

10221

Diagram No. 1251-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey ... Hydrographic
Field No. R/H-10-1-86
Registry No. H-10221

LOCALITY

State Florida
General Locality .. Straits of Florida
Sublocality Looe Key

1986

CHIEF OF PARTY
LCDR. R. K. Norris

LIBRARY & ARCHIVES

DATE May 13, 1987

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

10221

ACRS 9 Area 3

CHT
11445A }
11442 } CATALOG
11434 } SIGN OFF
11450V } IN BADE
11460V }
11420V }

HYDROGRAPHIC TITLE SHEET

H-10221

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.

R/H 10-01-86

State Florida

General locality Atlantic Ocean - East Coast straits of Florida.

Locality Looe Key

Scale 1:10000

Date of survey May 14, 1986 - June 10, 1986

May 14, 1986 - June 14, 1986

Instructions dated March 6, 1986

Project No. S-H661-Ru/He-86

Vessel NOAA Ships Rude (9040) Heck (9041)

Chief of party LCDR. Robert K. Norris

Surveyed by LCDR. R.K. Norris, LT. J.C. Talbott, Lt(jg) A.E. Francis, Lt(jg) J.E. Lowell

Soundings taken by echo sounder, hand lead, pole Raytheon DSF-6000N, hand lead, Raytheon DE-719

Graphic record scaled by A.E.F., J.E.L., W.L.M.K.F.S.

Graphic record checked by A.E.F., J.E.L.W.L.M.K.F.S.

Houston Instruments

Protracted by _____

Automated plot by Plotter (FIELD)

XYNETICS (24) Plotter (AMC)

Verification by Hydrographic Surveys Branch - AMC

Soundings in ~~XXXXXX~~ feet at ~~MLLW~~ ~~XXXXXX~~ corrected for predicted tides

REMARKS: all times recorded in UTC

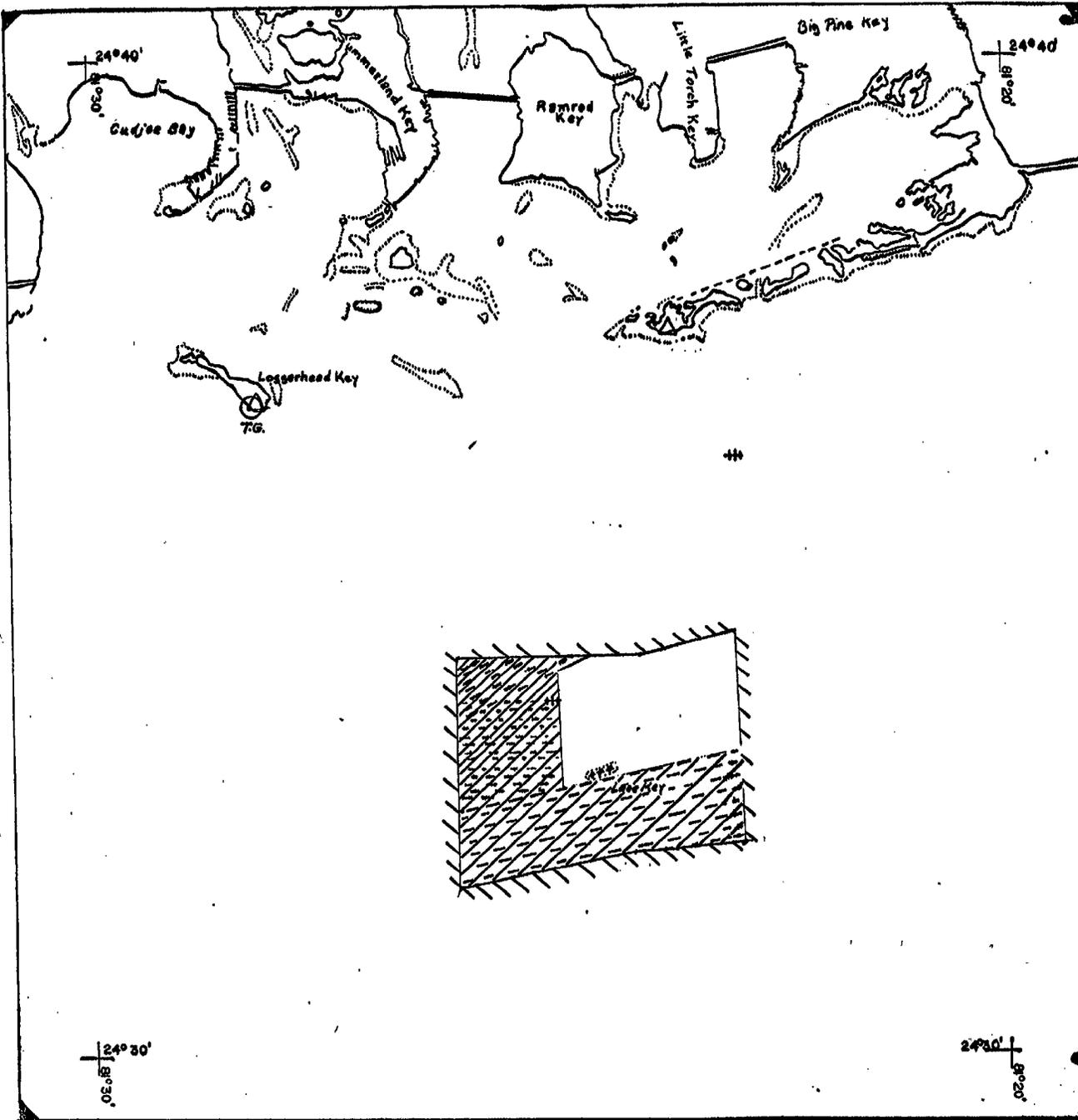
Notes in the Descriptive Report in red were made during office processing.

STANDARDS CK'D 5-16-87

Clay

AWOIS/SURF MSM 5/26/87

LC 2-5-87



PROGRESS SKETCH

OPR-8-H-661.RU/HE.66

LOOE KEY, FLORIDA

MAY - 1986

NOAA SHIPS RUDE & HECK

ROBERT K. NORRIS, LCDR, NOAA
COMMANDING

from chart 11442
scale 1:80,000

LEGEND

HYDRO.
 SIDE SCAN

MAY 01N

6.5	7.2	SQ NM SOUNDING
180	7.2	LNM MISC. DISTANCE
48.6	7.2	LNM DISTANCE TO AND FROM
80.8	7.2	LNM SOUNDING LINE
---		BOTTOM SAMPLES (GRAB)
4		CONTROL STATIONS
82.6	1.1	LNM SIDE SCAN
4.2	4.0	SQ NM SIDE SCAN
2		MARTEK CAST
1		TIDE GAGE

TABLE OF CONTENTS

A)	PROJECT AUTHORITY	1
B)	AREA SURVEYED	1
C)	SOUNDING VESSEL	1
D)	SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS	2
E)	HYDROGRAPHIC SHEETS	4
F)	CONTROL STATIONS	5
G)	HYDROGRAPHIC POSITION CONTROL	5
H)	SHORELINE	8
I)	CROSSLINES	8
J)	JUNCTIONS	8
K)	COMPARISON WITH THE SURVEY	9
L)	COMPARISON WITH THE CHART	10
M)	ADEQUACY OF SURVEY	11
N)	AIDS TO NAVIGATION	11
O)	STATISTICS	13
P)	MISCELLANEOUS	13
Q)	RECOMENDATIONS	14
R)	AUTOMATED DATA PROCESSING	14
S)	REFERRAL TO REPORTS	16
I)	HYDROGRAPHIC SHEET PARAMETERS	17 *
II)	FIELD TIDE NOTE	23 *
III)	GEOGRAPHIC NAMES LIST (FIELD)	26 *
IV)	SOUNDING CORRECTION ABSTRACT	28 *
V)	ABSTRACTS OF CORR. TO ELECTRONIC POSITION CONTROL	34 *
VI)	LIST OF STATIONS	40
VII)	ABSTRACT OF POSITIONS	42 *
VIII)	BOTTOM SAMPLES	53 *
IX)	NON-FLOATING AIDS AND LANDMARKS FOR CHARTING	55
X)	REQUEST FOR APPROVED TIDES	57 *
XI)	DANGERS TO NAVIGATION	60
XII)	SUPPLEMENTAL INFORMATION	61
XIII)	APPROVAL SHEET	75

* Removed from original Descriptive Report and
filed with original survey records

S-H661-RU/HE-86
FIELD SHEET # R/H 10-01-86
REGISTRY NO. H-10221
SCALE 1:10000
NOAA SHIPS RUDE and HECK
LCDR ROBERT K NORRIS, CMDG

A) PROJECT AUTHORITY

This project was conducted in accordance with Hydrographic Project Instructions S-H661-RU/HE-86, Looe Key, Florida, dated April 8, 1986. There was one change to the original project instructions dated May 12, 1986. This project was conducted on request of the Office of Ocean and Coastal Resource Management, Sanctuary Programs Division.

B) AREA SURVEYED

The area surveyed during this project was located within the Looe Key National Marine Sanctuary and some adjacent waters as shown on the attached chartlet. Looe Key is located in the lower Florida Keys, just offshore of Big Pine Key. Hydrography and side scan sonar (SSS) coverage was limited to that portion of the project area not mapped by photogrammetric surveys. The Change to the Project Instructions altered this requirement to junction hydrography and photobathymetry on the west side of the sheet at longitude 81° 25' 00" W. Basic hydrographic coverage was obtained in the project area from longitude 81° 25' 00" W to the western sheet limit. The junction with the photogrammetric surveys determined the remaining interior project limits.

The inclusive dates of survey operations were May ¹⁴12, 1986, day of year (DOY) ~~132~~¹³⁴ to June ¹⁴15, 1986, day of year (DOY) ~~166~~¹⁶¹.

C) SOUNDING VESSELS

Three sounding vessels were used to collect data during this survey. The vessel's numbers and the days of the year (DOY) they were conducting operations follow:

<u>EDP #</u>	<u>VESSEL</u>	<u>HULL #</u>	<u>DOY</u>
9040	NOAA ship RUDE	S590	135-161 (Side scan sonar only)
9041 9040	NOAA ship HECK	S591	134-161
9141	HECK Launch	HE-3	156, 161

The NOAA Ship HECK's Launch is a 21 foot, fiberglass hull, wire drag tester boat constructed by Sisu Marine. The launch was used only to position some of the inner core marker buoys that the ships could not reach due to draft constraints.

The NOAA ships RUDE & HECK are sister ships designed for wire drag surveys. This project consisted both of side scan sonar (SSS) coverage, and basic hydrography. The NOAA Ship RUDE did exclusively SSS survey operations, while the NOAA Ship HECK conducted basic hydrographic operations. There were no unusual configuration problems encountered.

D) SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO-SOUNDING

Both ships were equipped with Raytheon DSF 6000 N echo sounders. The NOAA Ship RUDE was equipped with an EG&G Side Scan Sonar system consisting of a model 260 image correcting side scan recorder, and a dual frequency towfish and towcable. The serial numbers and dates of equipment use are as follows:

9040	NOAA ship RUDE		
	Raytheon DSF 6000 N	S/N A116 N	entire project
	EG&G recorder	S/N 10884	entire project
	Towfish		entire project
9140	NOAA ship HECK		
	Raytheon DSF 6000 N	S/N B051 N	entire project
9141	HE-3		
	Raytheon DE-719C	10273	entire project

Soundings were taken in depths from ¹⁴ ~~30~~ to ¹⁸¹ ~~200~~ feet.

NOAA Ship HECK

Velocity correctors were determined by means of Martek casts. Deep and shallow casts were taken on May 13, 1986 (DOY 133), and June 05, 1986 (DOY 156). The Martek unit S/N 177, model 167, was calibrated on February 27, 1986 (DOY 058) (see appendix IV). Velocity correctors were applied to all soundings on the rough and smooth hydrographic plots via a velocity tape.

The following is a listing of the Martek casts performed:

<u>DOY</u>	<u>POSITION</u>	<u>MAXIMUM DEPTH</u>
133	LAT 024° 32.4' N LONG 081° 23.5' W	35 METERS
133	LAT 024° 33.1' N LONG 081° 25.5' W	5 METERS
156	LAT 024° 31.0' N LONG 081° 24.0' W	40 METERS
156	LAT 024° 31.0' N LONG 081° 24.8' W	5 METERS

At the beginning and ending of each day, or whenever possible, leadline comparisons were performed by the NOAA ship HECK. Leadline readings were taken on the port and starboard sides of the vessel abeam the DSF-6000N transducers. The mean of these soundings was then compared against the readings of the DSF-6000N. These comparisons were performed to determine the instrument corrector for the HECK's DSF-6000N echo sounder. A mean corrector of 6.8 feet was determined for this project and was applied to the smooth and rough hydrographic plots via a corrector tape.

Settlement and Squat was determined for the NOAA ship HECK and HE-3 on June 01, 1986 (DOY 152) in Key West harbor, Key West, Florida. Each vessel was run at various speeds past a level party located on the southern most pier of the Naval Air Station, Truman Annex. The settlement and squat correctors were placed on a TC/TI tape but were not applied to the rough or smooth plots of the hydrographic data.

Predicted tides were applied via a tide tape to both the rough and smooth plots of the hydrographic data (see appendix II).

NOAA Ship RUDE

It is presumed by the hydrographer that the sounding data collected by the NOAA Ship RUDE will not be used for charting. Hydrographic data was not digitized during on-line data acquisition or off-line processing. The fathograms were scanned for peaks that might have missed by the NOAA ship HECK but none were detected.

Throughout the project there were equipment problems with the EG&G SSS, including auto speed correction, auto gain, bottom tracking, faulty cable wiring and effective scanning width. None of the above problems, with the exception of the faulty cable wiring, were corrected in the field. EG&G was sent examples of the data and The Atlantic Marine Center was immediately notified of all problems.

Solutions to these problems were never determined, and at no time did the EG&G SSS work to its full capacity. However, the quality of the SSS data was considered adequate to complete this project.

To compensate for problems with the SSS, line spacing was adjusted to allow the range scale of 75 meters to be used. The only data considered of adequate quality was located inside the 50 meter range marks. On the coverage abstracts the effective scanning range has been reduced to 66% of the normal effective scanning range for range setting vs. towfish height (appendix VII). Target abstracts and target lists were not included for the SSS bottom texture work due to the nature of the project. No significant targets were located on the SSS search for AWOIS 2547.

Smooth tides were requested from Chief, Tides and Water Levels Branch (N/OMS12) in a letter dated July 22, 1986 (see appendix II).

E) HYDROGRAPHIC SHEETS (FIELD)

All field sheets were made aboard the NOAA ship RUDE using the DEC PDP 11/34 computer. One of the final products to be developed by this survey was a side scan sonar mosaic. Due to the inability of the existing computer programs onboard the NOAA Ship RUDE, an X,Y grid was developed onboard the NOAA Ship PEIRCE, using the DEC PDP 8e computer. The X,Y grid allowed the ships to use the Motorola Mini Ranger navigation system to run straight line tracks.

The field sheets were originally constructed with a 005⁰ skew. During the project, it was found that the off-line processing programs would not accept any skewed values. All plots except the boat sheets have the skew eliminated.

NOAA Ship RUDE

Trackline data is presented on three sheets, one for the SSS trackline used with the bottom texture overlay, and two for the SSS coverage obtained on AWOIS item 2546. Two sheets were used on the AWOIS item to improve legibility, and facilitate the coverage abstract. The last sheet is the bottom texture overlay developed using the SSS data.

NOAA Ship HECK

The DEC PDP 11/34 aboard the NOAA Ship RUDE does not have the software to produce a sounding plot for a hydrographic survey. For submission requirements to AMC, the data was logged and plotted onboard the NOAA ship PEIRCE using the DEC PDP 8e. The rough plots and final hydrographic field sheets were generated there. Each plot is divided into an overlay consisting of developments and a mainscheme sounding plot.

All field records and tapes will be forwarded to the Atlantic Marine Center for verification and smooth plotting.

F) CONTROL STATIONS

This survey was conducted using existing control throughout the project area. No new horizontal control stations were established by ships personnel. The stations used and their positions are as follows:

<u>STATION NUMBER</u>	<u>STATION NAME</u>
001	Newfound Az (1986) Lat: $24^{\circ} 37' 16.52''$ N Long: $081^{\circ} 23' 32.70''$ W <i>69</i>
002	Loggerhead (1920) Lat: $24^{\circ} 36' 31.25''$ N Long: $081^{\circ} 28' 08.49''$ W <i>48</i>
003	American Shoal Lighthouse (1909) Lat: $24^{\circ} 31' 28.89''$ N Long: $081^{\circ} 31' 10.58''$ W
004	Looe Key Light (1978) (see note 1) Lat: $24^{\circ} 32' 46.37''$ N Long: $081^{\circ} 24' 10.18''$ W
006	Bahia Honda 3 (1935) Lat: $24^{\circ} 40' 02.96''$ N Long: $081^{\circ} 15' 01.52''$ W <i>(Not used)</i>
007	Newfound (1920) Lat: $24^{\circ} 37' 19.17''$ N Long: $081^{\circ} 23' 25.88''$ W <i>(Not used)</i>

(1) not a third order position.

Except as noted, all stations are of Third-order, Class I control accuracy, or better. The station positions are based upon the North American Datum of 1927.

G) HYDROGRAPHIC POSITION CONTROL *See also section 2.2. of the Evaluation Report*

Hydrographic position control for the entire survey was a range-range system using the Motorola Mini-Ranger Falcon 484. Shore

stations were set up on Newfound AZ (001), Loggerhead (002), American Shoal LH (003) and Bahia Honda 3 (006). *Bahia Honda not used.*

For off line processing, stations Newfound AZ and Loggerhead were used. These stations provided the best angle of intersection and signal strength in the project area. American Shoal LH was used when the ships were located in a null zone from one station or the other. For onboard plotting, when a flyer was noted, a DR position was used and noted in the sounding volume. This method was used due to the infrequency of the low signal strengths. The third range was noted in the sounding volume, so any positional inaccuracies can be eliminated. The current computer programming aboard the NOAA ship RUDE does not allow this option. Due to the nature of the survey and the type of lines run, the Hydrographer In Charge felt that the DR positions were adequate for onboard use.

Critical calibrations were performed by setting up a HP-3808A total station on Newfound AZ, initializing on American Shoal LH and shooting a range and angle to the ships. This information was processed in the HP 9815A computer using the Range/Azimuth calibration program. The critical check was accomplished at the beginning and end of each weeks data collection. A Least Squares noncritical check was conducted twice daily, at the start and end of data collection.

Due to the inexperience of ships personnel with the Mini-Ranger system, critical calibrations were taken with the baseline calibration information preset in the units. This caused the critical system checks to not result in the actual system correctors, but correctors with the baseline information already applied. The mean of the correctors is the delta value that would have been developed using the method described in the Falcon 484 Calibration Procedures and Standard Forms, dated December 16, 1985.

A listing of RPU and Master R/T units used by the vessels during this survey are as follows:

<u>VESNO</u>	<u>RPU</u>	<u>MASTER R/T</u>	<u>DATES IN USE</u>
9040	E0149	F3410	entire project
9140	E0140	F3409	entire project
9020	F0257	E2965	DOY 156, DOY 161

A listing of R/T units installed on each electronic control station are as follows:

<u>STATION</u>	<u>R/T UNIT</u>	<u>CODE</u>
003	F3237	CODE 1
002	F3241	CODE 2
001	F3222	CODE 4
006	F3242	CODE 5 (<i>Not used</i>)

Two baseline calibrations were performed during this survey. All baseline calibrations took place in Key West, between the south east corner of the Truman Annex Basin to the southern end of Pier B. A baseline distance of 772.1 meters was established using a HP-3808A (S/N 60047). The following is a list of dates and serial numbers of RPU units, master R/T and remote R/T units calibrated.

<u>RPU</u>	<u>MASTER R/T</u>	<u>REMOTE R/T</u>	<u>CODES</u>
May 12, 1986			
E0149	F3410	F3237	01
		F3241	02
		F3222	04
		F3242	05
		F3244	06
E0140	F3409	same as above	
F0257	E2965	same as above	
June 15, 1986			
E0149	F3410	F3237	01
		F3241	02
		F3222	04
		F3242	05
		F3244	06
E0140	F3409	same as above	

On June 13, 1986 (DOY 164), RPU F0257 and R/T E2965 were exposed to saltwater and subsequently failed. Consequently, no ending baseline calibration was performed on these units. Daily critical calibrations verified that the units functioned properly throughout their use and it is recommended that all data collected utilizing this combination be accepted.

On June 15, 1986 (DOY 166), an ending project baseline calibration was performed on the remaining RPU's and R/T's over the previously mentioned baseline. A noticeable increase was observed in the ending baseline correctors but each was within acceptable limits.

Throughout the project, the RUDE & HECK conducted operations with the initial baseline correctors applied. When the final plot is compiled by AMC, the final correctors which will be applied should consist of the mean of the opening and ending baseline calibrations, minus the opening baseline correctors. The appropriate correctors

have already been applied via a corrector tape on the hydrographic portion of the survey. They only need be applied to the Side Scan Position plot portion of the survey.

On May 27, 1986 (DOY 147), the HP 3808A used for critical systems checks failed. The unit was repaired and returned to operation on June 6, 1986 (DOY 157). The critical systems check of June 6, verified that all systems were still functioning properly. Consequently, it is recommended that all data collected throughout this period be accepted. ✓

All daily system checks were within accuracy tolerances for a survey of this scale. It is requested that the baseline calibration data be applied to the raw position data during the final processing.

H) SHORELINE - See also section 2. b. of the Evaluation Report

As per the Project Instructions, no shoreline comparison inside the junctional area was accomplished. No significant discrepancies appeared to exist with the shoreline provided by the Photogrammetry Branch, TP-01063 Looe Key, scale 1:10000. Shoreline details were applied to the hydrographic final field sheet, but not to the final position plot for the SSS work or the final bottom texture sheet.

I) CROSSLINES - See also section 3.2. of the Evaluation Report

During this project, 7.8% of hydrographic crosslines were run.

In general, crosslines were in good agreement with mainscheme hydrography. Some apparent discrepancies were initially identified, but were later determined to be caused by comparisons made between mainscheme and crossline soundings over areas where bottom contours change rapidly. The slightest offset of the soundings resulted in radically different soundings plotted. No significant discrepancies were seen between mainscheme hydrography and crosslines. In all other areas of this survey, crosslines met those requirements put forth under section 4.6.1 of the hydrographic manual.

J) JUNCTIONS See also section 5. of the Evaluation Report.

This survey was to junction with photobathymetric survey TP-01063 / 1 shoreline (CM-8414), part 2 of 2 as supplied by the Photogrammetry Branch at AMC. A 1:10,000 scale photobathymetric overlay, provided by the Photogrammetry Branch was used to preform the junctional comparisons. 12 photobathymetric

In general, junctional comparisons between photobathymetry and hydrography were in good agreement. Three soundings along the junctional area were in disagreement with the hydrographic survey

data. In each case, (see list below) it was determined that the photobathymetry was in error. The hydrographer was unable to determine why such discrepancies exist between hydrography and photobathymetry in these areas. It is however the opinion of the hydrographer that hydrography should supersede photobathymetry in all areas where overlap occurs. *Do not concur. See also section 1.b. of the Evaluation Report.*

PHOTOBATHYMETRY DEPTH	SURVEYED DEPTH	PHOTOBATHYMETRIC POSITION
25	28-30 29	024° 33.46' N 081° 25.96' W <i>27.2"</i>
38	32-34 35	024° 32.67' N 081° 25.65' W <i>4φ.2"</i> <i>57.6"</i>
33	28-30 27-29	024° 32.80' N 081° 23.84' W <i>39.φ"</i> <i>48.φ"</i> <i>5φ.4</i>

K) COMPARISONS WITH PRIOR SURVEYS - *See also section 6. of the Evaluation Report.*

Comparisons were preformed with prior surveys:

REGISTRY NUMBER	SCALE	YEAR SURVEYED
H-669	1:20,000	1857
H-4168	1:40,000	1920 <i>(not common with present survey area)</i>
H-6323	1:20,000	1937-38
H-7933	1:80,000	1951-54

Comparisons performed between prior surveys H-669 and H-4168, were found to be in fair agreement. Several discrepancies were initially found but latter resolved to be caused by sounding offset in areas of rapidly changing contours and depths. In addition, some positional offset caused by sounding transfer between different scale surveys was apparent.

Comparisons preformed between prior surveys H-6323 and H-7933 were found to be in good agreement. Due to scale differences between the prior surveys and current field sheets, transferred soundings tended to be in the direct vicinity but not directly on the surveyed depths. This along with the rapidly changing contours and the numerous coral formations in the area were considered when the hydrographer conducted the comparisons.

Prior survey H-7933: A 96 foot sounding charted (chart 11445) in the vicinity of Lat. 024° 32.31' N, Long. 081° 24.91' W, plots in waters surveyed to be 101 feet in depth. This is an area of rapidly changing bottom slope and it is the opinion of the hydrographer that the charted sounding is adequate to reflect the area of concern.

Prior survey H-6323: A sounding of 53 feet charted (chart 11445) at Lat. 024° 32.48' N, Long. 081° 25.13' W plots in waters surveyed to be ~~38~~ 39 feet in depth. This charted sounding poses a hazard to the mariner by reflecting waters deeper than those which actually exist. It is the recommendation of the hydrographer that the charted sounding be removed and replaced on the next edition of this chart with a 39 ft sounding which more accurately depicts the depth in this area. ³⁸ Concur.

Prior survey H-6323: A sounding of 38 feet charted (chart 11445) at Lat. 024° 32.80' N Long. 081° 25.25' W plots in waters surveyed to be 34 feet in depth. This sounding should be removed and replaced on the next edition of this chart with a 34 ft depth which more accurately depicts the depth in this area. Concur

L) COMPARISON WITH THE CHART(S) - See also section 7.2. of the Evaluation Report.

The following charts were used for comparisons:

<u>CHART NUMBER</u>	<u>EDITION</u>	<u>EDITION DATE</u>	<u>SCALE</u>
11442	24th	July 20, 1985	1:80,000
11445A	23rd	May 04, 1985	1:20,000

11445A is 40,000 scale

As per the project Instructions, charted soundings were transferred onto the boat sheets before any sounding data was obtained. All charted features and soundings came from the largest scale chart of the area. This procedure allowed for direct chart comparison while the vessels were conducting operations.

Comparisons between chart 11442 soundings and data collected during the project were in good agreement. When transferring soundings from the 1:80,000 scale chart to the 1:10,000 scale smooth sheet, some positional offset was observed. This was taken into consideration by the hydrographer at the time the comparison was preformed.

Comparisons between chart 11445 and soundings collected during the project were generally in good agreement. Of the 29 charted soundings compared, 26 were in good agreement.

AWOIS item 02546; source, E. P. Ferguson, United States Power Squadron (USPS), form number CL1962, dated, 5/18/77. Reported wreck of 18 - 20 ft derelict awash in 1 - 2 ft of water. Visible against shoreline, visible at MHW. No menace to navigation in present position.

The ships investigated this area extensively during their stay and at no time was any wreck visible. Launches were sent out to search the shallow water and visually locate this item, with no

results. On DOY 161 divers were sent to the charted position to search for any sign of wreckage. A 100 meter circle search resulted in a negative finding (see appendix XII). There does exist however, some pipes and debris that form an obstruction, visible above MHW located at position Lat: 024° 32' 45.12" N Long: 081° 24' 30.34" W. It is believed by the hydrographer that this obstruction is AWOIS item 02546. Its position should be moved to the new position, and charted as a visible obstruction, 2 ft above MHW. The old wreck awash symbol should be removed from the chart. - *Concur - See also section 7. a. 1) of the Evaluation Report.*

AWOIS item 02547; source Local Notice to Mariners, Seventh Coast Guard District, dated August 2, 1978, (Chart 11445). A sunken sailboat, 20-24 ft in length, reported PA at position Lat. 024° 33' 30.00" N, Long. 081° 25' 00.00" W.

This item was investigated by the NOAA Ship RUDE (9040) using side scan sonar. Time restrictions only allowed a search of approximately 200 percent SSS coverage. On advice from Mr B. Causey, Sanctuary manager, divers were sent to investigate a position near a mooring buoy where wreckage had been reported. A three man diver sweep, 50 meters wide and 200 meters long resulted in a negative finding (see appendix XII). Since no salvage documentation was found and 400% coverage was not accomplished, it is recommended that the wreck remain charted at its present position, with the indication of "MAST" removed, until its disposition can be further resolved. *Concur - See also section 7. a. 2) of the Evaluation Report.*

No dangers to navigation were reported during this project.

M) ADEQUACY

The Hydrographic portion of this survey is believed to be complete and adequate to supersede all existing sounding data. The side scan sonar portion of the survey including the bottom texture survey, is adequate to supersede any bottom texture information previously available.

N) AIDS TO NAVIGATION - *See also section 7. b. of the Evaluation Report.*

Eight boundary marks were expected to be located during this survey, four Core Area Boundary Marks, and four Sanctuary Boundary Marks. All of the Sanctuary marks are maintained by the Looe Key Marine Sanctuary park personnel. Two Sanctuary Boundary Mark were discovered missing during this survey, and are so noted in the following table:

BUOY	LISTED POSITION	DETERMINED POSITION	AGREE WITHIN
------	-----------------	---------------------	--------------

Core Area Boundary Marks:

Northwest	Lat: 24-32-50.526 Long: 81-24-41.181	Lat: 24-32-50. ⁶⁷ 61 Long: 81-24-41. ³⁶ 40	^{7.6} 5.6 meters
Northeast	Lat: 24-33-04.237 Long: 81-24-16.586	Lat: 24-33-04. ²³ 22 Long: 81-24-16. ⁸³ 91	^{9.1} 6.9 meters
Southeast	Lat: 24-32-45.213 Long: 81-24-05.807	Lat: 24-32-43. ²⁹ 33 Long: 81-24-05. ⁷⁹ 85	^{57.9} 59.2 meters
Southwest	Lat: 24-32-37.242 Long: 81-24-38.572	Lat: 24-32-37. ²⁶ 29 Long: 81-24-38. ⁸⁷ 93	8.4 meters

Sanctuary Boundary Marks:

Northwest	Lat: 24-33-33.668 Long: 81-26-00.077	not located	
Northeast	Lat: 24-34-08.609 Long: 81-23-00.922	not located	
Southeast	Lat: 24-32-57.637 Long: 81-23-00.120	Lat: 24-32-57. ⁶⁴ 66 Long: 81-23-00. ⁴⁴ 49	^{10.4} 9.0 meters
Southwest	Lat: 24-32-18.935 Long: 81-26-00.123	Lat: 24-32-19. ⁴² 47 Long: 81-26-02. ⁴¹ 44	^{67.3} 66.1 meters

Looe Key light "24" was positioned as a third order station by the Photogrametric Branch in 1985. After a hurricane passed thru the area, the light was observed to have leaned over. Except for the slight lean, the light remains exactly as it was reported then. The light is adequate for its intended purpose, and its charted position should not be changed. -Concur

LIGHT	LISTED POSITION	DETERMINED POSITION	AGREE WITHIN
-------	-----------------	---------------------	--------------

24	Lat: 24-32-46. ³⁶⁶ 377 Long: 81-24-10.182	Lat: 24-32-46. ⁴³ 37 Long: 81-24-10. ²⁷ 18	^{0.22} 3.2 meters
----	--	---	--

O) STATISTICS

<u>VESNO</u>	<u>LINEAR MILES RUN</u>	<u>SQUARE MILES RUN</u>	<u>TOTAL POSITIONS</u>
9040	146.9	6.18	920
9041 914φ	155.5	12.05	1319
9025 9141	0.0	0.0	24
DIVES		18	
TIDE STATIONS		1	
MARTEC CASTS		4	

P) MISCELLANEOUS

Currents within the project area can be grouped into two distinct areas, the first is the shallow area over the reef and flats, the second, the deep water off the reef. In the shallow area, the currents tended to be light and variable, and a general determination of direction could be determined using the tide tables and water flowing into or out of Hawks Channel. At no time was any significant current noticed on the flats. In the deep water section, the currents were generally noticeable and always flowing in an easterly direction. The current was noticeable at all times operating in the deeper water, with the strength varying at given times. The current did seem to move closer to the reef at different times, but no general trend was noticed.

One of the expected products from this survey was the development of a mosaic using the SSS raw data of the deep water portion of the survey. It became apparent that much of the deep water area did not contain significant bottom topographic features. A request was made to reduce the requirement for the mosaic development to only that portion of the survey area that contained some significant features that could be identified between consecutive SSS strips. The request was granted and the following is a description of what was accomplished and the reasoning behind the methods used.

The mosaic was not attempted until all the SSS data had been collected and analyzed for the bottom texture plot. First, the areas of the mosaic were divided into three distinct localities. Area A was located in the Northwest corner of the project area and consisted of patches of vegetation and some coral. Area B was located where the reef line entered the project area on the West side and extended to where the SSS trace ended in sand. Area C was the continuation of the reef system in a Northeasterly direction until it exited the project area on the Eastern limit. The areas were labeled as A,B and C to help sorting and reconstructing the mosaic at a later time.

No change to the project instructions concerning the data submission requirements for the mosaic were ever received. After discussions with the Operations Section of the Hydrographic Surveys Branch, it was decided to submit the mosaic on cardboard sections approximately 4' square. The Northern section (A) was constructed using this method, but the results were poor. The other two sections (B, C) were constructed using mounting boards of uniform shape and size. The resulting product was better quality, and of a more manageable size.

The main problem handling the mosaic was smudging that occurred to the trace each time it was handled or moved. In an attempt to solve this problem one section was sprayed with a clear lacquer, but it was felt that some contrast was lost, and no other sections were coated.

The SSS trace that was not used for the mosaic, and the SSS fish height record that was trimmed from the mosaic trace are submitted with the data package for later analysis.

Before the mosaic was constructed, a bottom texture overlay was produced using the SSS data. Using a position plot and a method similar to a SSS contact plot, various features were plotted on a 1:10,000 scale grid. A general pattern was developed of any sea floor feature, and the positions were joined to delineate the different bottom types. The Bottom Texture Overlay developed in this manner compared well with the Preliminary Bottom Texture Overlay information produced by the Photogrammetry Branch.

No bottom samples were taken on this project. A series of dives were conducted to provide a "ground truth" for the bottom texture overlay, but no samples were taken (see appendix XII)

Q) RECOMMENDATIONS

The EG&G SSS system has the capability of storing the raw data collected in a digital format on a magnetic media. In the operational form we used, the raw data was produced in the form of a paper trace printout. After the construction on the mosaic was complete, the data was cut and smudged to such a degree that the usefulness of it for latter analysis is limited.

If mosaics are to become a regular product from a SSS survey, new hardware needs to be procured. A storage media that allows the raw data to be adjusted for speed corrections, and copies of the data to be used for rough work would be necessary.

R) AUTOMATED DATA PROCESSING

PDP11/34 Computer

PROGRAM NAME

GULP - Grid, Control Station, Lattice Plot
LEDIT - Lattice File Editor
PARC - Parameter File Editor
PEDIT - Position File Listing
@PRID - Predicted Tide Corrector Generator
SEdit - Station File Editor
@SMDUMP - Side Scan Sonar and Launch Drag Data Dump
SSCOM - Side Scan Sonar Data Position Computation
SSPLOT - Side Scan Sonar Data Plot
SSPOOL - Side Scan Sonar Position File Generator
STACR - Station and Lattice File Initialization
@WDGINI - Wire Drag Data Disc Initialization

PDP8/e Computer

The following HYDROPLOT programs were used to process the survey data:

<u>PROGRAM</u>	<u>PROGRAM NAME</u>	<u>VERSION</u>
RK 201	Grid, Signal, and Lattice Plot	4/18/75
RK 211	Range/Range Non-Real Time Plot	2/13/84
RK 330	Data Reformat and Check	5/04/76
AM 500	Predicted Tide Generator	11/10/72
PC 530	Layer Correction for Velocity	4/07/86
AM 602	Extended Line Oriented Editor	12/08/82

Hewlett-Packard 9815A Computer

RANGE/AZIMUTH CALIBRATION PROGRAM
GEODETIC PACKAGE -- 800610

S) REFERRAL TO REPORTS

The following reports have been sent to the Atlantic Marine Center. Please refer to them for any questions pertaining to their contents.

<u>REPORT</u>	<u>DATE SUBMITTED</u>
ELECTRONIC CORRECTORS	SEPT 10, 1986
COAST PILOT	SEPT 10, 1986
HORIZONTAL CONTROL	SEPT 10, 1986
CORR. TO ECHO-SOUNDINGS	SEPT 10, 1986

(XIII) APPROVAL SHEET

APPROVAL SHEET

S-H661-RU/HE-86

Field operations contributing to the accomplishment of this survey were conducted under my supervision with daily personal checks of progress and adequacy. This report and field sheets have been closely reviewed and are considered complete and adequate for charting.

Robert K. Norris

Robert K Norris, LCDR, NOAA
Commanding Officer
NOAA Ships RUDE & HECK

(VI) LIST OF STATIONS

STATION LIST
S-H661-RU/HE-86

STATION NUMBER	STATION NAME	LAT/LONG	ELEV	CARTO CODE
001	Newfound Az (1986)	Lat: 24 37 16.52 Long: 081 23 32.70 ⁶⁹	4 m	250
002	Loggerhead (1920)	Lat: 24 36 31.25 Long: 081 28 08.49 ⁴⁸	7 m	250
003	American Shoal Lighthouse (1909)	Lat: 24 31 28.89 Long: 081 31 10.58	30 m	250
004	Looe Key Light (1978) (see note 1)	Lat: 24 32 46.37 Long: 081 24 10.18		¹³⁹ 250
006	Bahia Honda 3 (1935)	Lat: 24 40 02.96 Long: 081 15 01.52	8 m	250 <i>Not used</i>
007	Newfound	Lat: 24 37 19.17 Long: 081 23 25.88		139 <i>Not used</i>

(1) not a third order position.

* ALL ELECTRONIC TRANSMITTER FREQUENCIES WERE AT 5400 MHZ

(IX) NON-FLOATING AIDS AND LANDMARKS FOR CHARTING

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

- TO BE CHARTED
- TO BE REVISED
- TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)

NOAA Ship RUDE & HECK

STATE

FLORIDA

LOCALITY

LOOE KEY

DATE

8/29/86

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
- GEODETIC PARTY
- PHOTO FIELD PARTY
- COMPILATION ACTIVITY
- FINAL REVIEWER
- QUALITY CONTROL & REVIEW GRP.
- COAST PILOT BRANCH

(See reverse for responsible personnel)

The following objects HAVE HAVE NOT been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.

S-H661-RU/HE-86

JOB NUMBER

H-10221

DATUM

NAD-27

CHARTING NAME

DESCRIPTION

(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses)

LIGHT "24" (see DR)

METHOD AND DATE OF LOCATION

(See instructions on reverse side)

OFFICE

FIELD

CHARTS

AFFECTED

(XI) DANGERS TO NAVIGATION

NEGATIVE REPORT

(XII) SUPPLEMENTAL INFORMATION

DIVER'S ITEM INVESTIGATION REPORT
S-H661-RU/HE-86

FIELD SHEET: R/H 10-1-86

STATE/COUNTY: MONROE

SUB-LOCALITY: Looe Key

DATE: June 4, 86 JD: 155

SHIP/LAUNCH: 9026

DIVEMASTER: A. Francis

DIVERS: A. Francis
J. Lowell

<u>TIME (UTC)</u>	<u>DIVE 1</u>	<u>DIVE 2</u>	<u>DIVE 3</u>
IN WATER	1114	1230	1303
UNDER WATER	1115	1231	1302
ON SURFACE	1122	1242	1322
IN BOAT	1124	1244	1324
DIVE DURATION	07	11	20
MAXIMUM DEPTH	60	100	60

<u>POSITION</u>	<u>DIVE</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
1751	SITE #7	24-32-26.57	81-25-18.97
1752	SITE #6	24-32-14.63	81-25-39.35
1750	SITE #11	24-32-13.93	81-25-52.76

VISIBILITY HOR. 50'
CURRENT: Light

VERT. 60'

REMARKS

Dive 1 - Dive Site #7

Middle reef to broken shell bottom, scattered soft corals over sand. Texture change from hard coral to sand (broken shell) bottom.

Dive 2 - Dive Site #6

Deep reef, Located edge of reef and sand, Large broken shell fragments make up sand bottom. Visible ripples in sand.

Dive 3 - Dive Site #11

Middle reef, Located mooring buoys and submerged subsurface buoys. Swimming NNW to sand finger. Large sand cut through coral. Sand composition; Med grain broken shell.

DIVER'S ITEM INVESTIGATION REPORT
S-H661-RU/HE-86

FIELD SHEET: R/H 10-1-86

STATE/COUNTY: FLORIDA/MONROE

SUB-LOCALITY: Looe Key

DATE: June 5, 86 JD: 156

SHIP/LAUNCH: 9026

DIVEMASTER: A. Francis

DIVERS: A. Francis
J. Lowell

<u>TIME (UTC)</u>	<u>DIVE 1</u>	<u>DIVE 2</u>	<u>DIVE 3</u>	<u>DIVE 4</u>
IN WATER	0847	0926	0945	
UNDER WATER	0847	0926	0945	
ON SURFACE	0855	0934	0956	
IN BOAT	0857	0935	0956	
DIVE DURATION	08	08	09	
MAXIMUM DEPTH	50	40	40	

<u>POSITION</u>	<u>DIVE</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
1753	SITE #1	24-33-53.80	81-25-16.00
1755	SITE #2	24-33-41.46	81-25-10.67
1754	SITE #3	24-33-41.41	81-25-27.66

VISIBILITY HOR.: 20'

VERT.: 25'

CURRENT: Very light

REMARKS

Dive 1 - Site #1

Swam westerly from position and found very light vegetation. A distinct boundary did exist between the silt and light vegetation.

Dive 2 - Site #2

Heavy vegetation, with sand "Blowouts". Blowout composition was sand/broken shell, with some soft coral on scattered hard bottom.

Dive 3 - Site #3

Light vegetation with some soft corals encountered.

DIVER'S ITEM INVESTIGATION REPORT
S-H661-RU/HE-86

FIELD SHEET: R/H 10-1-86

STATE/COUNTY: FLORIDA/MONROE

SUB-LOCALITY: Looe Key

DATE: June 5, 86 JD: 156

SHIP/LAUNCH: 9026

DIVEMASTER: A. Francis

DIVERS: A. Francis
J. Lowell

<u>TIME (UTC)</u>	<u>DIVE 4</u>	<u>DIVE 5</u>	<u>DIVE 6</u>
IN WATER	1005	1028	1344
UNDER WATER	1005	1028	1344
ON SURFACE	1016	1037	1350
IN BOAT	1017	1039	1352
DIVE DURATION	11	09	06
MAXIMUM DEPTH	40	40	60

<u>POSITION</u>	<u>DIVE</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
1756	SITE #4	24-33-39.38	81-25-39.06
1757	SITE #5	24-33-31.96	81-25-43.06
1769	SITE #10	24-32-36.43	81-23-56.92

VISIBILITY HOR.: 20'- 4&5, 60'-6 VERT.: 20'-4&5, 60'-6
CURRENT: Light , all dives

REMARKS

Dive 4 - Site #4

Scattered soft coral, patch hard coral build up and scattered vegetation. Broken shell bottom.

Dive 5 - Site #5

Scattered soft corals over broken shell/sand bottom. Some scattered heavy vegetation.

Dive 6 - Site #10

Broken shell in large pieces. Bottom built up into mounds.

DIVER'S ITEM INVESTIGATION REPORT
S-H661-RU/HE-86

FIELD SHEET: R/H 10-1-86

STATE/COUNTY: FLORIDA/MONROE

SUB-LOCALITY: Looe Key

DATE: June 5, 86 JD: 156

SHIP/LAUNCH: 9026

DIVEMASTER: A. Francis

DIVERS: A. Francis
J. Lowell

<u>TIME (UTC)</u>	<u>DIVE 7</u>	<u>DIVE 8</u>	<u>DIVE 9</u>	<u>DIVE 10</u>
IN WATER	1404	1424	1447	1516
UNDER WATER	1404	1424	1447	1516
ON SURFACE	1414	1434	1502	1531
IN BOAT	1416	1436	1504	1533
DIVE DURATION	10	10	15	15
MAXIMUM DEPTH	40	40	40	40

<u>POSITION</u>	<u>DIVE</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>
1763	SITE #16	24-32-59.38	81-22-57.55
1765	SITE #14	24-32-56.48	81-23-12.89
1762	SITE #15	24-33-03.59	81-23-06.81
1764	SITE #13	24-32-59.26	81-23-24.05

VISIBILITY HOR.: 60'
CURRENT: Light

VERT.: 40'

REMARKS

Dive 7 - Site #16

Scattered coral development with some rocks. Little vertical development. Crushed coral sand between coral developments.

Dive 8 - Site #14

Scattered coral development forming flat reef. Some soft coral intermixed with hard corals, crushed coral sand between coral patches.

Dive 9 - Site #15

Scattered coral, same as site #14.

Dive 10 - Site #13

Large and small coral heads, with good vertical development. Crushed coral sand between the heads.

DIVER'S ITEM INVESTIGATION REPORT
S-H661-RU/HE-86

FIELD SHEET: R/H 10-1-86

STATE/COUNTY: FLORIDA/MONROE

SUB-LOCALITY: Looe Key

DATE: June 6, 86 JD: 157

SHIP/LAUNCH: 9026

DIVEMASTER: J. Lowell

DIVERS: J. Lowell
J. Talbott

<u>TIME (UTC)</u>	<u>DIVE 1</u>	<u>DIVE 2</u>
IN WATER	0852	0929
UNDER WATER	0852	0929
ON SURFACE	0911	0944
IN BOAT	0913	0945
DIVE DURATION	19	15
MAXIMUM DEPTH	110	60

POSITION	DIVE	LATITUDE	LONGITUDE
1770	SITE #9	24-32-31.31	81-24-33.49
1771	SITE #8	24-32-28.59	81-24-33.31

VISIBILITY HOR.: 60'
CURRENT: Light

VERT.: 70'

REMARKS

Dive 1 - Site #9

Steep hard coral development, with large grain broken shell sand off coral development.

Dive 2 - Site #8

Widely scattered coral, some hard coral but predominantly soft coral. Crushed coral sand between coral patches.

DIVER'S ITEM INVESTIGATION REPORT
S-H661-RU/HE-86

FIELD SHEET: R/H 10-1-86

STATE/COUNTY: FLORIDA/MONROE

SUB-LOCALITY: Looe Key

DATE: June 9, 86 JD: 160

SHIP/LAUNCH: 9026

DIVEMASTER: J. Lowell

DIVERS: J. Lowell
J. Talbott

TIME (UTC) DIVE 1

IN WATER 1507
UNDER WATER 1507
ON SURFACE 1530
IN BOAT 1532

DIVE DURATION 19 (actual bottom time)
MAXIMUM DEPTH 110

POSITION	DIVE	LATITUDE	LONGITUDE
1772	SITE #12	24-31-45.20	81-22-46.37

VISIBILITY HOR.: 25'
CURRENT: Light

VERT.: 30'

REMARKS

Dive 1 - Site #12

Divers followed reef in a westerly direction. Scattered coral on steep silt/crushed coral rise.

DIVE INVESTIGATION REPORT
S-H661-RU/HE-86
R/H 10-01-86

DIVE DATE: June 10, 1986

I. AREA OF INVESTIGATION

A. STATE/COUNTRY: Florida

SUB-LOCALITY: Looe Key

B. POSITION: LATITUDE: 24⁰ 33' 31" N
LONGITUDE: 81⁰ 24' 49" W

C. METHOD OF POSITIONING: Scaled from chart.

II. PURPOSE OF INVESTIGATION

A. AWOIS ITEM NUMBER: 2547

B. SOURCE OF ITEM BEING INVESTIGATED (IF OTHER THAN AWOIS LISTING): AWIOS

C. CONTACTS (EG.) USCG, C OF E, HARBOR MASTERS, OWNERS, ETC.):
Mr B. Causy, Sanctuary Manager.

D. NAMES, ADDRESSES AND PHONE NUMBERS ETC. OF CONTACTS:
Phone #: 305-872-4039

III. SURVEY PROCEDURES

A. DETERMINATION OF DIVE SITE (EG. WIRE DRAG, SIDE DEVELOPMENT):
On discussion with Mr B. Causy, reported wreckage.

B. SEARCH PROCEDURE (EG. FOLLOWING A GROUNDWIRE, CIRCLE SEARCH, SWEEP ALONG KNOWN FEATURE, ETC.)
A diver sweep using three divers, 15 meters apart, swimming a compass course of 140°.

C. KNOWN REFERENCE TO FEATURES NEARBY: Small unmarked mooring bouy maintained by the Sanctuary personel.

D. AREA AND DEPTHS COVERED: An area 50 meters wide, and 300 meters long was visually searched. The general depths searched were 15 - 20 ft.

IV. DIVE DATA

A. DIVERS: J. Lowell, J Talbott, K. Sharack

B. TIME OF DIVE (IN UTC) - REAL:
ELAPSED: 45 min

C. GENERAL BOTTOM DEPTHS (UNITS AND METHOD OF DETERMINATION): General bottom depths were 15 - 20 ft, as measured by diver wrist gauges.

D. CURRENT AND CONDITIONS: No current, calm seas, good dive conditions.

E. VISIBILITY (NUMBER OF FEET - HORIZONTALLY AND VERTICALLY): Hor: 40'
Ver: top to bottom

F. BOTTOM TYPE (MUD,SAND,ROCKS,ETC.): Sand, Vegetation and scattered soft corals.

V. RESULTS

A. DETACHED POSITIONS NUMBER(S): None

B. DESCRIPTION OF FINDINGS: Negative results.

C. DIMENSIONS OF ITEM OR FEATURE (ATTACH SKETCH IF APPROPRIATE): N/A

D. UNUSUAL CONDITIONS: None

VI. CHARTING RECOMMENDATIONS

AWOIS item to remain charted with the indication of "Mast" removed.

DIVE INVESTIGATION REPORT
S-H661-RU/HE-86
R/H 10-01-86

DIVE DATE: JUNE 10,1986 (DOY 161)

I. AREA OF INVESTIGATION

- A. STATE/COUNTY: FLORIDA/MONROE SUB-LOCALITY: FLORIDA KEYS
- B. POSITION: LATITUDE: 024^o 32' 51.37" N
 LONGITUDE: 081^o 24' 23.71" W
- C. METHOD OF POSITIONING: Mini-Ranger (Range/Range mode)

II. PURPOSE OF INVESTIGATION

- A. AWOIS ITEM NUMBER: # 02546
- B. SOURCE OF ITEM BEING INVESTIGATED (IF OTHER THAN AWOIS LISTING): AWOIS LISTING
- C. CONTACTS (EG.) USCG,C OF E,HARBOR MASTERS,OWNERS,ETC.): NONE
- D. NAMES,ADDRESSES AND PHONE NUMBERS ETC. OF CONTACTS: NONE

III. SURVEY PROCEDURES

- A. DETERMINATION OF DIVE SITE (EG. WIRE DRAG,SIDE DEVELOPMENT):
 Buoy deployed in position reported on AWOIS listing
- B. SEARCH PROCEDURE (EG. FOLLOWING A GROUNDWIRE,CIRCLE SEARCH, SWEEP ALONG KNOWN FEATURE,ETC.)
 Circle Search of 100 meters in radius
- C. KNOWN REFERENCE TO FEATURES NEARBY: NONE
- D. AREA AND DEPTHS COVERED: A 100 meter radius circle centered around
 Lat. 024^o 32' 51.37" N
 Long. 081^o 24' 23.71" W

IV. DIVE DATA

A. DIVERS: LT. J. C. Talbott
LT(jg) A. E. Francis

B. TIME OF DIVE (IN UTC) - REAL: N/A
ELAPSED: 25 min

C. GENERAL BOTTOM DEPTHS (UNITS AND METHOD OF DETERMINATION): 6 -12 ft.

D. CURRENT AND CONDITIONS: Negligible

E. VISIBILITY (NUMBER OF FEET - HORIZONTALLY AND VERTICALLY):

Horizontal - 100 feet Vertical - Unlimited

F. BOTTOM TYPE (MUD,SAND,ROCKS,ETC.):

Sand, Grass, Coral

V. RESULTS

A. DETACHED POSITIONS NUMBER(S): 5334

TIME OF D.P.'S (UTC): 153500

LEAST DEPTH AND FIX NUMBERS (RAW DEPTH): NONE

METHOD OF DETERMINING DEPTH (THE RAW SOUNDING SHOULD BE
RECORDED. THE REDUCED LEAST DEPTH SHOULD BE PLOTTED ON THE
FIELD SHEET.): N/A

B. DESCRIPTION OF FINDINGS: Negative findings

C. DIMENSIONS OF ITEM OR FEATURE (ATTACH SKETCH IF APPROPRIATE): N/A

D. UNUSUAL CONDITIONS:NONE

VI. CHARTING RECOMMENDATIONS

See Section L (Chart Comparisons) of this Descriptive Report for
recommendations.



**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

NATIONAL OCEAN SERVICE

NOAA SHIPS RUDE & HECK
439 West York St.
Norfolk, VA.

TO: Commander, U.S. Coast Guard
7th District
Robert K. Norris
FROM: Robert K. Norris, LCDR NOAA
Commanding Officer
SUBJECT: Local Notice to Mariners

The NOAA Ships RUDE & HECK WILL be conducting survey operations beginning May 12, 1986 in the Looe Key Marine Sanctuary and surrounding vicinity. The ships are 90 feet in length, all white with blue stack markings.

Mariners are requested to stand well clear of the vessels while they are underway due to the nature of their restricted maneuverability during operations. The vessels will be monitoring channels 16 and 13 VHF if communications are required.

In addition, three orange survey banners, 20 feet in height will be erected at the following locations. Mariners are advised not to use the banners for navigational purposes.

BANNER LOCATIONS

24° 40' 02.3" N
81° 15' 01.5" W

24° 37' 16.5" N
81° 23' 32.7" W

24° 36' 31.3" N
81° 28' 08.5" W





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

NOAA Ships RUDE & HECK
439 West York Street
Norfolk, VA. 23510

July 18, 1986

To: N/MOA - Wesley V. Hull
FROM: *Robert K. Norris*
RUDE & HECK - Robert K. Norris
SUBJECT: Submission Deadline Extension for project OPR-S-H661-RU/HE-86;
request for

I request that the six week survey submission deadline be waived for the RUDE & HECK Looe Key, FL survey, OPR-S-H661, to allow the command time to complete data processing. The lack of onboard data processing equipment has required the RUDE & HECK to utilize processing facilities at the Atlantic Marine Center on an "as available" basis thereby causing unavoidable delays which severely restrict the ability of the command to control the processing timetable. I believe that this delay is necessary to produce a completed report commensurate with current AMC/NOS standards.

I believe that the project will be completed and all data ready for submission by the last week in August and, therefore request that the submission deadline be extended until that time.

7/25/86

CO Rude/Heck

Approved as requested.

Wesley Hull

CC MOA 2



JUL 23 1986

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

DATE: 10/27/86

Marine Center: Atlantic

OPR: H661

Hydrographic Sheet: H-10221

Locality: Looe Key, FL

Time Period: May 14 - June 10, 1986

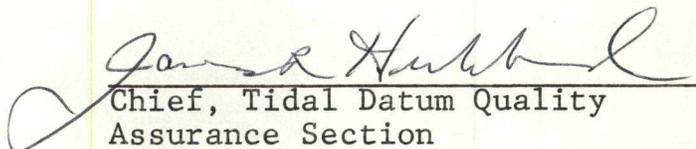
Tide Station Used: 872-4293 Loggerhead Key, FL

Plane of Reference (Mean Lower Low Water): 0.96 ft.

Height of Mean High Water Above Plane of Reference: 1.6 ft.

Remarks: Recommended Zoning:

Zone direct


Chief, Tidal Datum Quality
Assurance Section

GEOGRAPHIC NAMES

H-10221

Name on Survey	Source of Information											
	A	B	C	D	E	F	G	H	K			
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
FLORIDA (title)												1
LOOE KEY												2
STRAITS OF FLORIDA (title)												3
												4
												5
												6
												7
												8
												9
												10
												11
												12
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												24
												25

Approved:

Charles E. Harrington
Chief Geographer - N/CG 2x3

APR 20 1987

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NO.: H-10221

Number of positions	<u>1323</u>
Number of soundings	<u>3960</u>
Number of control stations	<u>4</u>

	<u>TIME-HOURS</u>	<u>DATE COMPLETED</u>
Preprocessing Examination	<u>40</u>	<u>9/16/86</u>
Verification of Field Data	<u>149</u>	<u>3/31/87</u>
Quality Control Checks	<u>42</u>	
Evaluation and Analysis	<u>62</u>	<u>4/10/87</u>
Final Inspection	<u>11</u>	<u>4/28/87</u>
TOTAL TIME	<u>304</u>	
Marine Center Approval		<u>4/30/87</u>

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

SURVEY NO.: H-10221

FIELD NO.: R/H-10-01-86

Florida, Straits of Florida, Looe Key

SURVEYED: May 12 through June 17, 1986

SCALE: 1:10,000

PROJECT NO.: S-H661-R/H-86

SOUNDINGS: RAYTHEON DSF-6000N Echosounder

CONTROL: MOTOROLA Falcon 484 Mini-Ranger (Range/Range)

Chief of Party.....R. K. Norris

Surveyed by.....J. C. Talbott

.....A. E. Francis

.....J. E. Lowell

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

1. INTRODUCTION

a. Some depth curves on the smooth sheet have been drawn with consideration given to the photobathymetric depth curves. In some of these cases there are no hydrographic or photobathymetric soundings to support the depth curves. In these cases the photobathymetric curves were used when a conservative approach was appropriate.

b. Photobathymetric depths plotted on the smooth sheet were selected after an evaluation of their compatibility with the hydrographic survey data. Photobathymetric depths not shown on the smooth sheet should not be considered for charting purposes.

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

2. CONTROL AND SHORELINE

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

b. Shoreline originates with 1:10,000 scale, final reviewed Class III Shoreline Manuscript (part 1 of 2) TP-01063 of 1986.

The dashed submerged coral limits originating with TP-01063 (part 1 of 2) on the south side of Looe Key between Longitude 81°24'07.0"W and Longitude 81°24'43.0"W are not shown on the present survey. The presence of the submerged

coral limit lines and the depth curves would have created congestion and confusion in the area. To avoid congestion and provide a clear portrayal of the bottom configuration, it was decided to draw only depth curves in this area. ✓

3. HYDROGRAPHY

a. Soundings at crossings are in good agreement and meet the criteria found in sections 4.6.1. and 6.3.4.3. of the HYDROGRAPHIC MANUAL. u/c

b. The standard depth curves and the supplemental 24-foot and 36-foot curves could drawn in their entirety. The zero (0) depth curve was not delineated in its entirety because of surf and breakers in the survey area. Dashed curves were added to better show bottom topography. The standard and supplemental depth curves were supplemented by depth curves shown on photobathymetric manuscript TP-01063 (part 2 of 2). 4/c

c. Development of the bottom configuration and determination of least depth is considered adequate with the following exceptions: 4/c

1) Lines perpendicular to the depth curves should have been run in the vicinity of Latitude $24^{\circ}32'34''N$, Longitude $81^{\circ}24'18''W$ to provide a better delineation of the depth curves. u/c

2) The strong indication of an unknown object shown on the fathogram is shown on the present survey as a 32-foot depth in Latitude $24^{\circ}34'04.63''N$, Longitude $81^{\circ}24'57.40''W$. This area should have been further developed by the hydrographer to determine whether the object was fish or an uncharted sunken wreck. u/c

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: u/c

a. A detached position for AWOIS Item #2547 was not obtained by the hydrographer. The geographic position for the dive on AWOIS Item #2547 was either erroneously scaled from the chart, or the geographic position listed in the dive report was typed incorrectly. The position given for the dive on AWOIS Item #2547 plots approximately 311 meters east of the charted position. See also section 7.a.2) of this report.

b. Throughout the survey the hydrographer consistently exceeded the maximum sounding interval requirements stated in

sections 1.4.6. and 4.5.6. of the HYDROGRAPHIC MANUAL by one ^{mlc}
(1) to four (4) millimeters at the scale of the survey.

5. JUNCTIONS

TP-01063, CM-8414 (part 2 of 2)

An excellent junction was effected between the present ^{mlc}
survey and the photobathymetric survey listed above.

There are no contemporary junctional surveys to the
north, south, east, or west of the combined hydrographic and ^{mlc}
photobathymetric survey. The surrounding charted depths are
in general harmony with the present survey depths.

6. COMPARISON WITH PRIOR SURVEYS

H-669 (1857) 1:20,000
H-6323 (1937-38) 1:20,000
H-7933 (1951-54) 1:80,000

The surveys listed above cover the survey area in its
entirety.

With the exception of 17-foot depths in the vicinity of
Latitude 24°33'45"N, Longitude 81°24'36"W, prior survey H-669 ^{mlc}
(1857) is superseded by prior survey H-6323 (1937-38) in the
common area. Present survey depths in this area are 17 to 21
feet.

Comparison with prior survey H-6323 (1937-38) shows
present survey depths in the area of photobathymetry
generally 1 to 5 feet shoaler with some scattered areas 10 to
12 feet shoaler than the prior survey. The prior survey also
compares well with present survey depths. Present survey
soundings generally 1 to 2 feet shoaler.

H-7933 (1951-58) covers the southern part of the present
survey. Prior survey soundings compare well with the present
survey; depths vary plus or minus 1 to 2 feet.

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

7. COMPARISON WITH CHART 11442 (24th Ed., July 20/85)
11445 (23rd Ed., May 04/85)

a. Hydrography

The charted hydrography originates with the
previously discussed prior survey and needs no further
consideration.

The following information is directed to the attention of the chart compiler concerning items not adequately addressed by the hydrographer:

1) AWOIS Item #2546 is a visible wreck awash charted in Latitude 24°32'51"N, Longitude 81°24'24"W that originates with CL1962 of 1977. The item was searched for by the hydrographer with negative results. The hydrographer did locate an uncharted obstruction (debris) in Latitude 24°32'45.14"N, Longitude 81°24'30.42"W. It is recommended that the charted visible wreck be removed from the chart and that an obstruction (debris) baring 2 feet above MLLW be charted as shown on the present survey. *app'd*

2) AWOIS Item #2547 is a dangerous sunken wreck, PA (masts) charted in Latitude 24°33'30"N, Longitude 81°25'00"W originating with Local Notice to Mariners 38 of 1978. The item was searched for by the NOAA Ship RUDE with side scan sonar with negative results. A dive was conducted at a small mooring buoy, in Latitude 24°33'31"N, Longitude 81°24'49"W, maintained by sanctuary personnel with negative results; however, it appears that the dive was conducted approximately 311 meters east of the charted position. Fathogram traces from the NOAA Ship HECK show the natural bottom rising to 19 feet in Latitude 24°33'30.48"N, Longitude 81°25'00.31"W. It is recommended that the present survey depths be charted. It is also recommended that the dangerous sunken wreck, PA be retained and the legend masts be deleted. *app'd*

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

b. Aids to Navigation

There is one (1) fixed aid to navigation on the present survey. This aid appears adequate to serve its intended purpose. Two (2) floating aids were located by the hydrographer. Their purpose is not apparent.

8. COMPLIANCE WITH INSTRUCTIONS

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

9. ADDITIONAL FIELD WORK

This is a good basic survey. Additional field work may be necessary at an opportune time to completely verify or disprove all questionable items addressed in section 7.a. of this report.

Douglas V. Mason

Douglas V. Mason
Cartographic Technician
Verification of Field Data

Robert L. Robinson

For Richard H. Whitfield
Cartographer
Evaluation and Analysis

Robert R. Hill

Robert R. Hill
Senior Cartographic Technician
Verification Check

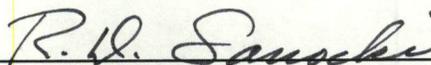
INSPECTION REPORT
H-10221

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval 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



Robert G. Roberson
Chief, Evaluation and Analysis
Group
Hydrographic Surveys Branch



R. D. Sanocki
Chief, Hydrographic Surveys
Processing Section
Hydrographic Surveys Branch

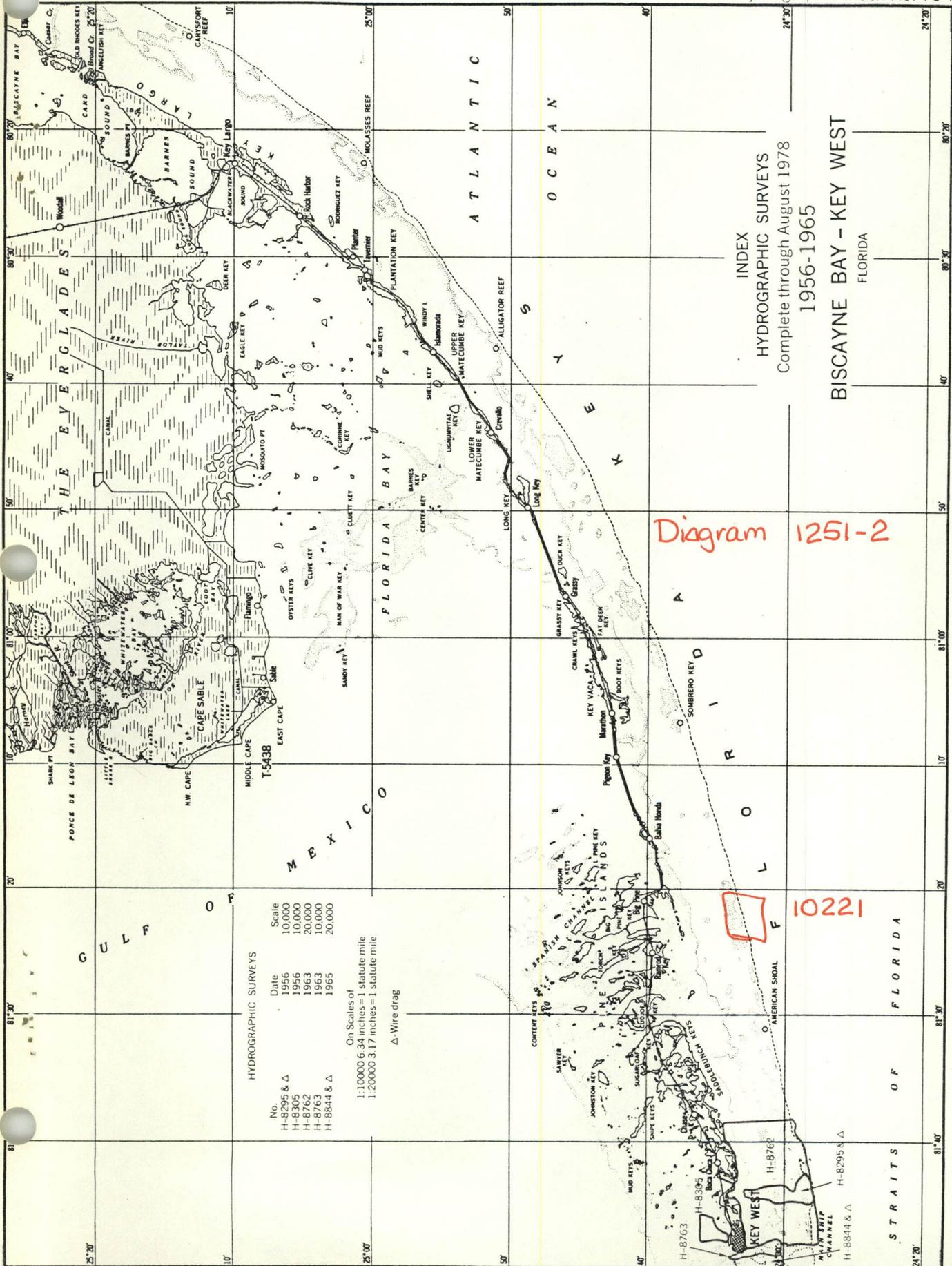
Approved: 30 April 1987



Ray E. Moses, RADM, NOAA
Director, Atlantic Marine Center

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

Hydrographic Index No. 79 F



INDEX
HYDROGRAPHIC SURVEYS
Complete through August 1978
1956-1965
BISCAYNE BAY - KEY WEST
FLORIDA

HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-8295 & Δ	1956	10,000
H-8305	1956	10,000
H-8762	1963	20,000
H-8763	1963	10,000
H-8844 & Δ	1965	20,000

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

Δ - Wire drag

Diagram 1251-2

Diagram 10221

