

**H11451**

NOAA FORM 76-35A

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

**DESCRIPTIVE REPORT**

*Type of Survey:* **Basic Hydrography**

*Field No.:* **NRT4**

*Registry Number:* **H11451**

**LOCALITY**

*State:* Illinois

*General Locality:* Lake Michigan

*Sub-locality:* Chicago Harbor

**2006**

CHIEF OF PARTY

**Lucy Massimillo, Team Leader**

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DATE:

NOAA FORM 77-28 U.S. DEPARTMENT OF COMMERCE (11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  <p style="text-align: center;"><b>HYDROGRAPHIC TITLE SHEET</b></p>	REGISTRY NUMBER:  <p style="text-align: center;"><b>H11451</b></p>
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 NUMBER: N/A
<p>State/Territory: <b>Illinois</b></p> <p>General Locality: <b>Lake Michigan</b></p> <p>Sub-Locality: <b>Chicago Harbor</b></p> <p>Scale: <b>1:5,000</b>                      Date of Survey: <b>June 8 to July 25, 2005</b></p> <p>Instructions Dated: <b>August 2, 2005</b>                      Project Number: <b>OPR-Y387-NRT4-05</b></p> <p>Vessel: <b>NOAA Launch 3001</b></p> <p>Chief of Party: <b>Lucy Massimillo</b></p> <p>Surveyed by: <b>Lucy Massimillo, Sarah Borakove, Jason McDannold</b></p> <p>Soundings by: <b>ODOM CVX2 Vertical Beam Echosounder</b></p> <p>Graphic record scaled by: <b>N/A</b></p> <p>Graphic record checked by: <b>N/A</b></p> <p>Protracted by: <b>N/A</b>                      Automated Plot: <b>N/A</b></p> <p>Verification by: <b>Atlantic Hydrographic Branch <i>Personnel</i></b></p> <p>Soundings in: <b>meters at Low Water Datum</b></p> <p>Remarks: <i>1) All Times are UTC.</i></p> <p style="padding-left: 40px;"><i>2) This is a basic Hydrographic Survey under the Navigable Area Concept.</i></p> <p style="padding-left: 40px;"><i>3) Projection is UTM Zone 16N.</i></p> <p style="padding-left: 40px;"><i>4) LWD is at elevation 176.00 meters International Great Lakes Datum of 1985 (IGLD85).</i></p> <p><b><i>Red, Bold, Italic notes in the Descriptive Report were made during office processing.</i></b></p>	

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**DESCRIPTIVE REPORT**

to accompany  
Hydrographic Survey H-11451  
OPR-Y387-NRT4-05

Scale of Survey 1:5,000  
Year of Survey: 2006  
Navigation Response Team 4  
NOAA Launch S3001  
Lucy Massimillo - Team Leader

**A. AREA SURVEYED**

This Basic Hydrographic survey was conducted in accordance with the Project Letter Instructions for project OPR-Y387-NRT-05, Chicago Harbor, Illinois. The instructions are dated August 5, 2005.

Chicago Harbor, on the southwest coast of Lake Michigan, serves the city of Chicago, Illinois. Chicago Harbor consists of an outer harbor protected by breakwaters on the NE and E sides and an inner basin at the natural mouth of the Chicago River. The outer harbor encompasses the entrance channel leading from Lake Michigan, outside the breakwater, to the Navy Pier and to the entrance of the inner basin on the Chicago River. The inner basin is protected by bulkheads and a lock at the mouth of the Chicago River. Recreational boats and commercial passenger vessels comprise the major traffic of Chicago Harbor. Barge traffic from the Mississippi River via the Illinois Waterway is also frequent in Chicago Harbor. The barge facilities are located primarily on the Chicago River. The major commodities handled at these facilities are general cargo, newsprint, salt, and cement.

The area, surveyed by NRT4, consisted of approximately 2 SNM inside and directly east of the breakwater.

Survey Limits for Sheet A, H-11451 are as follows:

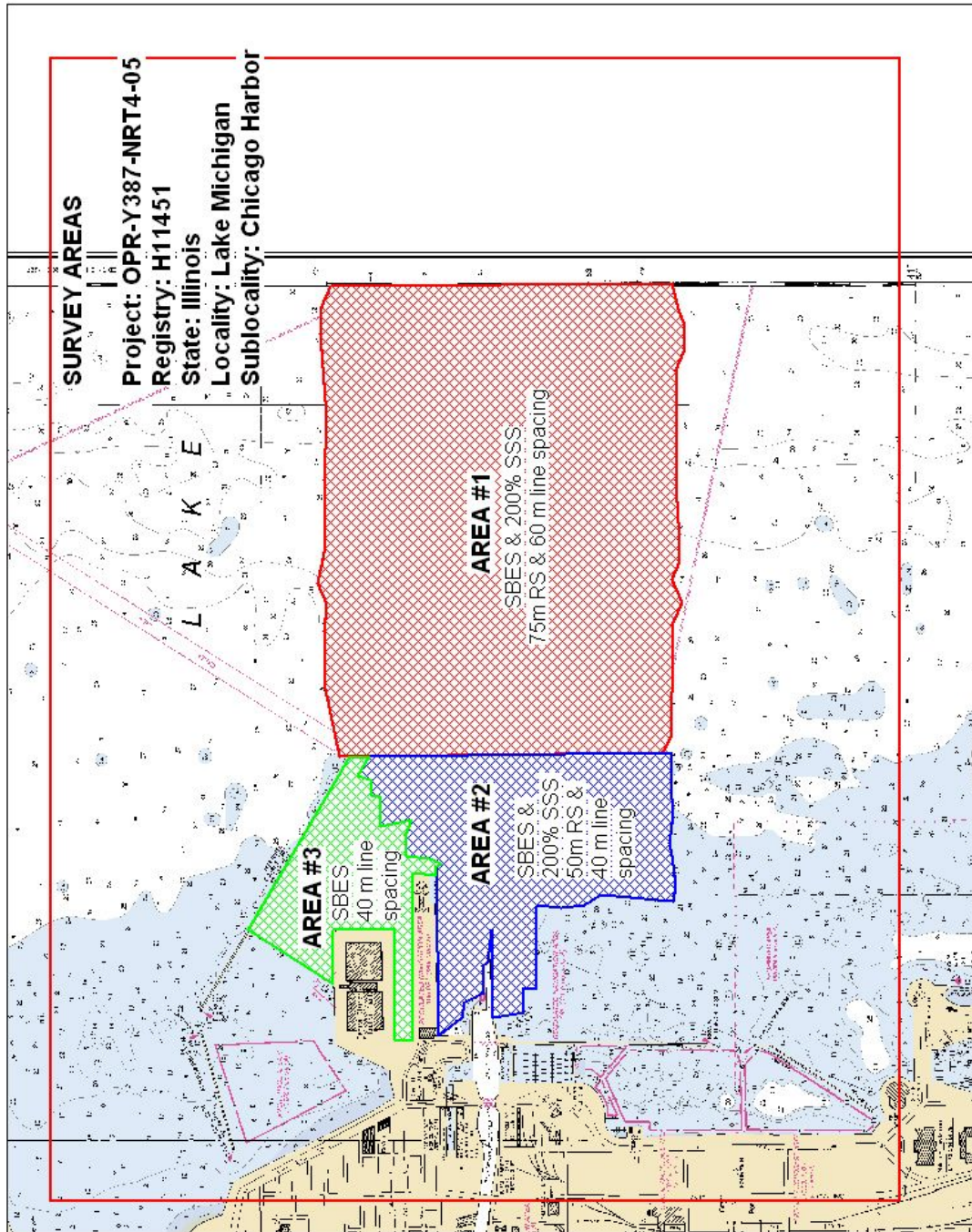
41° 52' 43.84" N	87° 36' 38.24" W
41° 54' 03.74" N	87° 33' 29.38" W

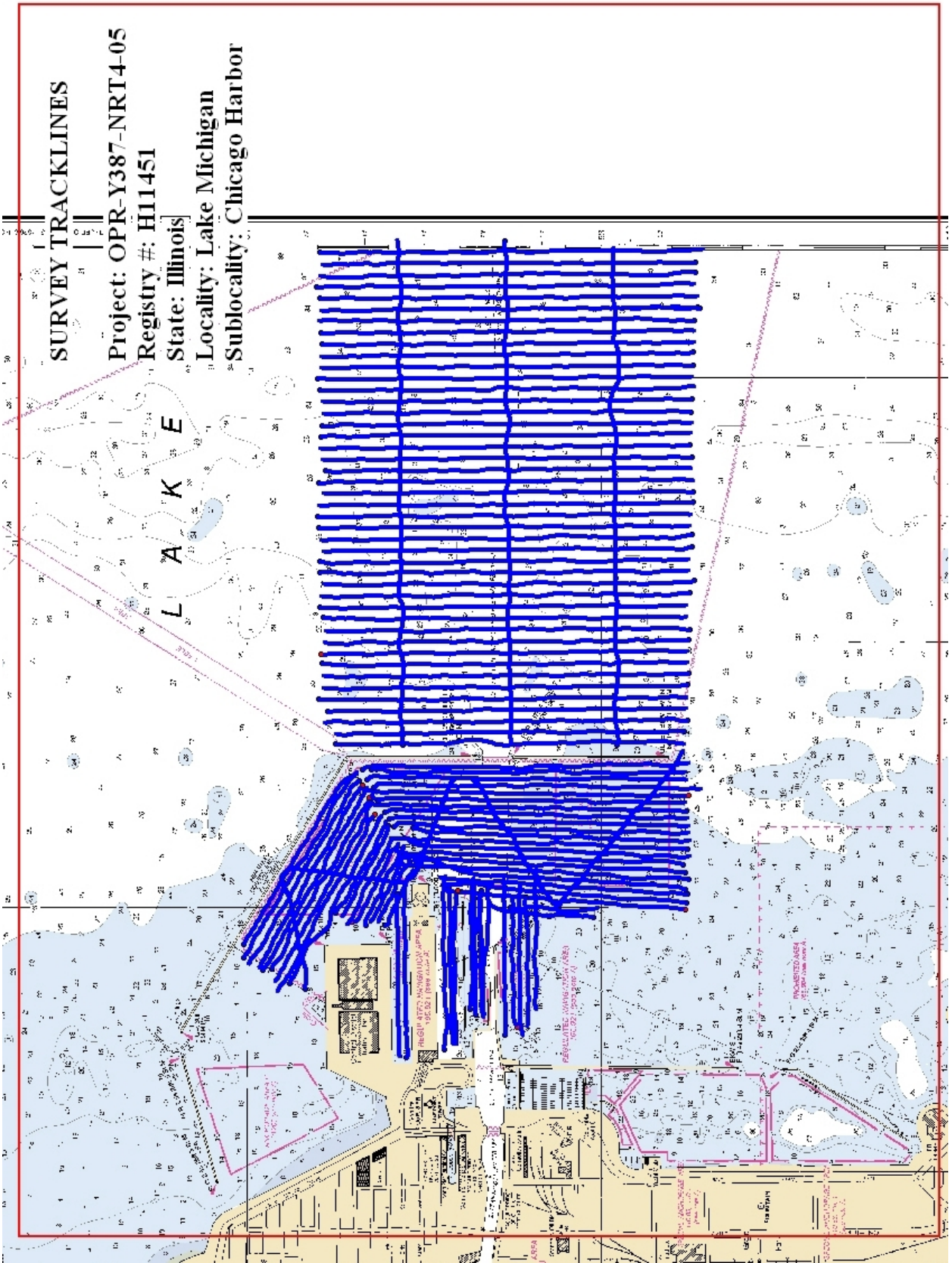
Survey Dates: June 8, 2006 (DN: 159) to August 4, 2006 (DN: 216)

This area was broken up into three sections by the field party. Singlebeam echosounder (SBES) and side scan sonar (SSS) data were acquired east of the breakwater. SSS data were acquired at 75 meter range scale and lines were spaced 60 meters, which resulted in 200% SSS coverage. SBES and SSS data were also acquired inside the breakwater, south of Navy Pier. However, the water depth was shallower in this area, so the line spacing was reduced to 40 meters and the SSS range scale was reduced to 50 meters. This again resulted in 200% SSS coverage. North of Navy Pier the water depth is much shallower and the lake floor is covered by dense vegetation.

The field party determined that SSS could not be safely acquired in this area. Therefore, only SBES data were collected at a line spacing of 40 meters.

Survey limits and tracklines are displayed graphically on the following pages.





**B. DATA ACQUISITION AND PROCESSING** *SEE ALSO THE EVALUATION REPORT.***B.1. EQUIPMENT**

Data were acquired by Navigation Response Team 4 using Survey Launch 3001. The vessel was configured as described in the Data Acquisition and Processing Report (DAPR)\* for this project. Major data acquisition systems are summarized below.

NOAA Survey Launch 3001 was used to acquire positions, soundings, imagery, and sound velocity data. Positions were acquired with a Trimble DSM212L Differential GPS (DGPS) beacon receiver. Soundings were acquired with an ODOM CVX2 single-beam echosounder (SBES) system. Imagery was acquired with a stern-towed KLEIN 3000 side scan sonar (SSS) system. Water column sound velocity data was acquired with an ODOM Digibar Pro DB1200 sound velocity profiler.

There were no unusual vessel configurations encountered during this project.

**B.2. QUALITY CONTROL** *See also the Evaluation Report*

Following the Field Procedures Manual v2.1, dated May, 2006, and the NOS Hydrographic Surveys Specifications and Deliverables Manual, dated June, 2006, has insured the integrity of the survey data for H11451.

Differential GPS (DGPS) was used for all hydrographic data acquired on this survey.

**Singlebeam Echosounder Quality Control**

The lake bottom north of Navy Pier is covered with dense vegetation. The digital soundings that were acquired in this area often represent the top of this vegetation and not the actual lake bottom. The SBES gains and power levels were continuously adjusted in this area in order to compensate for this problem. However, it was often very difficult to remove the vegetation from the data. Field team members then attempted to edit out the vegetation during processing. However, due to the possibility that a contact may have been masked by this vegetation, team members opted to be conservative in their editing.

While investigating side scan contacts, the least depth was often not digitized by the echosounder. However, the least depth was visible in the analog trace. Again, team members attempted to adjust the SBES gains and power levels to compensate for this. When this was not possible, the least depths were determined from the analog trace and then manually added to the digital data set during processing. *Concur*

*\*Data filed at Atlantic Hydrographic Branch (AHB).*

**Side Scan Sonar Quality Control**

The side scan sonar data were acquired at frequencies of 100kHz and 500kHz. The recorder was set to 75 meter range scale outside the breakwater and 50 meter range scale inside the breakwater. There were no water depths greater than 15 meters in areas where side scan data was collected

Daily confidence checks were conducted by observing side scan imagery in the vicinity of known contacts, such as breakwaters and piers. Side scan data were considered satisfactory if these items could be distinguished throughout the entire range of the side scan trace. The confidence checks were performed daily at both frequencies. Coverage of 200% was obtained wherever possible in the required survey areas and where water depth and/or hazards permitted. Side scan sonar coverage was conducted to the 12-foot depth curve where possible.

When operating in shoal waters, a short tow is required for the Klein system. When cable-out was approximately 7 meters or less, minor degradation of the side scan imagery may be noted due to cross-talk between the Klein and the Odom echosounder.

### **Crosslines**

Four checklines for a total of 6.37 linear nautical miles (LNM) were acquired by the field party. This is approximately 8.28 percent of mainscheme acquisition (76.89 LNM). A visual inspection of crossline data and main scheme data showed good comparison.

### **Junctions**

No junctioning surveys were provided for comparison with this project.

### **B.3. CORRECTIONS TO ECHO SOUNDING**

Corrections to echo soundings did not deviate from the method explained in the Data Acquisition and Processing Report (DAPR).\* A table detailing all sound velocity casts is located in Separate II.

***\*DATA FILED AT ATLANTIC HYDROGRAPHIC BRANCH (AHB).***



**C. VERTICAL AND HORIZONTAL CONTROL** *SEE ALSO THE EVALUATION REPORT.***C.1. VERTICAL CONTROL**

All soundings were reduced to Low Water Datum with verified water levels and preliminary zoning.

The operating National Water Level Observation Network (NWLON) station at Calumet Harbor, IL (908-7044) served as datum control for the survey area. LWD for Calumet Harbor is at elevation 176.00 meters International Great Lakes Datum of 1985 (IGLD 85).

Verified water levels from the N/OPS1 CO-OPS website were downloaded and applied to all soundings for this sheet. Water level corrections were applied to the soundings using CARIS HIPS and SIPS v6.0 Service Pack 2 Hotfix 13.

Zoning was provided on the project CD. Field personnel made no changes to zoning, time correctors, or range ratios.

A Request for Approved Water Levels letter was sent to N/OPS1 on August 30, 2006 and is included in Appendix IV.\*

**C.2. HORIZONTAL CONTROL**

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 16. The control reference station used for this survey was the USCG DGPS Beacon in the auto-select mode.

Horizontal dilution of precision (HDOP) was monitored daily on Hypack. At no point did HDOP exceed 4.00, and adequate satellite coverage was maintained throughout the survey period.

All positioning equipment was operated in a manner consistent with the manufacturer requirements and as described in the DAPR.\* There were no equipment malfunctions which affected the positional quality of the data.

*\*Data filed at Atlantic Hydrographic Branch (AHB).*

**D. RESULTS AND RECOMMENDATIONS**      *SEE ALSO THE EVALUATION REPORT.***D.1. CHART COMPARISON**

There are four charts and four ENC's affected by this survey:

Chart	Edition	Print Date	Scale
14905_1	30th	8/1/2003	1:120,000
14926_31	10th	4/1/2003	1:60,000
14927_1	24th	2/2/2002	1:60,000
14928_1	22nd	4/1/2005	1:15,000

ENC Cell	Last Updated	Corresponding Chart	Version	Edition
US4IL10M	10/22/2004	14927	2	1
US4IN01M	8/23/2006	14905	2	3
US5IL11M	8/23/2006	14928	2	3
US5IN11M	6/26/2006	14926	2	4

**General Agreement with Charted soundings**

In general, survey soundings compared favorably with charted depths within 1-2 feet. There were eleven notable exceptions in which survey depths differed from charted depths. *Concur*

The following is a list of notable sounding discrepancies on the chart:

- 1) 41°53'45.520"N, 087°34'49.705"W- A 26ft sounding occurs in a currently charted 30-36ft depth area. *Concur*
- 2) 41°53'28.389"N, 087°35'42.316"W to 41°53'25.753"N, 087°35'33.159"- Several 22ft and 23ft soundings occur in this area of the channel that is charted as having a least depth of 24ft. A chartlet of these soundings were forwarded to Mr. Jeffrey Zuercher of the United States Army Corps of Engineers on September 25, 2006. The Great Lakes Navigation Manager, Mr. Brian

Link, discussed this area with Mr. Zuercher and determined that it was not necessary to submit that area as a danger to navigation. This is due to its location on the extreme NE corner of the channel, the minimal amount of shoaling, and the lack of deep-draft vessels operating in the area.

**Concur** *See also the Evaluation Report.*

3) 41°53'56.109"N, 087°36'12.289"W to 41°53'29.255"N, 087°35'29.689"W- The majority of the soundings between these positions are shoaler than charted by 1-4ft, though they all fall within the currently charted depth area. Dense vegetation covers the lake bottom in the area NE of Navy Pier. Although the echosounder gains and signal strength were adjusted, it was often difficult to differentiate between the actual lake bottom and the vegetation. While processing the singlebeam data, the hydrographer attempted to edit the vegetation from the data. However, in many cases the hydrographer was conservative in editing these soundings. Therefore the lake bottom may not be realistically represented in the processed data and may be deeper than shown.

**Concur**

4) 41°53'44.525"N, 087°35'35.140"W to 41°53'26.356"N, 087°35'30.668"W- The 18ft contour between these positions has migrated east up to approximately 140m. Several 15ft, 16ft and 17ft soundings occur in this area that is currently charted as having depths of 18-24ft **Concur**

5) 41°53'21.976"N, 087°36'03.334"W- A 17ft sounding occurs in a currently charted 18-24ft depth area. **Concur**

6) 41°53'30.118"N, 087°35'48.611"W- A 16ft sounding occurs in a currently charted 18-24ft depth area. **Concur**

7) 41°53'34.622"N, 087°34'59.147"W to 41°53'23.641"N, 087°35'10.132"W- Several 28ft and 29ft soundings occur in a currently charted 30-36ft depth area. **Concur**

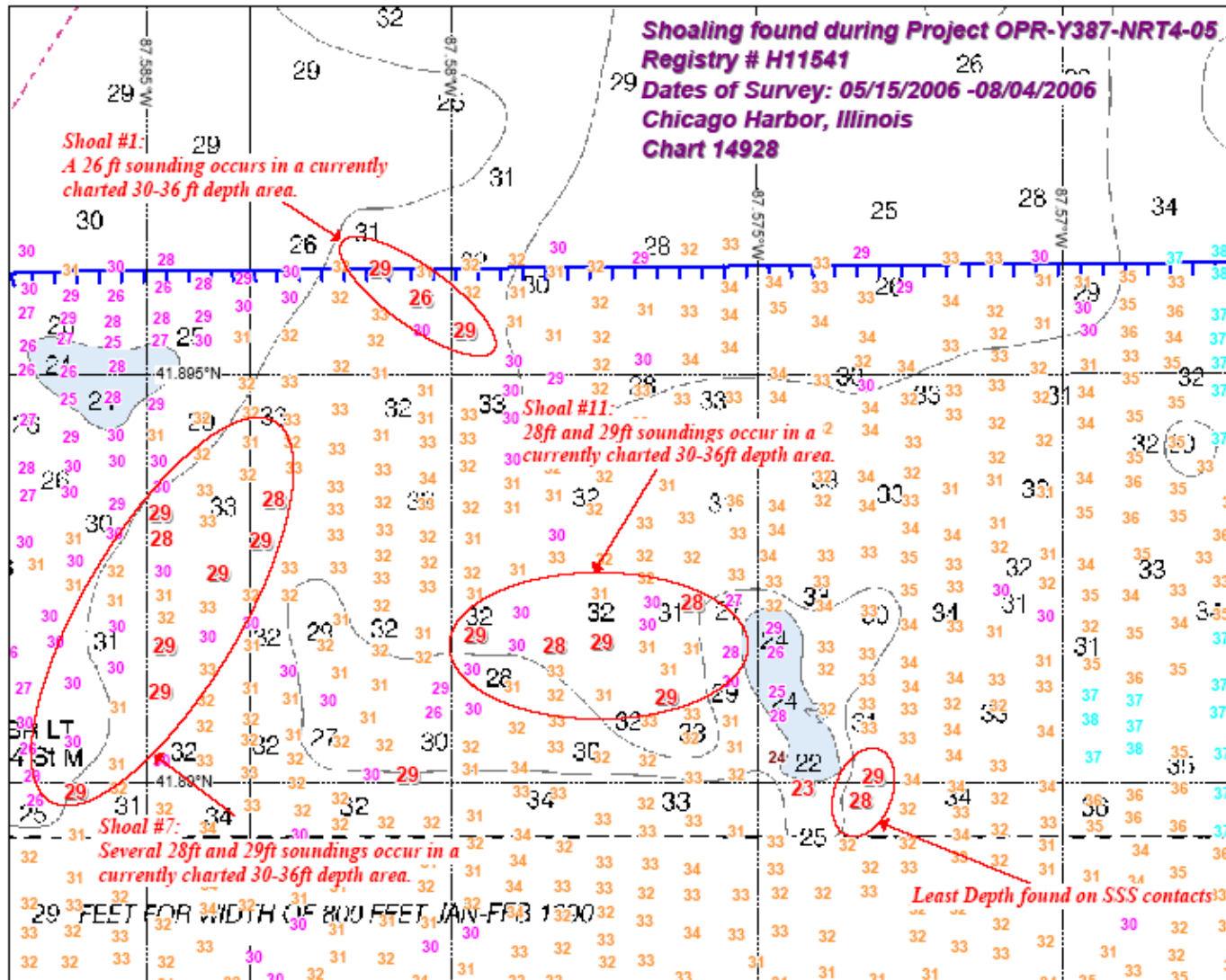
8) 41°53'09.426"N, 087°34'54.331"W to 41°53'11.657"N, 087°34'46.493"W- The 30ft contour between these positions has migrated northwest approximately 40m. 28ft and 29 ft soundings occur in this area that is currently charted as having depths of 30-36ft. **Concur**

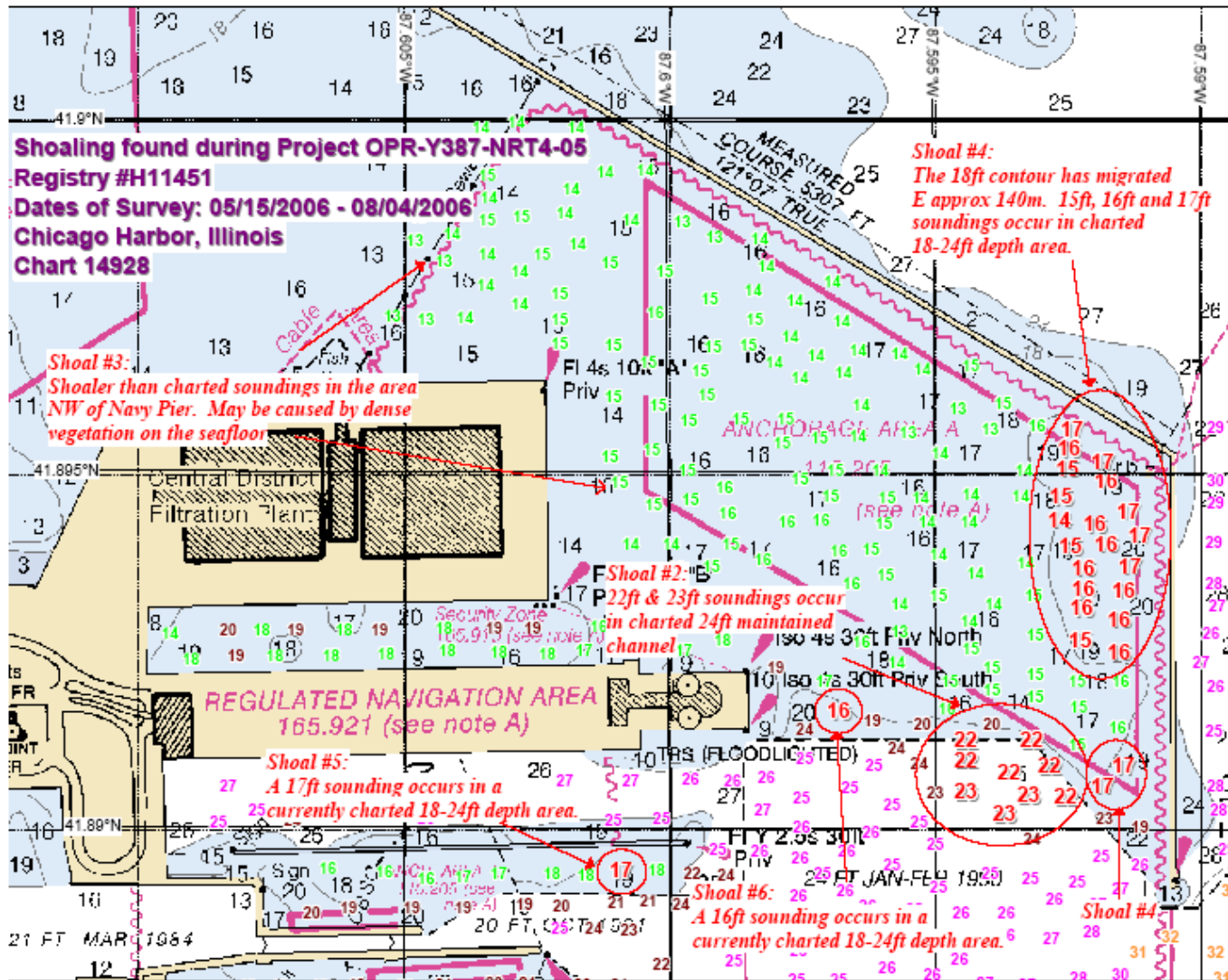
9) 41°52'55.108"N, 087°35'07.527"W to 41°52'54.255"N, 087°35'07.399"W- The 30ft contour between these positions has migrated east approximately 50m. 29ft soundings occur in this area that is currently charted as having depths of 30-36ft. **Concur**

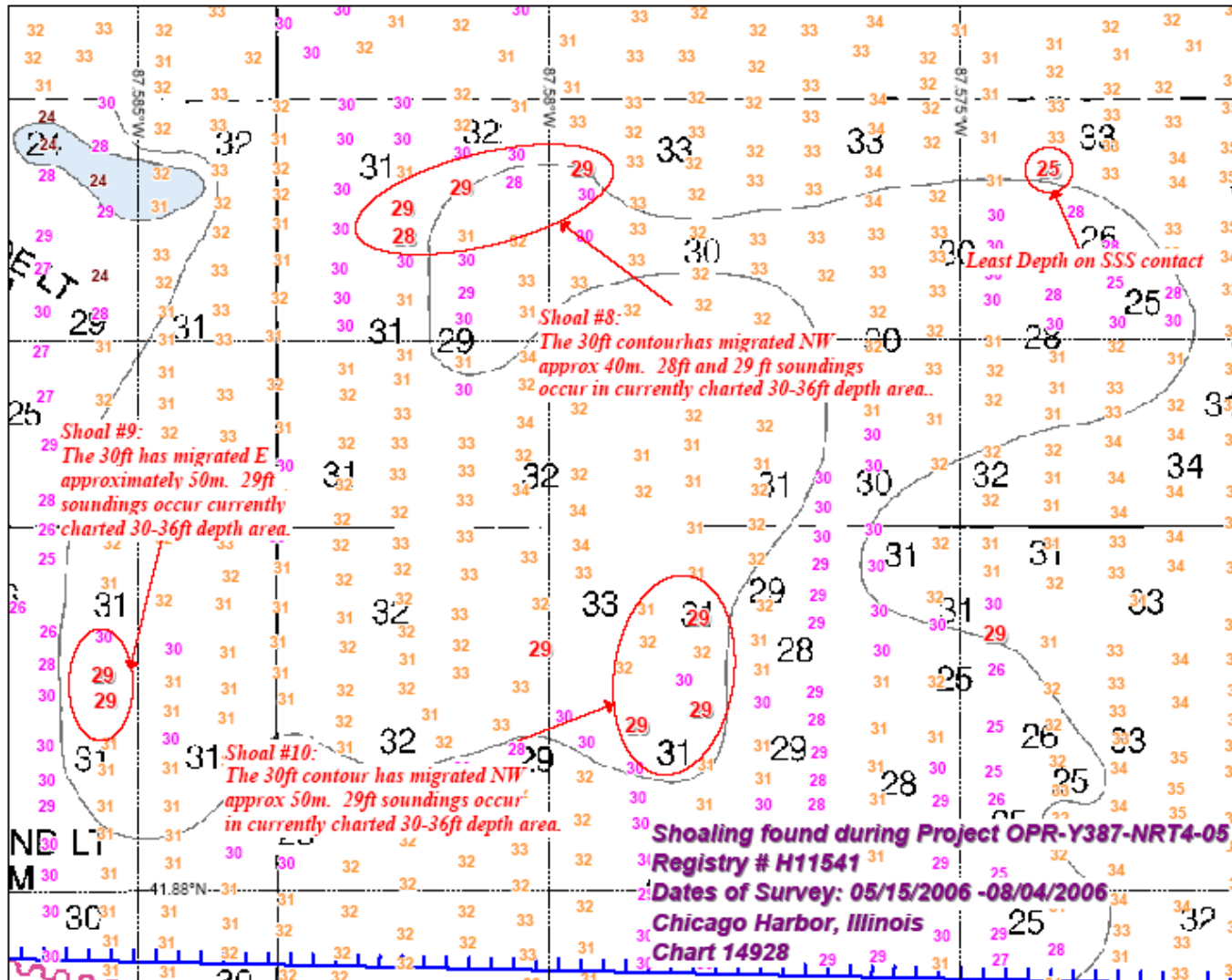
10) 41°52'56.948"N, 087°34'41.483"W to 41°52'53.424"N, 087°34'44.154"W - The 30ft contour between these position has migrated northwest approximately 50m. 29ft soundings occur in this area that is currently charted as having depths of 30-36ft. **Concur**

11) 41°53'31.896"N, 087°34'33.802"W to 41°53'30.538"N, 087°34'46.603"W- 28ft and 29ft soundings occur in a currently charted 30-36ft depth area. **Concur**

See the following three pages for graphical representations of the above described shoaling areas.







**AWOIS Item Investigations** *Final charting recommendations can be found in this report.*

One AWOIS item was assigned within the sheet boundaries. AWOIS item 13,030 was investigated and identified by the field party. Results of this investigation are contained in Appendix II.

**Dangers to Navigation** *Final charting recommendations can be found in this report.*

A Danger to Navigation report was submitted to the Marine Charts Division on September 19, 2006. This involved an uncharted wreck located at 41°53'11.570"N, 087°34'26.160"W and had a least depth of 25.3 feet in a surrounding depth of 32.4 feet. Further information on this can be found in Appendix I of this report.

**D. 2. ADDITIONAL RESULTS****Aids to Navigation and Other Detached Positions**

No Aids to Navigation were investigated by the field party.

**Ferry Routes**

There are no charted Ferry routes within the survey area. However water taxis and tour boat regularly operate in the area. *Concur*

**Submarine Cables and Pipelines**

There is one submarine cable running through the entire sheet. It starts on the north side of the Central District Filtration Plant, follows the entire breakwater south, proceeds east almost to the extent of the sheet and then turns north. There are two submarine cables running across the Inner Basin of the Chicago River, which are outside of the survey area. There is a submarine cable southeast of the Navy Pier. There is a cable area in the northern central portion of the sheet. There is also a small cable area north of the Central District Filtration Plant. No submarine cables or pipelines were investigated by the field party. *Concur*

**Bridges and Overhead Cables**

There are two bascule bridges and one fixed bridge located within the limits of this sheet, but outside of the assigned survey area. Both bascule bridges are located on the Chicago River and the fixed bridge is located in Ogden Slip. No bridges or overhead cables were investigated by the field party. *Concur*

**Locks**

The Chicago Lock is located in the west part of the sheet, but outside of the assigned survey area. The lock was not investigated by the field party. *Concur*

# H11451 Danger to Navigation Report

**Registry Number:** H11451  
**State:** Illinois  
**Locality:** Lake Michigan  
**Sub-locality:** Chicago Harbor  
**Project Number:** OPR-Y387-NRT4-05  
**Survey Date:** 07/25/2006

This report contains information relating to a Danger to Navigation, submitted by Navigation Response Team 4, during the survey of Chicago Harbor, H11451.

## Charts Affected

Number	Version	Date	Scale
14928	22nd Ed.	04/01/2005	1:15000
14926	10th Ed.	04/01/2003	1:60000
14927	24th Ed.	02/02/2002	1:60000
14905	30th Ed.	08/01/2003	1:120000
14901	14th Ed.	10/01/2002	1:500000
14500	27th Ed.	10/01/2002	1:1500000

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Wreck	7.71 m	041° 53' 11.570" N	87° 34' 26.160" W	---



## **1 - Danger To Navigation**

**1.1) Profile/Beam - 10920/1 from h11451 / 3001sb / 2006-206 / 000\_1635****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 041° 53' 11.570" N, 87° 34' 26.160" W  
**Least Depth:** 7.71 m  
**Timestamp:** 2006-206.16:46:58.000 (07/25/2006)  
**Survey Line:** h11451 / 3001sb / 2006-206 / 000\_1635  
**Profile/Beam:** 10920/1  
**Charts Affected:** 14928\_1, 14926\_31, 14927\_1, 14905\_1, 14901\_1, 14500\_1

**Remarks:**

An uncharted wreck was located with SSS and investigated with SBES at the surveyed position. The item has a surveyed height of 2.22m in a surrounding depth of 9.93m, and is determined to be a DTON.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11451/3001sb/2006-206/000_1635	10920/1	0.00	000.0	Primary
h11451/3001sss500k/2006-165/ch060614154500	0003	4.78	342.3	Secondary
h11451/3001sss500k/2006-165/ch060614153100	0001	8.81	020.9	Secondary
h11451/3001sss500k/2006-159/ch060608160900	0001	13.46	011.6	Secondary

**Hydrographer Recommendations**

Hydrographer recommends adding Submerged Wreck symbol to chart at surveyed location.

**Cartographically-Rounded Depth (Affected Charts):**

25ft (14928\_1, 14926\_31, 14927\_1, 14905\_1)

4 ¼fm (14500\_1)

25ft (14901\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)

**Attributes:** CATWRK - 2:dangerous wreck

HEIGHT - 2.22 m

STATUS - 1:permanent

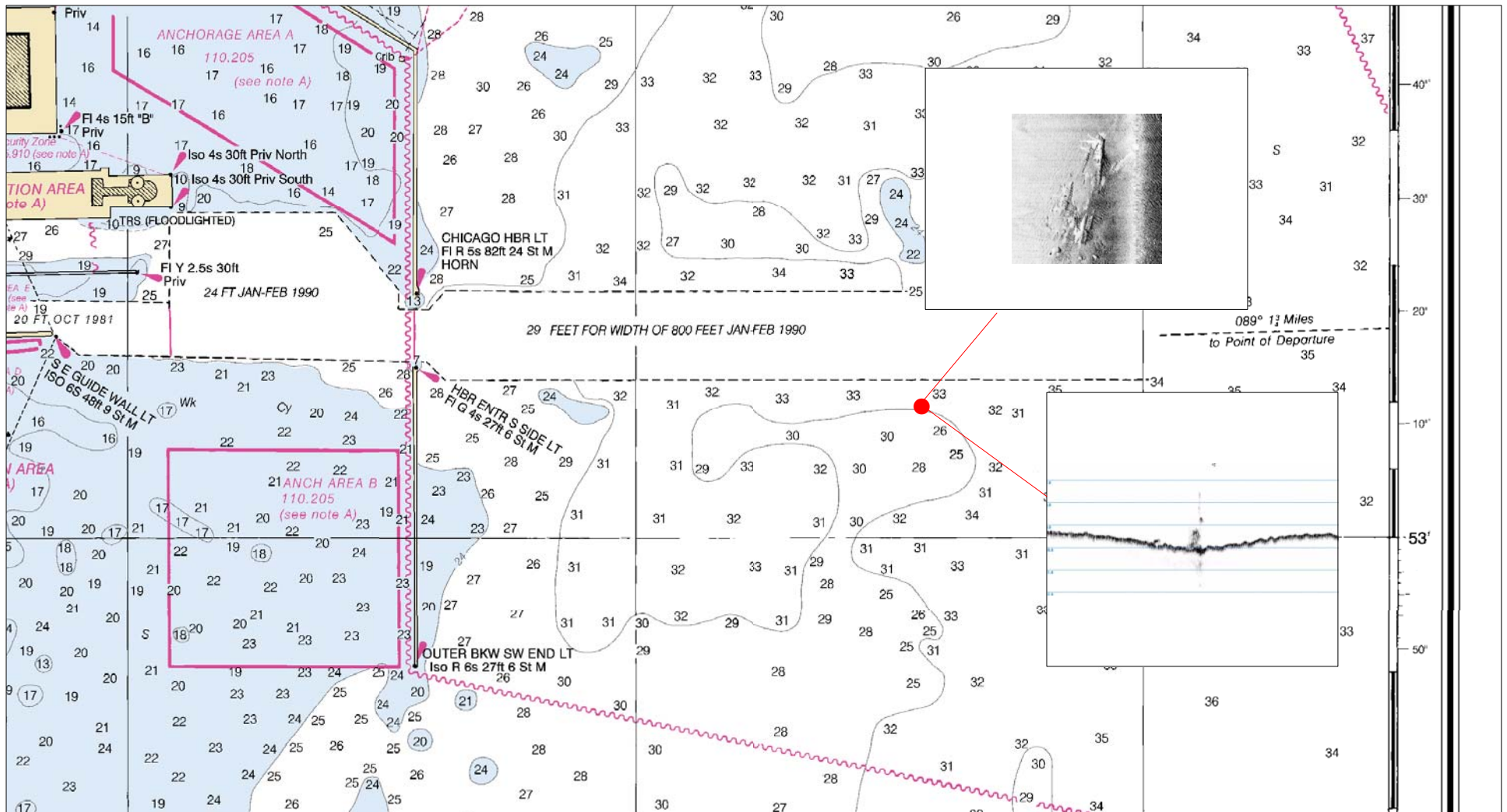
TECSOU - 1:found by echo-sounder; 2:found by side scan sonar

VALSOU - 7.715 m

VERDAT - 25:International Great Lakes Datum 1985

WATLEV - 3:always under water/submerged

See final charting disposition attached to this report.



**Chartlet 1 of 1**

Uncharted Wreck located at 41°53'11.570"N, 087°34'26.160"W, found by SBES & SSS.  
 Least Depth of 25.3 feet in surrounding depth of 32.4 feet. Chart 14928, 22nd Ed. Apr 05  
 Preliminary data subject to office review. Soundings corrected using verified observed water levels.  
 Data reflects state of sea floor in existence on day and at time the survey was conducted.

This chartlet has been corrected through  
 Notice to Mariners dated April 19, 2005  
**NOT FOR NAVIGATION.**



**NATIONAL OCEANIC AND  
 ATMOSPHERIC ADMINISTRATION  
 NATIONAL OCEAN SERVICE**

Project: OPR-Y387-NRT4-05  
 Survey: H11451  
 State: IL  
 Locality: Chicago  
 Sub-locality: Chicago Harbor  
 Survey Scale: 1:10,000

Sounding Units: Feet  
 Sounding Datum: MLLW  
 Horizontal Datum: NAD 83  
 Projection: UTM 16  
 Central Meridian: 087° 00 00  
 Scale Factor: 0.9996

**NOAA NRT-4  
 Lucy Massimillo  
 Team Leader**

May 15 to  
 August 4, 2006


**APPROVAL SHEET**

**OPR-K387-NRT4-05**  
**Basic Hydrographic Survey**  
**Lake Michigan**  
**Chicago Harbor**  
**Illinois**  
**Registry No. H11451**

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, this Descriptive Report, and all accompanying records and data are approved.

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,  
Submitted:



Lucy Massimillo  
Team Leader, Navigation Response Team 4

# H11451

**Registry Number:** H11451  
**State:** Illinois  
**Locality:** Lake Michigan  
**Sub-locality:** Chicago Harbor  
**Project Number:** OPR-Y387-NRT4-05  
**Survey Date:** 07/25/2006

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
14926	10th	04/01/2003	1:60,000 (14926_31) 1:15,000 (14926_6) 1:10,000 (14926_25)	[L]NTM: ?
14928	22nd	04/01/2005	1:15,000 (14928_1)	USCG LNM: 01/03/2006 (09/11/2007) CHS NTM: None (08/31/2007) NGA NTM: 02/14/2004 (09/22/2007)
14927	25th	08/01/2006	1:60,000 (14927_1)	USCG LNM: 03/06/2007 (09/11/2007) CHS NTM: None (08/31/2007) NGA NTM: 09/09/2006 (09/22/2007)
14905	30th	08/01/2003	1:120,000 (14905_1)	[L]NTM: ?
14901	14th	10/01/2002	1:500,000 (14901_1)	[L]NTM: ?
14500	27th	10/01/2002	1:1,500,000 (14500_1)	[L]NTM: ?

\* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS 13030 - Add 19 Wk	Sounding	5.90 m	41° 53' 11.8" N	087° 35' 55.5" W	13030
2.1	0008-Add 25 Wk	Wreck	7.71 m	41° 53' 11.6" N	087° 34' 26.2" W	---

## **1 - AWOIS Features**

## 1.1) AWOIS 13030 - Add 19 Wk

### Primary Feature for AWOIS Item #13030

**Search Position:** 41° 53' 11.3" N, 087° 35' 55.5" W  
**Historical Depth:** [None]  
**Search Radius:** 150  
**Search Technique:** S2, MB, ES, DI  
**Technique Notes:** [None]

#### History Notes:

L248/81-- RUNNING ON THE 540 METER ARC WITH DRAG, LAUNCH 519 SNAGGED ON THREE OCCASSIONS. DIVE TEAM WAS DEPLOYED AND INVESTIGATION REVEALED SNAG TO BE A 25 FT SAILBOAT LYING KEEL UP IN 22 FT WATER LWD. A LEAST DEPTH WAS OBTAINED WITH A LEAD LINE BY DIVERS (17.2 FT LDW). WRECK WAS LYING IN A NORTH (STERN)/ SOUTH (BOW) ORIENTATION PARALLEL TO SHORE. ■ LNM 14/83-- ADD 17 FT DEPTH, DANGER CURVE AND LABEL "WK" IN POSITION LAT. 41/53/11N, LONG. 87/35/55W. (ENTERED 3/05 CEH) ■■■ LOCATED BY NRT4 ON 7/25/2006 USING SSS AND INVESTIGATED USING SBES. WRECK EXISTS AS CHARTED. (ENTERED 9/11/06 LAM)

### Survey Summary

**Survey Position:** 41° 53' 11.8" N, 087° 35' 55.5" W  
**Least Depth:** 5.90 m (= 19.35 ft = 3.225 fm = 3 fm 1.35 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2006-206.19:13:47.200 (07/25/2006)  
**Survey Line:** h11451 / 3001sb / 2006-206 / 000\_1906  
**Profile/Beam:** 7286/1  
**Charts Affected:** 14926\_25, 14926\_6, 14928\_1, 14926\_31, 14927\_1, 14905\_1, 14901\_1, 14500\_1

#### Remarks:

AWOIS Item 13030. Item was located with SSS and investigated with SBES.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11451/3001sb/2006-206/000_1906	7286/1	0.00	000.0	Primary
h11451/3001sss500k/2006-180/ch060629114500	0001	0.62	288.7	Secondary
h11451/3001sss500k/2006-181/ch060630095500	0001	1.60	029.9	Secondary
h11451/3001sss500k/2006-180/ch060629100400	0002	3.46	159.2	Secondary



ChicagoAwois	AWOIS # 13030	13.78	355.5	Secondary
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## Hydrographer Recommendations

Retain as charted.

### Cartographically-Rounded Depth (Affected Charts):

19ft (14926\_25, 14926\_6, 14928\_1, 14926\_31, 14927\_1, 14905\_1)

3 ¼fm (14500\_1)

19ft (14901\_1)

## S-57 Data

**Geo object 1:** Wreck (WRECKS)

**Attributes:** VALSOU - 5.898 m

## Office Notes

Do not concur - Delete charted 17 Wk and danger curve. Chart a wreck with a depth of 19 feet in Lat 41°53'11.764"N, Lon 087°35'55.537"W. Add 19 Wk and danger curve.

## **2 - Dangers to Navigation**

**2.1) 0008-Add 25 Wk****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 41° 53' 11.6" N, 087° 34' 26.2" W  
**Least Depth:** 7.71 m (= 25.31 ft = 4.219 fm = 4 fm 1.31 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2006-206.16:46:58.000 (07/25/2006)  
**Survey Line:** h11451 / 3001sb / 2006-206 / 000\_1635  
**Profile/Beam:** 10920/1  
**Charts Affected:** 14928\_1, 14926\_31, 14927\_1, 14905\_1, 14901\_1, 14500\_1

**Remarks:**

An uncharted wreck was located with SSS and investigated with SBES at the surveyed position. The item has a surveyed height of 2.22m in a surrounding depth of 9.93m, and is determined to be a DTON.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h11451/3001sb/2006-206/000_1635	10920/1	0.00	000.0	Primary
h11451/3001sss500k/2006-165/ch060614154500	0003	4.78	342.3	Secondary
h11451/3001sss500k/2006-165/ch060614153100	0001	8.81	020.9	Secondary
h11451/3001sss500k/2006-159/ch060608160900	0001	13.46	011.6	Secondary

**Hydrographer Recommendations**

Hydrographer recommends adding Submerged Wreck symbol to chart at surveyed location.

**Cartographically-Rounded Depth (Affected Charts):**

25ft (14928\_1, 14926\_31, 14927\_1, 14905\_1)

4 ¼fm (14500\_1)

25ft (14901\_1)

**S-57 Data**

**Geo object 1:** Wreck (WRECKS)

**Attributes:** CATWRK - 2:dangerous wreck  
HEIGHT - 2.22 m  
INFORM - 25 Wk  
STATUS - 1:permanent  
TECSOU - 1:found by echo-sounder  
VALSOU - 7.715 m  
VERDAT - 25:International Great Lakes Datum 1985  
WATLEV - 3:always under water/submerged

### Office Notes

Concur-Chart a wreck with a depth of 25 feet in Lat 41°53'11.570"N, Lon 087°34'26.160"W. Add 25 Wk and danger curve.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Ocean Service  
Silver Spring, Maryland 20910

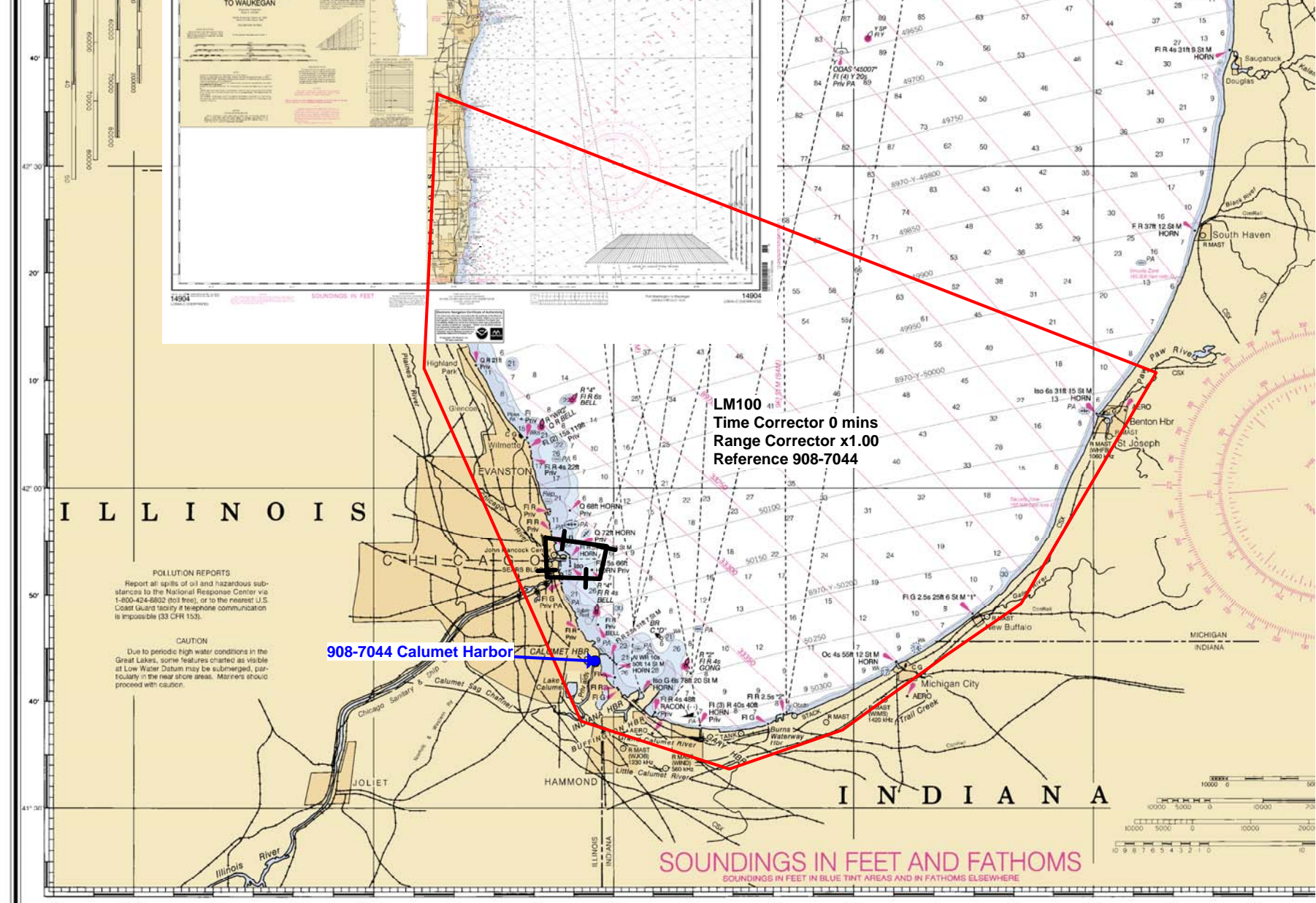


**Final tide zone node point locations for OPR-Y387-NRT4-2006, H11451**

Format:                   Tide Station (in recommended order of use)  
                              Average Time Correction (in minutes)  
                              Range Correction  
                              Longitude in decimal degrees (negative value denotes Longitude West),  
                              Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
Zone LM100	908-7044	0	1.00
-87.867545 42.610412			
-87.894816 42.185909			
-87.567561 41.635871			
-87.258487 41.560806			
-87.022135 41.622229			
-86.803183 41.740456			
-86.649428 41.819747			
-86.367625 42.179147			
-87.186569 42.414984			
-87.867545 42.610412			

# Final Zoning for OPR-Y387-NRT4-2006, H11451 Chicago Harbor, Lake Michigan, IL



**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT to Accompany  
Surveys H11451 (2006)**

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**

**B.1 DATA PROCESSING**

The following software was used to process and review data at the Atlantic Hydrographic Branch (AHB):

CARIS HIPS/SIPS version 6.1  
CARIS BASE Manager 2.1  
CARIS HOM 3.3 SP3  
PYDRO, version 7.3  
CARIS S-57 Composer 1.0

**B.2 QUALITY CONTROL**

**H-Cells**

The AHB source depth grid was generated as a 2m resolution BASE surface. Survey scale soundings were extracted from AHB generated 2m Base surface at a 1:15000 scale using a radius of 1.75m. Soundings were selected for charting by hand using the latest raster chart (14928) and smooth contours as background for sounding placement. Soundings were then checked for conflicts, corrected to remove conflicts, and edited to allow for proper sounding compilation placement with respect to existing charted depths outside the survey area. The BASE surface was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth curves were digitized by hand BASE Editor 2m surface. The curves were utilized during chart scale sounding selection at AHB.

The compilation products and Stand Alone HOB Files (SAHOB) are detailed in the Compilation Process Log of this document. All individual SAHOB files were assembled in BASE Editor during H-Cell compilation.



## H11451

The completed H-Cell was exported as a Base Cell File (ENC.000) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart units (ENC\_CS.000) with all values measured in feet following NOAA sounding rounding rules.

The H11451 CARIS H-Cell final deliverables include the following products:

US511451_CS.000	1:15,000 Scale	H11451 Selected Soundings (Chart Scale)
US511451_SS.000	1:5,000 Scale	H11451 Selected Soundings (Survey Scale)
US511451_BlueNotes.000	1:15,000 Scale	H11451 Cartographic Notes

### C. VERTICAL AND HORIZONTAL CONTROL

Final vertical correction processing was completed by office personnel. Office personnel applied verified water levels in conjunction with the final tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for H11451. Sounding datum is Low Water Datum (LWD). Vertical datum is Mean High Water (MHW).

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 16. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements. The horizontal geodetic datum was translated to Latitude and Longitude (LLDG) World Geodetic System-84 (WGS-84) during CARIS Base Manager processing.

### D. RESULTS AND RECOMMENDATIONS

#### Chart Comparison

#### 4927 (25<sup>th</sup>. Edition, Aug./06

Corrected through NM Aug. 26/06  
Corrected through LNM Aug. 22/06  
Scale 1:60,000

#### 14928 (22<sup>th</sup>.Edition, Apr./05

Corrected through NM Apr. 30/05  
Corrected through LNM Apr. 19/05  
Scale 1:15,000

ENC ComparisonUS4IN10M

Chicago Lake Front

Edition 3

Update Application Date 2008-06-09

Issue Date 2008-06-09

References: Charts 14927

ENC ComparisonUS5IL11M

Chicago Lake Front

Edition 5

Update Application Date 2007-04-03

Issue Date 2008-08-05

References: Charts 14928

Hydrography

The charted Hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in Section D. of the Descriptive Report. The following items were noted:

1) A charted Hulk in the vicinity of Latitude 41°53'27.16"N, Longitude 87°36'17.07"W was disproved by 200% side scan sonar. It is recommended that the Hulk be deleted from the chart.

2) The following charted depths were neither verified nor disproved by the present survey:

<u>Depth</u>	<u>Latitude N</u>	<u>Longitude W</u>
17	41°53'15.24	87°36'22.90
16	41°53'11.72	87°36'15.72
13	41°53'20.77	87°35'26.05
17	41°53'02.55	87°35'55.95
17	41°53'00.36	87°35'51.30
19	41°52'48.04	87°35'47.43

The charted depths were brought forward to supplement the present survey.

3) The following depth notations are recommended for change:

<u>Charted Notation</u>	<u>Latitude"N</u>	<u>Longitude"W</u>	<u>New Notation</u>
24 FT JAN -FEB 1990	41°53'21.63	87°35'44.17	22 FT JUN -AUG 2006
20 FT OCT 1981	41°53'19.25	87°36'08.25	19 FT JUN -AUG 2006
29 FEET FOR A WIDTH OF 800 FEET JAN-FEB 1990	41°53'18.31	87°34'57.53	29 FEET FOR A WIDTH OF 800 FEET JUN-AUG 2006

It is recommended that the above discussed item be deferred to MCD Source Data Branch for charting disposition.

**Adequacy of Survey**

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further survey requirements recommended by the hydrographer.

**Miscellaneous**

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey.

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**Norris A. Wike**  
Cartographer  
Verification of Data  
Evaluation and Analysis Report

# AHB PRE-COMPILATION PROCESS H11451

Components	File Names
<i>Product Surface</i>	H11451_EXTRACTED_2M
<i>Contour Layer</i>	H11451_CONTOURS
<i>Survey Scale Soundings</i>	H11451_SS_2M.hob
<i>Chart Scale Soundings</i>	H11451_CS_2M.hob
<i>ENC Retain Soundings</i>	H11451_ENC_SUPPLEMENTAL_DEPTHHS.hob
<i>Feature Layer</i>	H11451_Features.hob
<i>Meta-Objects Layer</i>	H11451_MCOV.hob H11451_MQUAL.hob
<i>Blue Notes</i>	H11451_BlueNotes.hob



## META-OBJECTS:

### a. M\_COV attributes

Acronym	Value
INFORM	H11451, OPR-Y387-NRT4-05, NOAA
SORDAT	20060804
CATCOV	1-coverage available
SORIND	US,US,SURVY,H11451

### b. M\_QUAL attributes

Acronym	Value
CATZOC	Zone of confidence B
INFORM	H11451, OPR-Y387-NRT4-05, NOAA
POSACC	10
SORDAT	20060804
SORIND	US,US,SURVY,H11451
SUREND	20060804
SURSTA	20060608

 H11451_EXTRACTED_2M	3 KB XML Document
 H11451_EXTRACTED_2M.hns	2,535 KB HNS File

**APPROVAL SHEET**  
**H11451**

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval of charted data. All revisions and additions made to the H-Cell files 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.

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Norris A. Wike  
Cartographer,  
Atlantic Hydrographic Branch

All final products have undergone a comprehensive review as per the Atlantic Hydrographic Branch Processing Manual and are verified to be accurate and complete except where noted in the Evaluation Report.

I have reviewed the Base Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Approved: \_\_\_\_\_  
Lt. Commander Shepard M. Smith, NOAA  
Chief, Atlantic Hydrographic Branch