

D00185

NOAA FORM 76-35A

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

CHART LETTER

Type of Survey **Hydrographic Survey**
Project No. **OPR-A321-FH-13**
Registry No. **D00185**

LOCALITY

State **New Hampshire**
General Locality **Gulf of Maine**
Sub-locality **Scantum Basin**

2013

CHIEF OF PARTY
LCDR Benjamin K. Evans, NOAA
HYDROGRAPHER
LCDR Benjamin K. Evans, NOAA

LIBRARY & ARCHIVES

DATE **September 13, 2013**

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.

Survey Summary Report to Accompany D00185	
Project	OPR-A321-FH-13
Survey	D00185
State	New Hampshire
Locality	Gulf of Maine
Sub Locality	Scantum Basin
Scale of Survey	1:40,000
Sonars Used	Reson 7125 & Reson 7111
Horizontal Datum	North American Datum 1983 (NAD83)
Vertical Datum	Mean Lower Low Water (MLLW)
Vertical Datum Correction	Verified Observed Tides
Projection	Latitude-Longitude (NAD83) UTM Zone 19 North
Field Unit	<i>NOAA Ship Ferdinand R. Hassler</i>
Survey Dates	August 21, 2013 - September 13, 2013
Chief of Party	LCDR Benjamin K. Evans, NOAA
Submission Date	12/06/2013

A. Area Surveyed

This hydrographic survey was acquired in accordance with the requirements defined in the Project Instructions OPR-A321-FH-13. It covers an area of relatively deep water southeast of the main OPR-A321-FH-13 project area. Figure 1 illustrates the survey limits overlaid on Chart 13278.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
42°56'40" N	42°45'59" N
070°37'01" W	070°22'13" W

Table 1. Survey limits

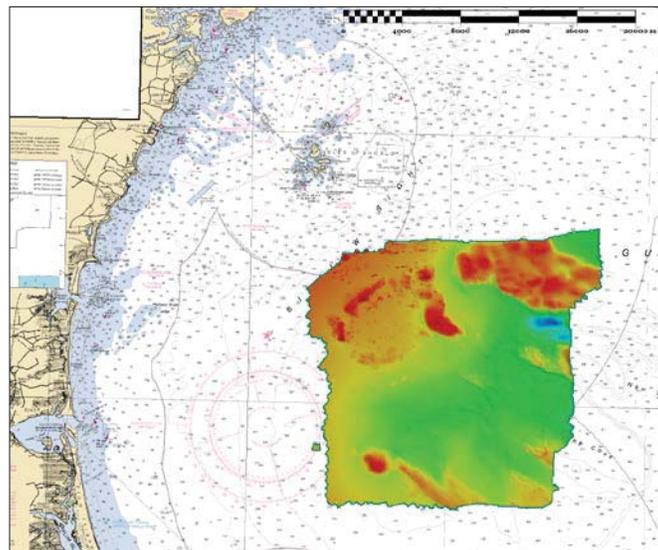


Figure 1. General locality of D00185 on Chart 13278

B. Survey Purpose

Survey D00185 was added to OPR-A321-FH-13 in Change_1 to the project instructions dated 8/19/2013. It was originally intended to provide an area for comparison of ship and Autonomous Underwater Vehicle-acquired bathymetric data as part of Coast Survey's REMUS 600 test and evaluation operations. Five percent of AUV crosslines were required for the test area in addition to the required 5% of ship multibeam crosslines.

This sheet was assigned as priority 8. *Hassler* worked this survey primarily at night, when higher priority survey areas were inaccessible due to the risk of damage to fixed fishing gear.

C. Intended Use of Survey

The primary objective of this survey was a comparison with the AUV data that was acquired within the sheet limits of D00185. This locality was chosen due to its proximity to the higher priority survey areas assigned as part of this project and the relatively low density of fixed fishing gear and risk of AUV entanglement.

Line spacing, ship speed and sound velocity cast frequency were designed to meet "complete" coverage requirements. Nearly 100% multibeam coverage was achieved within the sheet limits. There are several holidays in areas where the seafloor is deep and relatively flat. The hydrographer considers these coverage gaps to be insignificant.

While the AUV test and evaluation operations were operationally successful, the vehicle did not yield usable hydrographic survey data and no bathymetric data comparison was performed. This ship-acquired dataset is, however, complete. Although assigned as a reconnaissance survey, the hydrographer recommends full application to the charts in the common area as discussed in this Summary Report.

D. Data Acquisition and Processing

Please reference Data Acquisition and Processing Report "OPR-A321-FH-13_DAPR" for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods.

The Project Instructions did not specify coverage requirements for this survey. However it meets specifications for "Complete" coverage with the exception of some insignificant holidays.

Data was acquired with the following multibeam sonar configurations:

- Starboard Reson 7125 MBES in single-head mode operating at 200 kHz (majority of main-scheme operations)
- Port and starboard Reson 7125 in dual-head mode operating at 400kHz (shallow holiday lines and developments)
- Reson 7111 operating at 100kHz (two crosslines)

MBES	Linear Nautical Miles
Dual-head Reson 7125 400 kHz	5.7
Single-head Reson 7125 200 kHz	569.6
Single-head Reson 7111 100 kHz	17.2
	Square Nautical Miles
All Systems Combined	90.3

Table 2. Hydrographic survey statistics

Data provided with this Chart Letter meets requirements defined in the NOS Hydrographic Specifications and Deliverables (2013) for "Complete" multibeam coverage. Three finalized surfaces are included at 4-meter, 8-meter and 16-meter resolutions.

A density analysis was run to calculate number of soundings per surface node. Five or more soundings per node were present in over 99% of the 4-meter, 8-meter and 16-meter surfaces. For additional detail refer to the D00185_Standards_Compliance report submitted with this summary.

The 16-meter surface accounts for less than 1 nm² and meets density requirements. The 8-meter surface contains a holiday in this region that does not exist in the 16-meter surface. However, the 8-meter surface meets uncertainty and density standards through the deepest extents of the survey. The hydrographer recommends combining surfaces at an 8-meter resolution. The 16-meter surface is provided to the processing branch for quality assurance purposes only.

Backscatter was logged in Reson datagram 7008 snippets record in the raw .s7k files. The .s7k file also holds the navigation, attitude and bottom detections for all lines in this survey.

Bottom samples were not required in the instructions and were not acquired by the field party.

E. Results and Recommendations

a. Crosslines

Twenty-six linear nautical miles of crosslines were acquired. To increase the independence of the comparison, two crosslines were acquired with the Reson 7111 MBES and two with the starboard hull Reson 7125 MBES in 200 kHz mode. These account for 5.0% of mainscheme distance, excluding holiday and development lines, which satisfies requirements in the project instructions and NOS Hydrographic Specifications and Deliverables (2013). Crosslines were filtered to remove soundings greater than 45 degrees from nadir. To evaluate crossline agreement, two 4-meter surfaces were created: one from the crossline soundings, the other from mainscheme soundings. The crossline surface was differenced from the mainscheme surface using CARIS HIPS and SIPS. The statistical analysis of the difference between the mainscheme and crossline surfaces is shown below. The average difference between the surfaces is -0.02 meters; 95% of all differences were less than 0.27 meters. This is well within the acceptable total vertical uncertainty value for this survey of +/-0.7 m.

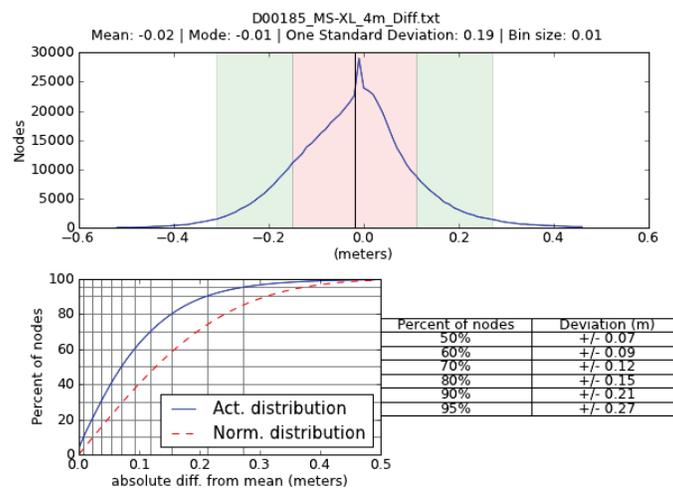


Figure 2. Statistical analysis of the mainscheme and crossline difference surface

b. Chart Comparison

Raster Chart	Scale	Edition	Edition Date	LNM Date	NM Date
13278	80,000	28	8/1/2013	11/12/2013	11/2/2013
ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary
US4MA04M	80,000	21	4/8/2013	10/24/2013	No

Table 3. Largest scale charts covering the survey area

Survey data agree well with chart 13278. Throughout the majority of the survey, soundings agree to within 5 feet of charted depths. Notable exceptions include:

- Surveyed soundings over rocky outcroppings in the northwest section of the survey grounds are up to 48 feet shoaler than charted soundings. In the water depth of this survey, these outcroppings are navigationally insignificant.
- In the northeast region of the survey area, some soundings are up to 20 feet deeper than charted depths.
- The current survey locates the 240-foot contour along the western sheet boundary up to 0.25 nautical miles west of its charted position.

Surveyed soundings were not compared with ENC US4MA04M as this data was sourced from Raster Chart 12378.

The hydrographer recommends that the current survey supersede charted depths and contours throughout the common area.

c. Junction

This survey overlaps with survey H12614 within project OPR-A321-FH-13. The overlapping MBES data is in the Northwest section of D00185. This junction is not required, yet included in this review because two different acquisition modes were used (H12614 data was acquired with the ship's Reson 7125 MBES operating in dual-head 400kHz mode). For details refer to "OPR-A321-FH-13_DAPR," referenced in Section C. The H12614, 4-meter finalized surface was differenced from the D00185 4-meter finalized surface. The average difference of the D00185 and H12614 4-meter finalized surfaces is 0.03m with a standard deviation of 0.37m. 95% of all differences were less than +/- 0.63m, meeting IHO total allowable uncertainty for this depth.

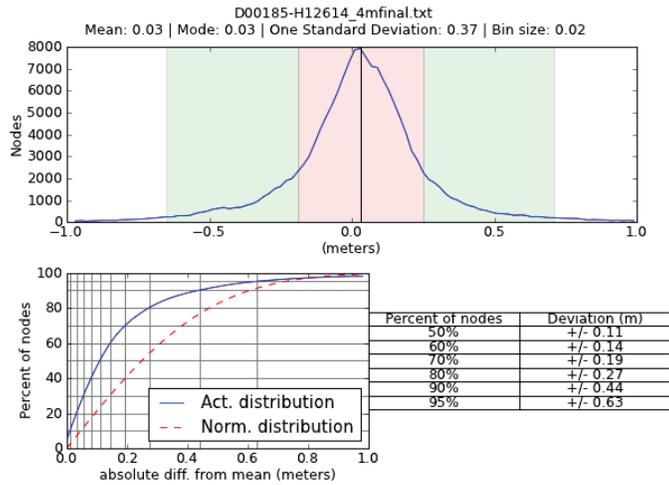


Figure 3. Difference Surface Statistics - D00185 minus H12614

F. Vertical and Horizontal Control

The vertical datum used for this project is Mean Lower Low Water (MLLW). Survey soundings were reduced to MLLW with gauge water levels corrected with discrete zoning.

A request for final tides was submitted to the Atlantic Hydrographic Branch on 10/2/2013. The Final Tide Note for this survey was received on 10/3/2013. Preliminary zoning is provisionally accepted as final zoning and an explanation is included in the memorandum. The tide note is included in Appendix 1, Tides and Water Levels, submitted with this report.

The following National Water Level Observation Network (NWLON) station served as a datum control for this survey:

Station Name	Station ID
Fort Point	842-3898

Table 4. NWLON tide station

The horizontal datum for this project is North American Datum of 1983 (NAD83). The entire project is located within Universal Transverse Mercator projection Zone 19 North (UTM-Zone 19N). Differential GPS (DGPS) was the sole method of positioning. The following DGPS Station was used for horizontal control:

DGPS Stations
Brunswick NAS,ME (316 kHz)

Table 5. DGPS station

G. Additional Results

No AWOIS items were assigned or investigated for this survey.

Three charted features were investigated; two wrecks and an unexploded mine. One wreck (position approximate) was within the sheet limits and the other charted wreck was outside of the survey limits to the west.

The charted wreck position outside of the survey limits was surveyed in hopes of locating an AUV investigation target. No evidence of a wreck was found, however the search radius was insufficient to justify disproving or relocating the feature.

No additional information was provided with the project instructions regarding the features within the survey limits. No evidence of the wreck, the mine, or any other navigationally significant feature was found by this survey. The hydrographer recommends removing the charted wreck. An unexploded mine is likely beyond the detection capabilities of the systems used for this survey; the hydrographer recommends retaining as charted.

H. Approval

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. While data acquired on this sheet were intended for comparison with the AUV data, ship standards of quality assurance were upheld. I have reviewed the attached survey data and reports. All field sheets, this Survey Summary Report and all accompanying records and data are approved. All records are respectfully forwarded to the Atlantic Hydrographic Branch.

The survey data meet or exceed requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Letter Instructions, and all HSD Technical Directives except for discrepancies discussed in this report. These data are adequate to supersede charted data in their common areas and the hydrographer recommends full application. This survey is complete and no additional work is required.

Approver Name	Approver Title	Approval Date	Signature
LCDR Benjamin K. Evans, NOAA	Chief of Party	12/6/2013	
LT Madeleine M. Adler, NOAA	Field Operations Officer and Survey Manager	12/6/2013	

APPENDIX I
TIDES AND WATER LEVELS



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

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 3, 2013

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-A321-FH-2013

HYDROGRAPHIC SHEET: D00185

LOCALITY: Scantum Basin, Gulf of Maine, NH

TIME PERIOD: August 20 - September 13, 2013

TIDE STATION USED: 842-3898 Fort Point, NH

Lat: 43° 4.3'N Lon: 70° 42.7'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.735 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is provisionally accepted as the final zoning for project OPR-A321-FH-2013, D00185, during the time period between August 20 - September 13, 2013.

Please use the zoning file A321NF2013CORP submitted with the project instructions for OPR-A321-FH-2013. Zones NA156 and NA169 are the applicable zones for D00185.

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: Annual Leveling for the tide station at Fort Point, NH (8423898) was not completed in FY13. A review of the verified leveling records from October 2002 - 2012 show the tide station benchmark network to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as final stability verification for the purposes of survey OPR-A321-FH-2013, D00185. CO-OPS will immediately provide a revised Tide Note should subsequent leveling records indicate any benchmark network stability movement beyond the allowable 0.009 m tolerance.

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2013.10.03 16:08:40 -04'00'

Chief, Products and Services Branch

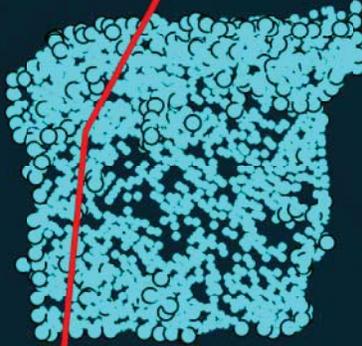


**Preliminary as Final Zoning for OPR-A321-FH-2013, D00185
Scantum Basin, Gulf of Maine**

8423898 FORT POINT, NH

NA156
Time Corrector -12 mins
Range Corrector x 0.98
Reference 8423898

NA169
Time Corrector -6 mins
Range Corrector x 1
Reference 8423898



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS
AND CORRESPONDENCE



OPR-A321-FH-13

4 messages

OPS.Ferdinand Hassler - NOAA Service Account

Tue, Sep 10, 2013 at 3:35

<ops.ferdinand.hassler@noaa.gov>

AM

To: Paul Turner - NOAA Federal <Paul.Turner@noaa.gov>

Cc: David Moehl - NOAA Federal <david.t.moehl@noaa.gov>

Good Morning Sir,

Below, please find a few questions regarding the *Hassler's* current project, OPR-A321-FH-13.

- Is there any information about the PA on Sheet D00185?

- Per our plan, we will complete acquisition on H12613, H12615 & D00185, we have opened sheet H12614 and started working from East to West. There will not be enough time to finish and we do not have any more days scheduled for this project. Would you prefer for us to append this data to sheet H12613 or box it off and keep it separate?

- The working grounds on H12614 are heavy with fishing gear. We cannot see this gear at night and have been working D00185 after sunset. We have three more nights underway here but probably only enough of this sheet left for one and a half nights or surveying. Is there any other offshore work we could do? Perhaps extend the limits to the north on D00185? Typically we would anchor, but with the AUV conducting night missions, anchoring would not allow for us to tend to the AUV, if needed.

Thank you for your help.

Very respectfully,

Madeleine

Field Operations Officer, *NOAA Ship Ferdinand R. Hassler*

29 Wentworth Road

New Castle, NH, 03854

Paul Turner - NOAA Federal <paul.turner@noaa.gov>

Tue, Sep 10, 2013 at 1:06 PM

To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

Cc: David Moehl - NOAA Federal <david.t.moehl@noaa.gov>

Good morning Madeleine-

Sounds like you all are plowing through the survey area up there. Regarding sheet H12614, please square off the sheet as best you can with the remaining time and submit as a stand alone H sheet. I prefer this to appending it with the junctioning sheet to the North.

I will extend the sheet limits of D00185 to the north to provide additional working grounds for night ops. Sounds like you will have about 18 - 24 hrs of survey time - does that sound right?

Regarding the PA, by what means would you be disproving this? I'll send you some background info on it along with the extended sheet limits by this afternoon. In the mean time please let me know if you have any additional comments or questions.

Thanks,

Paul

[Quoted text hidden]

--

Paul Turner
Physical Scientist
NOAA - Office of Coast Survey

301-713-2700 *106

Paul.Turner@noaa.gov

Paul Turner - NOAA Federal <paul.turner@noaa.gov>

Tue, Sep 10, 2013 at 7:47 PM

To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

Hi Madeleine-

I extended the sheet limits for D00185 to the north which adds an additional 14 snm (175 lnm) to the survey. Please let me know if this will be adequate for your remaining project time on OPR-A321-FH-13. I've attached the updated sheets file (as a MapInfo .tab and an ESRI .shp). I am having issues adding this to the CSF and will send that you later this week.

Thanks,

Paul

[Quoted text hidden]



MapInfo Data_9_10_13.zip

66K

OPS.Ferdinand Hassler - NOAA Service Account

Wed, Sep 11, 2013 at 4:36

<ops.ferdinand.hassler@noaa.gov>

AM

To: Paul Turner - NOAA Federal <paul.turner@noaa.gov>

Thank You Sir,

The files came through okay. I can give you an estimate tomorrow when I know what the ship completes tonight.

I appreciate your help and quick turnaround.

Very respectfully,

Madeleine

Field Operations Officer, *NOAA Ship Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

APPENDIX III

SURVEY FEATURES REPORT

Danger to Navigation - none

AWOIS - none

Maritime Boundary - none

Wrecks - two

D00185 Wreck

Registry Number: D00185
State: New Hampshire
Locality: Gulf of Maine
Sub-locality: Scantum Basin
Project Number: OPR-A321-FH-13
Survey Dates: 08/21/2013 - 09/13/2013

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13278	26th	06/01/2005	1:80,000 (13278_1)	[L]NTM: ?
13260	40th	05/01/2007	1:378,838 (13260_1)	[L]NTM: ?
13009	33rd	05/01/2007	1:500,000 (13009_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_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	Charted Wreck	Wreck	[None]	42° 48' 23.8" N	070° 36' 29.2" W	---
1.2	Wreck PA	GP	[None]	42° 52' 31.5" N	070° 29' 58.1" W	---

1 - Wreck

1.1) Charted Wreck

Survey Summary

Survey Position: 42° 48' 23.8" N, 070° 36' 29.2" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2004-121.00:00:00.000 (04/30/2004)
Dataset: D00185_wrecks.000
FOID: 0_ 0002019451 00001(FFFE001ED07B0001)
Charts Affected: 13278_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
D00185_wrecks.000	0_ 0002019451 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1:non-dangerous wreck
 EXPSOU - 1:within the range of depth of the surrounding depth area
 NINFOM - Retain wreck
 QUASOU - 2:depth unknown
 SORDAT - 20040430
 SORIND - US,US,graph,W-00181
 WATLEV - 3:always under water/submerged

Office Notes

SAR: wreck not located within D185 MB coverage. Bearing in mind the limited coverage recommend to retain.

COMPILE: Concur to retain charted wreck due to limited coverage.

1.2) Wreck PA

Survey Summary

Survey Position: 42° 52' 31.5" N, 070° 29' 58.1" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 1981-001.00:00:00.000 (01/01/1981)
Dataset: D00185_wrecks.000
FOID: 0_ 0002019453 00001(FFFE001ED07D0001)
Charts Affected: 13278_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
D00185_wrecks.000	0_ 0002019453 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)
Attributes: NINFOM - Delete wreck
 NTXTDS - ENC US4MA04M,ED 22,Update 2

Office Notes

SAR: no evidence of the wreck PA within the complete MB coverage. Wreck is considered as disproven, recommend to delete.

COMPILE: Concur. Delete charted wreck.

APPROVAL PAGE

D00185

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- D00185_ChartLetter.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- D00185_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

Lieutenant Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch