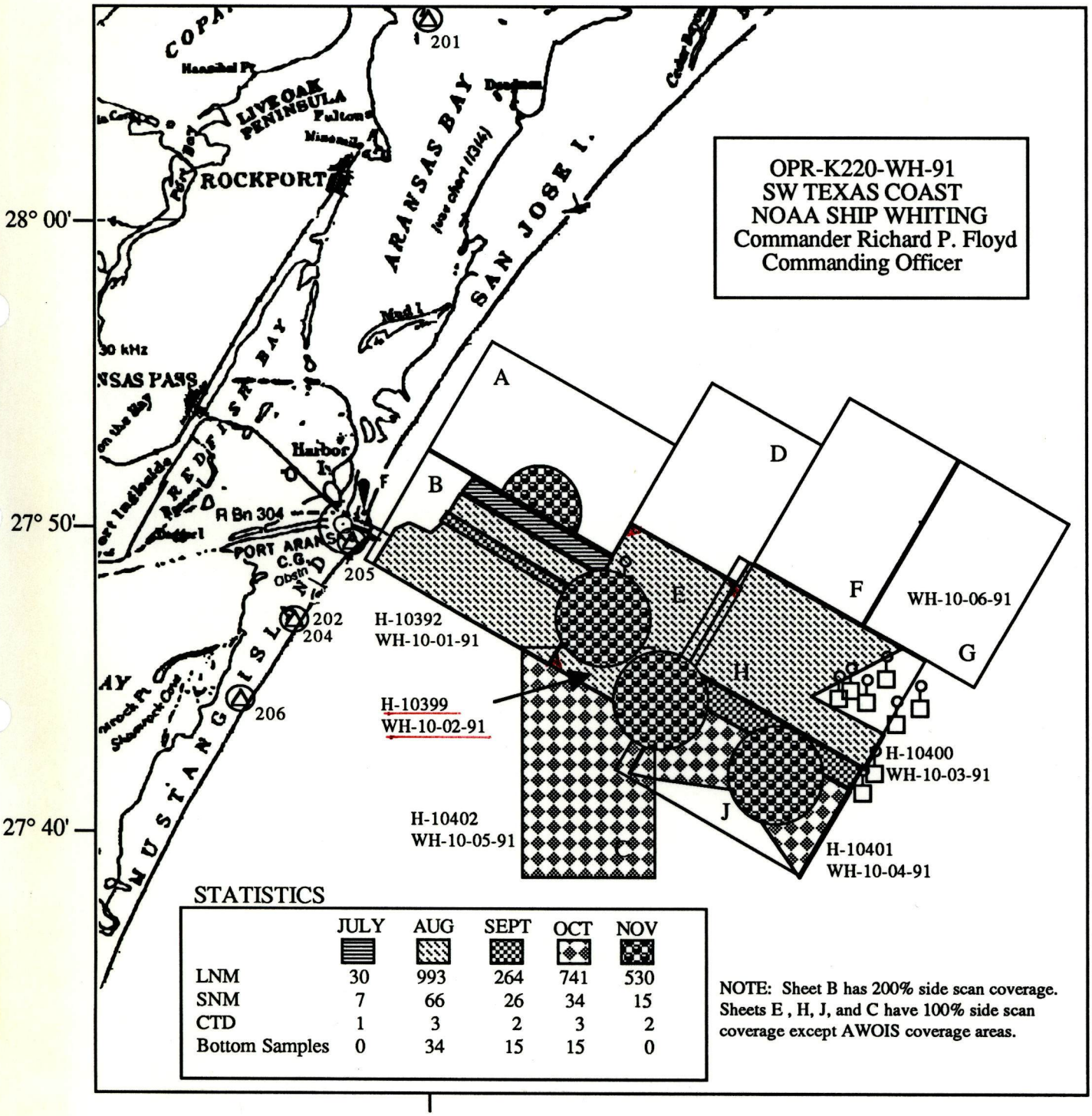
NOTES IN THE DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE PROCESSING.

JAN 29 1997 NOAA/SURF ✓ 9/28/93 SJV

KWW 5/12/94

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

PROGRESS SKETCH
NOAA SHIP WHITING
NOVEMBER 1991



STATISTICS

	JULY	AUG	SEPT	OCT	NOV
LNM	30	993	264	741	530
SNM	7	66	26	34	15
CTD	1	3	2	3	2
Bottom Samples	0	34	15	15	0

NOTE: Sheet B has 200% side scan coverage. Sheets E , H, J, and C have 100% side scan coverage except AWOIS coverage areas.

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-K220-WH
FIELD NUMBER WH-10-02-91
REGISTRY NUMBER H-10399
NOAA SHIP WHITING

CDR Richard P. Floyd, Commanding Officer

A. PROJECT

Project OPR-K220-WH is a basic hydrographic survey with side scan sonar (SSS) bottom coverage of the approaches to Corpus Christi, Texas. The survey was required for maintenance and revision of existing nautical charts.

The survey area is of interest because Port Ingleside, on the north shore of Corpus Christi Bay, is being planned as a major strategic home port for the United States Navy. The area also supports a significant sport and commercial fishing industry.

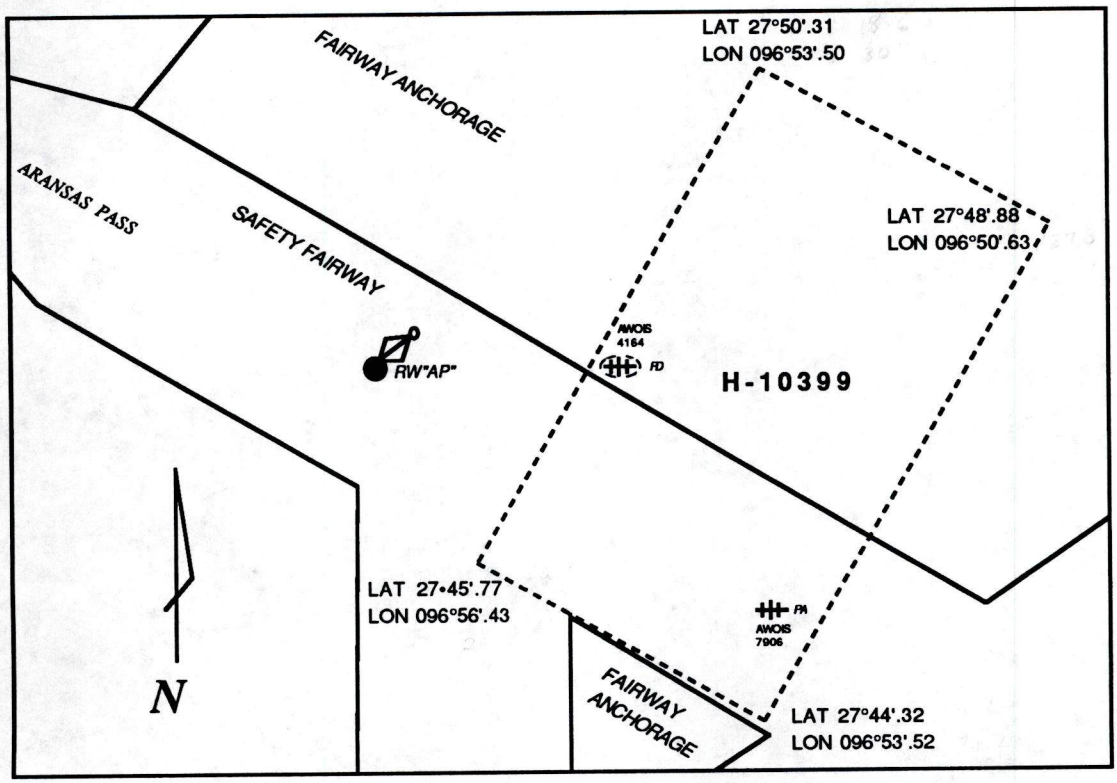
Survey operations were conducted in accordance with the May 28, 1991 Hydrographic Project Instructions OPR-K220-WH, S.W. Texas Coast, Texas. Change Number 1 to these instructions (August 14, 1991) approved WHITING's proposed sheet layout and reduced the required SSS bottom coverage to 100% in water depths greater than 20 meters. Change Number 2 (October 1, 1991) required observation of a new LORAN-C chain in the Gulf of Mexico.

Project OPR-K220-WH was divided into nine survey sheets, five of which were completed during WHITING's 1991 field season. The survey described in this report was designated as "E" Sheet, and assigned field sheet number WH-10-02-91 and registry number H-10399.

B. AREA SURVEYED

Hydrographic survey H-10399 is 9 nautical miles east southeast of Port Aransas, Texas. The survey encompasses portions of the safety fairway and the fairway anchorage.

The area surveyed is shown below:



Survey operations began on August 12, 1991 (DOY 224) and ended on November 16, 1991 (DOY 320). Survey operations on "E" sheet were sporadic due to rough weather, hardware problems, operations on other sheets, and scheduled port calls. Data were acquired on the following days:

DOY	Gregorian Date
224	August 12
227	August 15
235-237	August 23-25
242	August 30
254	September 11
267	September 24
276	October 3
296-298	October 23-25
306-307	November 2-3
311	November 7
319-320	November 15-16

C. SURVEY VESSEL

NOAA ship WHITING, vessel identification number 2930, was the platform for all data acquisition during survey H-10399. No unusual vessel configurations were used.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The Hydrographic Data Acquisition and Processing System (HDAPS) was used to collect and process data for survey H-10399. A listing of the program titles and version numbers can be found in Appendix VII. FILED WITH ORIGINAL SURVEY DATA

Program NADCON (version 1.01 for IBM compatible computer) calculated the datum shift from the North American Datum (NAD) of 1983 to NAD 27 for comparisons with prior surveys.

Program CALIB (version 2.0 for MicroVAX computer) recomputed ARGO partial lane correctors using Falcon Mini-Ranger ranges and ARGO rates recorded during the original calibrations. Recomputation of the partial correctors was necessary due to a position error in two of the Mini-Ranger stations.

The HDAPS program RECOMP (version 1.04) used the recomputed ARGO partial lane correctors to recalculate hydrographic positions of data acquired from DOY 224 to DOY 254.

The HDAPS program POINT (version 2.03) used the recomputed ARGO partial lane correctors to recalculate bottom sample positions.

Sound velocity corrections were determined using version 1.0 of program CAT and version 1.11A of program VELOCITY.

E. SIDE SCAN SONAR EQUIPMENT

Data acquisition included towing an EG&G model 272-T dual-channel SSS towfish astern of WHITING at a speed of 5 to 6 knots. The operating frequency of the SSS was 100 KHz and the range scale was 100 meters to both port and starboard, resulting in a 200-meter swath width. One of two interchangeable EG&G model 260 image correcting SSS recorders received data from the towfish and created a continuous sonargram of the bottom. Recorders were

exchanged frequently to minimize the interruption of survey operations for maintenance. The following table lists the serial numbers and dates of use for all SSS equipment aboard WHITING:

Type	S/N	Day Number
Towfish	011901	224-235, 276, 306-307
Towfish	011904	236-267, 296-298, 311-320
260 Recorder	0012102	224-237, 276, 297-311
260 Recorder	0012106	242-267, 296-297, 319-320

The towfish height was maintained between 8 and 20 meters off the bottom.

Survey H-10399 was the first sheet planned that required only 100% SSS coverage over most of its area. Main-scheme lines were run at a spacing of 175 meters. This resulted in a large number of holidays and areas of insufficient swath overlap. Splits were run in these areas. Extra lines were run perpendicular to the main-scheme lines in the northwest corner of the survey area to provide 200% coverage shoreward of the 20-meter contour.

Confidence checks were performed and annotated as required. However, it seemed from close examination of sonar records that noise in the outer edges of both channels might be obscuring possible contacts in that area. Trawl scars that crossed SSS records were consistently washed out at the outer edges of the record. To insure effective bottom coverage, WHITING ran additional survey lines, in the form of long splits, where the records where suspect.

The required 100% coverage was met or, in many cases exceeded over the entire survey area, and 200% coverage was achieved in the area shallower than 20 meters. In addition, 200% coverage was achieved in an investigation of two Automated Wreck and Obstruction Information (AWOIS) items, whose 3,000-meter search radii covered approximately two thirds of sheet H-10399.

The HDAPS Contact Utility Program used measurements of contacts to compute their location and true height off the bottom. Contacts with a height of at least 10% of the water depth and those with a notable shape were considered significant and thus worthy of further investigation.

In accordance with the project instructions, WHITING did not develop or investigate contacts discovered during survey H-10399. This work is scheduled for another ship. Significant contacts are listed in Separate V;* recommendations for future development are included in Section N.

* FILED WITH ORIGINAL FIELD RECORDS

F. SOUNDING EQUIPMENT

A Raytheon Digital Survey Fathometer (DSF) 6000N echo sounder was the only sounding equipment used to determine water depth during the survey. The DSF 6000N produced an analog record of a high frequency (100 Khz) and low frequency (24 Khz) depth. The high and low frequency depths were digitized and then recorded by the HDAPS acquisition system. The high frequency depths were selected as the primary depths.

The only echo sounder used for survey operations was S/N A111N.

In addition to being scanned to check the accuracy of digitized depths, echograms were carefully reviewed for significant features beneath the SSS towfish, none of which were found. Electronics technicians performed daily accuracy checks and preventive maintenance of the DSF 6000N for assurance of data quality.

G. CORRECTIONS TO SOUNDINGS

Sound velocity profiles of the water column were determined using a Seacat Conductivity, Temperature and Depth (CTD) profiler (model SBE-19, s/n 286). The profiler was calibrated on DOY 024 during WHITING's winter inport period. Calibration coefficients were applied via program VELOCITY. A copy of the calibration report can be found in the supplemental data cahier submitted with this survey.

The CTD, mounted on a rosette, was lowered through the water column to obtain data for sound velocity corrections. Program VELOCITY processed the data, selected significant data points, and created a corrector table, which was then manually entered into an HDAPS velocity table. The corrections were applied to soundings either on-line or in post processing. Velocity tables are included in Separate IV and a separate velocity binder can be found in the supplemental data cahier. FILED WITH ORIGINAL FIELD RECORDS

Data Quality Assurance (DQA) for the Seacat was performed by using a salt water hydrometer and a thermometer to determine the density of a surface water sample taken during the CTD cast. The Seacat program CAT compared these values to the CTD surface values, and confirmed that the velocity probe was working properly.

A summary of sound velocity casts follows:

DOY	Vel.Table#	Latitude	Longitude	Depth
218	2	27°47'06" N	96°48'00" W	28.3 m
232	3	27°48'05" N	96°53'54" W	24.0 m
238	4	27°45'59" N	96°44'22" W	38.2 m
252	5	27°45'06" N	96°44'54" W	38.3 m
261	6	27°45'09" N	96°45'06" W	35.3 m
276	7	27°41'44" N	96°45'46" W	36.8 m
289	8	27°45'06" N	96°44'54" W	30.3 m
306	9	27°49'09" N	96°48'21" W	39.2 m
319	10	27°44'54" N	96°45'06" W	36.4 m

Settlement and Squat correctors were determined on DOY 217 in Corpus Christi Channel, Cut "A" range by making several runs with the ship at various speeds past an observer. The observer recorded level readings of a stadia rod on the ship during each pass and at-rest readings between runs to eliminate tidal affects. Average correctors were determined for various ship speeds and entered into an HDAPS offset table. Relevant data are included in Separate IV. FILED WITH ORIGINAL FIELD RECORDS

The HDAPS data acquisition computer received data from a Heave, Roll, and Pitch sensor (HIPPY, s/n 19109-C), and corrected soundings for vessel heave.

Tidal datum for project OPR-K220-WH was mean lower low water. Predicted tides from NOAA Tide Tables, Galveston, Texas (station number 877-1450) were used as a reference for this project. Time and height correctors for the project were as follows: APPROVED TIDES WERE APPLIED DURING OFFICE PROCESSING.

	Time Correction:	Height Ratio:
High Water:	-1 hr 30 min	x1.28
Low Water:	-1 hr 30 min	x1.28

The operating tide stations at Corpus Christi, Texas (877-5870) and Port Isabel, Texas (877-9770) will be used as control for datum determination. Mr. Larry Nieson of the Atlantic Operations Group (N/OMA1213) confirmed the proper operation of the stations during the survey.

Attempted depth comparisons between the DSF 6000N and a calibrated leadline were unsuccessful due to difficulties measuring the leadline depth over an extremely soft bottom.

Excellent agreement was found between water depth determined by the DSF 6000N and that of a 3D Instruments pneumatic depth gauge (s/n 138921-30).

The following observations were recorded simultaneously on DOY 301 while WHITING was moored alongside the Naval Station Ingleside pier:

pneumatic gauge	DSF 6000N
47.4 ft	11.2 m
47.6 ft	11.2 m
47.5 ft	11.2 m
47.4 ft	11.2 m
47.4 ft	11.2 m
47.4 ft	11.2 m
47.4 ft	11.2 m
47.4 ft	11.2 m
47.4 ft	11.1 m
47.4 ft	11.2 m
Average depth = 47.4 ft	11.2 m
x.3048 m/ft	+3.2 m (WHITING draft)
=14.4 m	=14.4 m

The correction for WHITING's static draft was 3.2 meters, a historical value which WHITING divers confirmed by the pneumatic depth gauge on DOY 301. The Transducer Depth Determination Report is included in Separate IV.*

The pneumatic gauge was calibrated on DOY 058. Systems checks were completed in accordance with Hydrographic Survey Guideline number 55. These data are included in the Transducer Depth Determination Report.*

Sounding corrections were applied in post processing to the high frequency depths of the DSF 6000N.

H. CONTROL STATIONS SEE ALSO SECTION 3.2 OF THE EVALUATION REPORT

All geodetic positions were referenced to NAD 83.

Six horizontal control stations were used during survey H-10400: three occupied by Falcon Mini-Ranger receiver/transponders (RT's), and three occupied by Automatic Ranging and Grid Overlay (ARGO) towers. Geographic positions (GP's) of the occupied stations were verified to third-order, class I standards. Station descriptions and GP's are included in Appendix III.*

Two of the control stations were located on water tanks. Offsets were computed from the center of the tanks to the rail where the Mini-Ranger RT was secured. The original measurements did not adhere to 3rd order class I standards. Offset positions were re-surveyed to 3rd order class I standards in early September, and the following errors were noted:

* FILED WITH ORIGINAL FIELD RECORDS.

Port Aransas Tank Eccentric (station 205)
Erroneous position: 27° 49' 47.531" N 097° 03' 49.421" W
Corrected Position: 27° 49' 47.566" N 097° 03' 49.371" W
Error: 1.7 meters

Port Aransas Mustang Tank Eccentric (station 206)
Erroneous position: 27° 45' 06.430" N 097° 07' 29.160" W
Corrected position: 27° 45' 06.889" N 097° 07' 28.929" W
Error: 15.34 meters

These position errors affect ARGO calibrations conducted on or before DOY 262. The calibrations and their subsequent hydrographic positions were corrected before submission of this survey.

I. HYDROGRAPHIC POSITION CONTROL SEE ALSO SECTION 2.a. OF THE EVALUATION REPORT.

The DM-54 ARGO system, operated in the range-range mode, was the primary positioning system used during survey H-10399. The Falcon Mini-Ranger 484 short range positioning system was used to calibrate the ARGO stations.

ARGO positioning equipment included the following components:

Station	RPU	ALU
WHITING	R1083662	C1083309
Goose (201)	R047844	A047853
Sharkys (202)	R0680312	A047858
Mata (203) (before DOY 233)	R1085755	A0783640
Mata (203) (after DOY 233)	R0682566	A0980304

Problems were experienced with station 203, resulting in the replacement of the range processing unit (RPU), antenna loading unit, and power supply on DOY 233.

The Falcon Mini-Ranger network consisted of the shipboard RPU (s/n D0004) and an RT (s/n E2960) as well as the three shore based RT's:

Station	Code	Serial #
204	7	E2917
205	A	G2571
206	C	F3296

Mini-Ranger baseline calibrations were performed on DOY 212 and 214 at the Naval Station Ingleside, Texas, in accordance with AMC OPORDER 86 and the Field Procedures Manual 3.1.3.2. The "true" baseline distance was measured with a Hewlett Packard model 3810B Electronic Distance Measuring Instrument (s/n 1929A00355). HDAPS

recorded and processed Mini-Ranger range data across the baseline, and correctors for each combination of RT and RPU were entered into an HDAPS C-O (corrected minus observed) table before survey operations began. An abstract of baseline calibration correctors can be found in Separate III. FILED WITH ORIGINAL FIELD DATA

Ship positions were computed by the intersection of multiple lines of position (LOP's) from the shore-based stations. Positioning busts appeared on the track plot as fliers. If reliable positions existed on both sides of the flier, the questionable position was "smoothed" during post processing. Formal documentation of daily critical and noncritical systems checks was unnecessary; the HDAPS on-line computer screen included a graphic display of position geometry, residuals, and radius of the 95% error circle (ECR). The residual and ECR were recorded for each selected sounding. Survey data were collected using 1:20,000-scale accuracy standards. Hence, persistent ECR's greater than 30 meters or residuals greater than 10 meters were cause for data rejection.

Flooding during unusually high tides in late September caused ARGO station GOOSE to drop off the air. This forced WHITING to run with only two lines of position (LOP's) on DOY 267. Fix's 1463 through 1567 were acquired with two LOP's from 0135Z to 1024Z.

The closing calibration conducted on September 24, 1991 (DOY 267) at 1200Z, differed by 24 meters from the opening calibration conducted on September 23, 1991 (DOY 266) at 1956Z. The difference normally should not exceed 10 meters. These Data were acquired as splits to insure 100% SSS coverage and as additional reconnaissance of SSS contacts detected during main-scheme acquisition. WHITING obtained verbal approval from Commander Christopher Lawrence, Chief Atlantic Hydrographic Section, to accept the data and apply average correctors (average of opening and closing calibrations). The data (fix numbers 1798 to 1816) were repositioned with average correctors using the HDAPS program RECOMP. Output listings from program RECOMP are included with the survey data.

ARGO signals were calibrated at the beginning of each survey leg and whenever the maximum residuals persistently exceeded the tolerance of 0.5 mm at the scale of the survey. The HDAPS primary verses secondary method was used for calibration. The ship was positioned at the calibration site using Falcon as the primary positioning system and the ARGO stations as the secondary system. The HDAPS system provided a comparison of the Falcon position with each ARGO station. The ARGO whole and partial lane correctors for each station were displayed on the computer screen. Ten comparisons were obtained by performing a screen dump when the Falcon maximum residuals were less than 10 meters and the signal strengths were greater than 15. The ARGO whole and partial lane correctors were averaged for the ten observations and applied

using the delta range function in the ARGO control display unit.

The ARGO calibrations affected by erroneous positioning of Mini-Ranger stations described in Section H were recomputed off-line via the MicroVax program CALIB. New ARGO partial correctors were computed and the affected survey data were repositioned using HDAPS programs RECOMP or POINT. Commander Christopher Lawrence granted verbal approval to perform the position recomputation. A summary of the original and recomputed ARGO partial lane correctors can be found in Separate IV.* Listings from programs RECOMP and POINT are also included with the survey data.

A side effect of the position recomputation was a general increase in the residuals when compared to the data collected on-line. Program RECOMP calculated the best position possible using the Houtonbous algorithm, but only a portion of the data available on-line is logged. After recomputation, the residuals in some areas exceeded the tolerance of 0.5mm at the scale of the survey, due to fewer data being used in the calculation of residuals. This is not necessarily an indication of less accurate positions.

Offsets for positioning and survey equipment on the WHITING were obtained from historical data and verified before the start of survey H-10399, then entered into the HDAPS offset table. A diagram and table of offsets is included in Separate III. *

J. SHORELINE SEE SECTION 2.b. OF THE EVALUATION REPORT.

No shoreline existed in the survey area.

K. CROSS-LINES SEE SECTION 3.2 OF THE EVALUATION REPORT.

A total of 20.8 nautical miles of crosslines were run on H-10399. This was 12% of the main-scheme lines. Cross line and main-scheme agreement was excellent; 223 soundings were compared. The average difference was less than 0.1 meter with a standard deviation of 0.14 meter. The maximum difference was 0.4 meter.

L. JUNCTIONS SEE SECTION 5. OF THE EVALUATION REPORT.

The western edge of survey H-10399 junctioned with WHITING contemporary survey H-10392 (B sheet). Forty-six soundings were compared and very good agreement was found. The maximum difference between soundings was 0.6 meter. The average difference was 0.1 meter with a standard deviation of 0.16 meter.

* FILED WITH THE ORIGINAL FIELD RECORDS

A portion of the south edge of survey H-10399 junctioned with WHITING contemporary survey H-10402 (C sheet). Fifty-two soundings were compared and very good agreement was found. The maximum difference between soundings was 0.8 5 meter. The average difference was 0.0 meter with a standard deviation of 0.23 meter.

The northern half of the eastern edge of survey H-10399 junctioned with WHITING contemporary survey H-10400 (H sheet). Thirty-six soundings were compared and very good agreement was found. The maximum difference between soundings was 0.5 4 meter. The average difference was 0.1 meter with a standard deviation of 0.10 meter.

The souther half of the eastern edge of survey H-10399 junctioned with WHITING contemporary survey H-10401 (J sheet). Soundings were compared and excellent agreement was found. The maximum difference between soundings was 0.3 meter. The average difference was 0.1 meter with a standard deviation of 0.09 meter.

M. COMPARISONS WITH PRIOR SURVEYS SEE ALSO SECTION 6. OF THE EVALUATION REPORT.

H-10399 soundings were compared with three prior surveys. All prior surveys were referenced to NAD 27. For comparison purposes, a datum shift was applied to H-10399 in accordance with the Field Procedures Manual for Hydrographic Surveying.

Survey H-6402, scale 1:40,000, was completed in 1938 with Mean Low Water being the tidal datum. This survey encompassed all of the area surveyed on H-10399. Eighty-nine soundings from H-6402 were compared with those from H-10399, and showed good agreement. The average difference between soundings was 0.3 meter with a standard deviation of 0.15 meter.

Survey D-107, scale 1:40,000, was completed in 1989 8-89 with Mean Lower Low Water being the tidal datum. This survey covered the approximate southern three-quarters of the area surveyed on H-10399. Ninety soundings from H-10399 were compared with soundings from D-107, and showed good agreement. The average difference was 0.1 meter with a standard deviation of 0.36 meter.

Survey H-10205, scale 1:20,000 was completed in 1985. The northwestern edge of H-10399 was coincident with H-10205. Twenty-seven soundings from H-10205 were compared with soundings from H-10399, and agreement was very good. The average difference between soundings was 0.2 meter, and the standard deviation was 0.15 meter.

The soundings from survey H-10399 were consistently deeper than the soundings of all three of the prior surveys. Only 18 out of 206 soundings compared were shallower.

The area surveyed was flat and gently sloped toward the southeast. This agreed with all prior surveys.

No significant bottom features existed within the survey area.

N. COMPARISON WITH THE CHART SEE ALSO SECTION 7.a. OF THE EVALUATION REPORT

Survey H-10399 was compared with an enlargement (1:10,000) of chart 11307, 30th ed., Nov. 12/88; scale 1:80,000. All 20 charted soundings in the area covered by H-10399 were compared and agreement was good. The average difference was 0.4 meter with a standard deviation of 0.2 meter. H-10399 soundings were consistently deeper than those charted.

A CHARTED NON-DANGEROUS SUNKEN WRECK, PA

AWOIS item 7906 (unnamed 28-foot pleasure craft reported to have burned to the water line and sunk in the vicinity of 27°45'~~N~~, 19.10"N 96°~~50'W~~, 53'24.94"W position approximate), required 200% SSS coverage over a 3000-meter search radius to disprove the item. Approximately 75% of the search area is contained on survey H-10399. The remainder extends onto contemporary WHITING surveys H-10402 and H-10401. 200% SSS coverage was provided within the search radius, and no significant contacts were found in any of the surveys. WHITING recomends deleting AWOIS item 7906 from the chart. CONCUR

A CHARTED DANGEROUS SUNKEN WRECK, PD

AWOIS item 4164 (SCORPION, a 25-foot pleasure craft, capsized at latitude 27°47'30"N, longitude 96°55'00"W, PD) originated from a Coast Guard LNM. 1.19"N 94 The AWOIS listing required 200% SSS coverage over a 3000-meter search radius to disprove the item. Approximately two-thirds of the search area for AWOIS item 4164 was within the survey area for H-10399. The rest of the search radius extended onto contemporary WHITING survey H-10392. The required 200% SSS coverage was provided within the search radius except in the vicinity of latitude 27°47'22"N longitude 96°53'48"W where WHITING had to break line to avoid an anchored vessel and in the vicinity of 27°48'58"N longitude 96°54'17"W latitude where SSS coverage was suspect. Most of the area within these holidays still has 200% coverage resulting from splits of the main-scheme lines. No contacts were found in the remaining area, where only 100% coverage was obtained (three areas approximatly 130 meters X 130 meters each). No significant contacts were found within the search radius on surveys H-10399 or H-10392. WHITING recomends deleting AWOIS item 4164 from the chart. CONCUR.

Twenty-two SSS contacts were identified and none were found significant. There were no additional dangers to navigation found in the survey area. CONCUR. SEE ALSO SECTION 7.b. OF THE EVALUATION REPORT

O. ADEQUACY OF SURVEY SEE ALSO SECTION 9. OF THE EVALUATION REPORT

This survey is a complete basic hydrographic survey, adequate to supersede prior surveys of the area. No part of this survey is considered to be substandard.

P. AIDS TO NAVIGATION SEE ALSO SECTION 7. C. OF THE EVALUATION REPORT

No fixed or floating aids, platforms, or buoys existed within the survey limits of H-10399.

Q. STATISTICS

Number of Positions	3078
Nautical Miles of Main-scheme Sounding Lines	166
Nautical Miles of Cross-lines	20
Square Nautical Miles Surveyed	15
Days of Production	17
Detached Positions	16
Bottom Samples	16
Tide Stations Installed	0
Current Stations	0
Number of CTD Casts	8
Magnetic Stations	0

R. MISCELLANEOUS

Bottom samples from H-10399 were collected every 10 cm at the scale of the survey (20 cm at the scale of the plots submitted) in accordance with the project instructions. Samples were submitted to the Smithsonian Institution, as directed by the project instructions. Documentation is included in Separate II.

Side scan sonar operations were limited to a speed of 6 knots or slower. WHITING's main engines were not designed to run for prolonged periods under such a light load. It results in excessive engine wear and a heavy build up of oil in the exhaust piping, which increases the chance of stack fire. For this reason, WHITING suspended side scan operations twice daily to run the engines under full load. This time was used to run crosslines, repair equipment, or transit between survey areas.

S. RECOMMENDATIONS

The current chart layout for Aransas Pass is poorly organized. Our survey operations required the use of four charts. There isn't a single large-scale chart that covers the whole area, and

the price deters mariners from buying numerous charts. WHITING suggests the creation of one 1:80,000-scale chart, with Aransas Pass centered on the left side, for use by fishermen and merchant vessels approaching Corpus Christi. Concur

Considerable field time and logistics are involved in setting up and operating an ARGO and Falcon network. Time is spent recovering stations, establishing new control, setting up and dismantling towers, conducting calibrations, and keeping the systems operating. There is no question that use of a satellite positioning system is the most productive, cost effective solution. Concur

Numerous problems and suggested improvements were noted for the HDAPS system. A separate memorandum on this subject will be submitted to the Hydrographic Surveys Branch.

T. REFERRAL TO OTHER REPORTS

The following reports have been or will be submitted as part of OPR-K220-WH-91:

Coast Pilot Report will be forwarded
Horizontal Control Report, forwarded to N/CG244 on December 20, 1991
Electronic Control Report, forwarded to N/CG244 on December 20, 1991
Chart Agent Visit Report, forwarded to N/CG33 on November 17, 1991
Chart User and Evaluation Report, forwarded to N/CG243 on December 4, 1991

Submitted By:

David E. Bixby
Lieutenant junior grade, NOAA

Reviewed By:

Nancy L. Crews
Lieutenant, NOAA
Operations Officer

Approved By:

Richard P. Floyd
Commander, NOAA
Commanding Officer

Horizontal Control Station Data

Station No.	Latitude	Longitude	Antenna Elev. (m)	Carto Code	Station Name	Year Established	Seaward of HWL?	Station Source	Quad
201	28/07/31.118	096/58/52.429	N/A	250	Goose	1987	No	Published	N280954
202	27/47/32.060	097/05/13.451	N/A	250	Sharkys	1991	No	Published	N270971*
203	28/35/55.276	095/58/34.815	N/A	250	Mata	1991	No	Published	N270971
204	27/47/33.070	097/05/14.862	7	250	Knoll	1934	No	Published	N280963
205	27/49/47.566	097/03/49.371	38	250	Port Aransas Tank Ecc.		No	Field Position	N270971
								(3rd Order Class 1)	
206	27/45/06.889	097/07/28.929	43	250	Port Aransas Mustang		No	Field Position	N270971
					Tank Ecc.			(3rd Order Class 1)	

*QSN is 1040; Other QSN's unavailable

HDAPS Survey version: 6.05 PRE-SURVEY: CONTROL STATION TABLE 5 Dec 1991 18:47:54

Station No ? _

No	Type	Lat	Lon	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
201	A	028:07:31.118	096:58:52.429	0	250	1646.7	299670	2	07/23/91	GOOSE 1987
202	A	027:47:32.060	097:05:13.451	0	250	1646.7	299670	1	07/23/91	SHARKEYS 1991
203	A	028:35:55.276	095:58:34.815	0	250	1646.7	299670	3	07/23/91	MATA 1991
204	F	027:47:33.070	097:05:14.862	7	250	0.0	0	7	07/23/91	KNOLL 1934
205	F	027:49:47.566	097:03:49.371	38	250	0.0	0	A	07/23/91	PORT ARANSAS TANK ECC
206	F	027:45:06.889	097:07:28.929	43	250	0.0	0	C	07/23/91	PORT ARANSAS MUSTANG TANK ECC
207	V	027:45:06.745	097:07:29.159	43	250	0.0	0		08/23/91	PORT ARANSAS MUSTANG TANK
208	V	027:49:47.749	097:03:49.421	38	250	0.0	0		08/23/91	PORT ARANSAS TANK
209	V	027:51:49.898	097:03:22.015	20	250	0.0	0		08/23/91	ARANSAS PASS LIGHTHOUSE
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #10
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #11
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #12
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #13
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #14
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #15
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #16
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #17
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #18
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	STA #19
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	
		000:00:00.000	000:00:00.000	0	0	0.0	0		03/01/91	

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Coast and Geodetic Survey
Rockville, Maryland 20852

October 17, 1991

TO: CDR Richard P. Floyd, NOAA
Commanding Officer, NOAA Ship WHITING

FROM: LT Guy T. Noll, NOAA
HDAPS Office

SUBJECT: **Field testing** of new HDAPS software

A disk containing the newest version of the POINT program (v. 2.03) is enclosed. This version contains enhancements which have not yet been field-tested. WHITING has been chosen as the field test unit for this software because of your use of ARGO and ARGO/Falcon hybrid positioning systems; this version incorporates changes, outlined below, which allow single-point recomputation of hybrid positioning data. Please notify the HDAPS office if you have any questions, cannot install the software or are experiencing any problems with this new version.

Version 2.03 of POINT implements the following features:

1) ARGO antenna offset and layback are used;
2) ARGO and Falcon LOP's are 'weighted' as in HP-DAS;
3) New LOP intersections are shown, and distances from new position to intersections are given;
4) Data may be accessed by fix number or DSN (data record #);
5) Printing on-screen graphics is now possible; and
6) User may view both track plot and control stations on-screen.

This program should be loaded onto your HDAPS systems using the HDAPS Utilities function, Load New HDAPS Software.

APPROVAL SHEET
HYDROGRAPHIC AND
SIDE SCAN SONAR SURVEY
OPR-K220-WH-91
H-10399

This combined hydrographic and side scan sonar survey was conducted in accordance with the project instructions for OPR-K220-WH-91, the Hydrographic Manual (through change #3), AMC OPORDERS, Hydrographic Survey Guidelines (through #69), the Side Scan Sonar Manual, and the Field Procedures Manual for Hydrographic Surveying. The survey and reports were completed under daily supervision. All boat sheets and final transmitted sheets were reviewed in their entirety, and all supporting records were checked as well.

This survey is complete for the intended purposes of identifying items requiring further investigation by a different field unit.

Brian Greenawalt

for Richard P. Floyd, Cdr., NOAA
Commanding Officer
NOAA Ship WHITING

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Rockville, Maryland 20852

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 6, 1992

MARINE CENTER: Atlantic

OPR: K220-WH

HYDROGRAPHIC SHEET: H-10399

LOCALITY: Gulf of Mexico, Southwest Texas Coast

TIME PERIOD: August 11 - November 16, 1991

TIDE STATION USED: 877-5870 Corpus Christi (Bob Hall Pier), Texas
Lat. 27° 34.8'N Lon. 97° 13.0'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 20.58 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.6 ft.

REMARKS: RECOMMENDED ZONING

Times and heights are direct on Corpus Christi (Bob Hall Pier), Texas (877-5870).

Note: Times are tabulated in Central Standard Time.

for Richard K. Cummings
CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10399

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	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	
MEXICO, GULF OF (title)										1
PORT ARANSAS (title)										2
TEXAS (title)										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
				Approved:						15
				Charles E. Harrington						16
				Chief Geographer - 1/26/93						17
										18
				MAR 10 1993						19
										20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

08/18/93

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10399

NUMBER OF CONTROL STATIONS	6
NUMBER OF POSITIONS	2861
NUMBER OF SOUNDINGS	19940

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	83	05/22/92
VERIFICATION OF FIELD DATA	113	06/30/93
ELECTRONIC DATA PROCESSING	68	
QUALITY CONTROL CHECKS	48	
EVALUATION AND ANALYSIS	41	07/14/93
FINAL INSPECTION	21	08/04/93
TOTAL TIME	374	

ATLANTIC HYROGRAPHIC SECTION APPROVAL 08/09/93

COAST AND GEODETIC SURVEY
ATLANTIC HYDROGRAPHIC SECTION
EVALUATION REPORT

SURVEY NO.: H-10399 **FIELD NO.**: WH-10-2-91

Texas, Gulf Of Mexico, 9 NM ESE of Port Aransas

SURVEYED: 12 August through 16 November 1991

SCALE: 1:20,000 **PROJECT NO.**: OPR-K220-WH-91

SOUNDINGS: RAYTHEON DSF-6000N Fathometer, EG&G Model 272-T Side Scan Sonar

CONTROL: CUBIC WESTERN DM-54 ARGO (Range/Range)

Chief of Party.....R. P. Floyd

Surveyed by.....C. B. Greenawalt
.....N. L. Crews
.....R. A. Fletcher
.....D. E. Bixby
.....K. A. McNitt
.....K. G. Taggart
.....E. W. Berkowitz
.....J. A. Seitz
.....F. R. Cruz
.....E. A. Myers
.....R. L. Harris

Automated Plot by.....XYNETICS 1201 Plotter (AHS)

1. INTRODUCTION

a. This is a combined basic hydrographic/side scan sonar survey. Side scan sonar was operated simultaneously with the fathometer during survey operations.

b. During office processing a problem with the hydrographic position control for this project became apparent. When two adjacent lines of hydrography provided two positions for the same contact, the positions differed by 30 to 60 meters. Contacts that were noted on one line would not be seen on adjacent lines at the anticipated location. The following situations associated with the ARGO positioning system are probable causes for the contact position irregularities.

1) The site for station MATA was on the mainland. Signal attenuation may have been created by the signal from the station first passing over a body of water, the Intracoastal Waterway, then over a barrier island, and finally back over the water. This situation may have caused resultant

range errors.

2) The ground plane for station GOOSE flooded during high tide. This situation may have caused undetectable phase shifts during survey operations.

Atlantic Hydrographic Section personnel thoroughly examined the field data in order to determine the origin and magnitude of the positional error. The discrepancies exist regardless of the factors used in the algorithm used for position computations. Examination of the residuals from multiple line of position (LOP) fixes yielded no evidence of positional problems; however, there were some areas where the geometry for fix computation was poor. A positioning problem exists; however, the exact cause(s) and magnitude could not be determined.

In order to determine the applicability of this survey to the nautical chart the following specifications were considered:

- Section 1.2.3. of the HYDROGRAPHIC MANUAL states, "The survey scale is generally twice as large as that of the largest scale chart published or proposed for the area."

- PART A., Section I.1. of the International Hydrographic Bureau (1968) Special Publication 44 states, "The scale adopted should never be smaller than that of the intended chart."

- Section 1.B.1.5 of the International Hydrographic Organization (IHO) Special Publication No. 44, 3rd Edition, 1987, states, "The position of soundings, dangers, and all other significant features should be determined from field observations, relative to shore control, or directly using satellite positioning such that there is a 95 percent probability that the true position, lies within a circle of radius 1.5 mm at the scale of the survey about the determined position."

Considering the specifications quoted from IHO Special Publication No. 44, the maximum allowable error for a 1:20,000 scale survey is 30 meters. Since the maximum positional discrepancy for side scan sonar contacts located by the field unit and shown on the present survey is approximately 50 meters, it is concluded that this survey does not meet the criteria for a 1:20,000 scale survey. Based on this conclusion it is felt that the survey data from this survey is suitable only for charts at scales of 1:40,000 or smaller.

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

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections H., I., and T. of the Descriptive Report.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the survey datum and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27 move the projection lines 1.102 seconds (33.928 meters or 1.70 mm at the scale of the survey) north in latitude and 0.945 seconds (25.876 meters or 1.29 mm at the scale of the survey) west in longitude.

b. There is no shoreline within the limits of the present survey.

3. HYDROGRAPHY

a. Soundings at crossings are in agreement.

b. The standard depth curves are drawn in their entirety. A dashed curve has been added to delineate bottom relief.

c. The development of the bottom configuration and determination of least depths are considered adequate.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports conform to the requirements of the HYDROGRAPHIC MANUAL, FIELD PROCEDURES MANUAL, and SIDE SCAN SONAR MANUAL.

5. JUNCTIONS

H-10392 (1991)	1:20,000	to the west
H-10400 (1991)	1:20,000	to the northeast
H-10401 (1991)	1:20,000	to the southeast
H-10402 (1991)	1:20,000	to the south

Adequate junctions were effected between the present survey and the surveys listed above. Present survey depths are in harmony with the charted hydrography to the north.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-6402	(1938)	1:40,000
H-10205	(1985)	1:20,000
D-107	(1988-89)	1:40,000

The prior surveys listed above cover the present survey in its entirety.

Prior survey H-6402 (1938) soundings show a general trend of being 1 foot (0^3 m) shoaler than present survey soundings. Scattered prior soundings are 2 feet (0^6 m) shoaler than present soundings.

Prior survey H-10205 (1985) is common to a small area of the northwest part of the present survey. The prior hydrography is in good agreement with the present hydrography with scattered soundings 1 foot (0^3 m) shoaler than present soundings.

Prior survey D-107 (1988-89) soundings show a general trend of being 2 feet (0^6 m) deeper than present survey soundings.

The present survey is adequate to supersede the prior surveys within the common area.

7. COMPARISON WITH CHART 11300 (29th Edition, 29 Sept. 1990)
11307 (31st Edition, 16 March 1991)
11313 (19th Edition, 30 June 1990)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys and requires no further consideration. An adequate chart comparison is discussed in section N., page 12, of the Descriptive Report.

The present survey is adequate to supersede currently charted depths on the 1:80,000 scale charts. See also section 1.b. of this report.

b. Dangers to Navigation

There were no dangers to navigation submitted by the field unit on this survey. No dangers were noted during office processing.

c. Aid to Navigation

There are no aids to navigation within the limits of the present survey.

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions except as noted elsewhere in this report.

9. ADDITIONAL FIELD WORK

This is an adequate hydrographic/side scan sonar survey. No additional work is required for this survey.

Reginald L Keene
Cartographic Technician
Verification of Field Data

for Norris A. Wike
Cartographer
Evaluation and Analysis

Leroy G. Cram
Senior Cartographic Technician
Verification Check

APPROVAL SHEET
H-10399

Initial Approvals:

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 records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Richard H. Whitfield Date: August 9, 1993
Richard H. Whitfield
Cartographer, Atlantic Hydrographic Section

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Nicholas E. Perugini Date: 8/9/93
Nicholas E. Perugini, LCDR, NOAA
Chief, Atlantic Hydrographic Section

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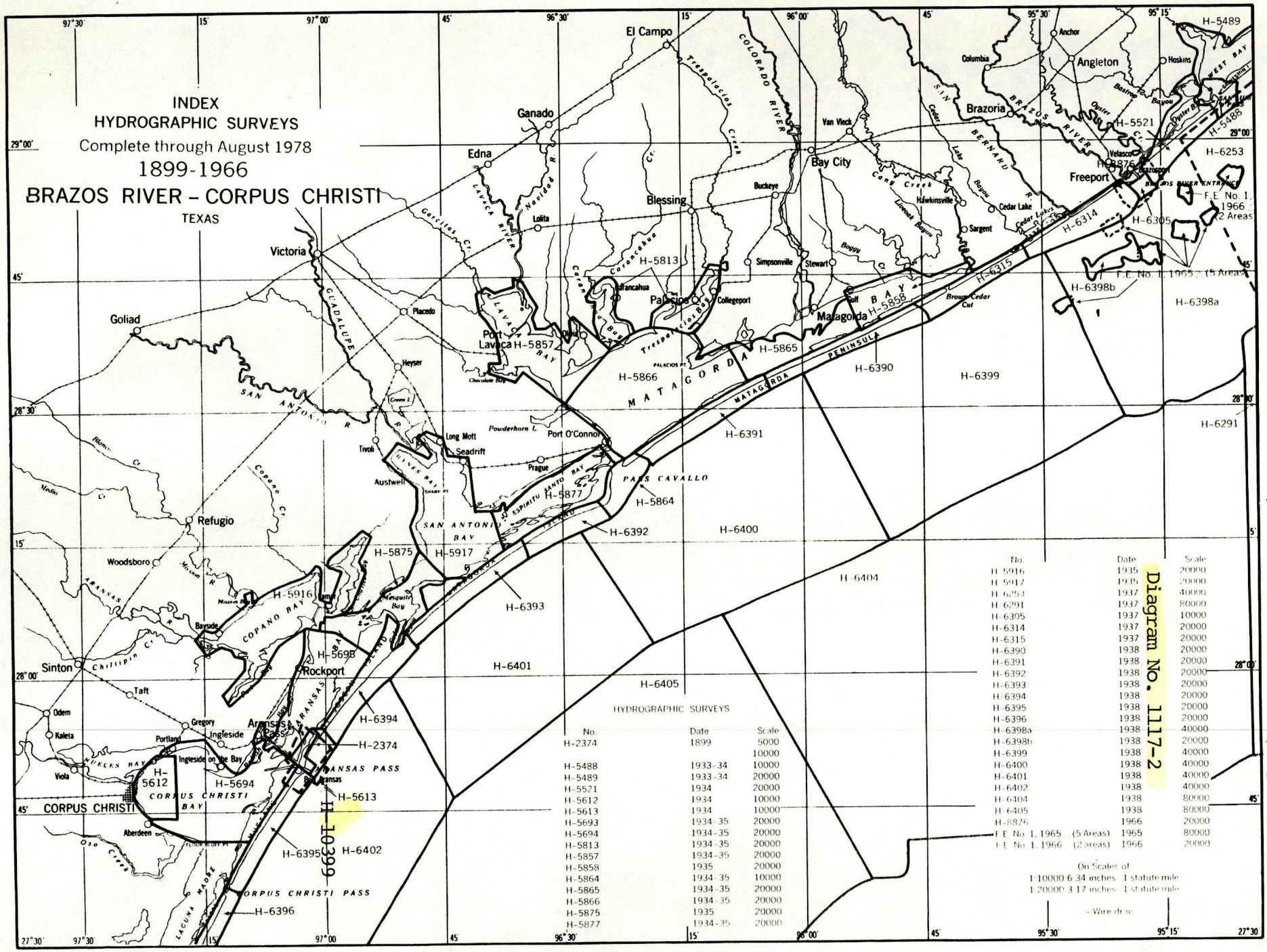
Final Approval:

Approved: J. Austin Yeager Date: 5/11/94
J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey



HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-2374	1899	5000
		10000
H-5488	1933-34	10000
H-5489	1933-34	20000
H-5521	1934	20000
H-5612	1934	10000
H-5613	1934	10000
H-5693	1934-35	20000
H-5694	1934-35	20000
H-5813	1934-35	20000
H-5857	1934-35	20000
H-5858	1935	20000
H-5864	1934-35	10000
H-5865	1934-35	20000
H-5866	1934-35	20000
H-5875	1935	20000
H-5877	1934-35	20000

No.	Date	Scale
H-5916	1935	20000
H-5917	1935	20000
H-6253	1937	40000
H-6291	1937	80000
H-6305	1937	10000
H-6314	1937	20000
H-6315	1937	20000
H-6390	1938	20000
H-6391	1938	20000
H-6392	1938	20000
H-6393	1938	20000
H-6394	1938	20000
H-6395	1938	20000
H-6396	1938	20000
H-6398a	1938	40000
H-6398b	1938	20000
H-6399	1938	40000
H-6400	1938	40000
H-6401	1938	40000
H-6402	1938	40000
H-6404	1938	80000
H-6405	1938	80000
H-8876	1966	20000
F.E. No. 1, 1965 (5 Areas)	1965	80000
F.E. No. 1, 1966 (2 areas)	1966	20000

On Scales of
1:10000 6.34 inches 1 statute mile
1:20000 3.17 inches 1 statute mile

- Wire drag

Diagram No. 1117-2

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

Hydrographic Index No. 90 C

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10399

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
11307	10/7/93	L. Ackerman	Full ~~Part~~ Before ~~After~~ Marine Center Approval Signed Via
			Drawing No. 42, APPD IN Full
11313	10/7/93	L. Ackerman	Full ~~Part~~ Before ~~After~~ Marine Center Approval Signed Via
			Drawing No. 40, APPD IN Full
411	2/1/94	Jenny Schumacher	Full ~~Part~~ Before ~~After~~ Marine Center Approval Signed Via
			Drawing No. 65, Exam N.C. - 3E-AREA
11300	3/10/94	~~Jeff~~ Taylor	Full ~~Part~~ Before ~~After~~ Marine Center Approval Signed Via
			Drawing No. 46 Appd in Full.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.