

9845^x

Diagram No. LS-5

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. HSB-20-4-79
Office No. H-9845

LOCALITY

State Michigan
General Locality Lake Huron
Locality Adams Point to Hammond

1979

CHIEF OF PARTY
CDR T.W. Richards

LIBRARY & ARCHIVES

DATE August 28, 1981

9845
00
02

HYDROGRAPHIC TITLE SHEET

H-9845

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.

HSB-20-4-79

State Michigan

General locality Lake Huron

Locality Rogers City Adams Point to Hammond

Scale 1;20,000 Date of survey Aug. 21 - Sept. 17, 19~~80~~⁷⁹

Instructions dated March 2, 1979* Project No. OPR-X115-PE/HSB-79

Vessel NOAA Launch 1255 - HFP4

Chief of party Thomas W. Richards, LCDR., NOAA

Surveyed by David A. Waltz, LT., NOAA

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

Graphic record scaled by SW, MJR, LP, SK, AA, RLK

Graphic record checked by SW, MJR, LP, SK, AA, DAW, RLK

Protracted by _____ Automated plot by Field-PDP8e/Hydroplot
AMC-Xyneretics 12001
Xyneretics

Verification by Verification Branch - AMC L.G. Cram. J. Scott Bradford

Soundings in ~~feet~~ x meters feet at ~~x MLT x x x x x~~ IGLD - LWD 576.8 ft.

REMARKS: *Change No. 1 - April 18, 1979 SW - Steve Weisner

changes in red ink made during MJR - Maria Restrepo

verification LP - Louis Podleiszek

SK - Sharon Kelly

DAW - David Waltz

RLK - Reginal Keene

AA - Andrew Armstrong

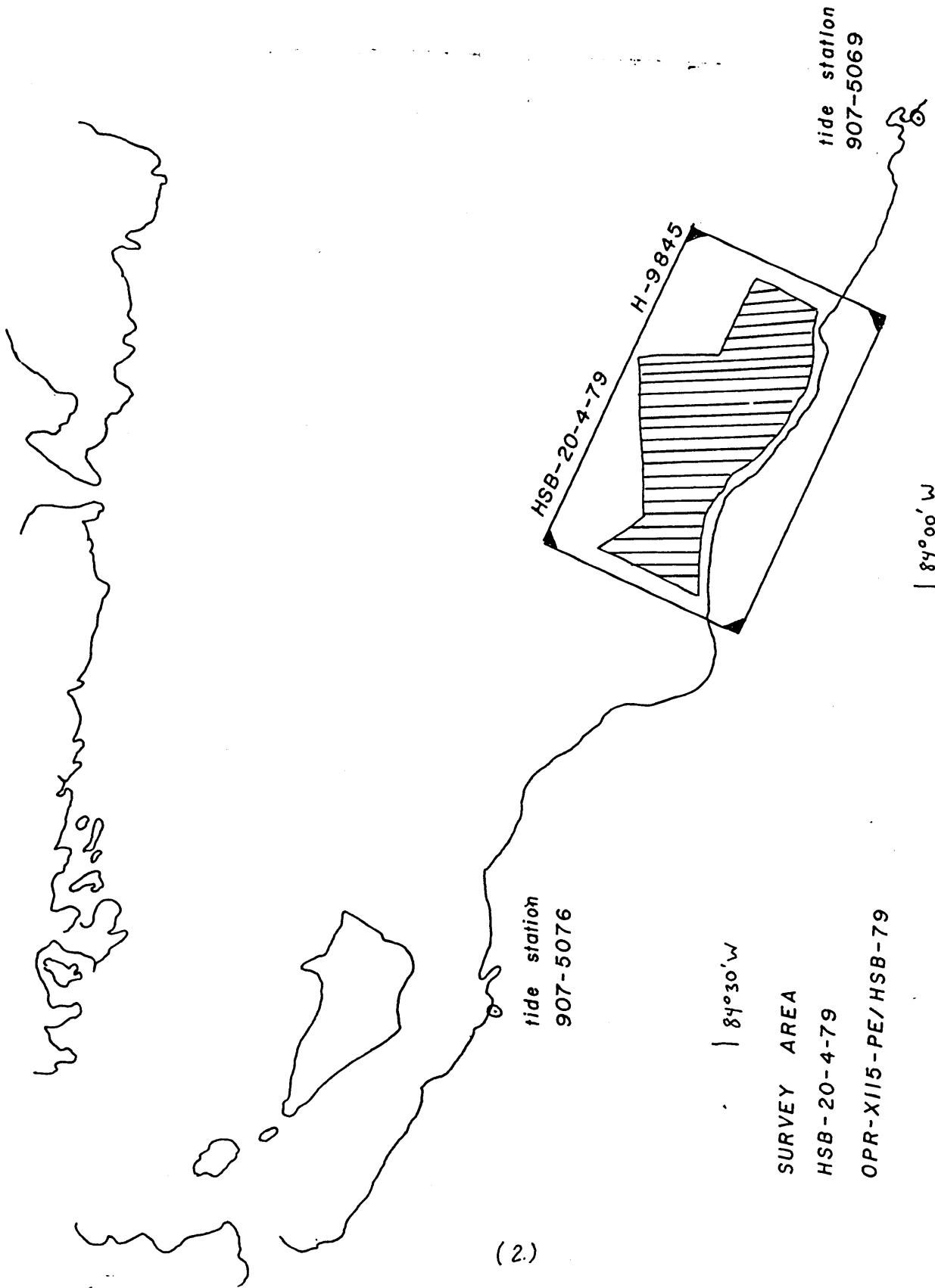
DIGITAL DATA COMPLETED BY AMC

*All times recorded in this survey are
Greenwich Mean Time.*

2-9-83 STANDARDS CK'D

(1)

Ciboy



DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY H-9845
HSB-20-4-79

Scale: 1:20,000

Chief of Party: Lt. Cdr. Thomas W. Richards

Officer-in-Charge: Lt. David A. Waltz

Hydrographic Surveys Branch, Hydrographic Field Party #4

Launch 1255

A. PROJECT ✓

This survey was accomplished under Project Instructions OPR-X115-PE/HSB-79, dated March 2, 1979, and amended by:

Change No. 1, April 18, 1979

B. AREA SURVEYED ✓

The area surveyed was in Lake Huron, offshore of Rogers City, Michigan, between Forty Mile Point and Adams Point and bounded by the following points:

Lat. 45°30.5'N, Long. 083°59.0'W

Lat. 45°33.0'N, Long. 083°57.0'W

Lat. 45°32.5'N, Long. 083°45.0'W

Lat. 45°28.2'N, Long. 083°45.0'W

Lat. 45°27.0'N, Long. 083°38.5'W

Lat. 45°24.6'N, Long. 083°40.0'W

This survey was conducted from August 21, 1980 to September 17, 1980, (J.D. 233 to 260) inclusive.

C. SOUNDING VESSEL ✓

All soundings obtained on this survey were obtained from NOAA Launch 1255 (EDP #1255). All survey records are annotated with the vessel number 1255.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

The following Raytheon fathometer equipment was used during the survey:

JD 233 - 239:	Recorder	Model #DE-723 Serial #37019
	ECU	Model #DE-723-D Serial #21310
	Digitizer	Model #DDM Serial #1907

JD 241 - 260:	Rcorder	Model #DE-723 Serial #37018
	ECU	Model #DE-723-D Serial #21310
	Digitizer	Model #DDM Serial #1907

No unusual problems were encountered with this equipment. The fathometer was monitored continuously while sounding and was under constant adjustment to insure that no initial corrections were necessary. Julian Days 233 through 239 required extensive rescanning in the field because recorder scales "C" and "D" were out of adjustment. These scales were consistently shoaler than the corresponding digitized depths by about 0.8 feet. This was later checked with a digital phase checker and corrected. Inexperienced scanning personnel did not recognize this condition at first, and rescanning was required.

In any case, all soundings are within the limits set by the Hydrographic Manual, Table 4-4, for soundings in exposed waters.

Settlement and squat tests on Launch 1255 were run on 8 July 1979 at Calcite, Michigan. The results of these tests are included in the Appendix of this report. Settlement and squat corrections will be applied via the TC/TI tape during plotting of the smooth sheet at the Atlantic Marine Center and were not applied to the field sheets.

Velocity and instrument corrections were determined by bar check and TDC casts. TDC casts were taken at the following locations and dates:

<u>DATE</u>	<u>POSITION</u>
JD 243	45°31'02"N, 83°46'20"W
JD 253	45°29'30"N, 83°45'36"W
JD 255	45°26'36"N, 83°46'36"W
JD 260	45°25'00"N, 83°05'10"W

Velocity corrections from these casts were grouped such that no sounding would be in error by more than 0.25% from velocity causes. Hydrography run on 11 and 12 September (J.D. 254 and 255) was grouped with Velocity Table Two. Weather during this time was dominated by strong offshore (southeast) wind, which is believed to have disturbed the water column. Other days of hydrography use Velocity Table One, whose weather was dominated by onshore (north) wind or calm. All correctors below actual depths observed were extrapolated from straight line extensions of the velocity curves. Supporting velocity correction data is included in the Appendix. Actual observed TDC values are recorded in the sounding volume.

A bar check taken in calm water was plotted with the TDC curve from JD 255. A displacement of about 0.3 foot was observed. This -0.3 foot instrument corrector will be applied on the TC/TI tape. The lengths of chain on the bar were checked before and after the survey, and a zero correction throughout its length was observed. The TDC used was a MARTEC Model 101-10, serial number 477.

E. SURVEY SHEETS

The field sheets were prepared in the field using a PDP8/e computer and a DP-3 complot plotter. Work sheets, smooth field sheets, and overlay sheets are included with this survey. Mainscheme hydrography is plotted on the smooth field sheets while crosslines, developments, splits, bottom samples, prior survey soundings, junction soundings, charted soundings, presurvey review items, and

aids to navigation are shown on various overlay sheets. Projection parameter tape listing for the field sheets is included in the Appendix of this report. The final smooth sheet and verification of this survey will be accomplished at the Atlantic Marine Center on the Harris/7 computer and the Xynetics 1201 plotter.

F. CONTROL STATIONS

Control stations used during this survey were either existing geodetic control stations published by NGS or were established by Hydrographic Surveys Branch Support Section to third order or better standards. All stations are referred to the North American 1927 datum. A list of all control stations used during this survey is included in the Appendix of this report.

G. HYDROGRAPHIC POSITION CONTROL

The method used to control this survey was the Del Norte Triponder System, operating in the range-range mode. The following equipment was used:

Mobile Station - NOAA Launch 1255

DMU Serial #395
Master Serial #162
Antenna Serial #53
Parallel Buffer Serial #118

Shore Stations:

Remote Code 74 Serial #1059
Remote Code 76 Serial #221
Remote Code 78 Serial #142

The master and antenna aboard Launch 1255 was installed on a steel pipe mast about 30 feet in height. Shore station units were mounted atop 10 or 20-foot Raydist tower sections. Shore stations were powered by two 12-volt auto batteries which were changed frequently.

The only problems encountered were caused by the water-surface grazing effect and the phase cancellation effect common with this type equipment. Such problems were solved by changing the station geometry or antenna height of the shore stations.

The control equipment was calibrated by twice daily sextant fixes, visibility permitting. Hydroplot Program RK561 was used to compute calibration fixes. An average of four fixes with less than five meter inverse was required for calibration. Averaged morning and evening calibrations were applied to a day's hydrography on the field sheet. An abstract of calibrations is included in the Appendix.

H. SHORELINE

There was no shoreline within the limits of this survey.

I. CROSSLINES

Crosslines constitute 16% of the mainscheme hydrography. 92% of the crossings agree within two feet. No soundings are in disagreement at crossing by more than five feet. The reasons for the disagreement of sounding at crossline is due to unpredicted changes in water level due to surface winds, and to steep bottom topography in areas of larger disagreement.

J. JUNCTIONS

This survey junctions with the following surveys:

1. H-9718 to the north;
2. H-9720 to the northeast;
3. LS 2025 to the south;
4. LS 2024 to the south;
5. LS 2022 to the south;
6. LS 2021 to the south;
7. H-9834 to the west.

Although this field sheet was plotted using a predicted water level corrector of about -3.0 feet, the hydroplot system apparently failed to apply the correction. This was checked by manually computing several random soundings.

When a predicted water level correction of -3.0 feet is made, the present survey agrees well with all junction soundings. 62% of Lake Survey Center soundings agree within one foot and 83% within two feet. 65% of MT MITCHELL soundings (H-9718 and H-9720) agree within one foot and 95% within two feet. 76% of Launch 1255's survey H-9834 field sheet agree within two feet. No junction sounding disagreed with the present survey by more than about six feet. The reasons for disagreement are believed to be unpredicted water level changes due to wind and to steep bottom topography.

The hydrographer recommends that in the junction areas, the soundings from the present survey be charted.

K. COMPARISON WITH PRIOR SURVEYS

There were no prior surveys made available to the field unit for comparison. *SEE VERIFICATION REPORT*

L. COMPARISON WITH THE CHART

There were no presurvey review items to be investigated within the limits of this survey. ~~SEE VERIFICATION REPORT~~

This survey was compared as the survey progressed with Chart 14880, 24th Edition and with Chart 14864, 20th Edition, enlarged to the scale of the survey. The following changes in charted depths were detected: *SEE VERIFICATION REPORT*

(1) A charted 120-foot sounding in position $45^{\circ}31.4'N$, $083^{\circ}54.3'W$ was found to be in 170 feet. A development of 100m spaced lines was run over the position. Recommendation: Chart depths from present survey. *Have 158 ft. depths approximately 500 meters south of the 120-ft charted depth. - see Verification Report*
north
6.

(2) A charted 138-foot sounding in position $45^{\circ}31.8^{\prime}N$, $083^{\circ}57.4^{\prime}W$ was found to be in about 120⁴³ feet. 100m spaced lines were run over the position. Recommendation: Chart soundings from present survey.

(3) A charted 90-foot sounding in position $45^{\circ}30.7^{\prime}N$, $083^{\circ}58.4^{\prime}W$ was found to be in about 70 feet.* 100m spaced lines were run over the position. Recommendation: Chart soundings from present survey. There is a 61-ft. depth approx. ^{250 meters east} of the charted 90-ft. depth. _{150 west}

(4) A charted 72-foot sounding in position $45^{\circ}30.9^{\prime}N$, $083^{\circ}57.3^{\prime}W$ was found to be in about 60 feet. Recommendation: Chart soundings from present survey. *concur* similar depths on the present survey.

(5) A charted 114-foot sounding in position $45^{\circ}30.8^{\prime}N$, $083^{\circ}56.4^{\prime}W$ was found to be in about 100¹¹ feet. 100m spaced lines were run over the position. Recommendation: Chart the sounding from the present survey. *concur*

NOTE: Items (2) through (5) are on steep bottom slopes and slight errors in transferring charted soundings to the field sheet could have produced these discrepancies. In any event, soundings from the present survey should be charted.

M. ADEQUACY OF SURVEY

This survey is complete and adequate to warrant^a its use to supersede prior surveys for charting in the common areas. See Verifiers Report Section 6.a.

N. AIDS TO NAVIGATION

There was only one floating aid to navigation within the survey area. This aid was located on JD 254, pos. 1363 as lighted buoy "I" Fl.W. radar reflector. It should be noted that Chart 14864, 20th Edition shows this buoy as "I" Fl.G. 6 sec with radar reflector symbol. Chart 14880, 24th Edition shows this aid as "I" Fl. 6 sec. without the radar reflector symbol. The 1980 Light List IV shows it as Fl. 6 sec. with radar reflector. It is recommended that both Chart 14864 and 14880 show this buoy as "I" Fl. 6 sec. with the radar reflector symbol.

Fixed aids to navigation are reported on Form 76-40 in the Appendix of this report.

O. STATISTICS

Number of Positions	1778
Nautical Miles of Sounding Line	366
Nautical Miles of Crossline	58
Nautical Miles of Development	5
Total Miles of Hydrography	429
Number of Bottom Samples	37
Number of Barchecks	2
Number of TDC Casts	4

P. MISCELLANEOUS

A dumping area for rock and fill is presently being used by the Michigan Limestone Operations of U.S. Steel Corporation. The dumping area is located 4000 feet due north of Calcite Breakwater Light (Signal No. 110) as shown on the enclosed sketch. Recommendation: Chart the dumpsite as shown on the enclosed sketch. ~~sketch~~ sketch was not ~~included~~ included with data for this survey.

Q. RECOMMENDATIONS

See Sections L and P for specific recommendations.

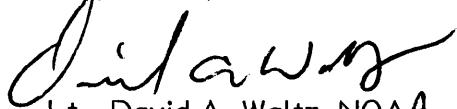
R. AUTOMATED DATA PROCESSING

<u>PROGRAM</u>	<u>DESCRIPTION</u>	<u>VERSION DATE</u>
RK111	Range-range Real Time Hydroplot	1/30/76
FA181	Range-azimuth Hydrolog	2/23/78
RK201	Grid, Signal, and Lattice Plot	4/18/75
RK211	Range-range Non-real Time Plot	1/15/76
RK212	Visual Station Table Load	4/01/74
RK300	Utility Computations	2/05/76
RK330	Reformat and Data Check	5/04/76
PM360	Electronic Corrector Abstract	2/02/76
RK407	Geodetic Inverse/Direct Computation	9/25/78
AM500	Predicted Tide Generator	11/10/72
RK530	Layer Corrections for Velocity	5/10/76
RK561	H/R Geodetic Calibration	2/19/75
RK562	Geodetic Calibration	9/10/74
AM602	Elinore-Line Oriented Editor	5/20/75

S. REFERENCE TO REPORTS

Descriptive Reports H-9834, H-9718, and H-9720. Control Report OPR-X115.

Respectfully submitted,



Lt. David A. Waltz, NOAA
OIC, HFP-4

APPROVAL SHEET
HYDROGRAPHIC SURVEY H-9845
HSB-20-4-79

The hydrographic data submitted with this report is adequate to justify the recommendations made by the Officer-in-Charge.

Daily supervision was not made by the Chief of Hydrographic Surveys Branch during the survey, and the Chief at the time of the survey was transferred before the survey was submitted for review. The field sheets and records were examined by Hydrographic Surveys Branch and the position plotting, fathogram scanning, and application of correctors were determined to be accurate. All detached positions were individually checked for plotting accuracy.

Approved and forwarded,


George W. Jamerson
LCDR, NOAA
Chief, Hydrographic Surveys Branch

MASTER SIGNAL TAPE FOR

OPR-X115-HSB-79

HSB-20-4-79

H-9345

LAKE HURON

012	7	45	29	50429	034	05	47872	250	0000	000000	H-10-MI-78	012
014	7	45	29	42809	033	58	13783	250	0000	000000	H-11-MI-78	014
016	7	45	29	32260	033	56	08498	139	0000	000000	H-5-MI-78	016
018	7	45	29	03580	033	54	34917	250	0000	000000	H-14-MI-78	018
107	7	45	29	10228	033	54	49063	139	0000	000000	FORTY MILE Pt. LIGHTHOUSE, 1956	107
108	7	45	26	01365	033	49	50657	250	0000	000000	H-17-MI-78	108
109	7	45	24	55069	033	49	11739	139	0000	000000	ROGERS CITY MUN. WATER TANK 1956	109
110	7	45	25	02997	033	46	22979	250	0000	000000	CALCITE BREAK WATER LT. (1956) No. 813	110
111	7	45	24	36049	033	47	12012	139	0000	000000	CALCITE LIGHT (1956)	111
112	7	45	24	51739	033	42	59723	250	0000	000000	ADAMS POINT USLS (1905)	112
114	7	45	25	21146	033	48	40173	139	0000	000000	ROGERS CITY W. BREAK WATER LT.	114
115	7	45	25	27245	033	48	43240	139	0000	000000	H-17A-MI-78 (1979)	115
116	7	45	23	25237	033	40	51530	250	0000	000000	TS-70P (1958, 1979)	116
117	7	45	24	47764	033	42	49279	250	0000	000000	H-13-MI-79	117

FOR VERIFICATION OF ABOVE G.P.'s SEE BOB DECROIX, HYDROGRAPHIC SURVEYS BRANCH SUPPORT SECTION.

Replaces C&GS Form 567.

NONFLOATING AIDS ~~FOR CHARTS~~

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

U.S. DEPARTMENT OF COMMERCE

ORIGINATING ACTIVITY

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)
HSB-HRP-4

STATE
Michigan

LOCALITY
Lake Huron
Rogers City

DATE
Oct. 1979

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

HYDROGRAPHIC PARTY
 GEODETIC PARTY
 PHOTO FIELD PARTY
 COMPILATION ACTIVITY
 FINAL REVIEWER
 QUALITY CONTROL & REVIEW GRP.
 COAST PILOT BRANCH
(See reverse for responsible personnel)

OPR PROJECT NO. OPR-X115

JOB NUMBER

SURVEY NUMBER
H-9845

DATA
NA 1927

METHOD AND DATE OF LOCATION
(See instructions on reverse aide)

CHARTING NAME

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

POSITION
LATITUDE
LONGITUDE
D.M. Meters
D.P. Meters

CHARTS AFFECTED

LIGHT
Forty Mile Point Lighthouse (1956)
LL #1333
Signal 107

45 29
10.228
83 54
49.063

NGS

14880

LIGHT
Calcite Breakwater Lt. (1956)
LL #1323
Signal 110

45 25
02.997
83 46
22.979

NGS

14880
14864

LIGHT
Calcite Light (1956) (Priv. maintd)
LL #1326
Signal 111

45 24
36.049
83 47
12.012

NGS

14880
14864

LIGHT
Rogers City Hbr. of Refuge West
Bkwr Lt. LL#1332. Sig. 114

45 25
21.146
83 48
40.173

HSB - 2nd order trav.
1979

14880
14864

LIGHT
Rogers City Hbr. of Refuge East
Bkwr Lt. LL#1331
See (L-95) (85)

45 25
21.466
83 48
36.455

HSB- 2nd order trav.
1979

14880
14864

LIGHT
Aero Beacon

45 24
38.84
83 48
38.28

automated charting
1979

14880
14864

LIGHT
Outgoing Rear Lt.
LL#1330 (Priv. maintd)

45 24
37.12
83 47
13.54

Automated charting

14864

LIGHT
Outgoing front Lt.
LL#1329 (Priv. maintd)

45 24
38.27
83 46
10.74

Automated charting

14864

LIGHT
Incoming rear range Lt.
LL#1328 (Priv. maintd)

45 24
36.04
83 47
12.01

Automated charting

14864

LIGHT
Incoming front range Lt.
LL#1327 (Priv. maintd)

45 24
39.01
83 47
05.83

Automated charting

14864

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

~~NONRECORDING CROSS~~ LANDMARKS FOR CHARTS

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

ORIGINATING ACTIVITY

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

Replaces C&GS Form 567.

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

REPORTING UNIT
(Field Party, Ship or Office)
HSB-HFP-4

STATE
Michigan

LOCALITY
Lake Huron
Rogers City

DATE
Oct. 1980

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

OPR PROJECT NO.
OPR-X115

JOB NUMBER

SURVEY NUMBER
H-9845

DATUM
NA 1927

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

CHARTS
AFFECTED

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

LATITUDE
/ D.M. Meters

LONGITUDE
/ D.P. Meters

OFFICE

FIELD

TANK Rogers City Municipal Tank, 1956
Sig. 109

45 24

55.069

83 49

11.739

NGS

Automated Charting

14880
14864

MAST Rogers City Radio WLC NE Mast, 1956

45 24

25.297

83 46

18.762

NGS

Automated Charting

14880
14864

SPIRE Rogers City St. Ignatius Spire, 1956
CATHOLIC CHURCH

45 24

50.707

83 48

36.526

NGS

Automated Charting

14880
14864

SILLO Silo

45 25

27.07

83 49

06.88

Automated Charting

14864

SPIRE Spire

45 26

02.55

83 49

13.07

Automated Charting

14864

TANK Tank

45 24

26.42

83 47

06.42

Automated Charting

14864

CHYS Chimneys

45 24

35.55

83 46

56.50

Automated Charting

14864

MAST Radio Mast F R

45 24

13.99

83 49

15.76

Automated Charting

14864

MAST Radio Mast Towers

45 24

23.78

83 46

24.98

Automated Charting

14864

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

NONFLUORESCENT OR LANDMARKS FOR CHARTS

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

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)

Replaces C&GS Form 567.

TO BE CHARTED
 TO BE REVISED
 TO BE DELETED

REPORTING UNIT (If field party, ship or office)
 HSB-HFP-4

STATE
 Michigan

LOCALITY
 Lake Huron
 Rogers City

DATE
 Oct. 1980

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 JOB NUMBER -----
 SURVEY NUMBER H-9845

DATUM
 NA 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	LATITUDE		LONGITUDE		OFFICE (See instructions on reverse side)	FIELD	CHARTS AFFECTED
		° /	// D.M. Meters	° /	// D.P. Meters			
MAST	Radio Mast (Tower)	45	24	25.18	83 46		Automated Charting	14864
MAST	Radio Mast (Tower)	45	24	26.25	83 46		Automated Charting	14864
MAST	Radio Mast (Tower)	45	24	23.86	83 46		Automated Charting	14864
MAST	Radio Mast (Tower)	45	24	23.21	83 46		Automated Charting	14864
	One tower not located by field							

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

H-9845

VELOCITY TABLE ONE

000600	0	0000	0001	000	125500	009345
000740	1	0002				
000320	1	0004				
000900	1	0006				
000930	1	0003				
001050	1	0010				
001130	1	0012				
001200	1	0014				
001230	1	0016				
001560	1	0020				
001900	1	0030				
002200	1	0040				
002500	1	0050				
002300	1	0060				
999999	0	0000				
002900	1	0070				

This velocity table was extended during verification to include several depths deeper than the original table.

VELOCITY TABLE TWO

000450	0	0000	0002	000	125500	009345
000530	1	0002				
000610	1	0004				
000690	1	0006				
000770	1	0003				
000350	1	0010				
000930	1	0012				
001000	1	0014				
001030	1	0016				
001160	1	0013				
001400	1	0020				
001300	1	0030				
002200	1	0040				
002600	1	0050				
002300	1	0060				
999999	0	0000				

FIELD WATER LEVEL NOTE

Actual water levels were not applied on the field sheet since non-periodic changes dominate the water level on Lake Huron.

ADR water level gages were installed at the following locations:

<u>SITE AND NUMBER</u>	<u>LOCATION</u>	<u>PERIOD</u>
Cheboygan MI 907-5076	45°38'50"N 84°28'14"N	25 June 1979 to End of Survey
Presque Isle Harbor, MI 907-5069	45°20'27"N 83°29'10"W	22 June 1979 to End of Survey

The permanent water level gage at De Tour Village, Michigan (907-5099) should also be used to provide data required to reduce soundings on this survey.

Contract observers were used to monitor all gages. A direct line of communication was maintained with the observers. Temporary gages were leveled and installed by field party personnel. Eastern Standard Time was the time zone used for temporary gage annotation.

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

WATER LEVEL NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center: CAM3

Hourly heights are approved for

Water Level Station Used: Presque Isle, Michigan (907-5069)

Period: August 21, 1979 - September 17, 1979

HYDROGRAPHIC SHEET: H - 9845

OPR- X115 - PE/HSB-79

Locality: Lake Huron

Plane of reference: Low Water Datum (IGLD 1955 : 576.8 Feet)

Remarks:

Zoning not required. Data from other gages on Lake Huron indicates no unusual water level movement during the survey period.

(57)

Philip C. Morris

Chief, Water Level Branch

GEOGRAPHIC NAMES

Name on Survey	Source of Name											
	A	B	C	D	E	F	G	H	K			
Forty Mile Pt. (control pt)												1
Schmidt Creek												2
Trout River												3
Rogers City (control pts)												4
Caloito (control pts)												5
Quarry Pt.												6
Little Lake												7
Swan Lake												8
Adams Pt. (control pt)												9
HAMMOND (Title)												10
MICHIGAN (Title)												11
LAKE HURON												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved:

Chas. E. Harrington
Chief Geographer - c3x5

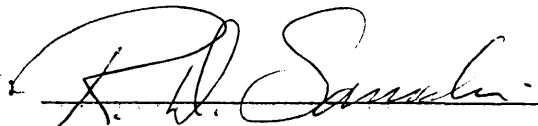
5 May 1982

APPROVAL SHEET
FOR
SURVEY H- 9845

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has ~~XXXXXX~~ been made. A new final sounding printout has ~~XXXXXXXX~~ been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the Verification Report.

Date: June 16, 1981

Signed:



Chief, Verification Branch

Reg. No. H-9845

DIGITAL DATA CERTIFICATION

The digital data for this survey have been completed by Marine Center personnel.

A microfilm record of the digital file (printout) and a digital data check plot have been made at NOS headquarters. The digital data are hereby certified for use in the NOS Automated Information System (AIS) for nautical charting.

Signature

Title

Date

ATLANTIC MARINE CENTER
VERIFICATION REPORT

REGISTRY NO.: H-9845

FIELD NO.: HSB-20-4-79

Michigan, Lake Huron, Adams Point to Hammond

SURVEYED: August 21 through September 17, 1980⁷⁹

SCALE: 1:20,000

PROJECT NO.: OPR-X115

SOUNDINGS: Raytheon DE-723D
Survey Fathometer

CONTROL NO.: Del-Norte
(Range-Range)

Chief of Party
.....
.....
.....
.....
.....
.....
Automated Plot by

T. W. Richards
D. A. Waltz
S. Weisner
M. Restrepo
L. Podleiszek
A. Armstrong
Xynetics 1201 Plotter (AMC)

1. INTRODUCTION

a. Unusual problems that were encountered are as follows:

(1) The lack of notes in the sounding volumes and the incomplete nature of the notes that were found on the raw data printouts detracted from the completeness on the survey, (No detached positions were abstracted).

(2) The field did not do any prior survey comparisons, they stated they didn't have any. The prior surveys were not identified in the Project Instructions for the area of this survey.

b. Notes and changes were made in red ink in the Descriptive Report during verification.

2. CONTROL AND SHORELINE

a. The source of control is adequately described in sections "F" and "G" of the Descriptive Report. There is a Control Report (included with the survey) that covers some of the stations on this sheet. filed with field records

b. No contemporary shoreline was available for this survey. - none required *dlw*

3. HYDROGRAPHY

a. The agreement of crossings on this survey is adequate; depths agree within the limits prescribed by the Hydrographic Manual.

b. The standard depth curves could be drawn in their entirety. Dashed curves, supplemental curves and brown curves were used to better delineate some features. There were a few areas of irregular bottom and developed areas where deeper soundings in excess could not always be included in the curves. The congestion of shoaler soundings precluded bringing these soundings to the zero excess level and in most cases they were within one foot of the shoaler soundings.

c. This survey is considered adequate to delineate the basic bottom configuration and to determine least depths when consideration is given to the supplemental data from the prior surveys that were brought forward to the present survey.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports comply with the requirements of the Hydrographic Manual with the exceptions listed in section "I" of this report and the following.

a. The electronic corrector tape abstract does not reflect the values obtained on the daily calibration forms and listed as means for the day (see day 242 or 260). The differences are not so great as to effect the quality of the smooth plotted data but it does detract from the survey as a whole.

b. Some data was lost when the field failed to change scales on the fathometer in time to get a continuous trace on the fathogram. The digital depths did not appear to be too good in these areas and were not used during verification (see day 243). This problem left some holidays in the survey area.

c. The velocity tables were not deep enough to cover the full range of depths on this survey, they were changed during verification. Only two bar checks were taken in the survey area.

5. JUNCTIONS

Adequate junctions were made with the following surveys:

H-9718	(1977) to the northwest
H-9720	(1977) to the northeast
LS-2025	(1958) to the southwest
LS-2024	(1958) to the south
LS-2022	(1958) to the south
LS-2021	(1958) to the southeast
H-9834	(1977) to the west
H-9894	(1980) to the east

The junctions with the 1977 work (H-9718, H-9720, H-9834) are complete and require no further work. The junctions with the 1958 work are complete, however the curves on these surveys should be revised to agree with the present survey. Contrary to the Project Instructions, section 4.8 regarding noncontemporary junctional surveys, the junctional surveys of 1958 to the south were found in substantial agreement with the present survey depths. Therefore, a junction was effected in this area.

6. COMPARISON WITH PRIOR SURVEYS

- a. LS-1182 (1909) 1:20,000
 LS-1183 (1909) 1:20,000
 LS-1184 (1909) 1:20,000
 LS-1838 (1945) 1:120,000

These are the most recent prior surveys in this area that provide complete coverage. It appears that the present survey is from 1 to 6 feet shoaler than these prior surveys. It should be noted that about 90% of the depths on these prior surveys are only from 0-2 feet deeper than the present survey. The greater differences (3-6 ft.) are generally from the 180-ft curve offshore to the limits of hydrography. The basic bottom configuration and least depths are in fair agreement.

It is reasonable to attribute these differences to the improved methods of obtaining soundings and to improvements in control methods.

Four shoal soundings were carried forward to the present survey from these prior surveys as follows:

(1) A 97-ft depth in approximate Latitude $45^{\circ}26'50''$, Longitude $83^{\circ}43'20''$ from LS-1182 (1909), shoalest depth on the present survey is 103 feet.

(2) A 66-ft. depth in approximate Latitude $45^{\circ}26'46''$, Longitude $83^{\circ}45'24''$ from LS-1182 (1909), shoalest depth from the present survey is 71 feet. 65 ft sounding exists 340 m to the west.

(3) A 89-ft. depth in approximate Latitude $45^{\circ}27'23''$, Longitude $83^{\circ}49'30''$ from LS-1183 (1909), shoalest depth from the present survey is 94 feet.

(4) A 37-ft. depth in approximate Latitude $45^{\circ}30'40''$, Longitude $83^{\circ}56'59''$ from LS-1184 (1909), shoalest depth from the present survey is 41 feet.

These four soundings are not charted, possibly due to the scale limitations of the chart. It is recommended that these soundings be given consideration by the chart compiler for charting on future editions of the charts.

With the addition of the bottom characteristics and these soundings described above to supplement the present survey it is adequate to supercede these prior surveys.

b. Wire-Drag Surveys

- LS-1182 (1909)
 LS-1183 (1909)
 LS-1184 (1909)

These surveys are basically hydrographic surveys with wire-drag swept areas portrayed on the most inshore areas of these surveys. There are no conflicts between the effective depths of these wire-drag areas and the present survey.

7. COMPARISON WITH CHARTS #14880 (25th Edition Oct. 20, 1979) #14864 (21st Edition May 3, 1980) #14881 (22nd Edition July 5, 1977)

a. Hydrography

Most of the ~~The~~ charted hydrography (90%) originates with the previously discussed prior surveys and no further consideration for those is required. The remaining 10% or approximately 38 depths originate with sources not ascertainable during verification. All but six of these depth agree within the limits as stated under the comparison with prior surveys section of this report. ~~The six charted soundings discussed below should be researched by the chart compiler as to source and value for possible retention on the chart.~~

(1) An ⁰12~~8~~-ft. depth in approximate Latitude $45^{\circ}31'30''$, Longitude $83^{\circ}54'15''$ was discussed in the Descriptive Report, section "L", item 1. (~~disproved by hydrographer~~)

(2) An 240-ft charted depth in approximate Latitude $45^{\circ}32'00''$, Longitude $83^{\circ}48'30''$. The shoalest depth in this area on the present survey is 247 feet.

(3) An 210-ft. charted depth in approximate Latitude $45^{\circ}30'40''$, Longitude $83^{\circ}46'27''$. The shoalest depth in this area on the present survey is 225 feet.

(4) An 138-ft charted depth in approximate Latitude $45^{\circ}26'19''$, Longitude $83^{\circ}43'04''$. The shoalest depth in this area on the present survey is 144 feet.

(5) An 34-ft charted depth in approximate Latitude $45^{\circ}26'19''$, Longitude $83^{\circ}43'04''$. The shoalest depth in this area on the present survey is 48 feet.

(6) An 34-ft. charted depth in approximate Latitude $45^{\circ}30'05''$, Longitude $83^{\circ}54'50''$. The shoalest depth in this area on the present survey is 49 feet.

These depths for the most part were not investigated by the field unit. They tend to be shoaler than the present survey depths which is the opposite of what was found to be the norm. ~~These depths are recommended for retention unless subsequent investigations have revealed otherwise, as they were not located or addressed by the hydrography.~~ The above soundings (items 1-6) are from miscellaneous sources and although not specifically investigated do not warrant retention as recommended

~~The field did not use the most recent edition of the charts for their comparisons and to what extent this might have contributed to the failure to investigate these items was not ascertained at this time.~~ It is further noted that while both charts described in the title of this section of the report cover the survey area only chart number 14880 was used for the chart mark-up. Both charts are at the same scale and the depths were compared and appear to be the same. The only difference is the enlargement of Rogers City Harbor on chart number 14864 and this falls outside the survey area. The 1979 25th edition of the chart (#14880) while subsequent to the hydrography was used as a comparison as there is no change of any depths between it and the 24th edition.

The present survey is adequate to supersede the charted information, ~~with the retention of the items listed in this report, the hydrographer's Descriptive Report, and when attention is given to the charted items from sources not readily ascertainable at the time of verification.~~

b. Aids to Navigation

The ^{charted} aids to navigation appear to adequately mark the intended features on this survey.


8. COMPLIANCE WITH INSTRUCTIONS


This survey adequately complies with the Project Instructions, with the exceptions listed elsewhere in this report.

9. ADDITIONAL FIELD WORK

This is a good basic survey. Additional work is only recommended if it is desirable to investigate the soundings addressed in this report.


J. Scott Bradford
Cartographic Technician


Leroy G. Cram
Cartographer


Harry R. Smith
Lead Cartographic Technician
Team Leader


INSPECTION REPORT

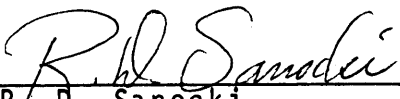
H-9845

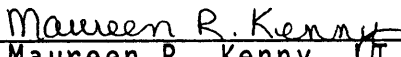
The completed survey has been inspected by the Hydrographic Inspection Team with regard to survey coverage, delineation of depth contours, development of critical depths, cartographic symbolization and verification or disproval of charted data. The Verification Report has presented the facts accurately and properly, the procedures used were appropriate, and the recommendations are logical and justifiable. The survey complies with National Ocean Survey requirements except as noted in the Verification Report. The survey records comply with NOS requirements except where noted in the Verification Report. The Hydrographic Inspection Team concurs with the verifier's findings, actions, and recommendations.

Examined and Approved
Hydrographic Inspection Team


Karl Wm. Kieninger, CDR, NOAA
Chief, Processing Division


Ronald W. Jones, LCDR, NOAA
Field Procedures Officer
Operations Division


R. D. Sanocki
Chief, Verification Branch
Processing Division


Maureen R. Kenny, LT, NOAA
Chief, EDP Branch
Processing Division

Approved/Forwarded
June 15, 1981


Richard H. Houlder, RADM, NOAA
Director, Atlantic Marine Center



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352:SRB

December 30, 1981

TO: Glen R. Schaefer *G*
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch *qu*
Stephen R. Baumgardner

FROM: Stephen R. Baumgardner
Quality Evaluator

SUBJECT: Quality Control Report for H-9845 (1979), Michigan, Lake Huron,
Adams Point to Hammond

A quality control inspection of H-9845 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, decisions made and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a one-half scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to the National Ocean Survey's standards and requirements except as stated in the Verifier's Report.

cc:
C351





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
~~NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION~~ CHARTING AND GEODETIC
Rockville, Md. 20852
SERVICES

JAN 19 1983

N/CG241:SVJ

TO: N/MOA - Richard H. Houlder

FROM: *fw* N/CG2 - C. William Hayes *Lawson RB*

SUBJECT: H-9845 (1979), Michigan, Lake Huron, Adams Point to Hammond, Report of Compliance with Project Instructions

The smooth sheet and Descriptive Report for the subject survey have been examined. This survey, except as noted in the Quality Control Report, dated December 30, 1981 (copy attached), and the Hydrographic Survey Inspection Team Report, dated June 15, 1981, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-X115-PE/HSB-79, dated March 2, 1979.

Attachment

cc:
N/CG242 w/o att.





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

C352:SRB

December 30, 1981

TO: Glen R. Schaefer *G*
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch *qu*
Stephen R. Baumgardner

FROM: Stephen R. Baumgardner
Quality Evaluator

SUBJECT: Quality Control Report for H-9845 (1979), Michigan, Lake Huron,
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cc:
C351



