

D00135

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.* N/A

*Registry No.* D00135

### LOCALITY

*State* Michigan

*General Locality* St. Clair River

*Locality* Lake Huron To Roberts Landing

2000

CHIEF OF PARTY  
Brian A. Link

### LIBRARY & ARCHIVES

DATE

**HYDROGRAPHIC TITLE SHEET**

**D00135**

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. **N/A**

State: Michigan

General Locality: St. Clair River

Locality: Lake Huron To Roberts Landing

Scale: 1:20,000 Date of Survey: June 22, 2000-August 29, 2000

Instructions Dated: 5-15-2000 Project No. OPR-W408-NRB

Vessel: NOAA Launch 1211

Chief of Party: Brain A. Link

Surveyed by: Navigation Response Team 1

Soundings taken by: (echo sounder, hand lead, pole) Echosounder-Innerspace Model 448

Graphic record scaled by: MJM, JBG\*

Graphic record checked by: MJM, JBG\* Automated Plot: HP DESIGN JET 2500CP

Verification by: Atlantic Hydrographic Branch Personnel

Soundings in (fathoms, feet, or meters at MLW or MLLW) FEET IGLD1985\*\*

Remarks: \*MJM - Mark J. Mcmann, JBG - John B. Gaskin

\*\*Soundings plotted and referenced in reports in feet but aquired  
in meters.

Red notes in the Descriptive Report were made during office  
processing.

**Descriptive Report to Accompany  
Hydrographic Survey D00135  
OPR-W408-NRB  
Scale: 1:10,000  
Navigation Response Team 1 – Launch 1211  
Brian A. Link - Team Leader**

This survey was conducted according to Port Instructions OPR-W408-NRB, Detroit and St. Clair Rivers, Michigan, dated May 15, 2000. This survey covers the northern portion of the St. Clair River from Roberts Landing northward to Lake Huron.

The purpose of this reconnaissance survey is to provide single-beam echo sounder hydrography at 100-meter line spacing throughout the survey area. This data was requested by the State of Michigan, Department of Environmental Quality, Source Water Assessment Program and the City of Detroit Water and Sewerage Department. The bathymetry will be used to enhance an existing preliminary flow model of the river to identify likely sources of water to public supply intakes and to provide a basis for coordinating real-time responses to contaminant spills. The hydrography will also be used to update the nautical charts.

**A. AREA SURVEYED**

The sheet letter for this survey is D.

The approximate survey area limits are:

North - 43°01'05"N  
South - 42°36'55"N  
East - 082°22'48"W  
West - 082°32'52"W

This survey was conducted from June 22, 2000 (DN 174) to August 29, 2000 (DN 242).

**B. DATA ACQUISITION AND PROCESSING** *See also the evaluation report*

**B1. Equipment**

An Innerspace model 448 depth sounder, S/Ns 186 was used to collect all echo soundings on this survey. A standard lead line calibrated in meters, S/N 1211, was used during this survey for comparison with the echo sounder. No problems were encountered with any of the sounding equipment.

A Starlink DGPS Beacon Receiver (S/N 855) was used as the remote station on launch 1211.

The instrument used for determining corrections for the speed of sound through the water

column was a Seabird-Seacat Velocity Profiler, model 19-03, S/N 192276-287.

NOAA launch 1211, a 27-foot SeaArk with a draft of 0.5 meters, was used to acquire all but the last two days of survey data. The last two days were acquired using NOAA Launch 517 after launch 1211 was totally destroyed by fire on August 19, 2000. There were no unusual vessel configurations used on either vessel.

## **B2. Quality Control**

The integrity of the survey data for D00135 is insured by adherence to the Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables Manual, June 2000.

Cross lines run on this survey represented 16.8% of the total main scheme mileage. The cross line soundings were within 1 foot of the main scheme hydrography throughout the survey area.

The lead line for launch 1211 was calibrated using a steel tape on April 17, 2000. No corrections were necessary. A static draft of 0.5 meters was applied to the sounding plots by the HPS REAPPLY program. The draft was measured by subtracting the difference from a punch mark on the side of launch 1211, 0.6 meter above the transducer, to the water surface.

Settlement and squat measurements for launch 1211 were taken on the previous survey, however the exact date could not be readily determined. The source data was not available because of the shut down of the field party which conducted this survey, causing the temporary abandonment of the trailer housing this information. These measurements were conducted in Tampa Bay, FL using the level method. Settlement and squat correctors were applied to the sounding plots using the HPS REAPPLY program.

Differential GPS (DGPS) was used for all hydrographic data acquired on this survey. DGPS performance checks were conducted in accordance with FPM 3.4.4 by comparing the DGPS position of the vessel to a calibration point determined using the Trimble Pro XRS portable GPS system. The point was set at the launch mooring location, which for this survey was at the Knight Marina, on the Belle River, in Marine City, Michigan. All records of the calibrations were destroyed in the fire which consumed launch 1211 on August 19, 2000. None of the calibration values exceeded tolerances.

## **B3. Corrections to Echo Soundings**

There are no deviations to be discussed in this section. Refer to Section **C. Correction to Echo Soundings** of the Data Acquisition and Processing Report \* (copy appended).

**\* Data filed with original field records**

## **C. VERTICAL AND HORIZONTAL CONTROL *See also the evaluation report***

The instrument used for determining corrections for the speed of sound through the water column was a Seabird-Seacat Velocity Profiler. Data quality assurance tests were performed after each cast. Program VELOCITY was used for computing the correctors. Corrections were

applied to the sounding plot using the HPS REAPPLY program.

Field water level reduction of soundings is based on unverified actual water levels from the NOAA/CO-OPS website. The Center for Operational Oceanographic Products and Services provided zoning correctors for the project area. The zoning equations provided were more complex than the HDAPS processing software program was configured for. Therefore, in the interest of timely field data processing, field zoning based on interpolating the area between the gages, then applying correctors direct from the closest gage, was used for field processing. All soundings on this survey are corrected to IGLD 1985. **Approved water levels and zones were applied during office processing.**

The horizontal control datum for this project is the North American Datum (NAD) of 1983. The control reference station used for this survey was the USCG DGPS beacon Detroit, MI (Station ID #838), located at 42°17.8' N; 083°5.7' W.

## **D. RESULTS AND RECOMMENDATIONS** *See also the evaluation report*

### **D1. Chart Comparison**

Hydrography acquired on this survey was compared with chart 14852, 43rd edition, November 8, 1997.

Soundings from this survey generally agree with charted soundings to within one foot throughout the survey area with the following exceptions:

- No evidence of the charted 24-foot shoal at 42°58'09.5"N, 082°24'48.2"W was seen during four crossings of hydrography. Surveyed depths were 27 – 31 feet. **Concur**
- The following sounding discrepancies were noted:

<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Charted Depth</u>	<u>Surveyed Depth</u>
42/59/30.8	082/25/32.2	35 feet	44 - 49 feet
42/48/14.5	082/29/01.6	22 feet	29 - 36 feet
42/48/14.4	082/28/00.8	34 feet	29 - 47 feet
<b>42/48/14.5</b>	<b>082/28/48.5</b>		

The above exceptions were the only areas of note, when considering that no sounding developments were done because of time limitations. **Concur**

No AWOIS items were assigned for this project because of the perceived [during project planning] time constraints to complete the higher priority bathymetry. There were no Danger to Navigation reports submitted for this survey.

**D2. Additional Results** *See also the evaluation report*

There were no Prior Survey comparisons conducted by the hydrographer for this survey. No aids to navigation were located during this survey due to time constraints.

There are numerous bridges, cables, pipelines, and crossing signs throughout the survey area. These regions were visually identified and compared to the raster and vector charts. No changes are recommended. Ferry routes are accurately charted and require no changes or additions to the charts.

**APPROVAL SHEET**  
**Reconnaissance Survey**  
**OPR-W408-NRB**  
**D00135**  
**June - August 2000**

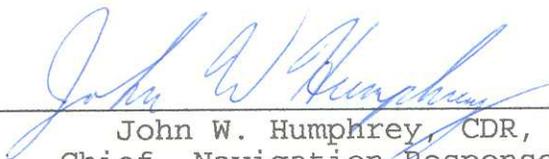
This reconnaissance survey was conducted in accordance with the Project Instructions for OPR-W408-NRB, the Hydrographic Manual, the Hydrographic Survey Guidelines, the Field Procedures Manual and the Hydrographic Specifications and Deliverables Manual. All reports, records, and survey plots were reviewed by the team leader. The team leader directly supervised this survey.

This survey is a complete reconnaissance survey for the areas described in Section A of this report.



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Brian A. Link  
Team Leader, Navigation Response Team 1



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John W. Humphrey, CDR, NOAA  
Chief, Navigation Response Branch



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Silver Spring, Maryland 20910

**WATER LEVEL NOTE FOR HYDROGRAPHIC SURVEY**

**DATE:** December 5, 2001

**HYDROGRAPHIC BRANCH:** Atlantic  
**HYDROGRAPHIC PROJECT:** OPR-W408-NRT1-2000  
**HYDROGRAPHIC SHEET:** D00135 (additional times)

**LOCALITY:** Northern St Clair River, MI  
**TIME PERIOD:** June 27 - June 28 & July 12, 2000

**WATER LEVEL STATION:** 901-4070 Algonac, MI  
Lat. 42° 37.2'N Lon. 82° 31.6'W  
**PLANE OF REFERENCE (IGLD 85):** 174.56 meters

**WATER LEVEL STATION:** 901-4080 St Clair State Police, MI  
Lat. 42° 48.8'N Lon. 82° 29.3'W  
**PLANE OF REFERENCE (IGLD 85):** 175.07 meters

**WATER LEVEL STATION:** 901-4084 Marysville, MI  
Lat. 42° 54.4'N Lon. 82° 28.0'W  
**PLANE OF REFERENCE (IGLD 85):** 175.34 meters

**WATER LEVEL STATION:** 901-4087 Dry Dock, MI  
Lat. 42° 56.7'N Lon. 82° 26.6'W  
**PLANE OF REFERENCE (IGLD 85):** 175.49 meters

**WATER LEVEL STATION:** 901-4090 Mouth of the Black River, MI  
Lat. 42° 58.4'N Lon. 82° 25.2'W  
**PLANE OF REFERENCE (IGLD 85):** 175.61 meters

**WATER LEVEL STATION:** 901-4096 Dunn Papar, MI  
Lat. 43° 0.2'N Lon. 82° 25.3'W  
**PLANE OF REFERENCE (IGLD 85):** 175.76 meters

**WATER LEVEL STATION:** 901-4098 Fort Gratiot, MI  
Lat. 43° 0.4'N Lon. 82° 25.4'W  
**PLANE OF REFERENCE (IGLD 85):** 175.91 meters



**WATER LEVEL NOTE FOR HYDROGRAPHIC SURVEY SHEET D00135 cont.**

**WATER LEVEL STATION:** 907-5002 Lakeport, MI  
Lat. 43° 8.5'N Lon. 82° 29.6'W  
**PLANE OF REFERENCE (IGLD 85):** 176.00 meters

**REMARKS: RECOMMENDED ZONING**

**WATER SURFACE COMPUTATIONS**

<u>Zone</u>	<u>Equation</u>	<u>Station #</u> <u>Station Name</u>
SR006	G	G=901-4070 Algonac
SR007	H-1/17(H-G)	H=901-4080 St Clair State Police
SR008	H-2/17(H-G)	J= Gauge not installed
SR009	H-3/17(H-G)	K=901-4087 Dry Dock
SR010	H-4/17(H-G)	L=901-4090 Mouth of the Black River
SR011	H-5/17(H-G)	M=901-4096 Dunn Paper
SR012	H-6/17(H-G)	N=901-4098 Fort Gratiot
SR013	H-7/17(H-G)	P=907-5002 Lakeport
SR014	H-8/17(H-G)	
SR015	H-9/17(H-G)	
SR016	H-10/17(H-G)	
SR017	H-11/17(H-G)	
SR018	H-12/17(H-G)	
SR019	H-13/17(H-G)	
SR020	H-14/17(H-G)	
SR021	H-15/17(H-G)	
SR022	H-16/17(H-G)	
SR023	H	
SR024	K-1/14(K-H)	
SR025	K-1/7(K-H)	
SR026	K-3/14(K-H)	
SR027	K-2/7(K-H)	
SR028	K-5/14(K-H)	
SR029	K-3/7(K-H)	
SR030	K-1/2(K-H)	
SR031	K-8/14(K-H)	
SR032	K-9/14(K-H)	
SR033	K-5/7(K-H)	
SR034	K-11/14(K-H)	
SR035	K-6/7(K-H)	
SR036	K-13/14(K-H)	
SR037	K	

WATER SURFACE COMPUTATIONS - continued

<u>Zone</u>	<u>Equation</u>	<u>Station #</u>	<u>Station Name</u>
SR038	L-1/4 (L-K)	L=901-4090	Mouth of the Black River
SR039	L-1/2 (L-K)	M=901-4096	Dunn Paper
SR040	L-3/4 (L-K)	N=901-4098	Fort Gratiot
SR041	L	P=907-5002	Lakeport
SR042	M-1/5 (M-L)		
SR043	M-2/5 (M-L)		
SR044	M-3/5 (M-L)		
SR045	M-4/5 (M-L)		
SR046	M		
SR047	N-1/5 (N-M)		
SR048	N-2/5 (N-M)		
SR049	N-3/5 (N-M)		
SR050	N-4/5 (N-M)		
SR051	N		
SR052	P-1/3 (P-N)		
SR053	P-2/3 (P-N)		
LH001	P		

Note 1: Provided time series data are tabulated in metric units (meters), relative to International Great Lakes Datum of 1985 (IGLD 85) and on Greenwich Mean Time.

Note 2: Water level corrections for Zones SR024 through SR036 have been adjusted to allow for zoning during times of hydrographic surveying before the water level gauge (J) at Marysville (901-4084) was installed for this project. Please be sure to use previously provided zoning for hydrographic surveying run in the above zones during the time of Marysville (901-4084) water level operation.

*Thomas V. Mero* 12/5/01  
 -----  
 CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

**LETTER TRANSMITTING DATA**

DATA AS LISTED BELOW WERE FORWARDED TO YOU  
BY (Check)

- ORDINARY MAIL
- REGISTERED MAIL
- GBL (Give number) \_\_\_\_\_
- AIR MAIL
- EXPRESS

DATE FORWARDED 06/18/2004

NUMBER OF PACKAGES 1

**TO:**

CHIEF, DATA ACQUISITION & CONTROL BRANCH

NOAA / NOS/OCS/HSD

1315 EAST-WEST HIGHWAY, STA:6704

SILVER SPRING, MARYLAND 20910-3282

**NOTE:** A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

D00135

Michigan - St. Clair River - Lake Huron To Roberts Landing

ONE TUBE CONTAINING THE FOLLOWING:

- 1 (AHB) SMOOTH SHEET FOR SURVEY D00135
- 1 RECORD OF APPLICATION TO CHARTS FORM (NOAA FORM #75-96)
- 7 H-DRAWINGS ON MYLAR FOR NOS CHART 14853 - Kapp:1302 - 1308
- 1 DESCRIPTIVE REPORT FOR D00135

FROM: (Signature)



**RECEIVED THE ABOVE**  
(Name, Division, Date)

**Return receipted copy to:**

NOAA \ NATIONAL OCEAN SERVICE

ATLANTIC HYDROGRAPHIC BRANCH N/CS33

439 WEST YORK STREET

NORFOLK, VA. 23510-1114

**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR D00135 (2000)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

**B. DATA ACQUISITION AND PROCESSING**

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System (HPS)  
NADCON, version 2.10  
SITEWORKS 02.01  
MicroStation J, version 07.01.04.16  
I/RAS B, version 07.01.000.18

The smooth sheet was plotted using an HEWLETT-PACKARD 2500CP plotter.

**C. VERTICAL AND HORIZONTAL CONTROL**

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values.

Vertical control used for this survey during data acquisition is based upon the International Great Lakes Datum of 1985. Office processing of this survey is based on these values.

**D. RESULTS AND RECOMMENDATIONS**

**D1. CHART COMPARISON 14852 (45<sup>th</sup> Edition, FEB /2003)**

Corrected through NM FEB 08/03  
Corrected through LNM DEC 17/02

**14853 (14<sup>th</sup> Edition, MAR /2003)**

Corrected through NM FEB 22/03  
Corrected through LNM DEC 17/02

The charted hydrography originates with prior surveys and miscellaneous sources. The hydrographer makes adequate chart comparisons in Section D1. of the Descriptive Report. The following should be noted:

1) The hydrographer did not verify nor disprove any features or charted least depths over cribs, pipelines, or

outfalls that fall within the common area of the present survey. It is recommended that all charted features and notations be retained as charted unless noted otherwise in this report.

2) The following charted depths originate with unknown sources and are not considered disproved by the present survey:

**Chart 14853-Page 43-KAPP 1302**

<b><u>Depth (ft)</u></b>	<b><u>Latitude (N)</u></b>	<b><u>Longitude (W)</u></b>
1	42°41'51.50"	82°30'07.74"
6	42°42'22.46"	82°29'29.67"

**Chart 14853-Page 44-KAPP 1303**

<b><u>Depth (ft)</u></b>	<b><u>Latitude (N)</u></b>	<b><u>Longitude (W)</u></b>
1	42°42'42.50"	82°28'56.00"
1	42°43'57.00"	82°29'19.80"
2	42°44'32.00"	82°29'07.00"
1	42°45'15.20"	82°28'31.20"
2	42°45'28.30"	82°27'54.10"

**Chart 14853-Page 45-KAPP 1304**

<b><u>Depth (ft)</u></b>	<b><u>Latitude (N)</u></b>	<b><u>Longitude (W)</u></b>
2	42°45'28.30"	82°27'54.10"
27	42°46'16.73"	82°28'02.74"
1	42°46'27.52"	82°27'56.70"
4	42°48'18.70"	82°28'42.43"
2	42°48'22.56"	82°28'42.43"

**Chart 14853-Page 46-KAPP 1305**

<b><u>Depth (ft)</u></b>	<b><u>Latitude (N)</u></b>	<b><u>Longitude (W)</u></b>
2	42°48'22.56"	82°28'42.48"
1	42°48'31.76"	82°28'41.88"
2	42°48'36.98"	82°28'40.47"
2	42°48'55.32"	82°28'35.14"
3	42°49'36.66"	82°28'45.73"
3	42°49'41.83"	82°28'45.41"
7	42°49'42.89"	82°28'46.33"
2	42°49'53.58"	82°28'10.91"
2	42°50'20.42"	82°28'36.97"
2	42°50'58.77"	82°27'55.75"
11	42°51'08.41"	82°27'56.08"

Chart 14853-Page 47-KAPP 1306

<u>Depth (ft)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
11	42°51'08.41"	82°27'56.08"
2	42°51'43.94"	82°27'46.69"
3	42°52'15.32"	82°28'29.15"
3	42°52'18.99"	82°28'29.09"
2	42°52'27.52"	82°27'52.87"
4	42°52'29.19"	82°28'06.15"
4	42°52'32.64"	82°27'51.76"
2	42°52'49.65"	82°27'31.65"
2	42°52'53.92"	82°28'08.28"
2	42°53'19.76"	82°28'09.05"
3	42°53'28.82"	82°27'33.50"
4	42°53'33.59"	82°27'34.08"
3	42°53'36.85"	82°27'58.67"
1	42°54'00.96"	82°27'30.67"

Chart 14853-Page 48-KAPP 1307

<u>Depth (ft)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
16	42°55'11.91"	82°27'18.64"
1	42°55'16.94"	82°27'12.54"
1	42°55'26.02"	82°27'08.79"
15	42°55'36.64"	82°27'31.86"
1	42°55'43.78"	82°26'59.69"
1	42°55'49.03"	82°26'56.94"
1	42°55'54.55"	82°26'53.70"
28	42°56'10.13"	82°26'44.89"
27	42°56'53.70"	82°25'45.34"
3	42°56'55.57"	82°25'40.10"
3	42°56'59.79"	82°26'09.57"

Chart 14853-Page 49-KAPP 1308

<u>Depth (ft)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
13	42°00'21.68"	82°24'40.07"
13	42°00'22.90"	82°24'34.66"

3) A charted controlling depth notation, 24 FEET OCT 1996, in the vicinity of Latitude 42°47'15.26" N, Longitude 82°28'20.38 W, was investigated and is considered superceded by the present survey. Mr. Donald Holly (313-226-6816) of the Detroit Office of the USACE was contacted about the removal of this charted notation. Mr. Holly stated that a search of the records in his office could not determine any reason why the

notation was charted. He also stated that the charted notation and its associated channel lines could be replaced by soundings from the present survey. It is recommended that the charted notation, 24 FEET OCT 1996, and its associated channel lines be deleted and that soundings from the present survey be charted.

4) In general, agreement between charted depths and surveyed depths is adequate. Present survey depths generally vary plus or minus ( $\pm$ ) one to three (1-3) feet. Charted depths varying more than three feet from present survey depths were generally located in shoal areas or near the river bank. These differences may be attributed to natural changes and improved hydrographic surveying methods and equipment.

Except as noted above, the present survey is adequate to supercede the charted hydrography within the common area.

## **D2. ADDITIONAL RESULTS**

A comparison with prior surveys was not performed since this was a reconnaissance survey and no prior survey information was provided by headquarters.

### **CONTROLLING DEPTHS**

A conflict between the charted controlling depths and survey soundings exists in the St. Clair to Stag Island Channel. The controlling depth is 24.4 feet. A 23 foot depth (7 m), in Latitude  $42^{\circ}51'13.15''N$ , Longitude  $82^{\circ}28'17.28''$ , was located. It is recommended that this depth be charted unless other information indicates otherwise.

### **ADEQUACY OF SURVEY**

This is an adequate reconnaissance survey. No additional work is recommended.



**Edward A. Owens**  
Physical Scientist  
Verification of Field Data  
Evaluation and Analysis

APPROVAL SHEET  
D00135

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Richard W. Blevins

Richard W. Blevins  
Cartographer,  
Atlantic Hydrographic Branch

Date: 11/21/03

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

Approved:

Emily B. Christman

Emily B. Christman  
Commander, NOAA  
Chief, Atlantic Hydrographic Branch

Date:

4/23/04

