9906

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. H-9906

Office No. WH-20-3-80

LOCALITY

State Michigan

General Locality Lake Huron

Locality Offshore Port Sanilac to Forestville

1980

CHIEF OF PARTY
CDR F.P.Rossi

LIBRARY & ARCHIVES

DATE March 29, 1982

☆U.S. GOV. PRINTING OFFICE: 1980—668-537

9906

Area 7
CHT: 14862
14860

FORM C&GS-537 (5-66)

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-9906

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

FIELD NO.

WH-20-3-80

State MICHIGAN

General locality Lake Huron

Locality ~~Southwest Coast~~ OFFSHORE PORT SANILAC TO FORESTVILLE

Scale 1:20,000 Date of survey 3 September-10 September 1980

Instructions dated 31 March 1980 Project No. OPR X115-WH/HSB-80

Vessel WHITING Launches 1014 (2932) and 1015 (2931)

Chief of party CDR Frank P. Rossi

Surveyed by N. Prahl, D. Mason, R. Mann, J. Gardner, D. Bland, J. Grant

Soundings taken by echo sounder, ~~hand lead, pole~~ ROSS Model 5000

Graphic record scaled by WHITING Personnel

Graphic record checked by NP, DM, RM, JCG, DB, JBG

Protracted by _____ Automated plot by ~~HYDROPLOT~~ XYNETICS 1201 PLOTTER (AMS)

Soundings penciled by _____

Soundings in ~~fathoms~~ feet at ~~MEAN LOW WATER~~ LOW WATER DATUM ~~Lake Level~~ (IGLD 1955: 576.8 FEET)

REMARKS: All times are Coordinated Universal Time

STANDARDS CK'D. 9-26-83
C.Clay

USCOMM-DC 37009-P66

DESCRIPTIVE REPORT

TO ACCOMPANY SURVEY

H-9906

WH-20-3-80

A. PROJECT

Hydrographic Survey H-9906, WH-20-3-80, was conducted under Project Instructions for ~~Operation~~ OPR X115-WH/HSB-80, Lake Huron, dated March 31, 1980, as amended by the following changes:

Change No.	Date
1	04/04/80
2	04/11/80
3	04/23/80
4	05/21/80
5	07/16/80
6	07/23/80
7	09/09/80

The intent of this project was to complete contemporary basic hydrographic coverage of the inshore area from the five-fathom curve to the twenty-meter curve.

B. AREA SURVEYED

Area surveyed was Lake Huron, Southwest Coast, bounded by 43°39.0'N Latitude to the North, 43°26.1'N Latitude to the South, 82°29.3'W Longitude to the East, and 82°35.1'W Longitude to the West. The survey was conducted from September 3, 1980, to September 10, 1980.

C. SOUNDING VESSELS

Sounding vessels for this survey were WHITING Launches 1015 and 1014, EDP numbers for these vessels are 2931 and 2932 respectively. Both vessels were equipped with standard hydrographic equipment. Neither of the vessels encountered any mechanical problems during the survey.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Launches 1015 and 1014 are equipped with a Ross Model 5000 ~~Fathometer~~ echo sounder, serial numbers 1087 and 1049 respectively. Phase check calibrations were performed on the Ross Model 5000 in accordance with the Hydrographic Manual. These calibrations were conducted regularly and are noted on all fathograms. Analog and digital output compared satisfactorily, and no instrument errors were observed. Bar checks were taken daily, weather and lake conditions permitting. The quality of bar checks varied with wind and lake conditions.

Velocity corrections were based on bar check averages checked with TDC casts taken at various times during the survey with a Martek Model 167 unit (s/n 127). Data from bar checks and TDC casts were compiled in direct comparison logs, and velocity corrections were computed in accordance with the Hydrographic Manual. Velocity corrections for Tables I and II* were based on bar check averages

* Table II was recomputed and reapplied during processing of this survey.

averaged with TDC cast data. Velocity and TRA corrections were applied to all soundings on the field sheet. The launches were run at a variety of speeds from 1500 RPM's to 2600 RPM's. Settlement and squat trials were run on Launch 1014 on July 10, 1980, and on Launch 1015 on September 1, 1980. The graphs and corresponding tables for settlement and squat are included in the appendix. All depths noted in this report are referenced to low water datum.

E. HYDROGRAPHIC SHEETS

The field sheets were prepared by WHITING personnel using a Houston Instruments DP-3 Roll Plotter, s/n 4680-1. For processing purposes, the area was divided into two plotter sheets. Plotter origins for the sheets are as follows:

North	South
43°31'36"N	43°24'55"N
82°28'48"W	82°27'18"W

A total of four plotter sheets are submitted with this survey. One pair covers the main scheme lines and crosslines; the other pair contains the developments, splits, and bottom samples done on H-9906.

F. CONTROL STATIONS

The following signals were used for electronic positioning sites, or for calibration signals.

Signal	Description	Year
100	CASEY (Port Sanilac Argo)	1980
102	POTH (Bayfield Argo)	1980
104	H-2-MI-79 (Port Huron Argo)	1979
120	Sanilac E-Cal	1980
121	Sanilac W-Cal	1980

Stations 100, 102, and 104 were used as electronic control sites and positions for these stations were obtained from NGS published horizontal control data.

Stations 120 and 121 were used as calibration signals only. They were established by WHITING personnel and are non-recoverable stations. All computations will be submitted to Operations Division, Atlantic Marine Center, Norfolk, Virginia, upon completion of OPR-X115-WH-80. See section 4a of Verification Report

G. HYDROGRAPHIC POSITION CONTROL

The range-range hydrography was performed by Launches 1015 and 1014. Both launches were equipped with an Argo Control and Display Unit, Range Processing Unit, and Chart Recorder. The ~~hydroplot~~ HYDROPLOT system was used in all range-range work. Slave Argo stations were chosen so that hydrography was run where intersections of rates was greater than 30° and less than 150°. Ranges and depths were recorded in real time using program RK-112.

Calibrations were taken two times daily in accordance with the Hydrographic Manual. Daily correctors were computed by known ranges from stations 120 and 121 to stations 100, 102, and 104. Distances of 5.42 lanes to station ~~104~~ 100 were computed for calibrating lanes at station 120. Distances of 5.30 lanes to station 100, 754.14 lanes to station 102 and 526.44 lanes to station 104 were computed for calibrating at station 121.

753.96 lanes to 102 and 526.41 to 104

The following CDU/RPU, Chart Recorder pairs were used during the project:

JD	VESSEL	CDU S/N	RPU S/N	CHART RECORDER S/N
247-254	2932	C047822	R047843	S097958
247-253	2931	C037953	R0379119	S097948

H. SHORELINE See section 2.b. of Verification Report

No shoreline or inshore features are within the survey limits.

I. CROSSLINES

The percentage of crosslines run in this survey was 18%. The nautical miles of crosslines run were 47.1 nautical miles. Agreement with mainscheme lines was excellent, with agreement of 0-2 feet in all areas. Crosslines were run in a North-South direction (350°-170°) to the East to West main scheme lines.

J. JUNCTIONS See sections 5 and 7 of Verification Report

H-9906 junctioned to the Southwest with Sheet No. 6 of 7, File #LS-1973, 1:10,000 scale, 1956; to the west with Sheet No. 7 of 7, File #LS-1974, 1:10,000 scale, 1956; to the west with Sheet No. 1 of 10, File #LS-2000, 1:10,000 scale, 1957; to the Northwest with Sheet No. 2 of 10, File #LS-2001, 1:10,000 scale, 1957; and to the east with CHS Sheet No. 3831, 1:100,000 scale, 1974. H-9906 also junctions to the south with unverified survey H-9898 (1980); and to the north with unverified survey H-9907 (1980). Both surveys were completed in 1980 by the WHITING.

During the entire period of this survey, the lake level was approximately 3.0 feet above datum. The difference in depth was not applied to the smooth data, but was taken into consideration when junctioning with the prior surveys.

H-9906 was junctioned with Sheet No. 6 of 7, File #LS-1973, 1:10,000 scale, 1956 to the southwest. Junctioning was done in the area bounded by:

North:	43°29.4'N	East:	82°31.1'W
South:	43°26.2'N	West:	82°33.0'W

Junctioning agreement was within 0-3 feet in all areas.

H-9906 was junctioned with Sheet No. 7 of 7, File #LS-1974, 1:10,000 scale, 1956 to the west. Junctioning was done in the area bounded by:

North:	43°34.0'N	East:	82°32.0'W
South:	43°29.0'N	West:	82°34.1'W

Junctioning agreement was within 0-3 feet in all areas.

H-9906 was junctioned to the west with Sheet No. 1 of 10, File #LS-2000, 1:10,000 scale, 1957. Junctioning was done in the area bounded by:

North:	43°38.5'N	East:	82°33.1'W
South:	43°34.1'N	West:	82°35.0'W

Junctioning agreement was within 0-4 feet in all areas.

H-9906 was junctioned to the northwest with Sheet No. 2 of 10, File #LS-2001, 1:10,000 scale, 1956. Junctioning was done in the area bounded by:

North:	43°39.0'N	East:	82°33.7'W
South:	43°38.5'N	West:	82°35.1'W

Agreement was within 0-3 feet in all areas.

H-9906 was junctioned to the East with CHS Sheet No. ~~3931~~ 3831, 1:100,000 scale, 1974. Junctioning was done in the area bounded by:

North:	43°39.0'N	East:	82°29.5'N
South:	43°26.1'N	West:	82°34.1'W

Agreement was within 0-15 feet, agreement being best the closer

inshore the comparison was. The average comparison on the southeastern half of the survey was 8-feet deeper than the CHS survey depths. The average comparison on the northeastern half of the survey was 5-feet deeper than the CHS survey depths. See letter to AMC, Processing, in References to Report.

H-9906 was junctioned to the South with unverified WHITING survey H-9898. Agreement was within 0-1 foot.

H-9906 was junctioned to the North with unverified WHITING survey H-9907. Agreement was within 0-3 feet.

K. COMPARISON WITH ~~THE CHART~~ PRIOR SURVEYS See sections 4.h. and 7 of Verification Report.

No prior surveys were available for comparison with H-9906.

L. COMPARISON WITH THE CHART See section 8 of Verification Report.

H-9906 was compared with NOS Chart 14862, 1:120,000 scale, 23rd Edition, July 29, 1978. Comparisons were made in the area bounded by:

North:	43°39.0'N	East:	82°29.5'W
South:	43°26.1'N	West:	82°34.1'W

Overall comparison with the chart was very good. Depths were from 0-3 feet deeper than those on the chart in most areas. There were three areas where depths were found to be more than 3-feet deeper.

The first area is centered at 43°29.4'N, 82°31.1'W. The charted depth in that area is 41 feet while the survey depth is 46 feet. The survey depth is 5-feet deeper than the charted depth. Concur, recommend charting of present depths

The second area is centered at 43°30.9'N, 82°32.0'W. The charted depth in this area is 33 feet, the survey depth in the area is 45 feet. The survey depth is 12-feet deeper than the depth shown on the chart. About 250 meter NE is a survey sounding of 35 feet.

The third area is centered at 43°32.4'N, 82°32.7'W. The charted depth in the area is 31 feet, the survey depth is 40 feet. The survey depth is 9-feet deeper than the depth on the chart. A survey depth of 31 feet is approximately 400 meters SE of the charted sounding.

It is recommended that NOS Chart 14862 be re-evaluated and updated according to the findings of this survey.

H-9906 was compared with NOS Chart 14860, 1:500,000 scale, 27th Edition, February 9, 1980. Comparisons were made in the area bounded by:

North:	43°39.0'N	East:	82°29.5'W
South:	43°26.1'N	West:	82°34.1'W

The entire survey was compared with NOS Chart 14862, 1:120,000 scale. There were no discrepancies found which were not discussed under the comparisons with Chart 14862.

The three feet above datum difference in lake level was taken into consideration when comparing these charts with the survey.

M. ADEQUACY OF SURVEY See sections 4.h., 7 and 8 of Verification Report.

This survey is complete and adequate to supersede prior surveys.

N. AIDS TO NAVIGATION

No floating aids to navigation were within the limits of H-9906.

O. STATISTICS

VESNO	NUMBER OF POSITIONS	TOTAL MILES
2931	911	222.80
2932	944	250.00

Total Miles of Hydro: 472.80

Water Levels Established: 1

Total Positions: 1,905

P. MISCELLANEOUS

None.

Q. RECOMMENDATIONS

Refer to Chart Comparison recommendations.

R. AUTOMATED DATA PROCESSING

Program No.	Description	Version Date
RK112	R/R Real Time Hydroplot	08/31/80
RK201	Grid & H/R Lattice Plot	04/18/76
RK300	Utility Computations	07/25/78
RK330	Reformat & Data Check	05/04/76
AM530	Layer Corrections for Velocities	05/10/76
AM602	Extended Line Oriented Editor	05/21/75
AM407	Geodetic Inverse/Direct Computations	09/25/78
RK612	Line Printer Listings	03/22/78
RK211	R/R NRT Plot	07/25/80
RK561	Geodetic H/R Calibration	02/19/75
PM360	Electronic Corrector Abstract	02/02/76

S. REFERENCES TO REPORTS

See attached letter.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA Ship WHITING
439 W. York Street
Norfolk, Virginia 23510

November 14, 1980

TO : AMC Processing, OA/CAM

FROM : Commander Frank P. Rossi, NOAA
Commanding Officer, NOAA Ship WHITING

SUBJECT: 1980 Lake Huron Surveys: Depth Descrepency between WHITING's Surveys and Canadian Surveys.

In late October I talked with Ross Douglas, Canadian Hydrographic Service, Burlington, Ontario, about our junction problem with the Canadian Surveys. He said that they were having problems with these Canadian Surveys, and indicated they were rejecting some of the work. The surveys were primarily for limnological studies and hydrographic use of them was secondary.

The fact that our junctions get worse the further one is from Port Huron - Sarnia would indicate that the CHS may be experiencing a problem with the propagtion velocity they used. They did not calibrate the Mini-Fix on the United States side of their work. A modest error in the propagation velocity will produce a considerable position error when carried to distances greater than 30 miles.

The WHITING generally did not work more than 15 miles from a calibration site; therefore, there should be little error (less than 10 meters) in the WHITING's positions.

APPROVAL

Supervision of all field and office work on this hydrographic survey was continuous on a day to day basis to ensure completeness of the survey and that all work was done in accordance with the Project Instructions.

Approved/Forwarded 11/24/86

Frank P. Rossi
CDR, NOAA
Commanding Officer, NOAA Ship WHITING

Respectfully submitted

Deborah A. Bland, LTjg NOAA

Deborah A. Bland, LTjg, NOAA

LIST OF STATIONS

100	6	43	26	00309	082	32	20465	250	0000	164510	CASEY (Port Sanilac Argo)
102	6	43	34	20443	081	42	30102	250	0000	164510	POTH (Bayfield Argo)
104	6	43	00	23671	082	25	21248	250	0000	164510	H-2-MI-79 (Port Huron Argo)
120	4	43	25	49004	082	32	04926	243	0000	000000	SANILAC E-CAL
121	3	43	25	48998	082	32	05664	243	0000	000000	SANILAC W-CAL

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

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

~~NONFLOATING AIDS OR~~ LANDMARKS FOR CHARTS

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

(See reverse for responsible personnel)

[X] TO BE CHARTED [ ] TO BE REVISED [ ] TO BE DELETED	REPORTING UNIT *(Field Party, Ship or Office)*	STATE	LOCALITY	DATE
	NOAA Ship WHITTING	MICHIGAN	LAKE HURON	~~11/3/80~~

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

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR X115-WH/HSB-80		H-9906	NAD 1927

CHARTING NAME	DESCRIPTION *(Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)*	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION *(See instructions on reverse side)* OFFICE	FIELD	CHARTS AFFECTED
TANK	Port Sanilac Tank	43 26	05.9	082 33	12.0		VIS ~~8/3/80~~	14860 ~~14862~~
SPIRES	Forester Spires	43 30	05.9 06.0	082 33 082 34	59.9 12.0		VIS ~~8/3/80~~	~~14862~~

VELOCITY TAPE I

VESSEL 2931

JD 247-253

000200	0	0000	0001	000	293100	009906
000430	0	0002				
000530	0	0000				
000630	1	0002				
000740	1	0004				
000850	1	0006				
999999	0	0000				

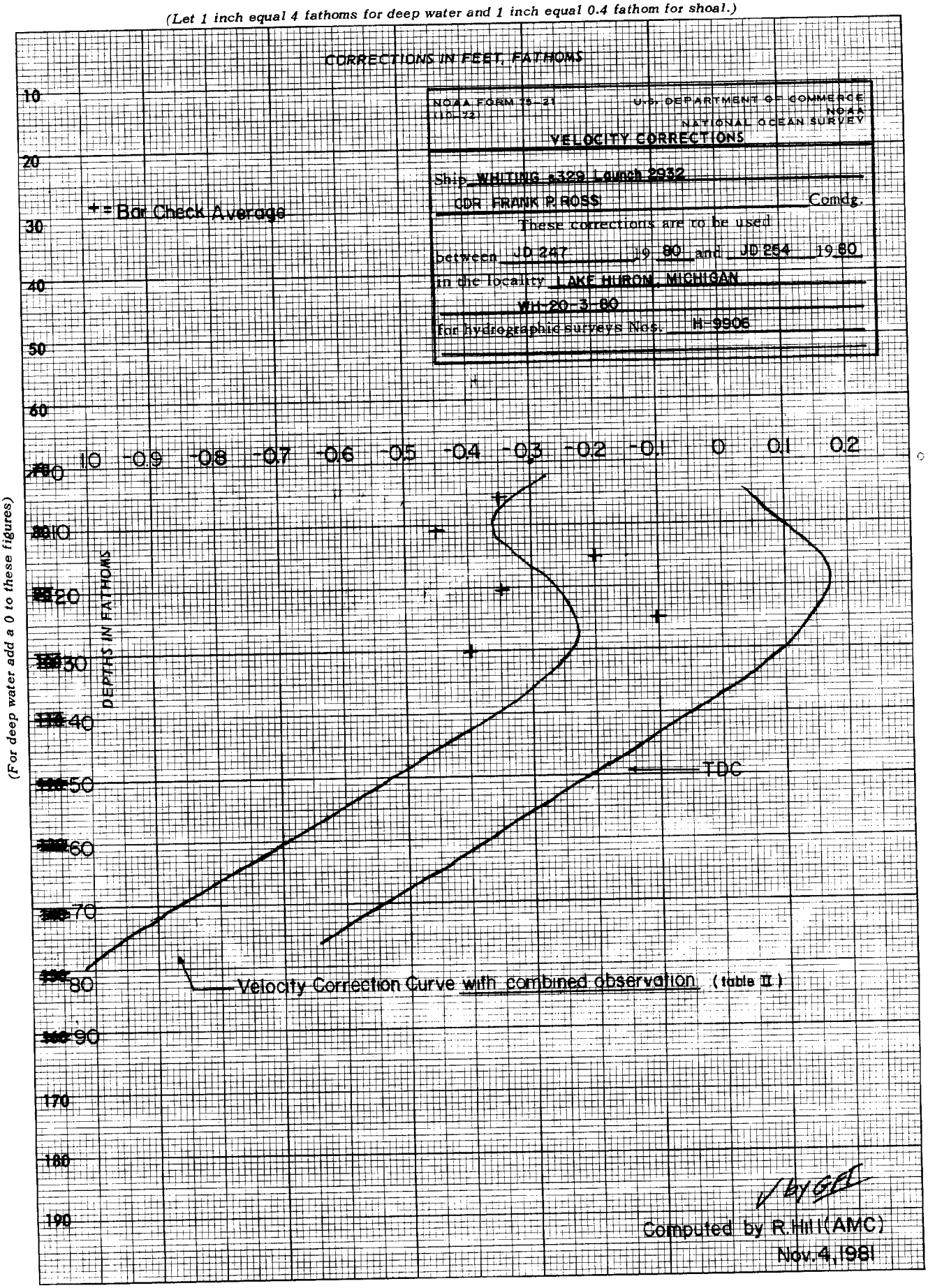
BAR CHECK DATA AVERAGES

VESNO 2931

JD 247-253

DEPTH	CORRECTION
5.10	-0.10
10.10	-0.10
15.08	-0.08
20.05	-0.05
25.03	-0.03
29.85	+0.15
34.85	+0.15
39.87	+0.13
45.10	-0.10

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)



☆U.S. GOV. PRINTING OFFICE: 1979—66

VELOCITY TABLE II
VESSEL 2932
JD 247-- JD 254

000035 1 0002 0002 000 293200 009906

000165 1 0004

000357 1 0002

000484 1 0004

000602 1 0006

000718 1 0008

999999 1 0000

Computed by R. Hill (AMC) Nov.4,1981

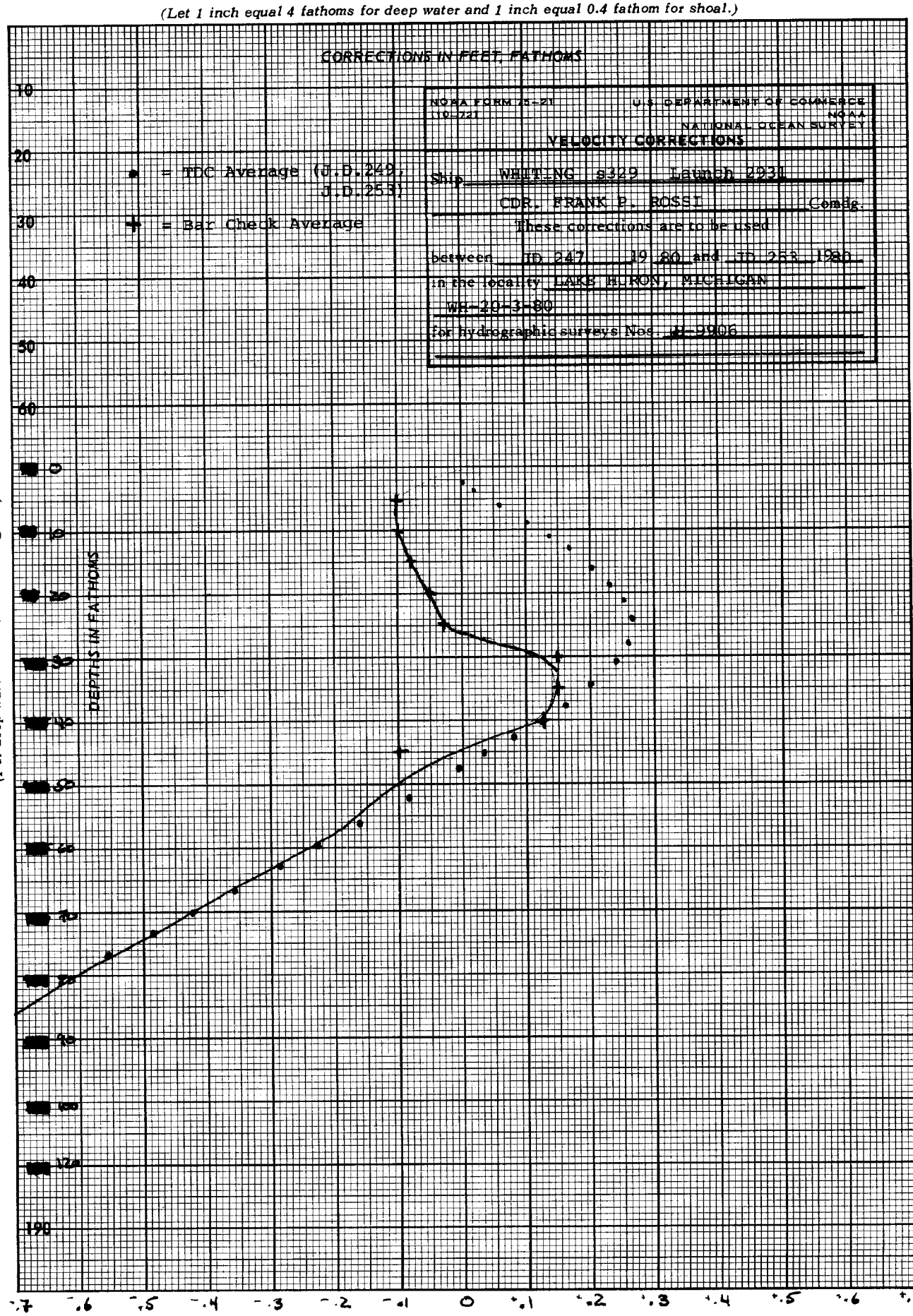
BAR CHECK DATA AVERAGES

VESNO 2932

JD 247-254

DEPTH	CORRECTION
5.35	-0.35
10.45	-0.45
15.20	-0.20
20.35	-0.35
25.10	-0.10
30.40	-0.40

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)



(For deep water add a 0 to these figures)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1972-761-

SETTLEMENT AND SQUAT TRIALS

Settlement and squat trials were run on launches 1014 and 1015 in Lake Huron, Michigan, in July and September 1980. Trials were run at a point of known depth, marked by a buoy. Results are the average of one run towards the buoy and one run away from the buoy with marks being taken when the buoy was abeam the transducer. The speeds and results are listed below.

SPEED IN RPM's	CORRECTION 1014	CORRECTION 1015
600	+0.10	+0.00
800	+0.10	+0.10
1000	+0.30	+0.10
1200	+0.30	+0.20
1400	+0.30	+0.20
1600	+0.30	+0.30
1800	+0.30	+0.40
2000	+0.40	+0.10
2200	+0.20	+0.10
2400	-0.10	-0.20
2600	-0.40	-0.40

Corrections for settlement and squat are made on the TC/TI Tape. Periods of reduced speed during actual hydrography are noted in the sounding volumes and on the printouts.

See the attached graph of the correctors versus RPM's for each vessel.

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 75-21 U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

SETTLEMENT AND SQUAT ~~XXXXXXXXX~~ CORRECTIONS

Ship WHITING Launch 2931 (1015)
FRANK P. ROSSI Comdg.

These corrections are to be used
between 7 July 1980 and 27 Oct. 1980
in the locality Lake Huron, MI
Western Coast
for ~~XXXXXXXXXXXXXXXXXXXX~~ OPR X115-WH/HSB-80

RPM's

DEPTHS IN FATHOMS

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600

RPM's	Correction in Feet
IDLE - 1000	0.0
1000 - 1450	0.2
1450 - 2020	0.4
2020 - 2200	0.2
2200 - 2340	0.0
2340 - 2520	-0.2
2520 - FULL	-0.4

-.4 -.3 -.2 -.1 0 +.1 +.2 +.3 +.4

Correctors

(For deep water add a 0 to these figures)

1240

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

CORRECTIONS IN FEET, FATHOMS

NOAA FORM 75-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

SETTLEMENT AND SQUAT ~~XXXXXXXX~~ CORRECTIONS

Ship WHITING Launch 2932 (1014)

FRANK P ROSSI Comdg

These corrections are to be used

between 7 July 19 80 and 27 Oct 1980

in the locality Lake Huron, MI

Western Coast

for ~~XXXXXXXXXXXXXXXXXXXX~~ OPR X115-WH/HSB-80

RPM's

600

800

1000

1200

1400

1600

1800

2000

2200

2400

2600

DEPTHS IN FATHOMS

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

-.4 -.3 -.2 -.1 0 +.1 +.2 +.3 +.4

Correctors

RPM's	Correction in feet
IDLE - 600	0.0
600 - 1360	0.2
1360 - 2060	0.4
2060 - 2280	0.2
2280 - 2440	0.0
2440 - 2580	-0.2
2580 - FULL	-0.4

(For deep water add a 0 to these figures)

1240

FIELD WATER LEVEL NOTE

Field water level reductions were not performed on Hydrographic Survey H-9906. A permanent primary gage located at Harbor Beach and monitored by a paid observer was in proper operating order throughout the survey. This gage was located at 43°50.7'N latitude and 82°38.6'W. longitude. WHITING personnel installed and monitored a secondary ADR gage at a seasonal water level gage site in Port Sanilac. This gage was also in proper operating order throughout the survey and was located at 43°26.0'N latitude and 82°32.2'W longitude.

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: Port Sanilac, Michigan (907-5011)

Period: September 5-12, 1980

HYDROGRAPHIC SHEET: H - 9906

OPR- X115-WH/HSB - 80

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.

Philip C. Morris

Chief, Water Level Branch

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-9906

GEOGRAPHIC NAMES (FIELD)

Name on Survey	A ON CHART NO. 14860, 14862	B ON PREVIOUS SURVEY NO. 14509	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
~~MICHIGAN~~	XXX									1
LAKE HURON	XXX									2
PORT SANILAC	XXX									3
FORESTER	XX									4
RICHMONDVILLE	XX									5
FORESTVILLE	XX									6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
					Approved:					19
										20
					Chas. E. Hemmington					21
					Chief Geographer - C3x5					22
					14 JUNE 1982					23
										24
										25

LS0
LS5
LS51

* U.S. G.P.O. 1972-769-565/516 REG.#6

APPROVAL SHEET
FOR
SURVEY H-9906

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/~~has not~~ been made. A new final sounding printout has/~~has not~~ 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: January 1982

R. W. Smith

Chief, Verification Branch

NOAA FORM 77-27 (5-77) | U. S. DEPARTMENT OF COMMERCE NOAA | HYDROGRAPHIC SURVEY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9906

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	4
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS./ARC, EXCESS	3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						1
CAHIERS	X		1 Box			
VOLUMES						2
BOXES			1- Sounding Vols., 1-Env. misc, 2-Smooth P/Os			

T-SHEET PRINTS (List) NONE

SPECIAL REPORTS (List)

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

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			1905
POSITIONS CHECKED		1905	1905
POSITIONS REVISED		34	34
SOUNDINGS REVISED		118	118
SOUNDINGS ERRONEOUSLY SPACED		212	212
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED			
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	20		20
VERIFICATION OF CONTROL		8	8
VERIFICATION OF POSITIONS		47	47
VERIFICATION OF SOUNDINGS		143	143
COMPILATION OF SMOOTH SHEET		63	63
APPLICATION OF TOPOGRAPHY			
APPLICATION OF PHOTOBATHYMETRY			
JUNCTIONS		1	1
COMPARISON WITH PRIOR SURVEYS & CHARTS		40	40
VERIFIER'S REPORT		11	11
OTHER		8	8
TOTALS	20	341	361

Pre-Verification by R. Whitfield	*Beginning Date* 12/5/80	*Ending Date* 12/9/80
Verification by R. Whitfield, R.Hill, R.Roberson	*Beginning Date* 1/13/81	*Ending Date* 11/20/81
Verification Check by G.F. Trefethen	*Time (Hours)* 59	*Date* 12/02/81
Marine Center Inspection by H.I.T.	*Time (Hours)* 8	*Date* 1/15/82
Quality Control Inspection by Dawn Gardner	*Time (Hours)* 30	*Date* 5/17/82
Requirements Evaluation by Stephen J. Perry	*Time (Hours)* 4.0	*Date* 8/4/83

G. Myers 6/11/82 4 hrs.

REGISTRY NO. 9906

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE_____ TIME REQUIRED_____ INITIALS_____

REMARKS:

ATLANTIC MARINE CENTER
VERIFICATION REPORT

REGISTRY NO.: H-9906 FIELD NO.: WH-20-3-80

Michigan, Lake Huron, Offshore Port Sanilac to Forestville

SURVEYED: September 3 through September 10, 1980

SCALE: 1:20,000 PROJECT NO.: OPR-X115

SOUNDINGS: Ross Model 5000 Digital Echo Sounder CONTROL: Argo (Range/Range)

Chief of Party ..... F. P. Rossi
Surveyed by ..... N. A. Prahl
..... C. D. Mason
..... R. G. Mann
..... D. A. Bland
..... J. B. Grant
Automated Plot by ..... Xynetics 1201 Plotter (AMC)

1. Introduction

a. During processing of this survey a discrepancy was found in the velocity correction curve for velocity Table II. It was determined that the records for the TDC had been erroneously recorded. The resultant curve was in error. The corrected values were used and a new velocity curve was constructed and a new velocity Table II was determined. The new table was then applied to the survey and the smooth sheet plotted.

b. The characteristic "medium" was used for some bottom characteristics on this sheet. It should be noted that there is no cartographic code for "medium" in the Hydrographic Manual.

c. Notes in the Descriptive Report were made in red during verification.

2. Control and Shoreline

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

b. Shoreline was not applied to this survey because there are no existing shoreline manuscripts. Charted shoreline is at a scale of 1:120,000. Transfer of charted shoreline is not practical because of the scale difference between the chart and the survey.

3. Hydrography

a. Depths at crossings are in good agreement.

b. The standard depth curves could be adequately delineated. The charted twenty four (24) foot curve was also drawn. An additional thirty-six (36) foot curve was drawn to show additional bottom features. Several brown curves were also used to show bottom configuration.

c. The development of bottom configuration and determination of least depths is considered generally adequate. The transfer of shoaler depths on features from prior surveys was necessary to supplement the present survey.

4. Condition of Survey

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

a. As stated, stations 120 and 121 are non-recoverable; however, the field data for these stations were not submitted to Operations Division, Atlantic Marine Center.

b. Daily bar checks were not taken in accordance with section 1.5.2 of the Hydrographic Manual.

c. Electronic corrector abstracts in the Descriptive Report did not coincide with the listings of the electronic corrector tapes.

d. There were no comparisons with prior surveys. The hydrographer noted that they were not "available". The Project Instructions (section 10.4) state that the prior surveys will be transmitted four (4) weeks from receipt of a request for prior surveys.

e. Velocity Table I did not coincide with the data on the velocity tape.

f. Velocity Table II was not computed correctly and was redone during verification of the survey (see section 1.a of this report).

g. Section 0. of the Descriptive Report (Statistics) does not support itself with respect to the number of positions. Only two vessels were used and the total number of positions exceeds the sum of the number of total positions.

h. Section M of the Descriptive Report states that this survey is adequate to supersede the prior surveys. The hydrographer failed to make a comparison; therefore a statement concerning supersession cannot be safely made.

i. The NOAA Form 76-40 "NONFLOATING AIDS OR LANDMARKS FOR CHARTS" were submitted; however, neither box for evaluation from seaward was checked. It is assumed that since the hydrographer submitted the form that the aids were inspected.

5. Junctions

Adequate junctions, except as noted, were effected with the following surveys:

H-9898 (1980) to the south
H-9907 (1980) to the north
CHS 3831 (1974) to the east Not available during QC.

Some minor adjustments will be required in order to bring the thirty (30) foot curve into coincidence between H-9907 (1980) and the present survey. These adjustments will have to be made during Quality Control Inspection. adjustments completed. SPB

The Canadian Survey is the eastern limit of the present survey and was prescribed as a junctional survey by the Project Instructions. Where the few sounding lines of the Canadian survey overlap with the present survey discrepancies are apparent. A letter from the Commanding Officer, NOAA Ship WHITING dated November 14, 1980 describes the problem. A copy is included following the body of the Descriptive Report. This survey, CHS 3831 (1974) should not be considered a junctional survey and should be superseded by the present survey in the common area.

6. Comparison with Prior Surveys

LS-1274 (1913) 1:20,000
LS-1275 (1913) 1:20,000
LS-1847 (1946) 1:120,000
LS-1973 (1956) 1:10,000
LS-1974 (1956) 1:10,000
LS-2000 (1957) 1:10,000
LS-2001 (1957) 1:10,000

The above surveys taken together cover the entire survey area. Generally, the prior surveys are in fair agreement; however, variances of up to twelve (12) feet were found. See summary below:

LS-2000 (1957) and LS-2001 (1957) were in good general agreement the present survey depths were zero (0) to three (3) feet deeper than the prior surveys. Attention is directed to several sounding lines between latitude 43°35'30"N and 43°36'30"N and 43°36'30"N on LS-2000 (1957) that vary as much as eight feet from the present survey.

LS-1973 (1956) and LS-1974 (1956) were in fair agreement with the present survey being zero (0) to three (3) feet deeper than LS 1974 north of latitude 43°32'30"N. South of latitude 43°32'30"N the present depths varied from to two (2) feet shoaler to five (5) feet deeper. The present survey is five (5) feet shoaler to six (6) feet deeper than LS-1973 (1956).

LS-1274 (1913) and LS-1275 (1913) are generally from 2 to 3 ft shoaler than the present survey, in addition ~~in excellent agreement; however;~~ there is a conflict with swept depth and the present survey. Present survey depths are one (1) foot shoaler at latitude 43°32'24"N, longitude 82°33'45"W. This conflict is not significant and could be attributed to changes in the bottom configuration from natural causes.

LS-1847 (1946) - depths from this survey vary from zero (0) to twelve (12) feet. There present survey being the shoaler of the two (2).

The quality of the horizontal control of ~~sounding line of~~ the prior surveys appears erratic, prior survey depths were only brought forward when consistency of agreement in the bottom configuration supported the existence of shoaler depths. This is particularly apparent regarding inshore 1:10,000 scale Lake Surveys listed above.

The present survey is adequate to supersede the prior surveys in the common area except where prior survey soundings and bottom characteristics were brought forward.

7. Comparison with Chart 14862 (23rd Edition, July 29, 1978)
14860 (27th Edition, February 9, 1980)

a. Hydrography

The charted soundings originates with the previously discussed prior surveys and unascertainable sources, and require no further discussion.

The present survey is adequate to supersede the charted hydrogrpahy in the common area.

b. Aids to Navigation

There were no floating aids within the survey area. See section 4.i of this report for comment concerning fixed aids.

8. Compliance with Instructions

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

9. Additional Field Work

This is an adequate basic survey and no additional field work is recommended.

Robert R. Hill, Jr.
Cartographic Technician
Verification of Data

Robert G. Roberson
Cartographer
Evaluation and Analysis

Guy T. Trefethen
Senior Cartographic Technician
Verification Check

INSPECTION REPORT
H-9906

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.

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

Examined and Approved
Hydrographic Inspection Team

R. D. Sanocki
Chief, Verification Branch
Processing Division

James C. Gardner, Jr., LTJG, NOAA
Chief, EDP Branch
Processing Division

Approved/Forwarded
January 15, 1982

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

May 17, 1982

TO: Glen R. Schaefer for
Chief, Hydrographic Surveys Division

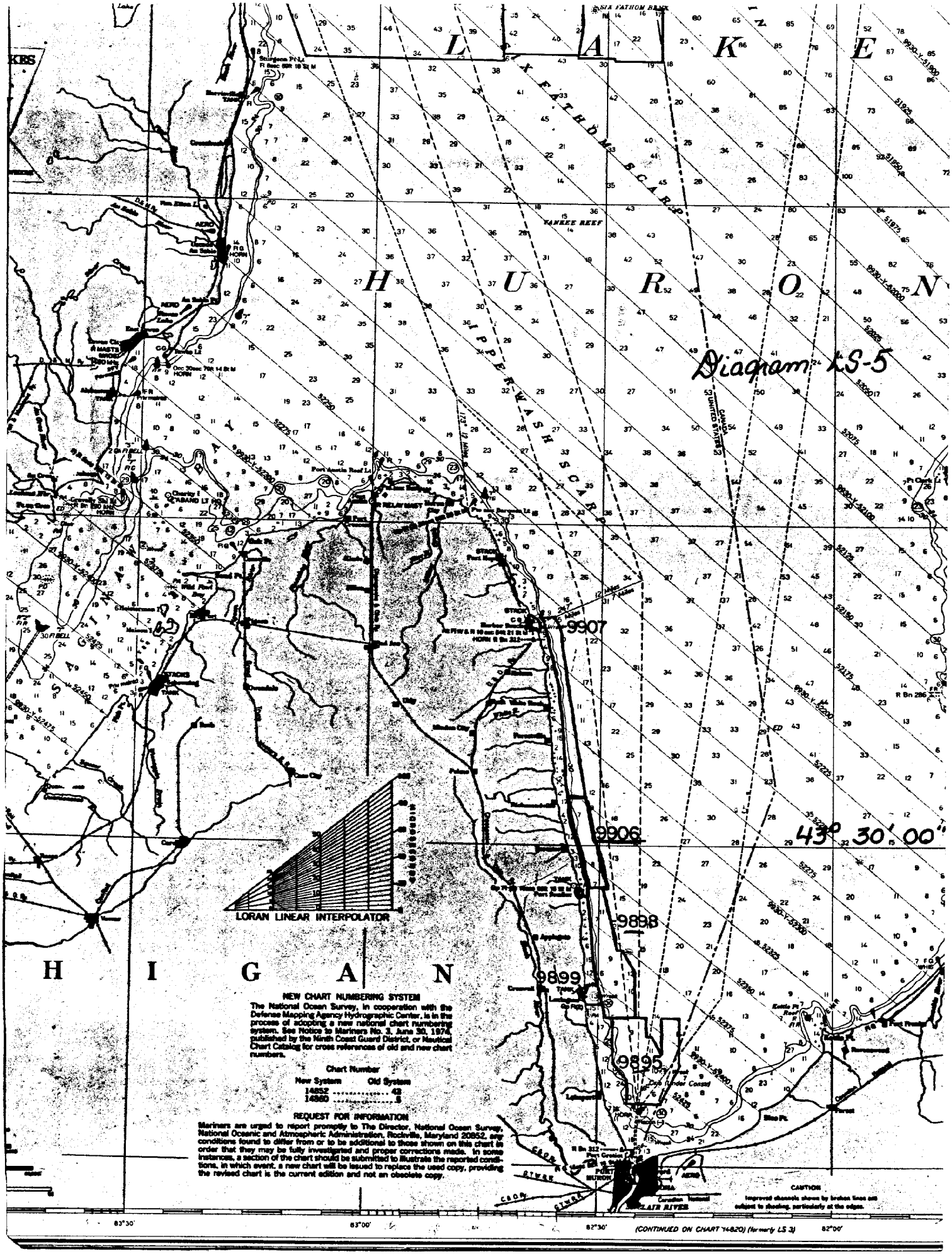
THRU: Chief, Quality Control Branch

FROM: S. Baumgardner
Quality Evaluator

SUBJECT: Quality Control Report for H-9906 (1980), Michigan, Lake Huron, Offshore Port Sanilac to Forestville

A quality control inspection of H-9906 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


L A K E
H U R O N
M I C H I G A N
Diagram LS-5
43° 30' 00"
9907
9906
9898
9899
9895
LORAN LINEAR INTERPOLATOR
NEW CHART NUMBERING SYSTEM
The National Ocean Survey, in cooperation with the Defense Mapping Agency Hydrographic Center, is in the process of adopting a new national chart numbering system. See Notice to Mariners No. 3, June 30, 1974, published by the Ninth Coast Guard District, or Nautical Chart Catalog for cross references of old and new chart numbers.
Chart Number
New System Old System
14852 ..... 4B
14860 5
REQUEST FOR INFORMATION
Mariners are urged to report promptly to The Director, National Ocean Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20852, any conditions found to differ from or to be additional to those shown on this chart in order that they may be fully investigated and proper corrections made. In some instances, a section of the chart should be submitted to illustrate the reported conditions, in which event, a new chart will be issued to replace the used copy, providing the revised chart is the current edition and not an obsolete copy.
CAUTION
Improved channels shown by broken lines are subject to shoaling, particularly at the edges.
83°30'
83°00'
82°30'
(CONTINUED ON CHART 14820) (formerly LS 3)
82°00'

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
CHARTING AND GEODETIC SERVICES
Rockville, Md. 20852

AUG 30 1983

N/CG241:SJV

TO: N/MOA - Wesley V. Hull

FROM: for N/CG2 - C. William Hayes /Sig/ R. Peters

SUBJECT: Report of Compliance for Survey H-9906

The smooth sheet and Descriptive Report for survey H-9906 (1980), Michigan, Lake Huron, Offshore Port Sanilac to Forestville, have been examined. This survey, except as noted in the Quality Control Report, dated May 17, 1982 (copy attached), and the Hydrographic Survey Inspection Team Report, dated January 15, 1982, is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-X115-WH/HSB-80, dated March 31, 1980.

Attachment

cc:
N/CG242 w/o att.

FORM C&GS-8352
(9-28-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9906

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
14860	1/24/84	W. A. Spatz	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 6
14862	12-6-84	Ralph B. Ross	Full ~~Part Before~~ After Verification Review Inspection Signed Via
			Drawing No. 4
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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