

D00140

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey **Hydrographic Reconnaissance**

Registry No. **D00140**

LOCALITY

State **Louisiana**

General Locality **Chandeleur Sound**

Sub-locality **07 NM West of Chandeleur
Islands**

2008-2009

CHIEF OF PARTY
Joseph Talbott
TerraSond Ltd.

LIBRARY & ARCHIVES
DATE **April 29, 2009**

NOAA FORM 77-28 U.S. DEPARTMENT OF COMMERCE
(11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HYDROGRAPHIC TITLE SHEET

REGISTRY NUMBER:

D00140

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

State/Territory: **Louisiana**

General Locality: **Chandeleur Sound**

Sub-Locality: **7 NM West of Chandeleur Islands**

Scale: 1:20,000

Date of Survey: JUL 02, 2008 – JAN 22, 2009

Instructions Dated:

APR 21, 2008

Project Number: **OPR-J977-TE-08**

Vessel:

M/V Thomas R. Dowell

Chief of Party:

Joseph Talbott

Surveyed by:

TerraSond Ltd.

Soundings by:

Singlebeam Echosounder

Graphic record scaled by: N/A

Graphic record checked by: N/A

Protracted by:

N/A

Automated Plot: N/A

Verification by:

Atlantic Hydrographic Branch

Soundings in:

Meters at MLLW

Remarks:

1) All Times are UTC.

2) This is a basic Hydrographic Survey under the Navigable Area Concept.

3) Projection is UTM Zone 16N.

Bold italic red notes in the Descriptive Report were made during office processing.

DESCRIPTIVE REPORT OPR-J977-TE-08



Registry Number: D00140

M/V Thomas R. Dowell

Survey: G

State: Louisiana General Locality:

Chandeleur Sound Sublocality: 7 NM West of Chandeleur Islands

Survey Dates: July 2, 2008 – January 22, 2009

Lead Hydrographer: Joseph C. Talbott

TABLE OF CONTENTS

A. AREA SURVEYED	1
B. DATA ACQUISTION AND PROCESSING.....	2
B.1. Equipment.....	2
B.2. Quality Control	3
B.2.1. Vertical Beam Echo Sounder (VBES).....	3
B.2.2. Crosslines.....	3
B.2.3. Survey Junctions	3
B.3. Corrections to Echo Soundings.....	4
B.4. Data Processing.....	4
C. VERTICAL AND HORIZONTAL CONTROL	5
D. RESULTS AND RECOMMENDATIONS.....	5
D.1. Chart Comparison	5
D.1.1. New Features	7
D.1.2. Changed Features.....	8
D.1.3. Disproved Features	11
D.1.4. Soundings.....	13
D.1.5. Trends and Changeable Areas	13
D.1.6. AWOIS Items Summary.....	15
D.2. Additional Results.....	15
D.2.1. Aids to Navigation	15
D.2.2. Drilling Structures.....	16
D.2.3. Comparison with Prior Surveys.....	16
D.2.4. Bottom Samples.....	16
D.2.5. Bridges and Overhead Cables.....	16
D.2.6. Submarine Cables and Pipelines.....	16
LETTER OF APPROVAL	17

APPENDICES

I Danger to Navigation Reports

II Survey Feature Report

III Progress Sketch

IV Tide and Water Levels

V Supplemental Survey Records and Correspondence

SEPARATES

I Acquisition and Processing Logs

II Sound Velocity Profile Data

III Hydrographic Survey Letter Instructions/Statement of Work

IV Crossline Comparisons

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Descriptive Report to Accompany Hydrographic Survey

D00140

Survey G July 2, 2008 – January 22, 2009

TerraSond Ltd.

Lead Hydrographer: Joseph C. Talbott

A. AREA SURVEYED

A singlebeam echo sounder survey was conducted in Chandeleur Sound, Louisiana in accordance with the NOAA, National Ocean Service, Statement of Work (SOW), Side Scan Sonar Services, OPR-J977-TE-08, dated April 21, 2008.

The purpose of this project was to provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of the assigned area. The project area was approximately 281 square nautical miles and was located in Chandeleur Sound, 7 nautical miles west of the Chandeleur Islands, east of the Mississippi River Delta, in the State of Louisiana.

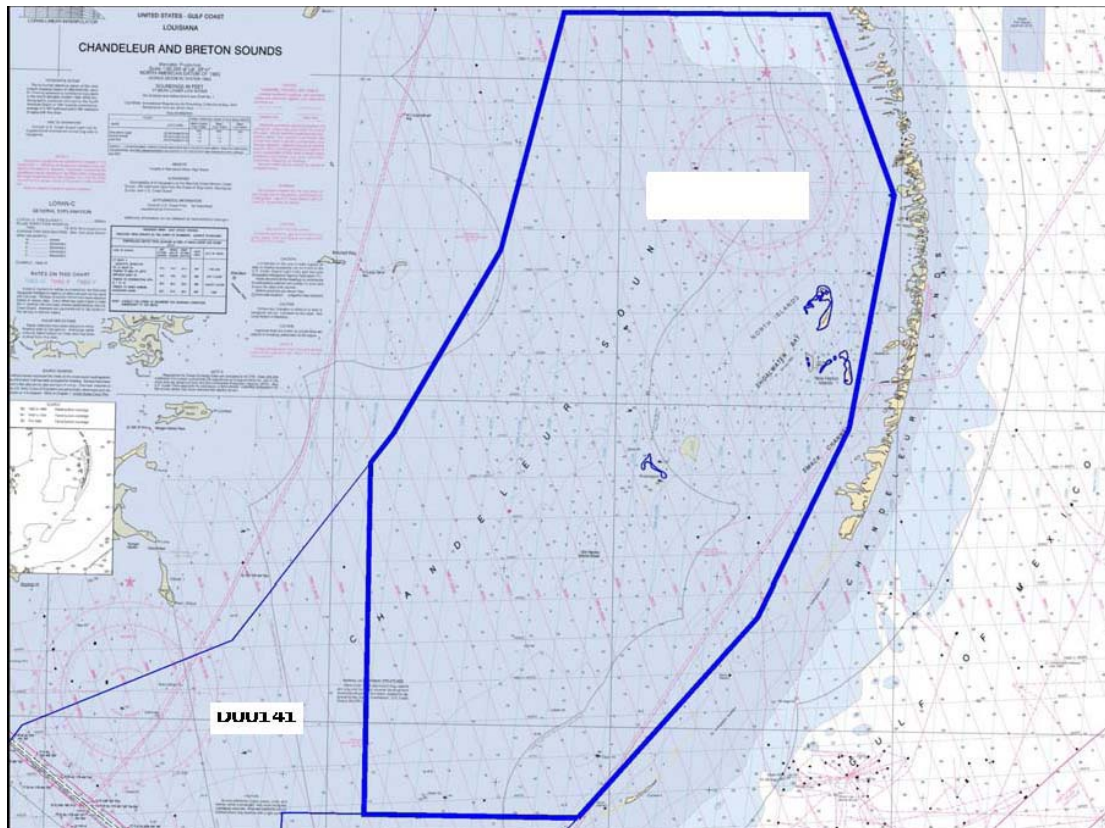


Figure 1 – Overview of D00140 with Chart 11363, 41st Edition, June 2007. Soundings in feet.

The project area is located in Chandeleur Sound which has an active shrimp and oyster fishery and contains several oil and gas structures. The project area is located north of the Mississippi River Gulf Outlet (MRGO) which, prior to its closure in 2008, provided a primary access route to the New Orleans Industrial Canal for barge traffic from Eastern Gulf of Mexico ports to New Orleans and the Mississippi River. At the time of the survey, the MRGO was in the process of being closed by the US Army Corps of Engineers. This closure involves the placement of riprap across the mouth of the MRGO and the removal of aids to navigation marking the MRGO channel.

The SOW for OPR-J977-TE-08 specified a survey of D00140 using a singlebeam echo sounder with survey lines spaced 1000 meters apart. The survey was intended to provide a baseline for a chart adequacy review of the area to determine future charting needs. Discussions with the NOAA Contracting Officers Technical Representative (COTR) during the survey resulted with the survey being downgraded to a reconnaissance. This eliminated the requirement to pursue additional development work in areas where the 2008 survey found significant discrepancies with the charted data. *Concur (see attached documentation)*

This survey has a maximum depth of 7.6 meters and a minimum depth of 0.2 meters below the Mean Lower Low Water (MLLW) tidal datum.

For complete survey limits, refer to Figure 1 on the preceding page.

B. DATA ACQUISITION AND PROCESSING

B.1. Equipment

Bathymetry for this survey was acquired using the hydrographic survey vessel *M/V Thomas R. Dowell*.

M/V Thomas R. Dowell

The *M/V Thomas R. Dowell* is an aluminum hulled survey vessel, 10.2 meters length overall with a 2.9 meter beam and a 0.4 meter draft. The *Dowell* is powered by two four-stroke 150 HP Honda outboard motors. Auxiliary electrical service is provided by a 3 KW Honda generator. The primary survey systems used on the *M/V Thomas R. Dowell* are listed in Table 1.

Table 1 - Major systems used aboard the *M/V Thomas R. Dowell*.

VESSEL <i>M/V Thomas R. Dowell</i> LOA: 10.2 m, BEAM 2.9 m, DRAFT: 0.4 m	
Equipment	Manufacturer & Model
Singlebeam echo sounder	Odom Hydrotrac
Positioning	Trimble DSM-232
Sound speed	Odom Digibar Pro
Vessel course and pitch	Hemisphere Crescent V100

Equipment performance details are provided in the Data Acquisition and Processing Report (DAPR), Sections A. Equipment and B. Quality Control.

B.2. Quality Control

B.2.1. Vertical Beam Echo Sounder (VBES)

No conditions with the potential for adversely affecting data integrity were encountered on the *M/V Thomas R. Dowell* with the VBES suite during this survey.

VBES confidence checks were conducted on a weekly basis, when possible. The confidence checks consisted of a single depth deployment of a bar check apparatus at a fixed distance below the VBES transducer to check for drift in the VBES system index value. No significant drift in the index value was observed during the course of the survey.

A detailed discussion of VBES system calibrations, data acquisition, and processing is provided in the Data Acquisition and Processing Report (DAPR), Paragraphs A. Equipment and B. Quality Control. *Concur.*

B.2.2. Crosslines

33 mainscheme lines totaling 380 lineal nautical miles and 3 lines totaling 42 lineal nautical miles of crosslines were run during the 2008 survey of D00140. The ratio of the lineal nautical miles of crosslines to the lineal nautical miles of mainscheme lines, at

11.1 %, exceeds the 8 % required by “NOAA, NOS Hydrographic Surveys Specifications and Deliverables,” April 2007, Section 5.1.4.

Crossline analysis was conducted by creating a BASE surface of the mainscheme lines and a separate BASE surface using the crosslines. The surfaces were then compared and the difference between the surfaces was computed.

2,244 surface difference values were compared in D00140. 100% of the compared values were within the allowable error for the depths surveyed.

A comprehensive explanation of the crossline analysis process is in the Data Acquisition and Processing Report (DAPR), Paragraphs A. Equipment and B. Quality Control. Contemporary Survey Junctions *Concur.*

B.2.3. Survey Junctions

D00140 junctions with two other surveys completed in 2008 / 2009. The southern limits of D00140 junctions with the northern limits of D00142 (OPR-J977-TE-08) and the westerly limits of D00140 junctions with the eastern limits of D00141 (OPR-J977-TE08).

Five meter BASE surfaces were created for each survey in the area of overlap. CARIS Subset Editor was then used to analyze the difference between sounding values for each sheet at each survey junction. The soundings are in general agreement between the surveys. No adjustments are recommended based on the junction analysis.

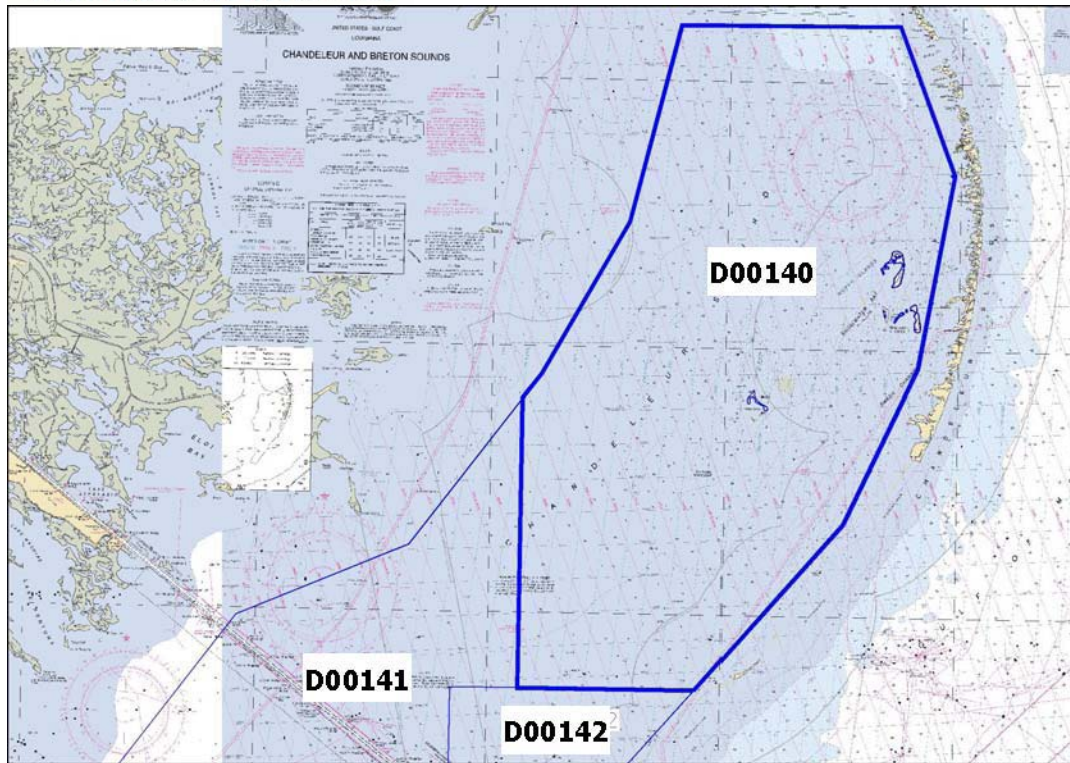


Figure 2 – Overview of survey area showing the junction locations of D00140 with D00141 and D00142 (OPR-J977-TE-08). Chart 11363, 41st Edition, June 2007..

B.3. Corrections to Echo Soundings

Survey D00140 was performed in conjunction with five other surveys in Project OPRJ977-TE-08. Any change to the corrections to echo soundings affects all surveys in the area and is described in detail in the DAPR.

Sounding data were reduced using zoning provided by NOAA/CO-OPS under the SOW with final tides for the National Water Level Observation Network (NWLON) stations at Pilot Station East, LA (8760922) located at the Gulf of Mexico end of Southwest Pass, Bay Waveland Yacht Club, MS (8747437), Gulfport Harbor, MS (8745557) and one supplemental station established for this survey. The supplemental station, Olga Compressor Station, LA (8760889) was installed, maintained, and removed by TerraSond Ltd. in conjunction with survey operations conducted for OPR-J977-TE-08. Refer to the Horizontal and Vertical Control Report (HVCR) for tidal zoning methods and operations. *Concur.*

B.4. Data Processing

The final depth information for D00140 was submitted as a collection of CARIS BASE surfaces which best represented the seafloor at the time of the 2008 / 2009 survey. All possible measures were taken to ensure the data was correctly processed and the appropriate designated soundings, representing the least depth of significant contacts, were selected and retained in the finalized surfaces.

Two digital products were submitted for the D00140. A CARIS BASE uncertainty surface, covering the entire survey area in which the finalized uncertainty was the greater of either the standard deviation of sounding values, or *a priori* uncertainty values, and a sun-illuminated Digital Terrain Model (DTM). The naming convention used for each grid was:

CARIS BASE Uncertainty Surface: D00140_5m.hns

- 5m represents the 5.0 m resolution

Sun-Illuminated Elevation DTM: D00140_5m.tif

- 5m represents the 5.0 m resolution

The Data Acquisition and Processing Report Paragraphs A: Equipment – Data Collection; and B: Quality Control contain detailed discussions of the steps followed when acquiring and processing the 2008 / 2009 survey data. *Concur.*

C. VERTICAL AND HORIZONTAL CONTROL

Sounding data were tide adjusted using final tide levels for National Water Level Observation Network (NWLON) stations at Pilot Station East, LA (8760922) located at the Gulf of Mexico end of Southwest Pass, Bay Waveland Yacht Club, MS (8747437), Gulfport Harbor, MS (8745557) and one supplemental station established at the historic USC&GS tide station site at Olga Compressor Station, Grand Bay, LA (876-0889) The final zoning methodology is described in detail in the project wide HVCR.

The horizontal control datum used for this survey is the North American Datum of 1983 (NAD 83). The projection used was UTM, Zone 16 North.

Sounding position control was determined using a Differential Global Positioning System (DGPS). The primary source of navigation correctors was the United States Coast Guard DGPS station at English Turn, LA, StaID 292. Correctors from the USCG differential DGPS station at Mobile Point, AL, StaID 300, were used when the English Turn station was unavailable. A summary of weekly DGPS confidence checks is provided in Separates I: Acquisition and Processing Logs included with this report. *Concur.*

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

The chart comparison for D00140 was performed by examining all raster navigational charts (RNC) and electronic navigation charts (ENC) covering the survey area and comparing charted depths with surveyed depths at the same location. CARIS HIPS was used to create 5 meter resolution soundings from the survey data which were used as a foreground layer with the RNC or ENC in the background. Each charted depth was compared with the 2008 / 2009 survey soundings at, or closest to, the same location. The RNC / ENC depth and the shoalest corresponding 2008 / 2009 survey sounding was then analyzed to determine trends. All depths were recorded in feet and, where the survey depth was deeper or shallower than the charted depth by a factor greater than or equal to 10% of the water depth, the position, charted depth,

survey depth and an image showing the depths being compared were included in Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE.

Local Notice to Mariners (LNM) updates were applied to all RNC's and ENC's during the survey of D00140 to ensure the field observations represented the most current published information available. LNM number 08-08-2009 dated February 26, 2009 was the last LNM reviewed for this project.

There were 2 features submitted as Dangers to Navigation (DTON) for the 2008 / 2009 survey. A copy of each DTON is included in Appendix I: DANGER TO NAVIGATION REPORTS.

All survey data were compared to the data published in the RNC's listed in Table 2 and the ENC's listed in Table 3. Figure 3 and Figure 4 show the survey limits with respect to the RNC and ENC used for chart comparison.

Table 2 - Raster Navigational Chart used during chart comparisons.

Chart	Scale	Edition Number	Issue Date
11363	1:80,000	41	June 2007

Table 3 -Electronic Navigation Chart used during chart comparisons.

Cell Name	Chart	Scale	Edition Number	Issue Date
US4LA34M	11363	1:80,000	1	June 18, 2008

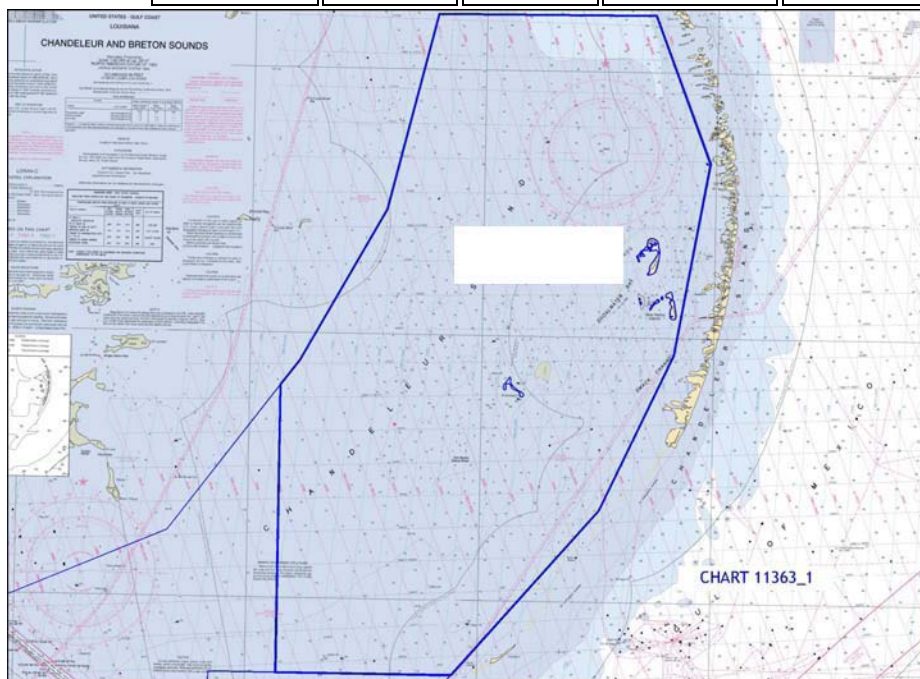


Figure 3- Survey limits of D00140 shown with raster navigational chart 11363, 41st Edition.

All charted features were investigated visually and with a vertical beam echosounder as appropriate. High levels of turbidity and biomass limited visibility in the water column to a few inches in the southern portion of D00140 to approximately one foot in the northern portion and the ability to visually examine features in the water was significantly reduced, even in very shallow water. *Concur.*

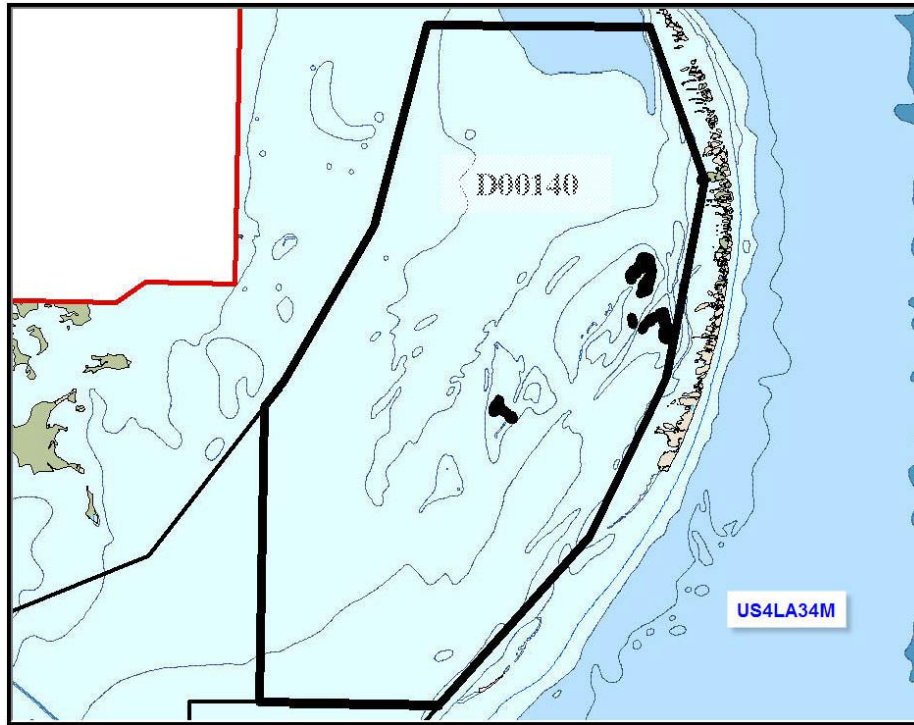


Figure 4 - Survey limits of D00140 shown with ENC US4LA34M, 1st Edition.

The 2008 / 2009 survey data differ significantly from the depths depicted on RNC and ENC covering D00140. Discrepancies between the referenced charts and the 2008 / 2009 survey data are detailed in the following paragraphs:

D.1.1. New Features

The 2008 survey identified two (2) features which are not currently charted. The positions of these features are shown in Figure 5 and a detailed description is contained in Table 4.

Table 4 - Detailed description of the uncharted feature shown in Figure 5 positioned during OPR-J977-TE-08 survey in D00140.

Feature1	Latitude	Longitude	Least Depth	Description
G22	29° 39' 12.53" N	089° 00' 12.88" W	Above surface	Uncharted wreck. DTON submitted.

Concur with clarification. RNC and ENC have been updated with DTON. Wreck was not verified with sparse data and was charted as an OBSTN.

G23	29° 49' 05.54" N	089° 04' 41.39" W	On surface	Uncharted buoy.
<i>Concur with clarification. Lat/Lon cannot be verified without a DP.</i>				

Feature designator corresponds to the identification number used in the master contact file (APPENDIX V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1. CHART COMPARISON).

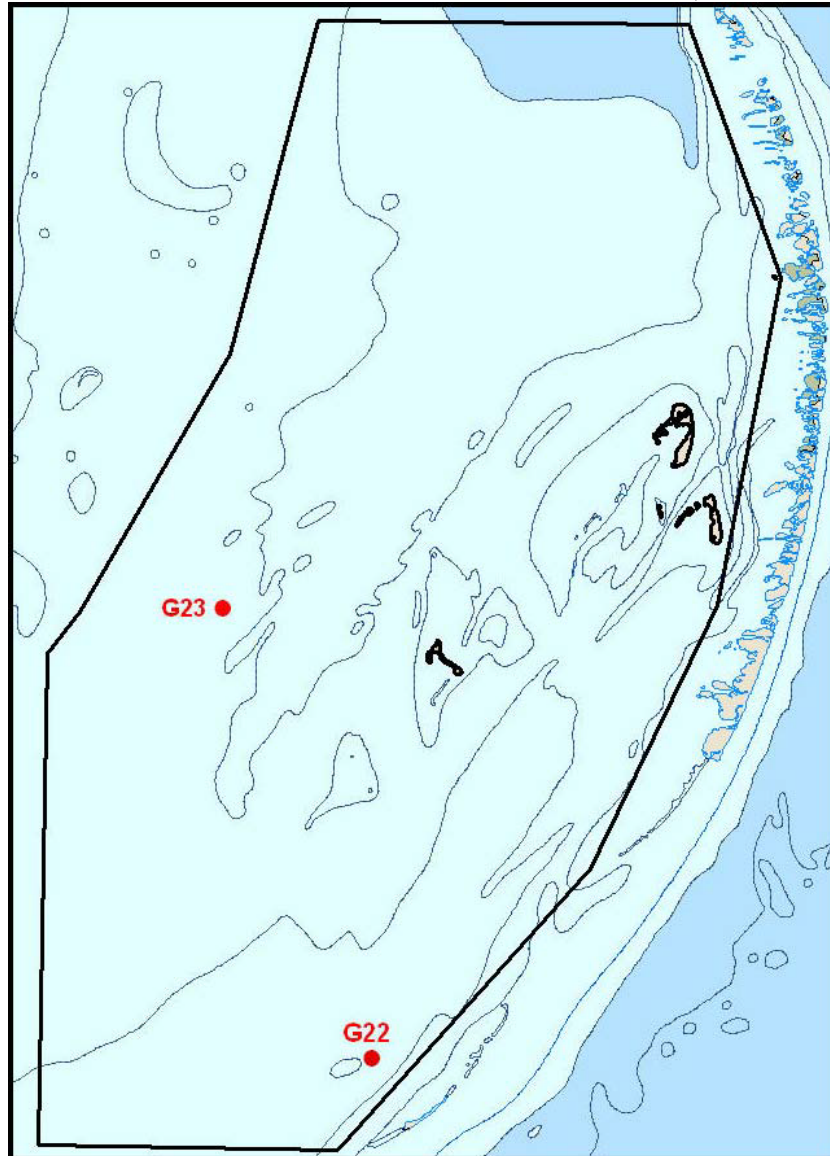


Figure 5- Overview of D00140 showing the location of uncharted features which were found during OPR-J977-TE-08. ENC US4LA34M, 1st Edition.

The hydrographer recommends updating RNC 11363, 41st Edition and ENC US4LA34M, 1st Edition to include the features found during the 2008 / 2009 survey.

D.1.2. Changed Features

Shoreline

Shoreline verification was not required under the task order for OPR-J977-TE-08 and the line spacing specified for the survey did not provide sufficient data density to adequately delineate the shoreline however, significant horizontal displacement in the position of several distinctive islands was noted during the survey. An example of this positioning error is the location of Freemason Island, shown in Figure 6. The island is charted approximately 1300 meters north of the actual position. Figure 7 shows the 2008 / 2009 survey lines at the charted position and Figure 8 shows the actual location of the island.

Although the hydrographer would normally recommend that the chart be updated to reflect the depths determined by the 2008 / 2009 survey, the line spacing specified by the statement of work does **not** provide sufficient data to adequately define the area. The bathymetry in the survey area is complex and is located in a complex coastal zone which receives significant storm activity on an annual basis. The existing bathymetry and the on-going processes which are affecting the area cannot be reasonably detailed without additional development.

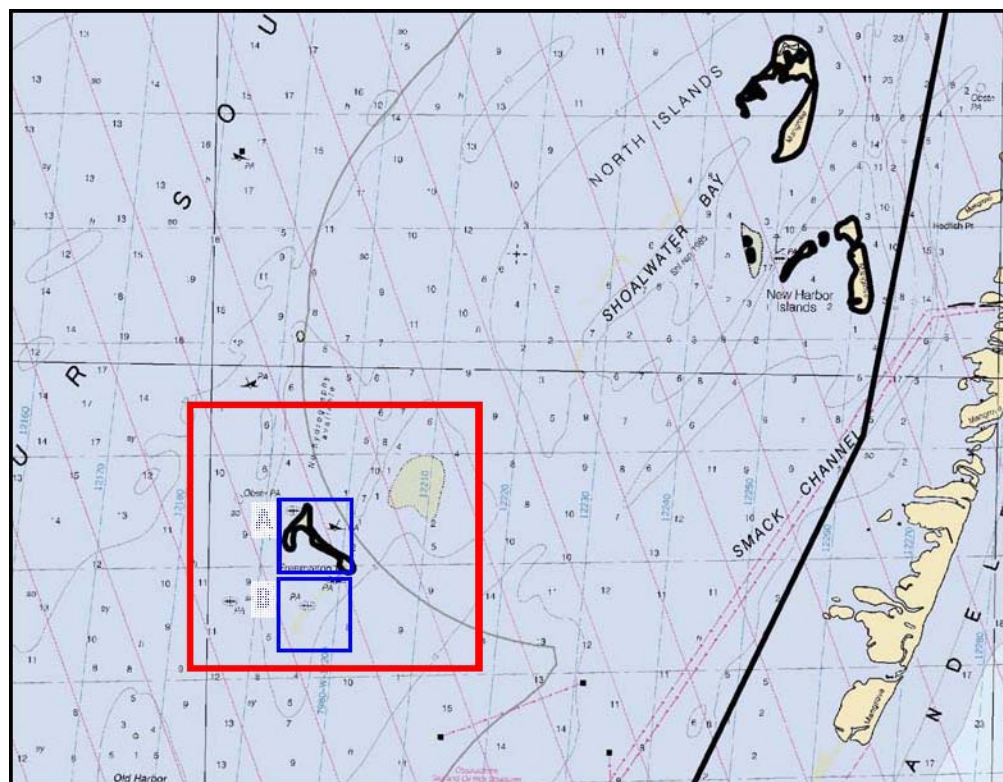


Figure 6 - Detailed view of the vicinity of Freemason Island. Chart 11363, 41st Edition. Depths in feet. Figure 7 - Detailed view of the charted position of Freemason Island showing the 2008 / 2009 survey depths (blue). Depths in feet.

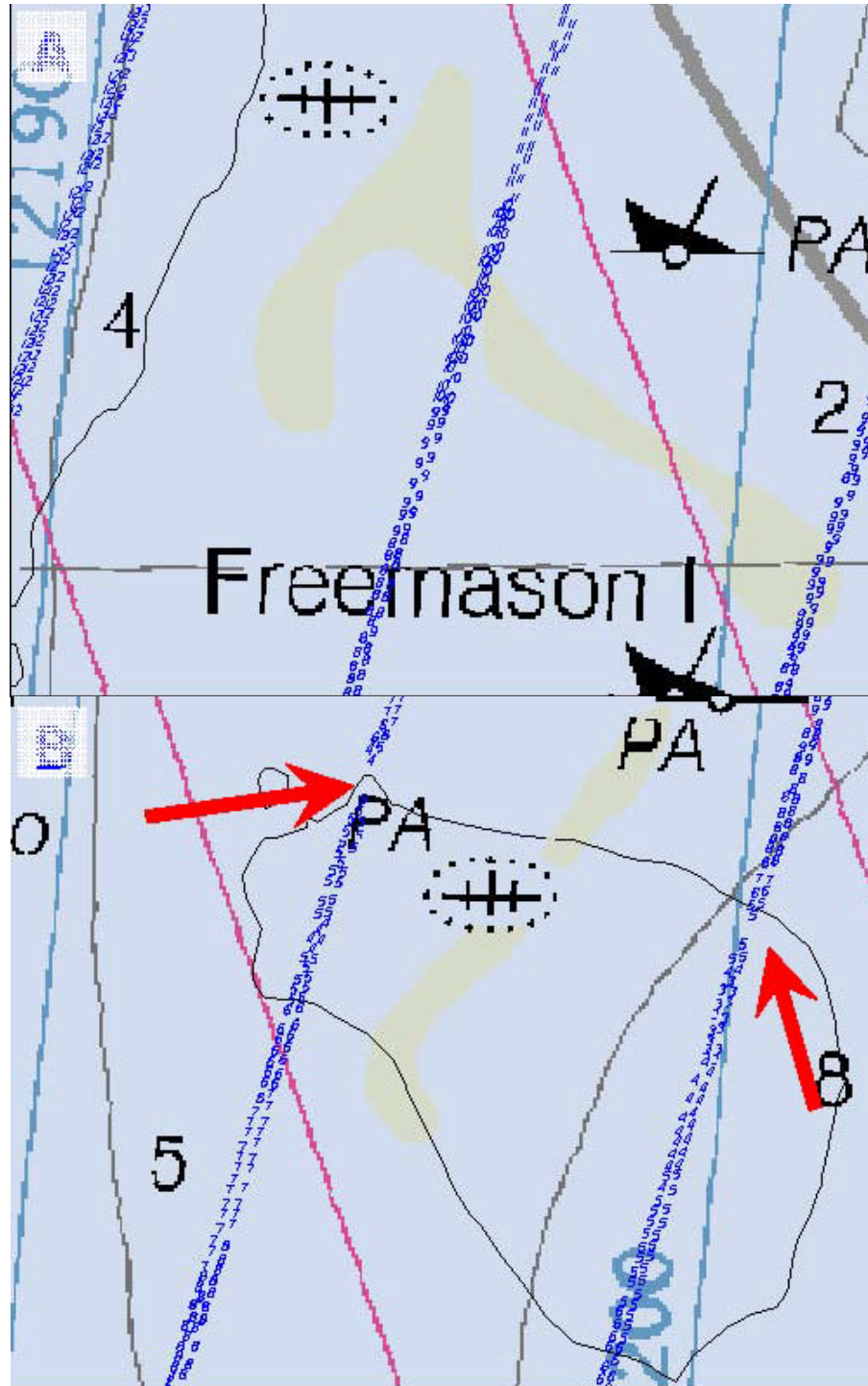


Figure 8 - Detailed view of the actual position of Freemason Island showing the 2008 / 2009 survey depths (blue). The location of the island is indicated by the break in the survey lines (red arrows). Depths in feet.

D.1.3. Disproved Features

19 features appearing on RNC 11363, 41st Edition and ENC US4LA34M, 1st Edition, within the boundaries of D00140, were searched for but not found during the 2008 / 2009 survey. The locations of these features are shown in Figure 9 and a detailed description is contained in Table 5. A complete listing of all features investigated in D00140 is provided in APPENDIX V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1. CHART COMPARISON. *Concur with clarification. Survey was conducted using a SBES with 1000 meter line spacing. Additional data is needed to disprove these features.*

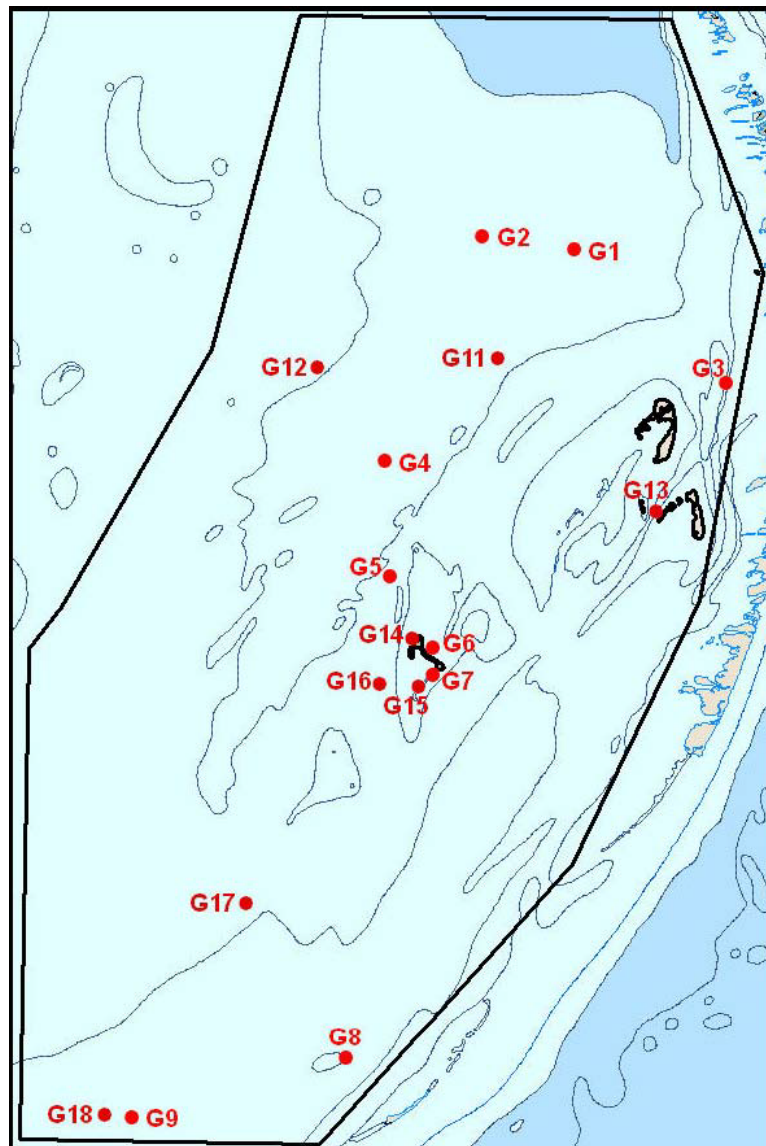


Figure 9 - Overview of D00140 showing the locations of charted featured which were searched for but not found during OPR-J977-TE-08. ENC US4LA34M, 1st Edition.

Table 5 - Detailed description of charted features shown in Figure 9 searched for but not found during OPR-J977-TE-08 survey in D00140.

Feature1	Latitude	Longitude	Description	Remarks
G1	29° 57' 01.84"	88° 55' 00.38"	Charted wreck awash PA	Searched for visually but not found.
G2	29° 57' 18.41"	88° 57' 19.16"	Charted wreck awash PA	Searched for visually but not found.
G3	29° 54' 08.31"	88° 51' 06.40"	Charted wreck awash PA	Searched for visually but not found.
G4	29° 52' 18.00"	88° 59' 42.00"	Charted wreck awash PA	Searched for visually but not found.
G5	29° 49' 46.15"	88° 59' 30.64"	Charted wreck awash PA	Searched for visually but not found.
G6	29° 48' 12.00"	88° 58' 24.00"	Charted wreck awash PA	Searched for visually but not found.
G7	29° 47' 36.68"	88° 58' 23.76"	Charted wreck awash PA	Searched for visually but not found.
G8	29° 39' 05.13"	89° 00' 25.20"	Charted wreck awash PA	Searched for visually but not found.
G9	29° 37' 42.00"	89° 05' 48.00"	Charted wreck awash PA	Searched for visually but not found.
G11	29° 54' 36.18"	88° 56' 53.95"	Charted wreck PA	Searched for visually but not found.
G12	29° 54' 20.84"	89° 01' 26.72"	Charted wreck PA	Searched for visually but not found.
G13	29° 51' 17.90"	88° 52' 48.77"	Charted wreck PA	Searched for visually but not found.
G14	29° 48' 23.87"	88° 58' 55.99"	Charted wreck PA	Searched for visually but not found.
G15	29° 47' 20.87"	88° 58' 44.28"	Charted wreck PA	Searched for visually but not found.

G16	29° 47' 22.72"	88° 59' 43.17"	Charted wreck PA	Searched for visually but not found.
G17	29° 42' 28.55"	89° 03' 00.41"	Charted wreck PA	Searched for visually but not found.
G18	29° 37' 43.45"	89° 06' 30.31"	Charted wreck PA	Searched for visually but not found.
G19	29° 48' 31.02"N	88° 59' 37.99"W	Charted obstruction PA	Searched for visually but not found.
G20	29° 40' 29.76"N	89° 02' 10.27"W	Charted obstruction PA	Searched for visually but not found.

¹Feature designator corresponds to the identification number used in the master contact file (APPENDIX V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1. CHART COMPARISON).

D.1.4. Soundings

The 2008 / 2009 survey depths differ significantly from the depths depicted on the RNC and ENC covering D00140. The charted depths selected for comparison with the survey data were those which were located in close proximity to the survey lines. The result of this comparison is summarized in Table 6. A complete listing of all charted and survey depths used in this comparison is located in Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE: D.1.4. SOUNDINGS.

Table 6 - Summary of charted depths compared with surveyed depths.

Chart	Total Depths Compared ¹	Chart Shoaler than Survey	Chart Deeper than Survey
11363	120	96 (80%)	24 (20%)
US4LA34M	117	98 (84%)	19 (16%)

¹This includes only the charted depths which varied from the survey data by $\geq 10\%$ of the water depth.

Although the hydrographer would normally recommend that the charts be updated to reflect the 2008 / 2009 survey data, the 1000 meter minimum line spacing specified by the SOW for OPR-J977-TE-08 does not provide sufficient sounding density to disprove shoal soundings depicted on the charts where the survey depths are deeper than the charted depths. The hydrographer recommends updating the RNC and ENC to reflect the 2008 / 2009 survey data only for those areas where the survey depths are shoaler than the charted depths. *Concur.*

D.1.5. Trends and Changeable Areas

Charted Depths vs. Survey Depths

The majority of the depths surveyed in D00140 are significantly deeper than the depths shown on RNC 11363, 41st Edition and ENC US4LA34M, 1st Edition. An exception to this statement however, is a fairly large area in the center of D00140 with charted depths in excess of 3 meters while the surveyed depths are slightly greater than 1 meter.

The 2008 / 2009 survey contours were compared with the charted contours in D00140. The charts used for this comparison included raster navigational chart 11363, 41st Edition, dated June 2007 and electronic navigation charts US4LA34M, 1st Edition, dated June 18, 2008. Figure 10 and Figure 11 show the survey data with the respective charts which were used during the comparison.

The contours generated from the 2008 / 2009 survey data differ significantly from the contours depicted on the RNC and the ENC covering the survey area. D00140 is located in a very dynamic coastal environment which is subject to significant erosion, deposition and along-shore sediment transportation. These processes occur on a recurring and short-term, basis. Local watermen have reported changes in the bathymetric and surface feature character of Chandeleur Sound with each hurricane that has impacted the area in the past 25 years.

In general terms, the depth contours produced by the 2009 / 2009 survey trend in a northeast to southwest direction and the depths tend to be deeper than the depths shown on the chart. Although the hydrographer would normally recommend that the charts be updated to reflect the 2008 / 2009 survey data, the 1000 meter minimum line spacing specified by the SOW for OPR-J977-TE-08 does not provide sufficient sounding density in D00140 to conclusively define the bathymetric contours. *Concur.*

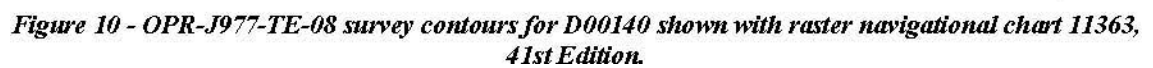


Figure 10 - OPR-J977-TE-08 survey contours for D00140 shown with raster navigational chart 11363, 41st Edition.

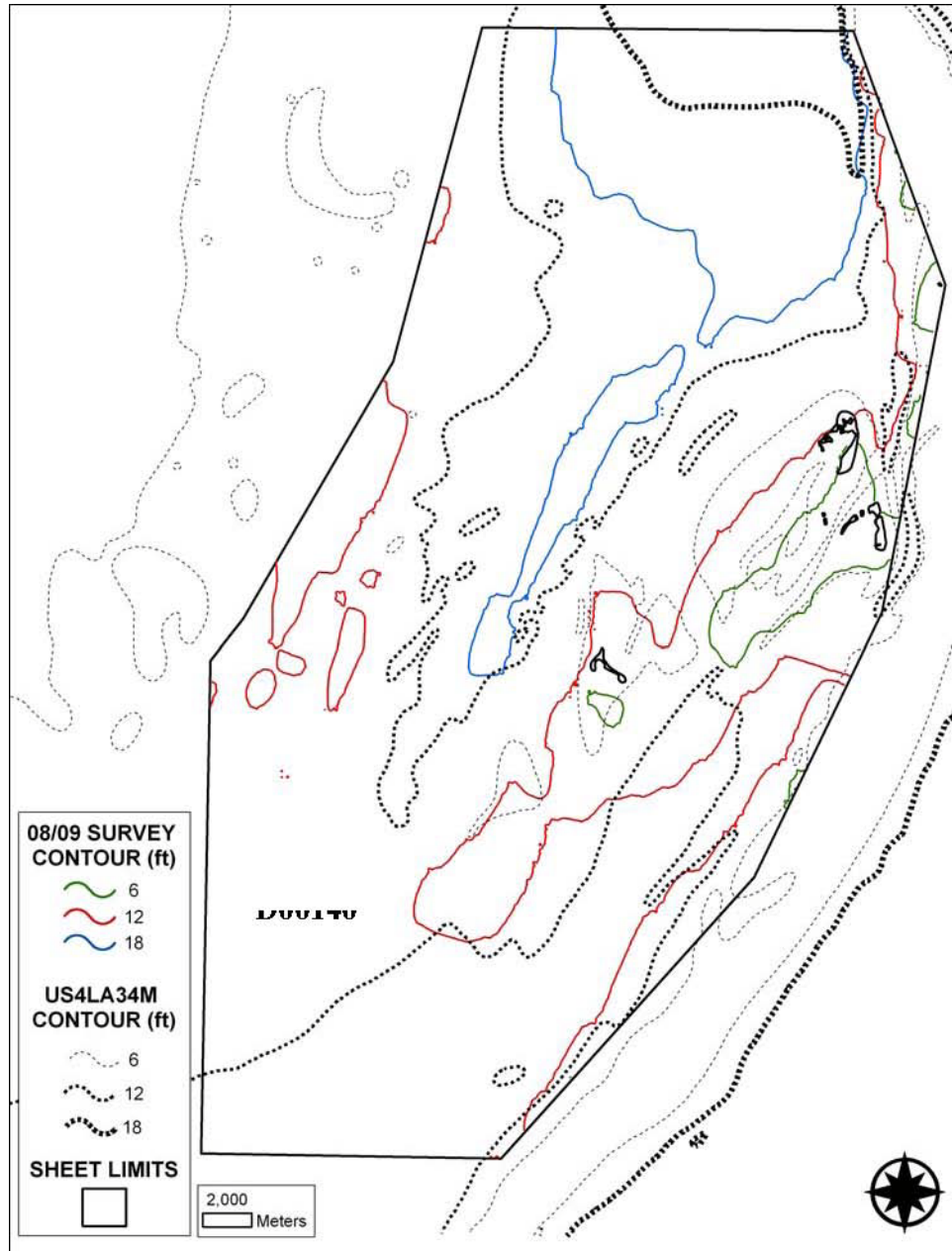


Figure 11- OPR-J977-TE-08 survey contours for D00140 shown with electronic navigation chart US4LA34M, 1st Edition.

D.1.6. AWOIS Items Summary

Investigation of Automated Wreck and Obstruction Information System (AWOIS) items was not required under this task order.

D.2. Additional Results

D.2.1. Aids to Navigation

There are no floating or non-floating aids to navigation located in D00140.

D.2.2. Drilling Structures

Six (6) drilling structures are shown on the charts within the boundaries of D00140. All structures were positioned using DGPS in conjunction with CARIS Notebook. One (1) charted structure position was verified as charted. Five (5) charted structures were searched for but not found. Four (4) uncharted structures were positioned as “new” features.

Refer to Appendix II: SURVEY FEATURE REPORT for a tabular listing of all oil and gas related structures in D00140 and their associated graphics files.

D.2.3. Comparison with Prior Surveys

A comparison with prior surveys was not required under this task order.

D.2.4. Bottom Samples

57 bottom samples were collected in D00140. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in “NOAA Hydrographic Surveys Specifications and Deliverables”, Section 7.1 as modified by the SOW.

Refer to Appendix V: SUPPLEMENTAL RECORDS AND CORRESPONDENCE for a tabular listing and description of all bottom samples collected in D00140.

Concur with clarification. AHB reconfigured the DR, bottom samples were restructured to Appendix II of the DR.

D.2.5. Bridges and Overhead Cables

There are no bridges or overhead cables in the survey area.

D.2.6. Submarine Cables and Pipelines

Numerous submarine pipelines, active and abandoned, crisscross the survey area. These pipelines connect wellheads, production and distribution platforms, compressor stations and extend to the shore. Specific identification of individual pipelines was not pursued during OPR-J977-TE-08.



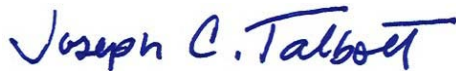
LETTER OF APPROVAL

REGISTRY NO. D00140

This report and the accompanying digital data are respectfully submitted.

Field operations contributing to the accomplishment of survey D00140 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report, digital data, and accompanying records have been closely reviewed and are considered complete and adequate as per the Statement of Work. Other reports submitted with this survey include the Data Acquisition and Processing Report and the Horizontal and Vertical Control Report.

I believe this survey is complete and adequate for its intended purpose.



Joseph C. Talbott, Lead Hydrographer

TerraSond Ltd. Date April 28, 2009



APPENDIX I

Danger To Navigation Reports

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: D00140

Survey Title: State: Louisiana
Locality: Chandeleur Sound
Sublocality: 7 NM West of Chandeleur Sound

Project Number: OPR-J977_TE-08
Survey dates: June 22, 2008 – February 1, 2009
Survey Danger Acquisition Date and Time: January 22, 2009; 1723 UTC

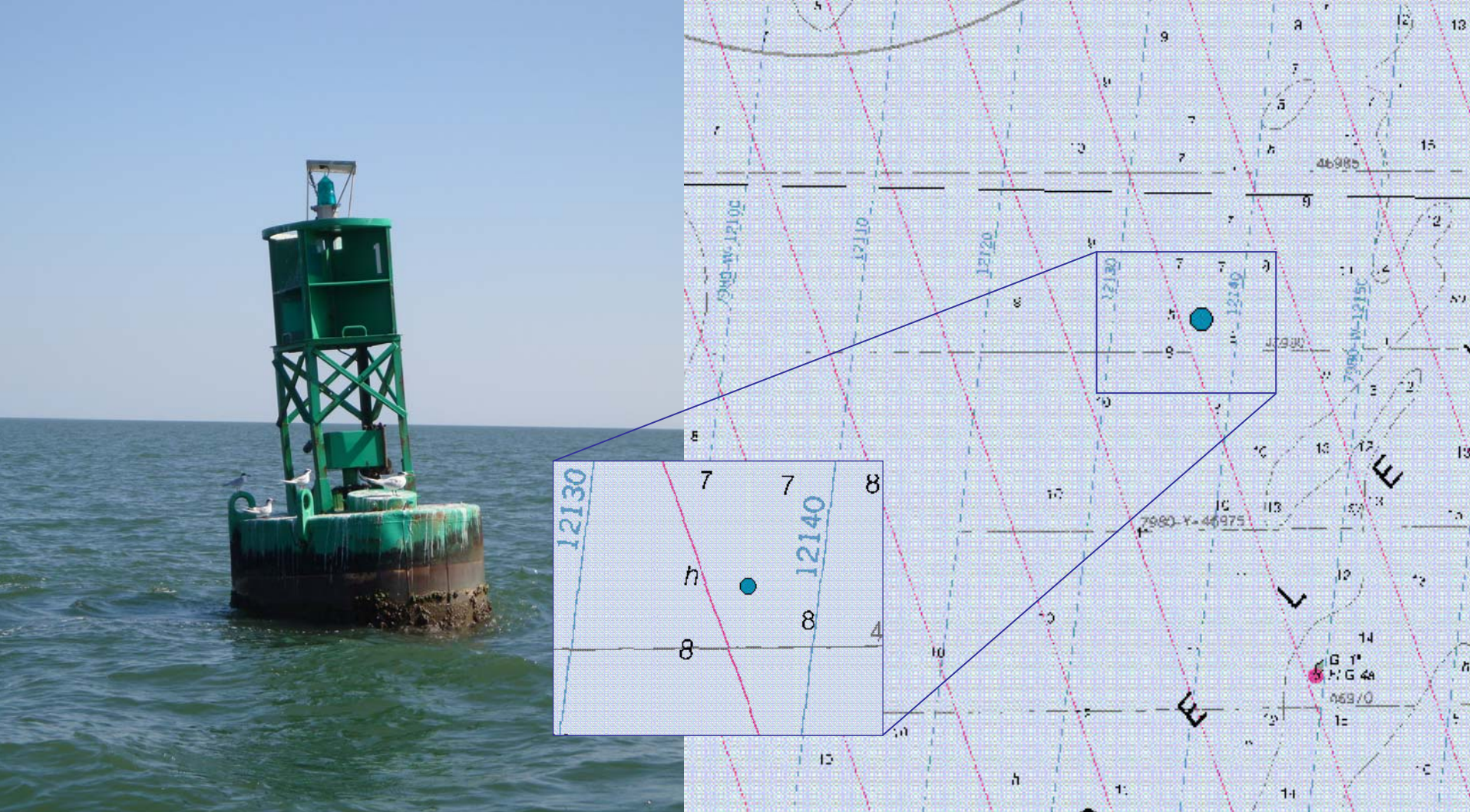
Chart affected: 11363 41st Edition/June 1, 2007, scale 1:80,000, NAD 83

DANGER TO NAVIGATION

FEATURE	DEPTH (FT)	LATITUDE (N)	LONGITUDE (W)
Green Lighted Buoy #1	N/A	29/49/06	89/04/41

Green Lighted Buoy #1 was found 15700 ft NW of a charted green lighted buoy #1.

Questions concerning this report should be directed to Terrasond (907) 745-7215.



Green Lighted Buoy # 1 found 15700 ft NW of charted green lighted buoy #1.

Chartlet 1 of 1 Sheet G

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: D00140

Survey Title: State: Louisiana
Locality: Chandeleur Sound
Sublocality: 7 NM West of Chandeleur Sound

Project Number: OPR-J977_TE-08
Survey dates: June 22, 2008 – February 1, 2009
Survey Danger Acquisition Date and Time: January 24, 2009; 1552 UTC

Water depth is reduced to Mean Lower Low Water using verified NOAA tides and the obstruction is positioned on NAD 83.

Chart affected: 11363 41st Edition/June 1, 2007, scale 1:80,000, NAD 83

DANGER TO NAVIGATION

FEATURE	DEPTH (FT)	LATITUDE (N)	LONGITUDE (W)
Obstruction	N/A	29/39/13	89/00/13

The obstruction is located approximately 415 m or 1362 ft NE from a charted wreck in a water depth of 4.5 m or 14.8 ft.

Questions concerning this report should be directed to Terrasond (907) 745-7215.



Obstruction found in Chandeleur Sound 5 ft above the surface in a water depth of 14.8 ft.

Chartlet 1 of 1 Sheet G



APPENDIX II

Survey Feature Report

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AWOIS

There were no Automated Wrecks and Obstructions (AWOIS) features assigned for review in D00140.

A comprehensive search of the NOAA / NOS online AWOIS database, <http://www.nauticalcharts.noaa.gov/hsd/awois.html>, did not produce any features that were located within the survey limits of D00140.

1 Oil Related Structures

Six (6) charted petroleum industry related structures (e.g. drilling structures, production platforms, well heads, etc.) appear within the survey boundaries of D00140 on raster chart 11363, 41st edition, dated June 2007 and Electronic Navigation Chart (ENC) US4LA34M, updated May 2008. The position of each charted structure was examined in the field and, except as noted in Table 1 and Table 2, all of the charted information was determined to be correct as represented on the chart.

Five (5) charted structures were searched for but not found. These structures should be removed from the chart(s).

Table 1 –Petroleum industry structures that appear on the raster chart or ENC in D00140 that were not found during OPR-J977-TE-08.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
1/21/2009	2019	29° 55' 07.49"	89° 01' 58.35"	Charted structure searched for and not found.
1/21/2009	2056	29° 52' 23.00"	88° 59' 40.00"	Charted structure searched for and not found.
1/22/2009	1905	29° 45' 54.33"	88° 57' 01.45"	Charted structure searched for and not found.
1/22/2009	1904	29° 45' 45.49"	88° 54' 52.09"	Charted structure searched for and not found.
1/24/2009	1624	29° 37' 38.97"	89° 04' 25.20"	Charted structure searched for and not found.

Four (4) uncharted petroleum industry structures were positioned in D00140. These structures should be added to the chart(s).

Table 2 – Petroleum industry structures positioned in D00140 during OPR-J977-TE-08 that do not appear on the raster chart or ENC.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
1/22/2009	1646	29°50'09.34"	88°56'45.76"	Structure does not appear on the chart of the area.
1/22/2009	1652	29°49'45.22"	88°58'35.21"	Structure does not appear on the chart of the area.
1/22/2009	1654	29°49'28.63"	88°58'31.87"	Structure does not appear on the chart of the area.

1/22/2009	1622	29°37'11.97"	89°4.'33.62"	Structure does not appear on the chart of the area.
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2 Bottom Samples

Fifty-seven (57) bottom samples were collected bottom samples were collected in D00140 pursuant to OPR-J977-TE-08. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in NOAA Hydrographic Surveys specifications and Deliverables, Section 7.1 dated April 2007 as amended by the Statement of Work for OPR-J977-TE-08 dated April 21, 2008.

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
G1	1/21/2009	1655	3.8	29° 56' 29.70"	89° 01' 50.70"		Fine	Sand	Shells
G2	1/21/2009	1708	4	29° 58' 38.93"	89° 01' 54.57"		Fine	Sand	
G3	1/21/2009	1716	4.3	30° 00' 47.66"	89° 01' 56.63"		Fine	Sand	
G4	1/21/2009	1726	5.9	30° 00' 49.53"	88° 59' 27.39"		Fine	Sand	
G5	1/21/2009	1734	7.1	30° 00' 51.43"	88° 56' 58.38"		Sticky	Mud	
G6	1/21/2009	1746	6.7	30° 00' 54.38"	88° 54' 29.62"		Fine	Sand	
G7	1/21/2009	1806	3.2	29° 58' 46.17"	88° 51' 58.89"		Fine	Sand	
G8	1/21/2009	1812	5.7	29° 58' 44.77"	88° 54' 25.64"		Fine	Sand	
G9	1/21/2009	1819	5.4	29° 58' 42.96"	88° 56' 53.41"		Fine	Sand	Shells
G10	1/21/2009	1831	5.1	29° 58' 39.77"	88° 59' 22.86"		Sticky	Mud	Shells
G11	1/21/2009	1836	5.1	29° 56' 30.42"	88° 59' 23.17"		Fine	Sand	Shells
G12	1/21/2009	1845	5	29° 54' 21.06"	88° 59' 19.58"		Fine	Sand	
G13	1/21/2009	1940	5.1	29° 56' 31.72"	88° 56' 53.20"		Fine	Sand	
G14	1/21/2009	1946	5.6	29° 56' 33.70"	88° 54' 23.20"		Fine	Sand	

G15	1/21/2009	1954	4.1	29° 56' 36.01"	88° 51' 54.17"		Fine	Sand	
G16	1/21/2009	2002	4.3	29° 54' 26.70"	88° 51' 52.13"		Sticky	Mud	
G17	1/21/2009	2008	4.3	29° 54' 24.57"	88° 54' 20.98"		Fine	Sand	
G18	1/21/2009	2015	5.5	29° 54' 22.49"	88° 56' 48.01"		Fine	Sand	Shells
G19	1/21/2009	2026	4.3	29° 54' 19.79"	89° 01' 45.33"		Fine	Sand	
G20	1/21/2009	2034	4	29° 54' 14.59"	89° 04' 17.36"		Fine	Sand	
G21	1/21/2009	2041	3.5	29° 52' 07.95"	89° 04' 16.45"		Fine	Sand	Shells
G22	1/21/2009	2050	4.8	29° 52' 07.37"	89° 01' 47.04"		Fine	Sand	Shells
G23	1/21/2009	2058	5.4	29° 52' 09.84"	88° 59' 17.71"		Sticky	Mud	
G24	1/22/2009	1528	4	29° 52' 13.99"	88° 56' 47.62"		Fine	Sand	
G25	1/22/2009	1536	3	29° 52' 14.70"	88° 54' 18.37"		Broken	Shells	
G26	1/22/2009	1546	1.2	29° 52' 12.62"	88° 51' 55.75"		Fine	Sand	Broken Shells
G27	1/22/2009	1557	1.4	29° 50' 05.02"	88° 54' 16.87"		Fine	Sand	
G28	1/22/2009	1615	1.6	29° 50' 07.00"	88° 51' 51.69"		Fine	Sand	Broken Shells
G29	1/22/2009	1625	3.7	29° 47' 55.59"	88° 54' 13.83"		Fine	Sand	Sticky Mud
G30	1/22/2009	1635	2.8	29° 47' 53.41"	88° 56' 41.97"		Fine	Sand	Broken Shells
G31	1/22/2009	1644	3.8	29° 50' 03.78"	88° 56' 45.12"		Sticky	Mud	
G32	1/22/2009	1658	4.4	29° 50' 01.59"	88° 59' 14.29"		Fine	Sand	Broken Shells
G33	1/22/2009	1706	4.8	29° 49' 58.65"	89° 01' 42.83"		Fine	Sand	
G34	1/22/2009	1726	3.1	29° 49' 54.76"	89° 04' 13.00"		Broken	Shells	

G35	1/22/2009	1736	3	29° 49' 53.73"	89° 06' 41.39"		Fine	Sand	Broken Shells
G36	1/22/2009	1744	3.6	29° 47' 44.61"	89° 06' 38.22"		Broken	Shells	Fine Sand
G37	1/22/2009	1800	4	29° 47' 46.17"	89° 4' 09.15"		Broken	Shells	Sticky Mud
G38	1/22/2009	1818	5.4	29° 47' 48.67"	89° 01' 39.16"			Silt/Ooze	
G39	1/22/2009	1835	3.1	29° 47' 51.47"	88° 59' 14.45"		Fine	Sand	
G40	1/22/2009	1845	2.5	29° 45' 43.46"	88° 59' 09.56"		Fine	Sand	Broken Shells
G41	1/22/2009	1900	2.9	29° 45' 46.85"	88° 54' 11.29"		Fine	Sand	
G42	1/22/2009	1910	3.2	29° 45' 44.38"	88° 56' 36.75"		Fine	Sand	Broken Shells
G43	1/22/2009	1918	3.9	29° 43' 33.68"	88° 56' 37.67"		Fine	Sand	
G44	1/22/2009	1925	4.3	29° 43' 32.67"	88° 59' 04.55"		Fine	Sand	Broken Shells
G45	1/22/2009	1933	2.8	29° 43' 31.77"	89° 01' 32.51"		Fine	Sand	Broken Shells
G46	1/22/2009	1940	4.4	29° 45' 38.92"	89° 01' 37.11"		Fine	Sand	Broken Shells
G47	1/22/2009	1945	4.3	29° 45' 38.41"	89° 04' 06.52"		Fine	Sand	Broken Shells
G48	1/22/2009	1951	3.3	29° 45' 36.31"	89° 06' 36.97"		Broken	Shells	
G49	1/24/2009	1513	3.6	29° 43' 23.40"	89° 06' 32.95"		Fine	Sand	
G50	1/24/2009	1522	4.6	29° 43' 25.41"	89° 04' 03.94"		Fine	Sand	Broken Shells
G51	1/24/2009	1528	3.7	29° 41' 16.00"	89° 04' 03.05"		Fine	Sand	
G52	1/24/2009	1536	3.7	29° 41' 19.27"	89° 01' 34.33"		Fine	Sand	
G53	1/24/2009	1542	3.9	29° 41' 21.28"	88° 59' 03.53"		Fine	Sand	Broken Shells
G54	1/24/2009	1558	4.7	29° 39' 10.00"	89° 01' 29.26"		Broken	Shells	

G55	1/24/2009	1635	4.8	29° 39' 08.23"	89° 03' 58.00"		Sticky	Mud	
G56	1/24/2009	1642	4.2	29° 39' 05.74"	89° 06' 27.04"		Fine	Sand	
G57	1/24/2009	1649	3.4	29° 41' 15.13"	89° 06' 29.67"		Fine	Sand	Broken Shells

OPR-J977-TE-08 Chart Comparison TerraSond, Ltd D00140 Sheet G



APPENDIX III

Progress Sketch

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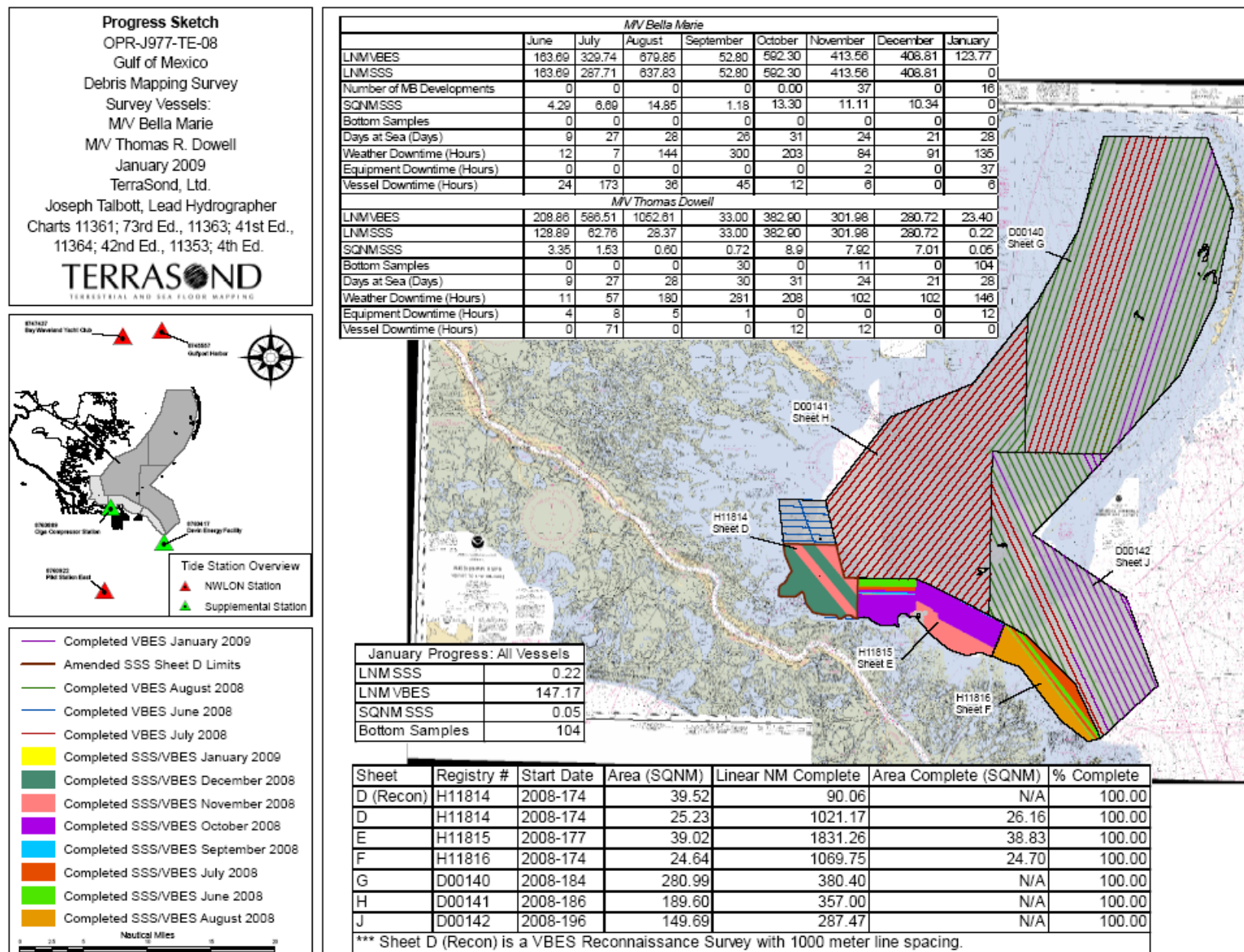


Figure 1-Final Progress Sketch for OPR-J977-TE-08



APPENDIX IV

Tides and Water Levels

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Abstract of Times Hydrography

Project: OPR-J977-TE-08

Registry No.: D00140

Table 1 – Sheet G Times of Hydrography: Inclusive Dates: July 2, 2008 – January 22, 2009.

START		END	
Day (Julian)	Time (UTC)	Day (Julian)	Time (UTC)
2008-184	1619	2008-184	1917
2008-193	1247	2008-193	2059
2008-194	1249	2008-194	1844
2008-199	1246	2008-199	2004
2008-219	1304	2008-219	2032
2008-228	1307	2008-228	1934
2008-231	1331	2008-231	2023
2008-232	1252	2008-232	2220
2008-233	1258	2008-233	2106
2008-234	1255	2008-234	1842
2008-235	1427	2008-235	2009
2008-240	1408	2008-240	1643
2009-017	1338	2009-017	1834
2009-021	1854	2009-021	1933
2009-022	1714	2009-022	1827

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FINAL TIDE NOTE and FINAL TIDE ZONING CHART**DATE:** February 1, 2009**HYDROGRAPHIC BRANCH:** Atlantic**HYDROGRAPHIC PROJECT:** OPR-J977-TE_08**HYDROGRAPHIC SHEET:** D00140**LOCALITY:** 7 NM West of Chandeleur Islands, LA**TIME PERIOD:** July 2, 2008 – January 22, 2009**TIDE STATION USED:**

Station No.	Station Name	Latitude	Longitude
8745557	Gulfport Harbor, MS	30° 21.6' N	089° 04.9' W
8760889	Olga Compressor Station, Grand Bay, LA	29° 23.1' N	089° 22.8' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:**

Station No.	Station Name	MHW
8745557	Gulfport Harbor, MS	0.500 m
8760889	Olga Compressor Station, Grand Bay, LA	0.392 m

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: CGM108, CGM109, CGM110, CGM111, CGM112, CGM113, CGM114, CGM115, CGM116, CGM125, CGM126, CGM127, CGM128, CGM129, CGM130, CGM131, CGM132, CGM133, CGM134, CGM135, CGM170, CGM171, CGM172, CGM173, CGM174, CGM175, CGM176, CGM177, CGM178, CGM179, CGM180, and CGM181

Refer to Figure 1 for zoning information.

Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Universal Time, Coordinated (UTC).

Note 2: Pilot Station East, LA (8760922) served as datum control for subordinate tide stations but was not used to supply MLLW correctors for this hydrographic survey. The datum for this station was updated in February 2009.

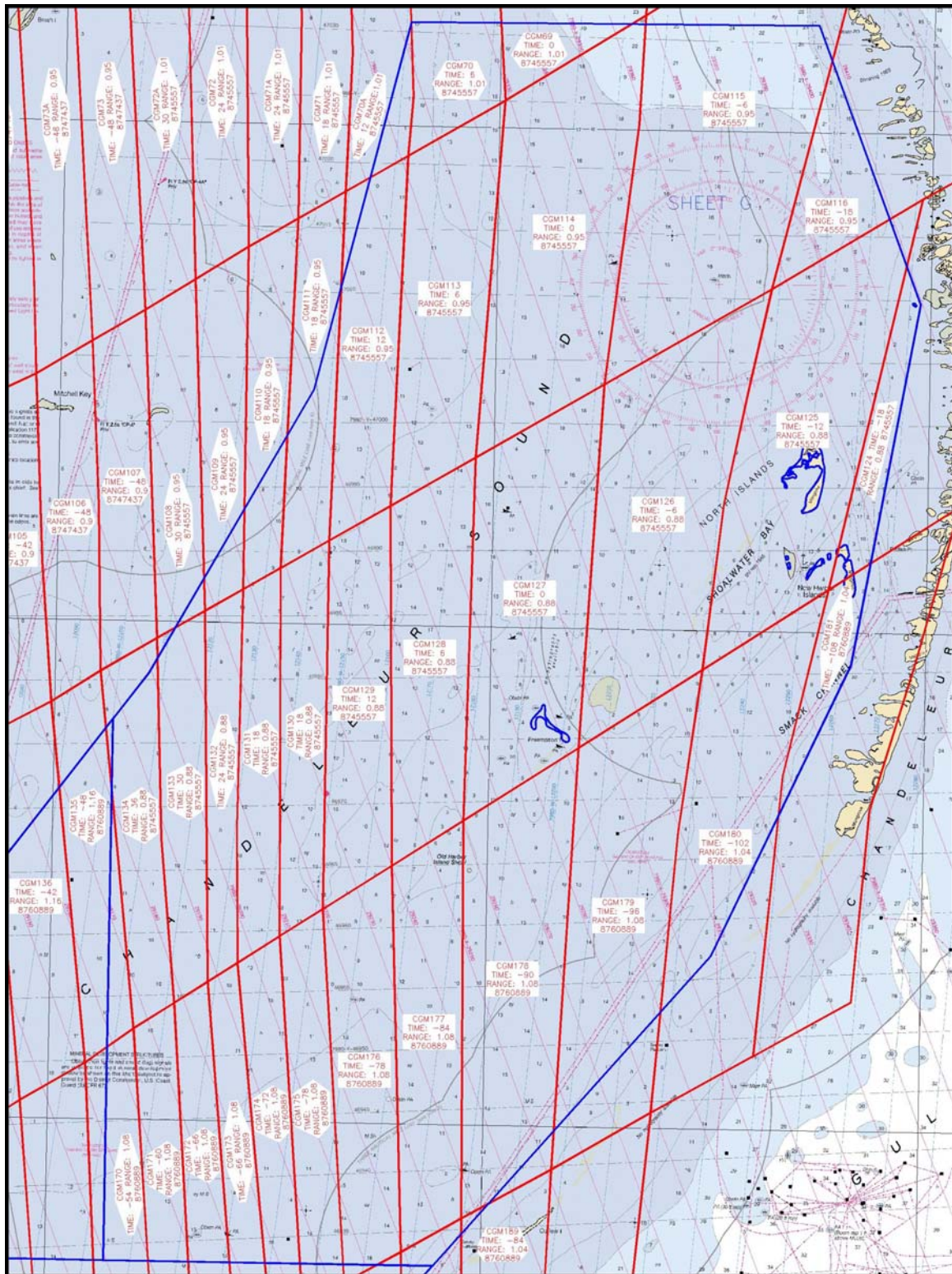
Final Tidal Zoning for OPR-J977-TE-08

Figure 1 - Final Tidal Zoning Chart for OPR-J977-TE-08, Sheet D00140 with Chart 11363, 41st Edition, June 2007. Soundings in feet.



Descriptive Report for Tidal Zoning

OCS Project: S-J977-KR-TERRA-2008
Client: Terrasond, Ltd.
JOA Work Order: 115
Primary Tide Stations for Project: 8760922 Pilot Station East, LA (*datum control only*)
8747437 Bay Waveland Yacht Club, MS (*not used in final zoning*)
8745557 Gulfport Harbor, MS

Tertiary Tide Stations for Project: 8760417 Devon Energy Facility, LA
8760889 Olga Compressor Station, LA

Submitted by: Mike Zieserl
Email: mike@joasurveys.com

Preliminary Zoning

The preliminary zoning from CO-OPS generally shows the tide range increasing from about 0.3m to 0.5m from south to north, while the tide generally progresses from east to west taking nearly 3 hours to move through the survey area.

Preliminary tidal zoning from CO-OPS was based on the following NWLON stations:

- 8745557 Gulfport Harbor, MS
- 8747437 Bay Waveland, MS
- 9760922 Pilot Station East, LA

Final Zoning

The preliminary zoning was edited to make the zoning factors relative to the following tide stations:

- 8745557 Gulfport Harbor, MS (NWLON)
- 8760889 Olga Compressor Station (tertiary)
- 8760417 Devon Energy Facility (tertiary)

A comparison of the GT at the three tide stations showed that the preliminary zoning essentially had the range ratios modeled correctly. Looking at the difference in time of the tides between these three stations also showed that the time offsets were nearly correct as well.

GT for the 3 zones where the tide stations are located

	Gulfport Harbor	Olga Compressor	Devon Energy
Preliminary Zoning	0.53	0.39	0.36
Actual	0.53	0.40	0.37
Final Zoning	0.53	0.40	0.37

Time change in minutes between the tide stations

	Gulfport Harbor to Olga	Devon Energy to Olga Compressor
Preliminary Zoning	84	114
Actual	50 (1 sigma = 88min)	112 (1 sigma = 88min)
Final Zoning	84	114

The final zoning was not edited to reflect the measured time change between Olga and Gulfport Harbor (determined by comparing times of high and low tides) because the standard deviation of the measured time difference was so large. During the development of the final zoning, the measured time change between Gulfport and Olga was used to modify the time offsets as a test, and it did not improve the discrete shift at the zoning boundary between these two tide stations. Therefore, the preliminary zoning scheme was generally maintained, and the zoning factors were simply edited to reference these stations. The geometry of the zoning was not changed, with the exception of 15 zones that were deleted because they were not required for the survey area.

The deleted zones are listed below:

CGM151	CGM152	CGM99	CGM100	CGM101	CGM102
CGM103	CGM104	CGM105	CGM106	CGM107	CGM108
CGM74	CGM73A	CGM73			

The Bay Waveland NWLON was removed from the zoning because the tide station did not have verified data on several occasions during survey operations. Gulfport Harbor and Olga Compressor station were used to cover the zones that had been assigned to Bay Waveland.

Changed these zones to reference Gulfport instead of Bay Waveland:

CGM124	CGM125	CGM126	CGM127	CGM128	CGM129
CGM130	CGM131	CGM132	CGM133	CGM134	

Changed these zones to reference Olga instead of Bay Waveland:

CGM135	CGM136	CGM137	CGM138	CGM139	CGM140
CGM141	CGM142	CGM143	CGM159	CGM160	

Zoned tides covering the entire time period of the survey were compared at the boundary between Olga Compressor and Devon Energy at CGM260, and at the boundary of Olga Compressor and Gulfport Harbor at CGM134. The zoned tides from Devon and Olga compare passably. The average of the differenced zoned tides (excluding the 2 hurricanes) is about 1cm, with a standard deviation of 8cm.

The comparison of zoned tides between Olga and Gulfport at CGM134 do not match nearly as well. The water seems to behave much differently at Gulfport and Bay Waveland then it does at Olga or Devon. The average of the difference between the two zoned tides (excluding the 2 hurricanes) is 6cm. Starting in September, the Olga MLLW tide data seems to be consistently higher than the Gulfport MLLW data, possibly indicating a seasonal difference between these two areas, or a difference in the datum epoch. The standard deviation of the difference is 13cm.

Recommendations

For future hydrographic survey projects, COOPS should include the time and range contours, as well as any boundary conditions that are used to develop the preliminary zoning, with the SOW. This would make zoning revision much more straight forward. Currently, the time and range contours have to be recomputed from the preliminary zoning factors, and some guesswork is involved.

In addition, COOPS should include the historic station summary files they use to create the preliminary zoning. It can be difficult to understand, much less perform meaningful revision to the preliminary tidal zoning without the justifying data that went into creating it.

For future surveys in this area, it may be beneficial to install a tide station at the NE boundary of the project, near the Chandeleur Islands, to help bridge the difference between the water levels in the south (Olga and Devon) and north (Bay Waveland and Gulfport).

While the tide range is rather small, and fairly slow to change across the project area, the time of the tide changes much more, and is much more erratic depending on local weather conditions. Instead of discrete tide zones, averages of water levels from two or more tide stations, weighted for importance, may produce better results, and smoother transitions between zone boundaries.



APPENDIX V

Supplemental Survey Records and Correspondence

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Oil Related Structures

Six (6) charted petroleum industry related structures (e.g. drilling structures, production platforms, well heads, etc.) appear within the survey boundaries of D00140 on raster chart 11363, 41st edition, dated June 2007 and Electronic Navigation Chart (ENC) US4LA34M, updated May 2008. The position of each charted structure was examined in the field and, except as noted in Table 1 and Table 2, all of the charted information was determined to be correct as represented on the chart.

Five (5) charted structures were searched for but not found. These structures should be removed from the chart(s).

Table 1 –Petroleum industry structures that appear on the raster chart or ENC in D00140 that were not found during OPR-J977-TE-08.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
1/21/2009	2019	29° 55' 07.49"	89° 01' 58.35"	Charted structure searched for and not found.
1/21/2009	2056	29° 52' 23.00"	88° 59' 40.00"	Charted structure searched for and not found.
1/22/2009	1905	29° 45' 54.33"	88° 57' 01.45"	Charted structure searched for and not found.
1/22/2009	1904	29° 45' 45.49"	88° 54' 52.09"	Charted structure searched for and not found.
1/24/2009	1624	29° 37' 38.97"	89° 04' 25.20"	Charted structure searched for and not found.

Four (4) uncharted petroleum industry structures were positioned in D00140. These structures should be added to the chart(s).

Table 2 – Petroleum industry structures positioned in D00140 during OPR-J977-TE-08 that do not appear on the raster chart or ENC.

Survey Date	Time (UTC)	Latitude (N)	Longitude (W)	Comments
1/22/2009	1646	29°50'09.34"	88°56'45.76"	Structure does not appear on the chart of the area.
1/22/2009	1652	29°49'45.22"	88°58'35.21"	Structure does not appear on the chart of the area.
1/22/2009	1654	29°49'28.63"	88°58'31.87"	Structure does not appear on the chart of the area.
1/22/2009	1622	29°37'11.97"	89°4.'33.62"	Structure does not appear on the chart of the area.

Bottom Samples

Fifty-seven (57) bottom samples were collected bottom samples were collected in D00140 pursuant to OPR-J977-TE-08. The samples were distributed geographically to obtain a full representation of the bottom characteristics as specified in NOAA Hydrographic Surveys specifications and Deliverables, Section 7.1 dated April 2007 as amended by the Statement of Work for OPR-J977-TE-08 dated April 21, 2008.

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
G1	1/21/2009	1655	3.8	29° 56' 29.70"	89° 01' 50.70"		Fine	Sand	Shells
G2	1/21/2009	1708	4	29° 58' 38.93"	89° 01' 54.57"		Fine	Sand	
G3	1/21/2009	1716	4.3	30° 00' 47.66"	89° 01' 56.63"		Fine	Sand	
G4	1/21/2009	1726	5.9	30° 00' 49.53"	88° 59' 27.39"		Fine	Sand	
G5	1/21/2009	1734	7.1	30° 00' 51.43"	88° 56' 58.38"		Sticky	Mud	
G6	1/21/2009	1746	6.7	30° 00' 54.38"	88° 54' 29.62"		Fine	Sand	
G7	1/21/2009	1806	3.2	29° 58' 46.17"	88° 51' 58.89"		Fine	Sand	
G8	1/21/2009	1812	5.7	29° 58' 44.77"	88° 54' 25.64"		Fine	Sand	
G9	1/21/2009	1819	5.4	29° 58' 42.96"	88° 56' 53.41"		Fine	Sand	Shells
G10	1/21/2009	1831	5.1	29° 58' 39.77"	88° 59' 22.86"		Sticky	Mud	Shells
G11	1/21/2009	1836	5.1	29° 56' 30.42"	88° 59' 23.17"		Fine	Sand	Shells
G12	1/21/2009	1845	5	29° 54' 21.06"	88° 59' 19.58"		Fine	Sand	
G13	1/21/2009	1940	5.1	29° 56' 31.72"	88° 56' 53.20"		Fine	Sand	
G14	1/21/2009	1946	5.6	29° 56' 33.70"	88° 54' 23.20"		Fine	Sand	
G15	1/21/2009	1954	4.1	29° 56' 36.01"	88° 51' 54.17"		Fine	Sand	
G16	1/21/2009	2002	4.3	29° 54' 26.70"	88° 51' 52.13"		Sticky	Mud	
G17	1/21/2009	2008	4.3	29° 54' 24.57"	88° 54' 20.98"		Fine	Sand	

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
G18	1/21/2009	2015	5.5	29° 54' 22.49"	88° 56' 48.01"		Fine	Sand	Shells
G19	1/21/2009	2026	4.3	29° 54' 19.79"	89° 01' 45.33"		Fine	Sand	
G20	1/21/2009	2034	4	29° 54' 14.59"	89° 04' 17.36"		Fine	Sand	
G21	1/21/2009	2041	3.5	29° 52' 07.95"	89° 04' 16.45"		Fine	Sand	Shells
G22	1/21/2009	2050	4.8	29° 52' 07.37"	89° 01' 47.04"		Fine	Sand	Shells
G23	1/21/2009	2058	5.4	29° 52' 09.84"	88° 59' 17.71"		Sticky	Mud	
G24	1/22/2009	1528	4	29° 52' 13.99"	88° 56' 47.62"		Fine	Sand	
G25	1/22/2009	1536	3	29° 52' 14.70"	88° 54' 18.37"		Broken	Shells	
G26	1/22/2009	1546	1.2	29° 52' 12.62"	88° 51' 55.75"		Fine	Sand	Broken Shells
G27	1/22/2009	1557	1.4	29° 50' 05.02"	88° 54' 16.87"		Fine	Sand	
G28	1/22/2009	1615	1.6	29° 50' 07.00"	88° 51' 51.69"		Fine	Sand	Broken Shells
G29	1/22/2009	1625	3.7	29° 47' 55.59"	88° 54' 13.83"		Fine	Sand	Sticky Mud
G30	1/22/2009	1635	2.8	29° 47' 53.41"	88° 56' 41.97"		Fine	Sand	Broken Shells
G31	1/22/2009	1644	3.8	29° 50' 03.78"	88° 56' 45.12"		Sticky	Mud	
G32	1/22/2009	1658	4.4	29° 50' 01.59"	88° 59' 14.29"		Fine	Sand	Broken Shells
G33	1/22/2009	1706	4.8	29° 49' 58.65"	89° 01' 42.83"		Fine	Sand	
G34	1/22/2009	1726	3.1	29° 49' 54.76"	89° 04' 13.00"		Broken	Shells	
G35	1/22/2009	1736	3	29° 49' 53.73"	89° 06' 41.39"		Fine	Sand	Broken Shells
G36	1/22/2009	1744	3.6	29° 47' 44.61"	89° 06' 38.22"		Broken	Shells	Fine Sand
G37	1/22/2009	1800	4	29° 47' 46.17"	89° 4' 09.15"		Broken	Shells	Sticky Mud
G38	1/22/2009	1818	5.4	29° 47' 48.67"	89° 01' 39.16"			Silt/Ooze	

Point Number	Date	Time (UTC)	Depth (m)	Latitude (N)	Longitude (W)	Color	Surface Description	Nature of Surface	Secondary Nature of Surface
G39	1/22/2009	1835	3.1	29° 47' 51.47"	88° 59' 14.45"		Fine	Sand	
G40	1/22/2009	1845	2.5	29° 45' 43.46"	88° 59' 09.56"		Fine	Sand	Broken Shells
G41	1/22/2009	1900	2.9	29° 45' 46.85"	88° 54' 11.29"		Fine	Sand	
G42	1/22/2009	1910	3.2	29° 45' 44.38"	88° 56' 36.75"		Fine	Sand	Broken Shells
G43	1/22/2009	1918	3.9	29° 43' 33.68"	88° 56' 37.67"		Fine	Sand	
G44	1/22/2009	1925	4.3	29° 43' 32.67"	88° 59' 04.55"		Fine	Sand	Broken Shells
G45	1/22/2009	1933	2.8	29° 43' 31.77"	89° 01' 32.51"		Fine	Sand	Broken Shells
G46	1/22/2009	1940	4.4	29° 45' 38.92"	89° 01' 37.11"		Fine	Sand	Broken Shells
G47	1/22/2009	1945	4.3	29° 45' 38.41"	89° 04' 06.52"		Fine	Sand	Broken Shells
G48	1/22/2009	1951	3.3	29° 45' 36.31"	89° 06' 36.97"		Broken	Shells	
G49	1/24/2009	1513	3.6	29° 43' 23.40"	89° 06' 32.95"		Fine	Sand	
G50	1/24/2009	1522	4.6	29° 43' 25.41"	89° 04' 03.94"		Fine	Sand	Broken Shells
G51	1/24/2009	1528	3.7	29° 41' 16.00"	89° 04' 03.05"		Fine	Sand	
G52	1/24/2009	1536	3.7	29° 41' 19.27"	89° 01' 34.33"		Fine	Sand	
G53	1/24/2009	1542	3.9	29° 41' 21.28"	88° 59' 03.53"		Fine	Sand	Broken Shells
G54	1/24/2009	1558	4.7	29° 39' 10.00"	89° 01' 29.26"		Broken	Shells	
G55	1/24/2009	1635	4.8	29° 39' 08.23"	89° 03' 58.00"		Sticky	Mud	
G56	1/24/2009	1642	4.2	29° 39' 05.74"	89° 06' 27.04"		Fine	Sand	
G57	1/24/2009	1649	3.4	29° 41' 15.13"	89° 06' 29.67"		Fine	Sand	Broken Shells

D.1. Chart Comparison

Features

Charted features investigated and new features positioned during OPR-J977-TE-08 are listed in Table 1.

Table 1 - All features and significant contacts located in D00140 during OPR-J977-TE-08.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
G1	29° 57' 01.84"	88° 55' 00.38"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G2	29° 57' 18.41"	88° 57' 19.16"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G3	29° 54' 08.31"	88° 51' 06.40"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G4	29° 52' 18.00"	88° 59' 42.00"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G5	29° 49' 46.15"	88° 59' 30.64"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G6	29° 48' 12.00"	88° 58' 24.00"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G7	29° 47' 36.68"	88° 58' 23.76"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G8	29° 39' 05.13"	89° 00' 25.20"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.
G9	29° 37' 42.00"	89° 05' 48.00"	11363_1 US4LA34M	Charted wreck showing above surface PA. Searched for visually but not found during the 2008 / 2009 survey.

Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
G10				Feature ID not used.
G11	29° 54' 36.18"	88° 56' 53.95"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G12	29° 54' 20.84"	89° 01' 26.72"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G13	29° 51' 17.90"	88° 52' 48.77"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G14	29° 48' 23.87"	88° 58' 55.99"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G15	29° 47' 20.87"	88° 58' 44.28"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G16	29° 47' 22.72"	88° 59' 43.17"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G17	29° 42' 28.55"	89° 03' 00.41"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G18	29° 37' 43.45"	89° 06' 30.31"	11363_1 US4LA34M	Charted submerged wreck PA. Evidence of wreck searched for visually but not found during 2008 / 2009 survey.
G19	29° 48' 31.02"N	88° 59' 37.99"W	11363_1 US4LA34M	Charted obstruction PA. Searched for but not found during 2008 / 2009 survey.
G20	29° 40' 29.76"N	89° 02' 10.27"W	11363_1 US4LA34M	Charted obstruction PA. Searched for but not found during 2008 / 2009 survey.
G21				Feature ID not used.

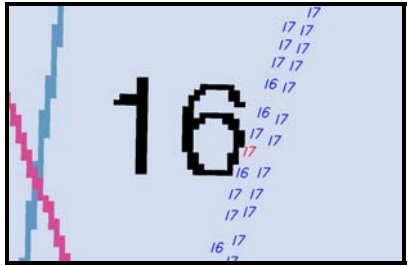
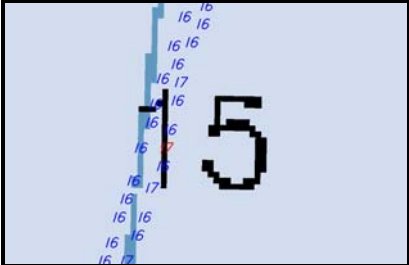
Feature	Latitude (N)	Longitude (W)	Charts Affected	Description
G22	29° 39' 12.53"	89° 00' 12.88"	11363_1 US4LA34M	Uncharted wreck showing mast above the surface. Found during visual search during 2008 / 2009 survey. DTON submitted.
G23	29° 49' 05.54"	89° 04' 41.39"	11363_1 US4LA34M	Uncharted green pillar buoy #1 found during visual search. Buoy does not appear to be serving any purpose at present location. DTON submitted.


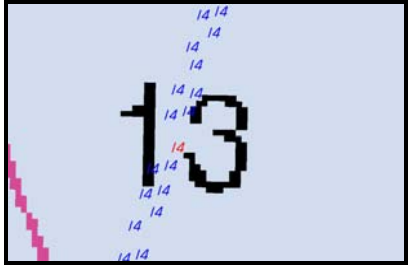
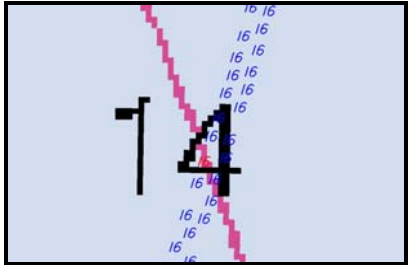
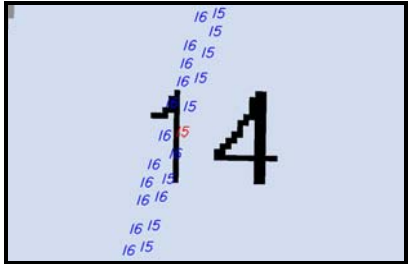
D.1. Compare to Chart

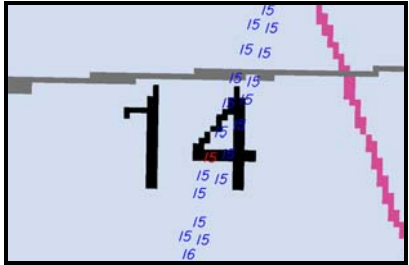
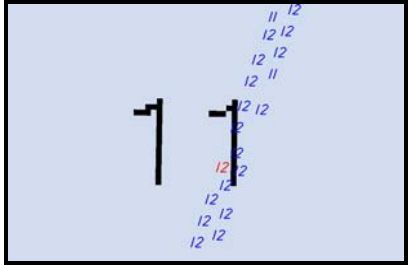
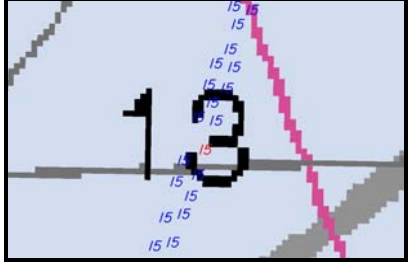
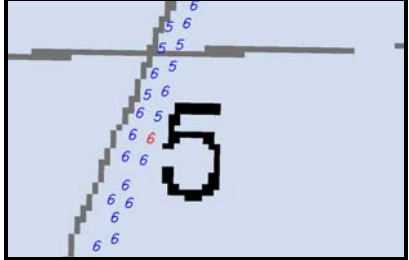
D.1.4. Soundings

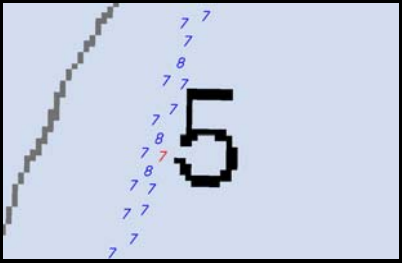
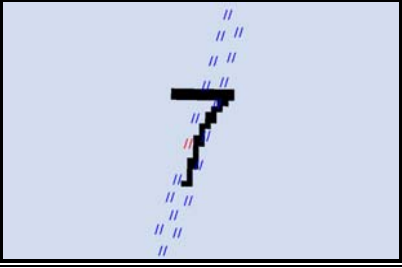
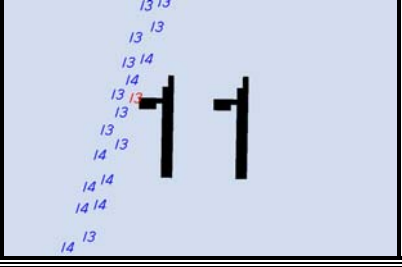
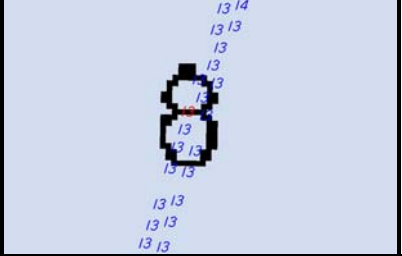
The 2008 / 2009 survey depths were compared with the charted depths in D00140. The charts used for this comparison included raster navigational chart 11363, 41st Edition, dated June 2007, 11364 and electronic navigation charts USA4LA34M, 1st Edition, dated June 18, 2008. Tables 1 through 4 contain detailed information for each survey depth that differed from the charted depth by greater than 10% of the water depth at the charted position. The tables are separated by the respective chart and are further classified by whether the charted depth is shoaler or deeper than the survey depth.

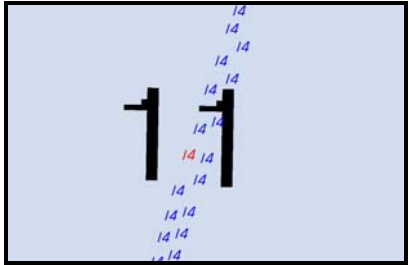
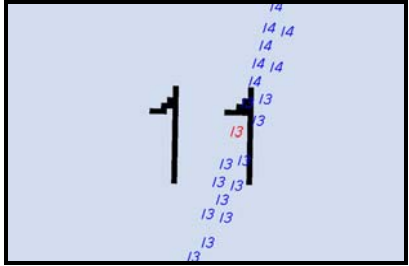
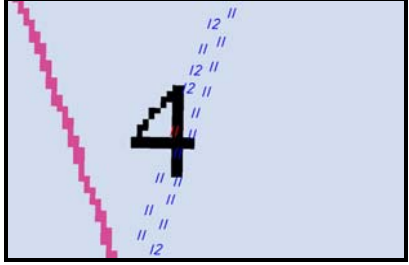
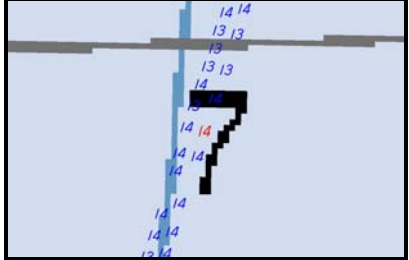
Table 1 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Chart 11363, 41st Edition, June 2007.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 37' 17.08" N	089° 02' 28.59" W	11363, 41 st Edition, June 2007	16 ft	17 ft	 A rectangular inset from a nautical chart showing a depth of 16 feet. The number '16' is large and black. To its right, several smaller numbers '17' are visible, indicating a shallower depth. The background is light blue with some pink and blue lines.
29° 38' 23.35" N	089° 01' 25.46" W	11363, 41 st Edition, June 2007	15 ft	17 ft	 A rectangular inset from a nautical chart showing a depth of 15 feet. The number '15' is large and black. To its right, several smaller numbers '16' and '17' are visible, indicating a shallower depth. The background is light blue with some pink and blue lines.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 38' 46.93" N	089° 03' 14.19" W	11363, 41 st Edition, June 2007	15 ft	16 ft	
29° 39' 11.14" N	089° 06' 19.84" W	11363, 41 st Edition, June 2007	13 ft	14 ft	
29° 39' 33.03" N	089° 01' 41.32" W	11363, 41 st Edition, June 2007	14 ft	16 ft	
29° 40' 34.41" N	089° 00' 40.32" W	11363, 41 st Edition, June 2007	14 ft	15 ft	

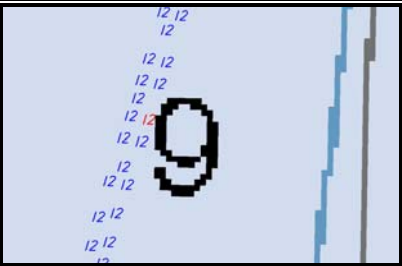
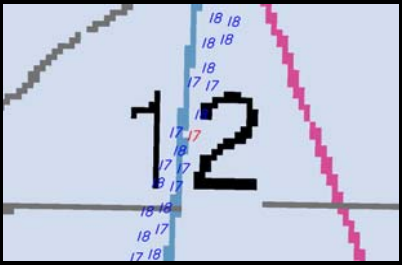

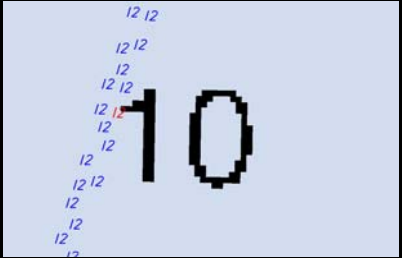
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 41' 31.28" N	088° 59' 42.62" W	11363, 41 st Edition, June 2007	14 ft	15 ft	
29° 42' 16.19" N	089° 03' 20.27" W	11363, 41 st Edition, June 2007	11 ft	12 ft	
29° 42' 50.33" N	088° 59' 14.24" W	11363, 41 st Edition, June 2007	13 ft	15 ft	
29° 42' 54.00" N	088° 55' 58.38" W	11363, 41 st Edition, June 2007	5 ft	6 ft	

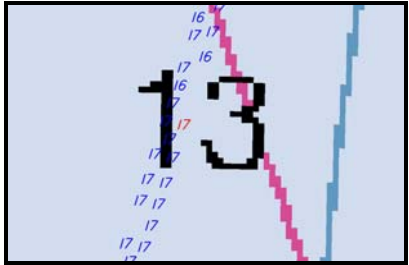
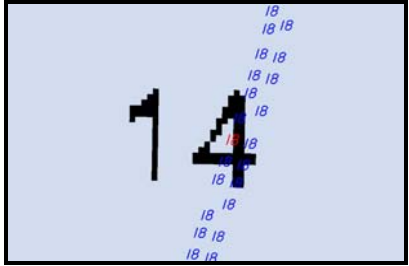
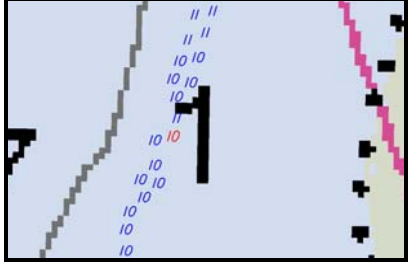

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 43' 56.77" N	088° 54' 57.62" W	11363, 41 st Edition, June 2007	5 ft	7 ft	
29° 44' 30.16" N	089° 01' 15.87" W	11363, 41 st Edition, June 2007	7 ft	11 ft	
29° 44' 32.84" N	089° 08' 21.52" W	11363, 41 st Edition, June 2007	11 ft	13 ft	
29° 44' 35.61" N	089° 02' 31.94" W	11363, 41 st Edition, June 2007	8 ft	13 ft	


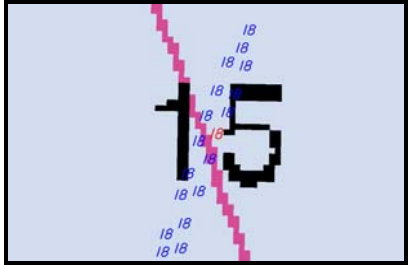
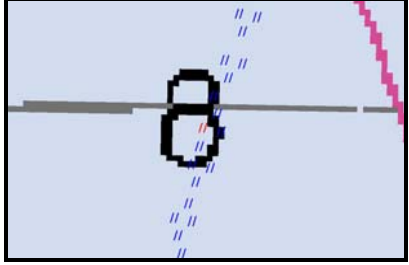
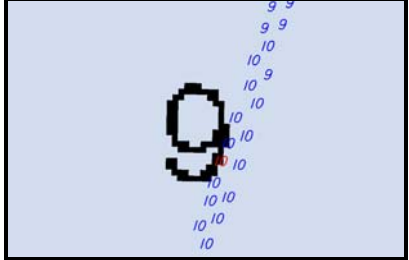
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 44' 36.63" N	089° 03' 10.33" W	11363, 41 st Edition, June 2007	11 ft	14 ft	
29° 44' 43.56" N	089° 07' 40.15" W	11363, 41 st Edition, June 2007	11 ft	13 ft	
29° 45' 05.87" N	089° 01' 03.56" W	11363, 41 st Edition, June 2007	4 ft	11 ft	
29° 45' 07.46" N	089° 01' 41.00" W	11363, 41 st Edition, June 2007	7 ft	14 ft	

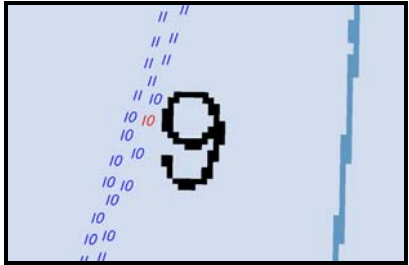
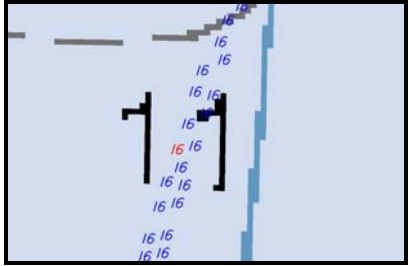
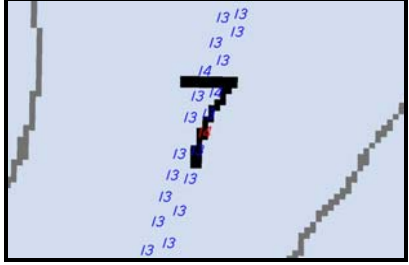
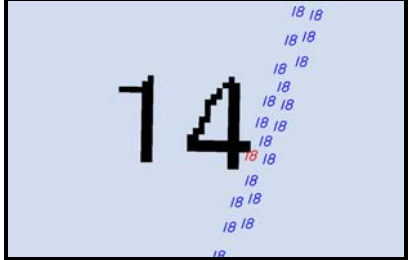
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 45' 11.10" N	088° 53' 52.81" W	11363, 41 st Edition, June 2007	2 ft	6 ft	
29° 45' 16.00" N	089° 02' 56.44" W	11363, 41 st Edition, June 2007	10 ft	14 ft	
29° 45' 38.70" N	089° 00' 52.13" W	11363, 41 st Edition, June 2007	1 ft	12 ft	
29° 46' 18.23" N	088° 54' 48.24" W	11363, 41 st Edition, June 2007	11 ft	13 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 46' 19.50" N	089° 02' 34.54" W	11363, 41 st Edition, June 2007	8 ft	15 ft	
29° 46' 38.95" N	088° 53' 22.25" W	11363, 41 st Edition, June 2007	5 ft	7 ft	
29° 47' 17.56" N	089° 02' 52.54" W	11363, 41 st Edition, June 2007	13 ft	17 ft	
29° 47' 19.88" N	089° 03' 30.51" W	11363, 41 st Edition, June 2007	12 ft	15 ft	

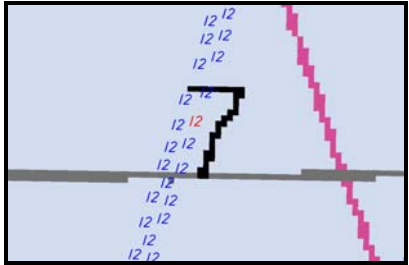
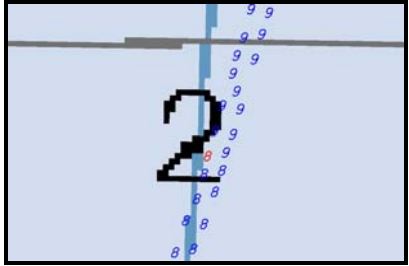
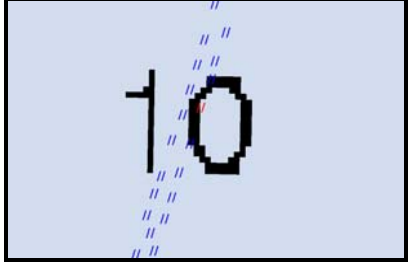
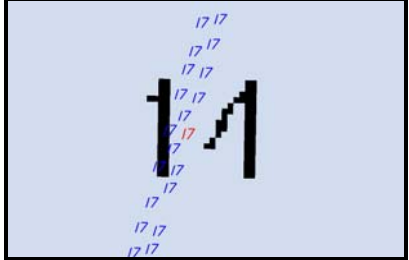
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 47' 37.22" N	088° 59' 31.07" W	11363, 41 st Edition, June 2007	9 ft	12 ft	
29° 47' 46.04" N	089° 01' 24.87" W	11363, 41 st Edition, June 2007	12 ft	17 ft	
29° 47' 47.37" N	089° 04' 00.89" W	11363, 41 st Edition, June 2007	13 ft	15 ft	
29° 47' 52.65" N	089° 05' 54.69" W	11363, 41 st Edition, June 2007	10 ft	12 ft	

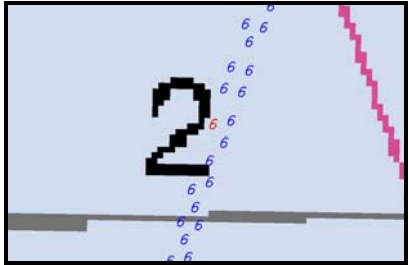
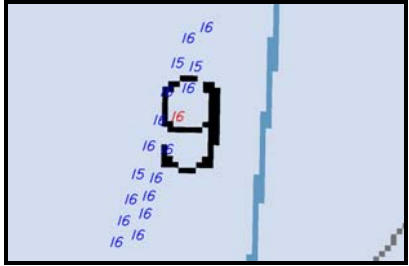

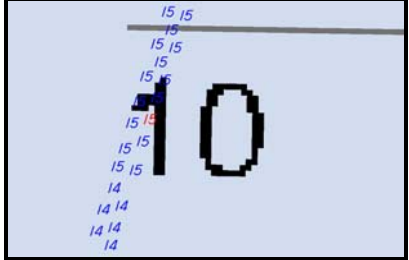
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29° 48' 12.14" N	089° 02' 33.36" W	11363, 41 st Edition, June 2007	13 ft	17 ft	
29° 48' 14.58" N	089° 01' 54.62" W	11363, 41 st Edition, June 2007	14 ft	18 ft	
29° 48' 34.85" N	088° 57' 53.15" W	11363, 41 st Edition, June 2007	1 ft	10 ft	
29° 48' 40.85" N	089° 03' 02.77" W	11363, 41 st Edition, June 2007	12 ft	15 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 41.76" N	089° 02' 24.07" W	11363, 41 st Edition, June 2007	13 ft	16 ft	
29° 48' 44.99" N	089° 01' 43.30" W	11363, 41 st Edition, June 2007	15 ft	18 ft	
29° 48' 51.93" N	089° 04' 56.21" W	11363, 41 st Edition, June 2007	8 ft	11 ft	
29° 48' 56.50" N	088° 52' 35.11" W	11363, 41 st Edition, June 2007	9 ft	10 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 57.10" N	088° 53' 12.97" W	11363, 41 st Edition, June 2007	9 ft	10 ft	
29° 49' 07.54" N	089° 00' 18.47" W	11363, 41 st Edition, June 2007	11 ft	16 ft	
29° 49' 30.96" N	088° 57' 33.48" W	11363, 41 st Edition, June 2007	7 ft	14 ft	
29° 49' 35.72" N	089° 00' 47.54" W	11363, 41 st Edition, June 2007	14 ft	18 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 49' 36.84" N	089° 02' 04.85" W	11363, 41 st Edition, June 2007	14 ft	16 ft	
29° 49' 57.21" N	088° 57' 25.35" W	11363, 41 st Edition, June 2007	7 ft	14 ft	
29° 49' 57.37" N	089° 03' 53.41" W	11363, 41 st Edition, June 2007	9 ft	13 ft	
29° 49' 58.48" N	088° 56' 45.14" W	11363, 41 st Edition, June 2007	9 ft	14 ft	

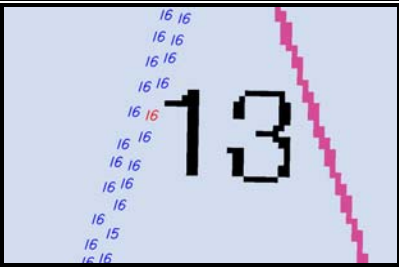

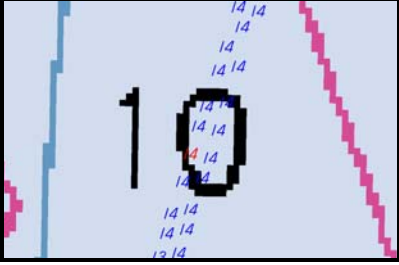
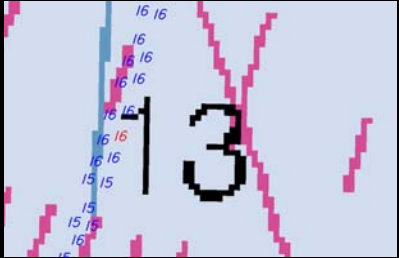
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29° 50' 11.98" N	089° 04' 27.55" W	11363, 41 st Edition, June 2007	7 ft	12 ft	
29° 50' 14.42" N	088° 56' 01.42" W	11363, 41 st Edition, June 2007	2 ft	8 ft	
29° 50' 19.35" N	089° 05' 42.83" W	11363, 41 st Edition, June 2007	10 ft	11 ft	
29° 50' 22.27" N	089° 01' 48.28" W	11363, 41 st Edition, June 2007	14 ft	17 ft	


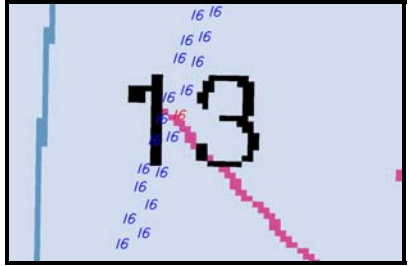
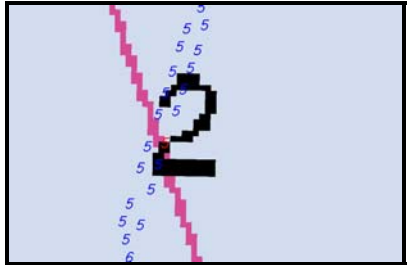
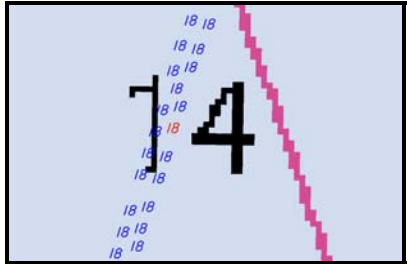
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 50' 25.17" N	088° 54' 39.93" W	11363, 41 st Edition, June 2007	2 ft	6 ft	
29° 50' 33.71" N	088° 59' 08.49" W	11363, 41 st Edition, June 2007	9 ft	16 ft	
29° 51' 07.52" N	088° 56' 21.14" W	11363, 41 st Edition, June 2007	6 ft	16 ft	
29° 51' 29.77" N	088° 57' 31.33" W	11363, 41 st Edition, June 2007	10 ft	15 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 51' 36.37" N	089° 02' 02.47" W	11363, 41 st Edition, June 2007	13 ft	16 ft	
29° 52' 18.73" N	088° 51' 23.62" W	11363, 41 st Edition, June 2007	2 ft	12 ft	
29° 52' 35.53" N	089° 02' 20.62" W	11363, 41 st Edition, June 2007	13 ft	15 ft	
29° 52' 47.56" N	088° 57' 43.03" W	11363, 41 st Edition, June 2007	14 ft	17 ft	

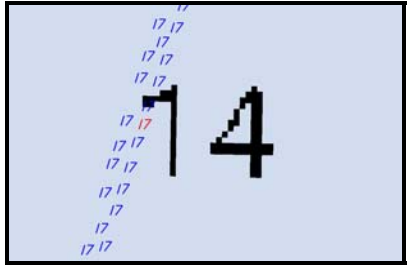
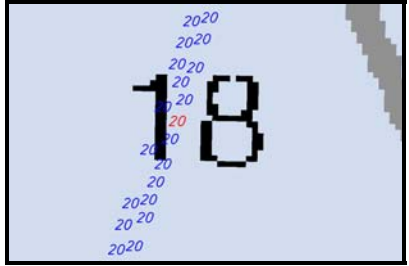

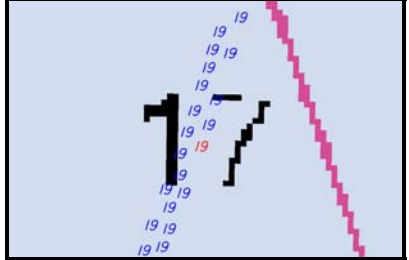
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 52' 56.34" N	088° 56' 22.42" W	11363, 41 st Edition, June 2007	13 ft	14 ft	
29° 53' 00.42" N	088° 59' 36.19" W	11363, 41 st Edition, June 2007	15 ft	18 ft	
29° 53' 07.93" N	089° 00' 50.50" W	11363, 41 st Edition, June 2007	14 ft	16 ft	
29° 53' 18.25" N	088° 51' 42.40" W	11363, 41 st Edition, June 2007	11 ft	13 ft	

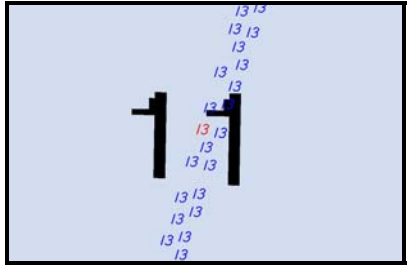
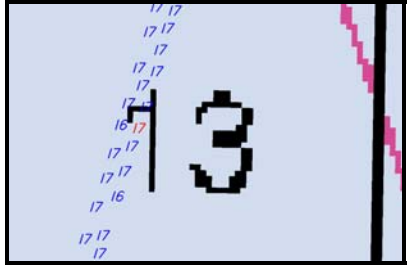
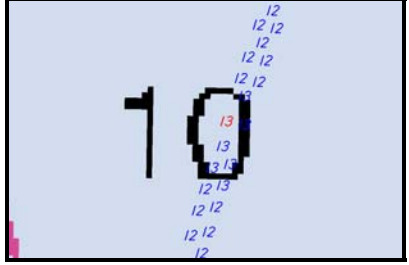
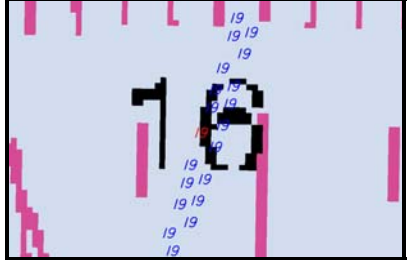
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 53' 31.69" N	088° 58' 46.51" W	11363, 41 st Edition, June 2007	17 ft	18 ft	
29° 53' 59.86" N	089° 00' 33.29" W	11363, 41 st Edition, June 2007	13 ft	15 ft	
29° 54' 03.72" N	089° 01' 50.00" W	11363, 41 st Edition, June 2007	12 ft	15 ft	
29° 54' 30.06" N	089° 01' 01.99" W	11363, 41 st Edition, June 2007	12 ft	15 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 54' 31.70" N	089° 00' 21.46" W	11363, 41 st Edition, June 2007	13 ft	16 ft	
29° 54' 32.48" N	088° 57' 07.41" W	11363, 41 st Edition, June 2007	15 ft	18 ft	
29° 54' 44.37" N	088° 52' 30.50" W	11363, 41 st Edition, June 2007	10 ft	14 ft	
29° 55' 04.77" N	088° 55' 37.27" W	11363, 41 st Edition, June 2007	13 ft	16 ft	


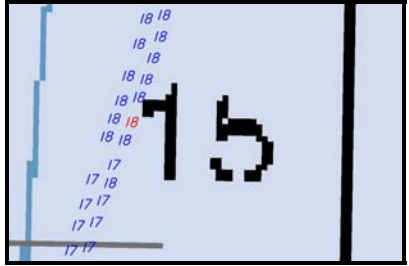
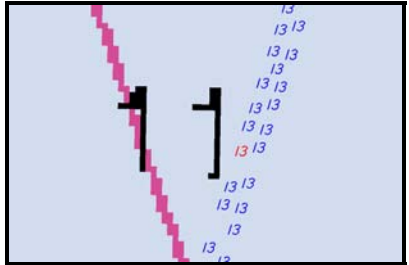

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 55' 29.32" N	089° 00' 41.41" W	11363, 41 st Edition, June 2007	12 ft	15 ft	
29° 55' 42.92" N	088° 53' 27.13" W	11363, 41 st Edition, June 2007	13 ft	16 ft	
29° 55' 46.78" N	088° 50' 49.81" W	11363, 41 st Edition, June 2007	2 ft	5 ft	
29° 55' 56.66" N	088° 55' 58.25" W	11363, 41 st Edition, June 2007	14 ft	18 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 56' 34.99" N	088° 57' 03.65" W	11363, 41 st Edition, June 2007	14 ft	17 ft	
29° 56' 51.58" N	089° 02' 09.42" W	11363, 41 st Edition, June 2007	11 ft	14 ft	
29° 57' 06.59" N	089° 00' 07.37" W	11363, 41 st Edition, June 2007	12 ft	16 ft	
29° 57' 19.14" N	088° 56' 08.33" W	11363, 41 st Edition, June 2007	15 ft	18 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 57' 42.05" N	088° 59' 15.21" W	11363, 41 st Edition, June 2007	14 ft	17 ft	
29° 57' 49.27" N	088° 54' 00.86" W	11363, 41 st Edition, June 2007	18 ft	20 ft	
29° 58' 18.97" N	088° 55' 08.57" W	11363, 41 st Edition, June 2007	16 ft	19 ft	
29° 58' 34.38" N	088° 53' 05.93" W	11363, 41 st Edition, June 2007	17 ft	19 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 58' 34.89" N	089° 02' 12.64" W	11363, 41 st Edition, June 2007	11 ft	13 ft	
29° 58' 42.26" N	089° 00' 12.14" W	11363, 41 st Edition, June 2007	13 ft	17 ft	
29° 58' 47.85" N	089° 02' 47.01" W	11363, 41 st Edition, June 2007	10 ft	13 ft	
29° 58' 53.76" N	088° 54' 57.27" W	11363, 41 st Edition, June 2007	16 ft	19 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 59' 24.39" N	088° 56' 03.54" W	11363, 41 st Edition, June 2007	17 ft	19 ft	
29° 59' 40.56" N	088° 59' 13.92" W	11363, 41 st Edition, June 2007	15 ft	19 ft	
29° 59' 41.90" N	089° 01' 09.30" W	11363, 41 st Edition, June 2007	13 ft	15 ft	
30° 00' 06.41" N	088° 55' 09.90" W	11363, 41 st Edition, June 2007	18 ft	19 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
30° 00' 14.54" N	089° 00' 58.88" W	11363, 41 st Edition, June 2007	13 ft	15 ft	
30° 00' 37.88" N	089° 00' 10.83" W	11363, 41 st Edition, June 2007	15 ft	18 ft	
30° 01' 13.12" N	089° 01' 56.38" W	11363, 41 st Edition, June 2007	11 ft	13 ft	
30° 01' 21.36" N	088° 56' 01.62" W	11363, 41 st Edition, June 2007	21 ft	24 ft	

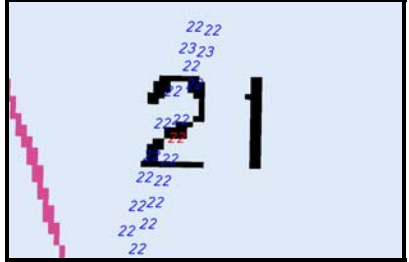
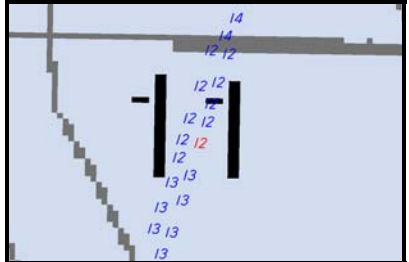
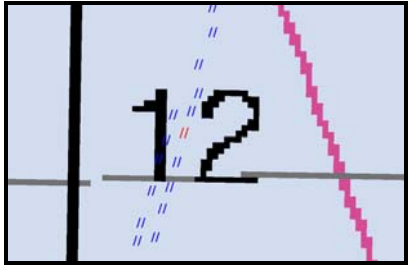
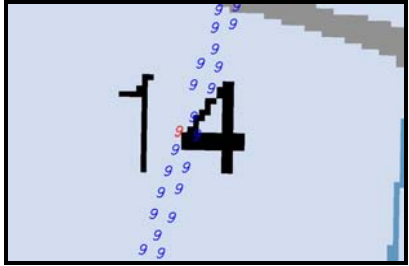
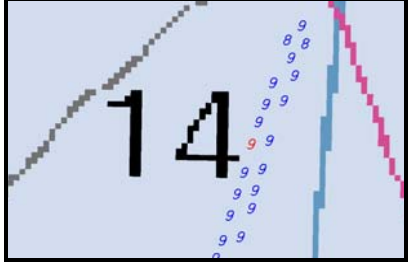
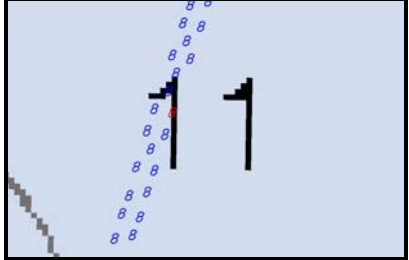
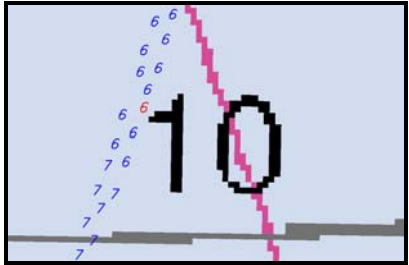
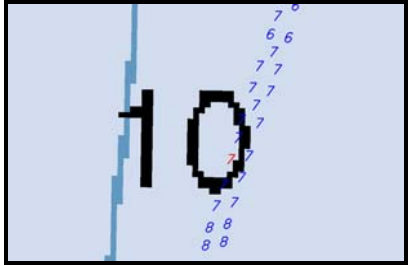
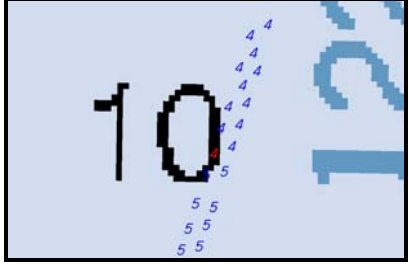
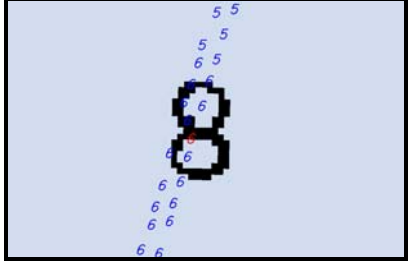
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
30° 01' 25.86" N	088° 54' 03.06" W	11363, 41 st Edition, June 2007	21 ft	22 ft	
30° 01' 42.21" N	088° 52' 39.39" W	11363, 41 st Edition, June 2007	11 ft	12 ft	

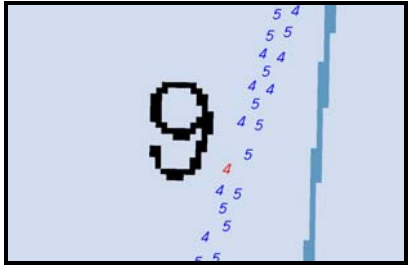
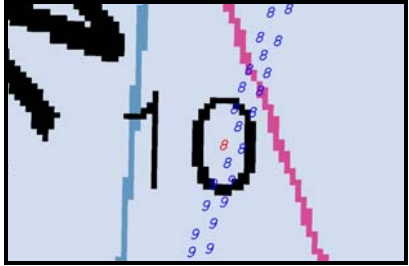
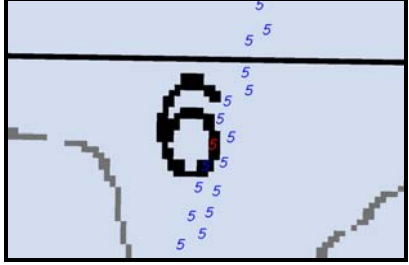
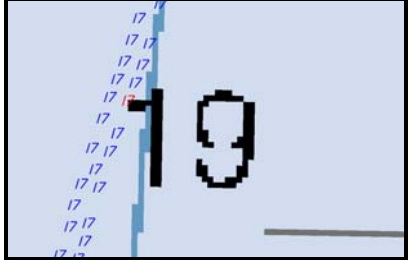
Table 2 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Chart 11363, 41st Edition, June 2007.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 38' 22.53" N	089° 07' 15.44" W	11363, 41 st Edition, June 2007	15 ft	14 ft	
29° 41' 15.53" N	088° 57' 11.63" W	11363, 41 st Edition, June 2007	11 ft	5 ft	
29° 41' 55.68" N	088° 56' 58.62" W	11363, 41 st Edition, June 2007	11 ft	8 ft	
29° 42' 49.86" N	089° 01' 50.69" W	11363, 41 st Edition, June 2007	12 ft	10 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 43' 04.36" N	088° 56' 34.70" W	11363, 41 st Edition, June 2007	14 ft	7 ft	
29° 44' 52.24" N	088° 57' 53.35" W	11363, 41 st Edition, June 2007	15 ft	13 ft	
29° 45' 48.86" N	088° 56' 15.39" W	11363, 41 st Edition, June 2007	14 ft	12 ft	
29° 46' 05.94" N	088° 53' 34.72" W	11363, 41 st Edition, June 2007	8 ft	7 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 46' 32.06" N	088° 59' 53.97" W	11363, 41 st Edition, June 2007	12 ft	11 ft	
29° 46' 58.45" N	088° 56' 31.00" W	11363, 41 st Edition, June 2007	14 ft	9 ft	
29° 47' 28.83" N	088° 56' 20.42" W	11363, 41 st Edition, June 2007	14 ft	9 ft	
29° 47' 33.12" N	088° 55' 38.97" W	11363, 41 st Edition, June 2007	11 ft	8 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 47' 57.81" N	088° 55' 30.35" W	11363, 41 st Edition, June 2007	10 ft	6 ft	
29° 48' 05.32" N	088° 56' 07.78" W	11363, 41 st Edition, June 2007	10 ft	7 ft	
29° 48' 23.88" N	088° 55' 22.06" W	11363, 41 st Edition, June 2007	10 ft	4 ft	
29° 48' 30.72" N	088° 55' 57.95" W	11363, 41 st Edition, June 2007	8 ft	6 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 54.57" N	088° 55' 11.52" W	11363, 41 st Edition, June 2007	9 ft	4 ft	
29° 48' 57.88" N	088° 51' 55.83" W	11363, 41 st Edition, June 2007	10 ft	8 ft	
29° 49' 56.26" N	088° 54' 49.96" W	11363, 41 st Edition, June 2007	6 ft	5 ft	
29° 50' 19.69" N	089° 01' 10.28" W	11363, 41 st Edition, June 2007	19 ft	17 ft	


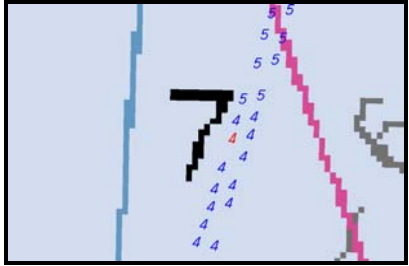
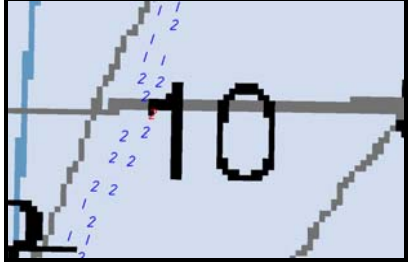
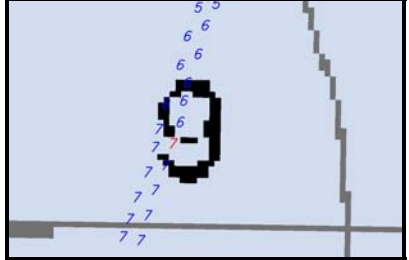
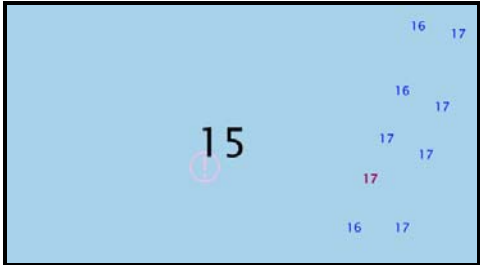
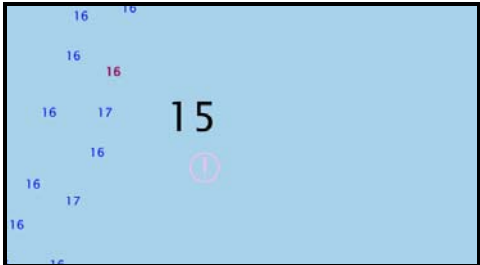
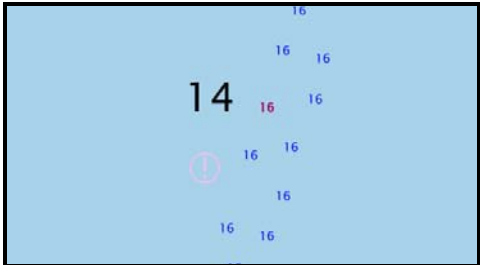
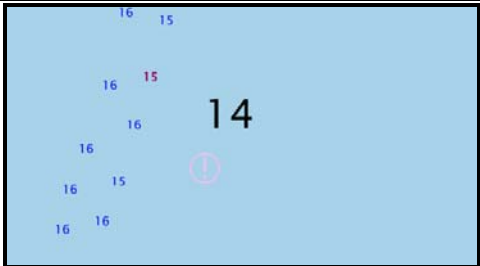
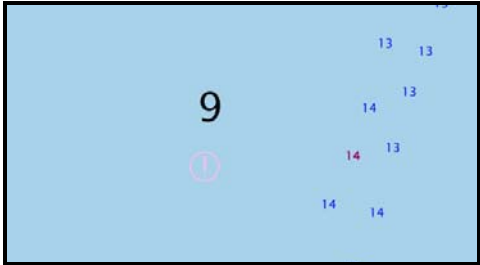
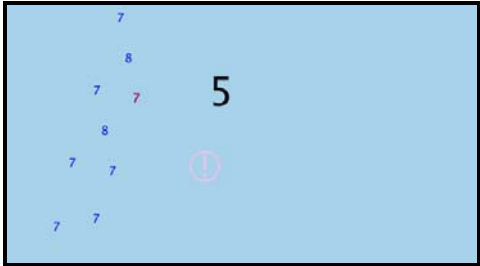

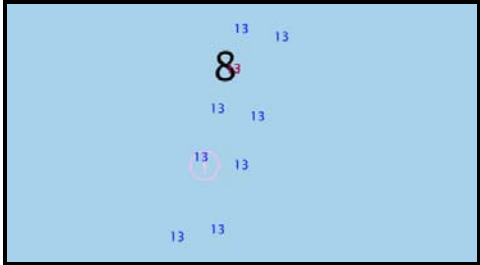
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 50' 47.66" N	088° 53' 13.25" W	11363, 41 st Edition, June 2007	13 ft	1 ft	
29° 50' 58.01" N	088° 53' 49.45" W	11363, 41 st Edition, June 2007	7 ft	4 ft	
29° 51' 37.95" N	088° 52' 43.73" W	11363, 41 st Edition, June 2007	10 ft	2 ft	
29° 59' 16.19" N	088° 51' 33.44" W	11363, 41 st Edition, June 2007	9 ft	7 ft	

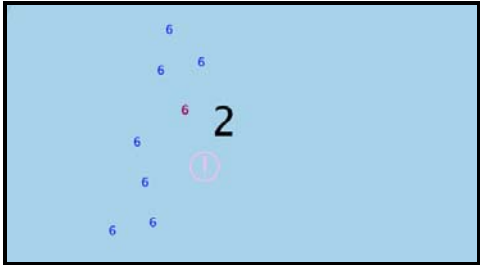
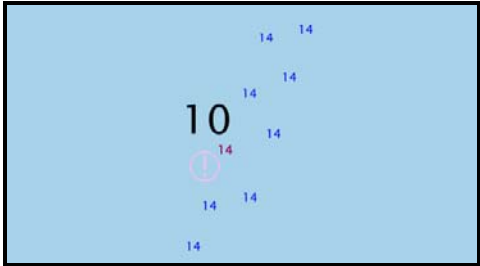

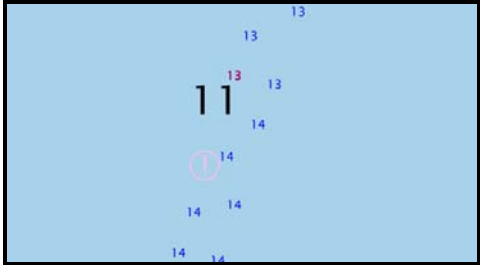
Table 3 - Charted depths are shoaler than OPR-J977-TE-08 survey depths. Electronic Navigation Chart (ENC) US4LA34M, June 18, 2008.

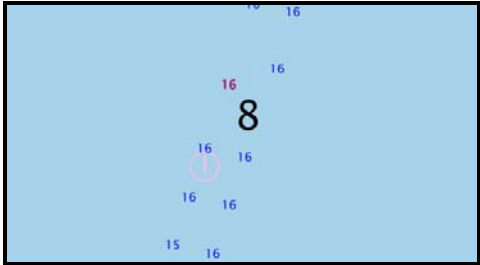

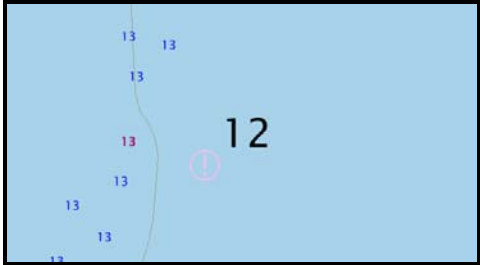
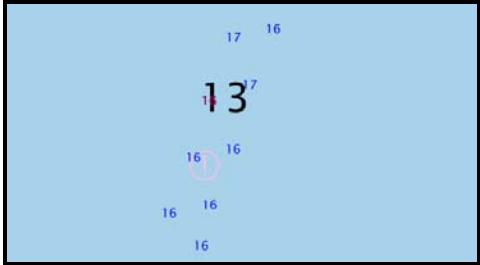
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 37' 17.09" N	089° 02' 28.61" W	US4LA34M June 18, 2008	15 ft	17 ft	
29° 38' 24.16" N	089° 01' 25.27" W	US4LA34M June 18, 2008	15 ft	16 ft	
29° 39' 33.08" N	089° 01' 41.34" W	US4LA34M June 18, 2008	14 ft	16 ft	
29° 40' 34.43" N	089° 00' 40.27" W	US4LA34M June 18, 2008	14 ft	15 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 42' 49.86" N	088° 59' 15.34" W	US4LA34M June 18, 2008	13 ft	15 ft	
29° 42' 54.07" N	088° 55' 58.40" W	US4LA34M June 18, 2008	5 ft	6 ft	
29° 43' 16.82" N	089° 02' 58.22" W	US4LA34M June 18, 2008	9 ft	11 ft	
29° 43' 34.41" N	089° 02' 13.36" W	US4LA34M June 18, 2008	9 ft	11 ft	

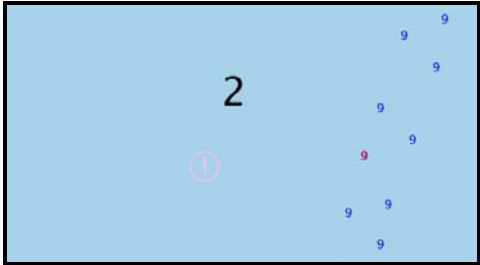
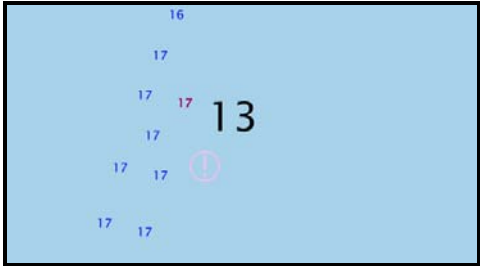
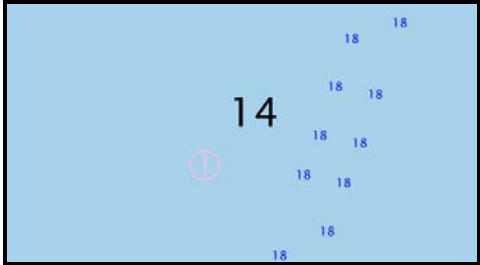
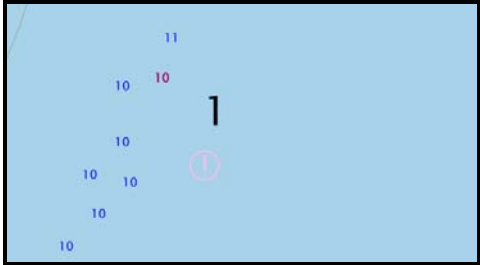
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 43' 37.76" N	088° 59' 37.50" W	US4LA34M June 18, 2008	9 ft	14 ft	 A bathymetric image showing depth contours. The background is light blue. There are several numerical values in blue and red: 13, 14, 13, 14, 14. A circled '1' is visible in the lower-left quadrant.
29° 43' 56.84" N	088° 54' 57.65" W	US4LA34M June 18, 2008	5 ft	7 ft	 A bathymetric image showing depth contours. The background is light blue. There are several numerical values in blue and red: 7, 8, 7, 7, 7, 7, 7. A circled '1' is visible in the lower-right quadrant.
29° 44' 30.17" N	089° 01' 15.87" W	US4LA34M June 18, 2008	7 ft	11 ft	 A bathymetric image showing depth contours. The background is light blue. There are several numerical values in blue and red: 11, 11, 11, 11, 11. A circled '1' is visible in the lower-left quadrant.
29° 44' 34.85" N	089° 02' 32.06" W	US4LA34M June 18, 2008	8 ft	13 ft	 A bathymetric image showing depth contours. The background is light blue. There are several numerical values in blue and red: 13, 13, 13, 13, 13. A circled '1' is visible in the lower-left quadrant.





Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 44' 36.69" N	089° 03' 10.44" W	US4LA34M June 18, 2008	11 ft	14 ft	
29° 44' 42.18" N	089° 07' 40.57" W	US4LA34M June 18, 2008	11 ft	13 ft	
29° 45' 05.94" N	089° 01' 03.56" W	US4LA34M June 18, 2008	4 ft	11 ft	
29° 45' 06.34" N	089° 01' 41.34" W	US4LA34M June 18, 2008	7 ft	14 ft	

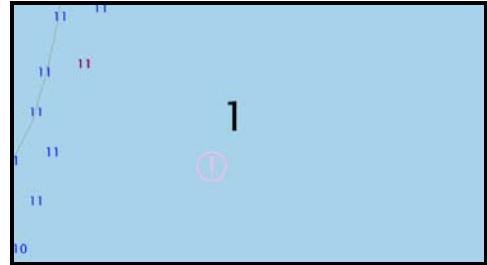
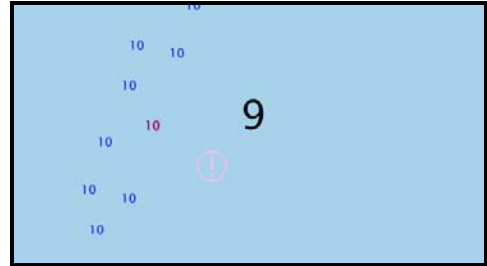
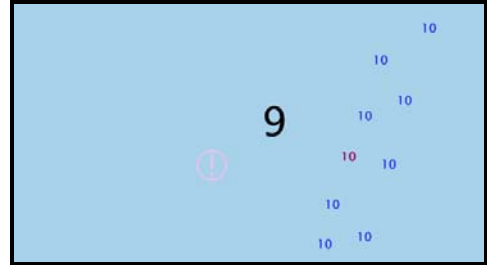
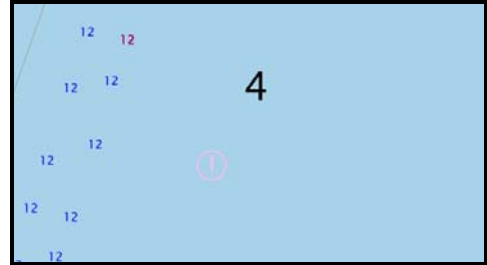
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 45' 11.18" N	088° 53' 52.80" W	US4LA34M June 18, 2008	2 ft	6 ft	
29° 45' 14.90" N	089° 02' 57.08" W	US4LA34M June 18, 2008	10 ft	14 ft	
29° 45' 37.78" N	089° 00' 52.27" W	US4LA34M June 18, 2008	1 ft	12 ft	
29° 46' 18.26" N	088° 54' 48.24" W	US4LA34M June 18, 2008	11 ft	13 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 46' 19.56" N	089° 02' 34.57" W	US4LA34M June 18, 2008	8 ft	16 ft	
29° 46' 38.80" N	088° 53' 23.17" W	US4LA34M June 18, 2008	5 ft	7 ft	
29° 46' 57.20" N	088° 55' 12.81" W	US4LA34M June 18, 2008	12 ft	13 ft	
29° 47' 17.25" N	089° 02' 53.43" W	US4LA34M June 18, 2008	13 ft	16 ft	

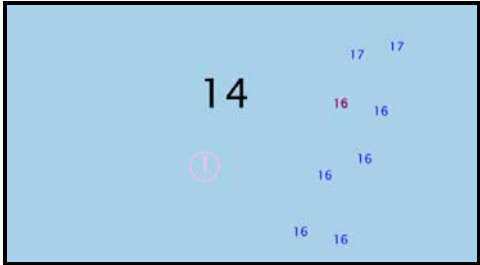
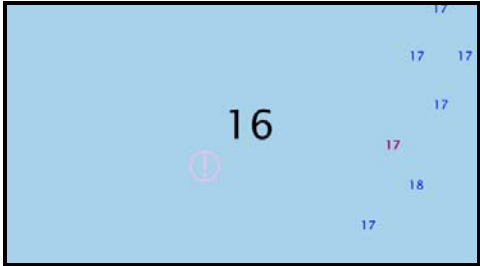
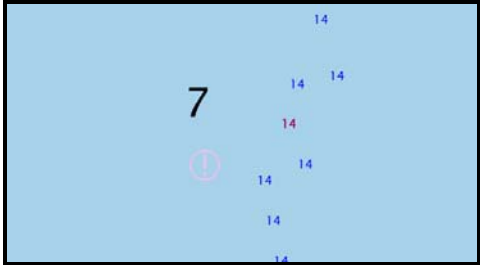
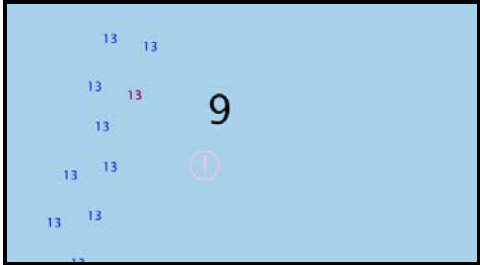
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 47' 18.62" N	089° 03' 31.05" W	US4LA34M June 18, 2008	12 ft	15 ft	
29° 47' 36.26" N	088° 59' 31.43" W	US4LA34M June 18, 2008	9 ft	12 ft	
29° 47' 45.42" N	089° 04' 01.58" W	US4LA34M June 18, 2008	13 ft	15 ft	
29° 47' 46.05" N	089° 01' 24.83" W	US4LA34M June 18, 2008	12 ft	17 ft	

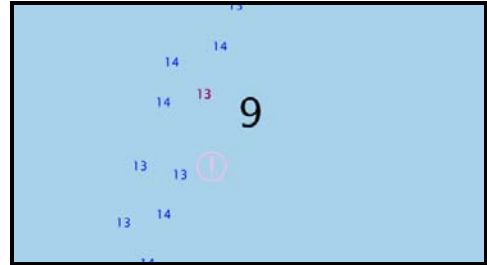

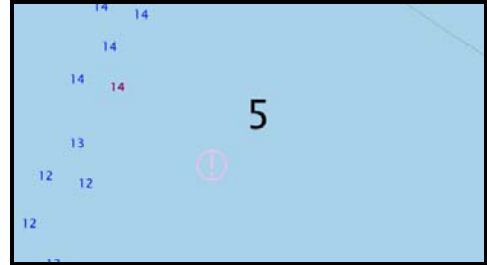
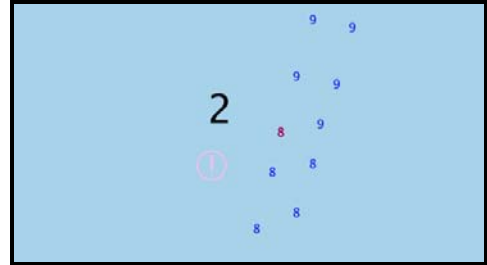
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 47' 58.63" N	088° 58' 06.78" W	US4LA34M June 18, 2008	2 ft	9 ft	 A seafloor image showing a light blue background with several small, dark, circular features. A large number '2' is centered in the image. A pink circle with a '1' inside is located near the bottom left of the image.
29° 48' 12.13" N	089° 02' 33.31" W	US4LA34M June 18, 2008	13 ft	17 ft	 A seafloor image showing a light blue background with several small, dark, circular features. A large number '13' is centered in the image. A pink circle with a '1' inside is located near the bottom center of the image.
29° 48' 13.68" N	089° 01' 54.98" W	US4LA34M June 18, 2008	14 ft	18 ft	 A seafloor image showing a light blue background with several small, dark, circular features. A large number '14' is centered in the image. A pink circle with a '1' inside is located near the bottom left of the image.
29° 48' 34.88" N	088° 57' 53.15" W	US4LA34M June 18, 2008	1 ft	10 ft	 A seafloor image showing a light blue background with several small, dark, circular features. A large number '1' is centered in the image. A pink circle with a '1' inside is located near the bottom center of the image.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 40.90" N	089° 03' 02.77" W	US4LA34M June 18, 2008	12 ft	15 ft	
29° 48' 41.81" N	089° 02' 24.05" W	US4LA34M June 18, 2008	13 ft	16 ft	
29° 48' 45.05" N	089° 01' 43.34" W	US4LA34M June 18, 2008	15 ft	18 ft	
29° 48' 51.95" N	089° 04' 56.21" W	US4LA34M June 18, 2008	8 ft	11 ft	

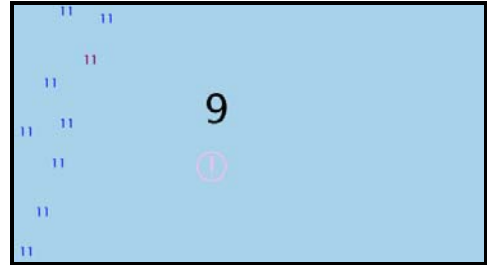
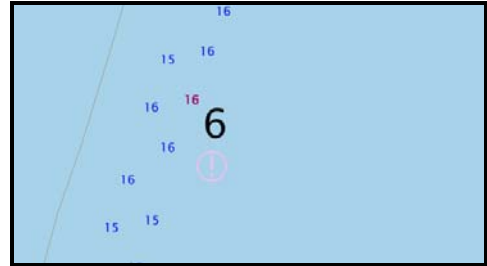
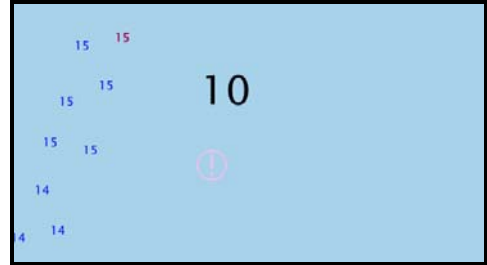
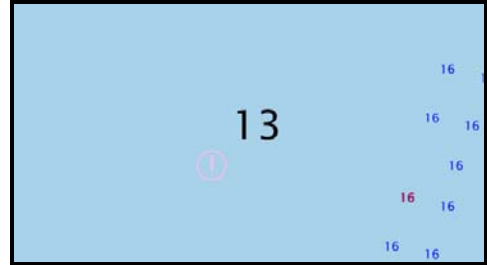
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 52.52" N	088° 57' 46.98" W	US4LA34M June 18, 2008	1 ft	11 ft	
29° 48' 55.69" N	088° 53' 13.47" W	US4LA34M June 18, 2008	9 ft	10 ft	
29° 48' 56.56" N	088° 52' 35.11" W	US4LA34M June 18, 2008	9 ft	10 ft	
29° 48' 56.74" N	088° 59' 03.41" W	US4LA34M June 18, 2008	4 ft	12 ft	

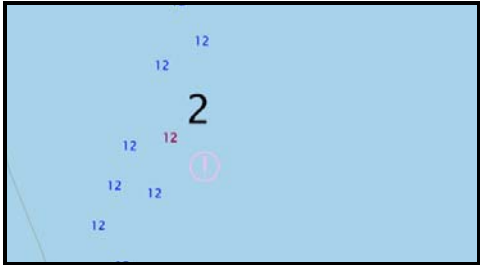
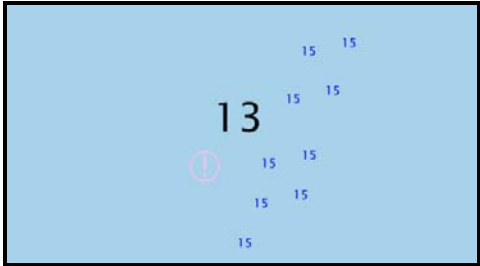
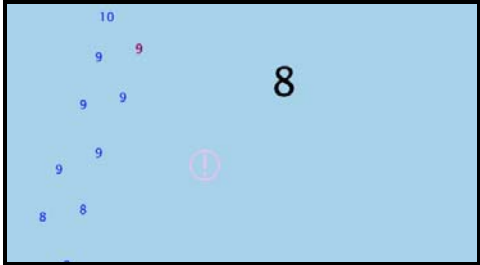
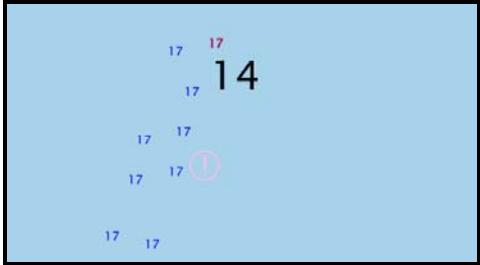
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 49' 07.63" N	089° 00' 18.49" W	US4LA34M June 18, 2008	11 ft	16 ft	
29° 49' 30.29" N	088° 53' 01.45" W	US4LA34M June 18, 2008	9 ft	10 ft	
29° 49' 31.67" N	088° 57' 34.33" W	US4LA34M June 18, 2008	7 ft	13 ft	
29° 49' 35.76" N	089° 00' 47.56" W	US4LA34M June 18, 2008	14 ft	18 ft	

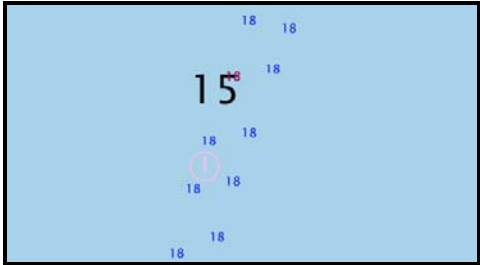
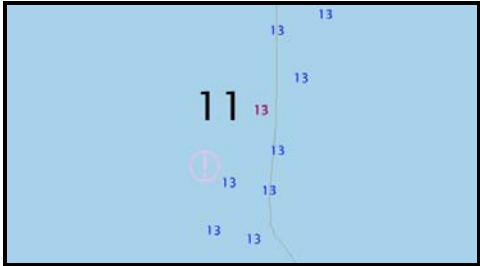

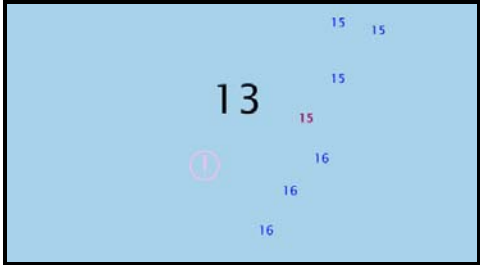
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 49' 36.84" N	089° 02' 04.87" W	US4LA34M June 18, 2008	14 ft	16 ft	
29° 49' 54.59" N	089° 01' 19.96" W	US4LA34M June 18, 2008	16 ft	17 ft	
29° 49' 56.50" N	088° 57' 25.51" W	US4LA34M June 18, 2008	7 ft	14 ft	
29° 49' 57.40" N	089° 03' 53.68" W	US4LA34M June 18, 2008	9 ft	13 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 49' 57.58" N	088° 56' 45.47" W	US4LA34M June 18, 2008	9 ft	13 ft	
29° 50' 11.00" N	089° 04' 27.86" W	US4LA34M June 18, 2008	7 ft	12 ft	
29° 50' 12.16" N	088° 58' 37.15" W	US4LA34M June 18, 2008	5 ft	14 ft	
29° 50' 14.46" N	088° 56' 01.46" W	US4LA34M June 18, 2008	2 ft	8 ft	

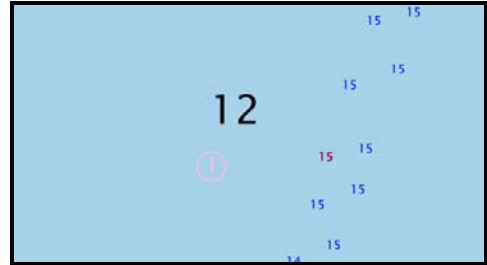
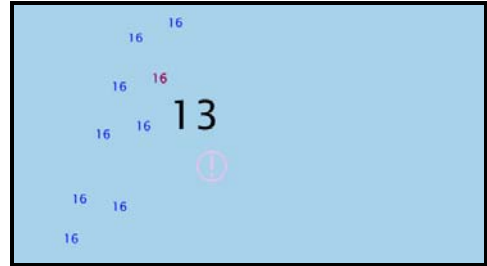
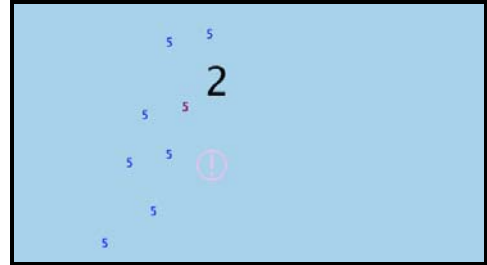
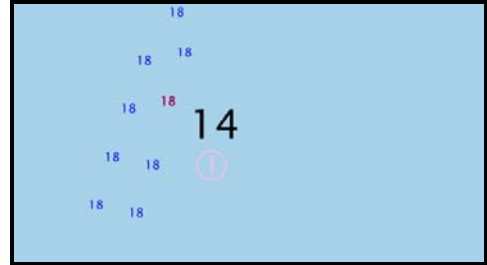
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 50' 17.77" N	089° 05' 43.26" W	US4LA34M June 18, 2008	10 ft	11 ft	
29° 50' 22.25" N	089° 01' 48.27" W	US4LA34M June 18, 2008	14 ft	17 ft	
29° 50' 25.22" N	088° 54' 39.91" W	US4LA34M June 18, 2008	2 ft	6 ft	
29° 50' 32.30" N	088° 59' 09.02" W	US4LA34M June 18, 2008	9 ft	16 ft	

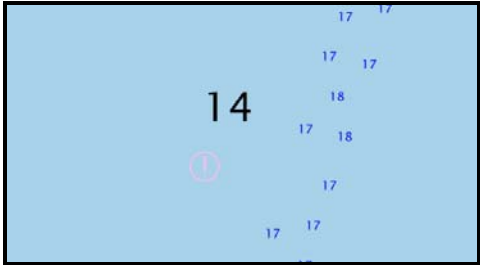
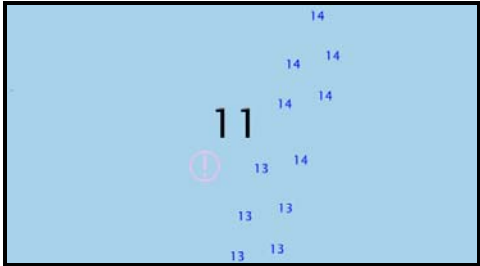
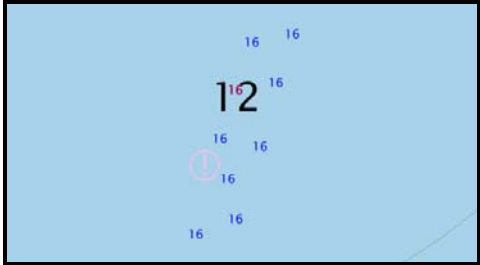
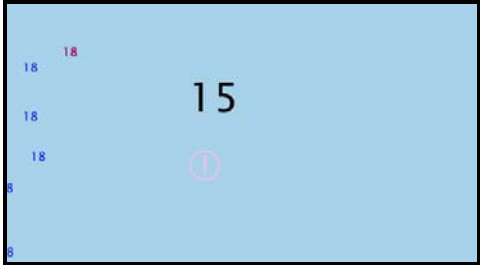
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 50' 47.31" N	089° 05' 33.07" W	US4LA34M June 18, 2008	9 ft	11 ft	
29° 51' 07.60" N	088° 56' 21.12" W	US4LA34M June 18, 2008	6 ft	16 ft	
29° 51' 29.79" N	088° 57' 31.23" W	US4LA34M June 18, 2008	10 ft	15 ft	
29° 51' 36.41" N	089° 02' 02.45" W	US4LA34M June 18, 2008	13 ft	16 ft	

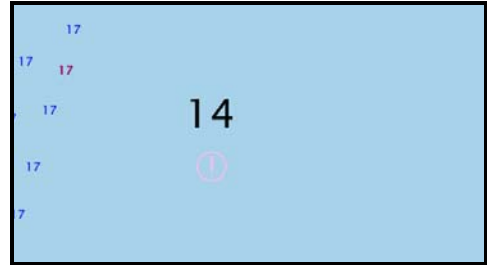
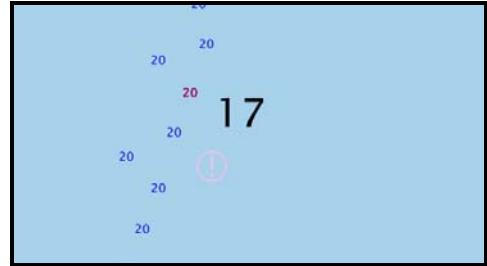
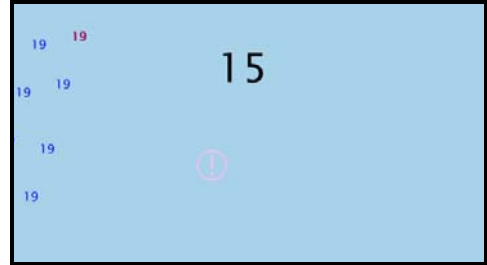

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 52' 18.79" N	088° 51' 23.62" W	US4LA34M June 18, 2008	2 ft	12 ft	
29° 52' 34.25" N	089° 02' 21.14" W	US4LA34M June 18, 2008	13 ft	15 ft	
29° 52' 35.71" N	088° 51' 56.54" W	US4LA34M June 18, 2008	8 ft	9 ft	
29° 52' 47.57" N	088° 57' 43.00" W	US4LA34M June 18, 2008	14 ft	17 ft	

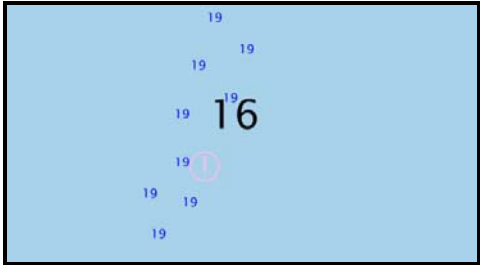
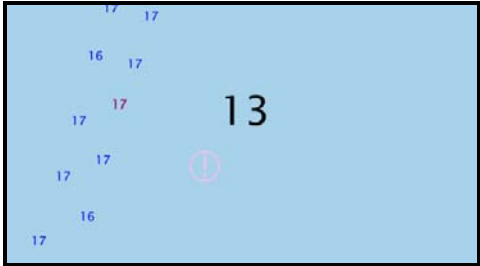
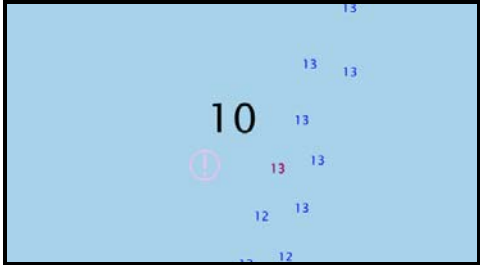

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 53' 00.49" N	088° 59' 36.19" W	US4LA34M June 18, 2008	15 ft	18 ft	
29° 53' 18.29" N	088° 51' 42.43" W	US4LA34M June 18, 2008	11 ft	13 ft	
29° 53' 31.76" N	088° 58' 46.49" W	US4LA34M June 18, 2008	16 ft	18 ft	
29° 53' 59.87" N	089° 00' 33.28" W	US4LA34M June 18, 2008	13 ft	15 ft	

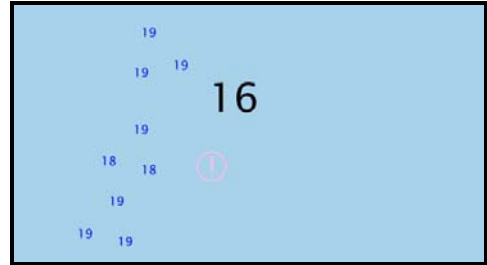
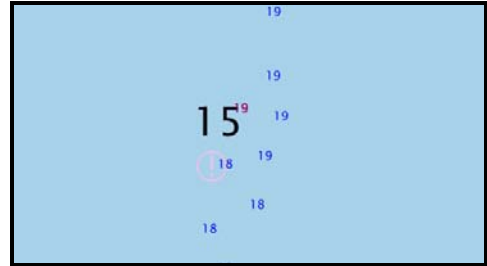
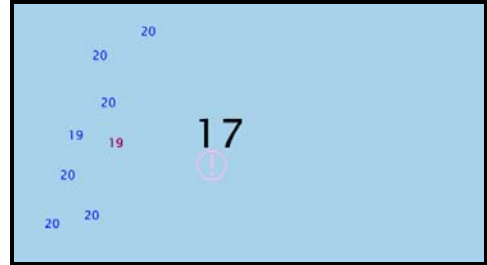
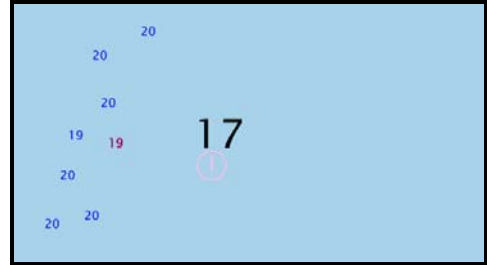
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 54' 02.75" N	089° 01' 50.32" W	US4LA34M June 18, 2008	12 ft	15 ft	
29° 54' 32.51" N	088° 57' 07.40" W	US4LA34M June 18, 2008	15 ft	18 ft	
29° 54' 44.50" N	088° 52' 30.45" W	US4LA34M June 18, 2008	10 ft	14 ft	
29° 55' 04.85" N	088° 55' 37.25" W	US4LA34M June 18, 2008	13 ft	16 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 55' 29.39" N	089° 00' 41.42" W	US4LA34M June 18, 2008	12 ft	15 ft	
29° 55' 42.96" N	088° 53' 27.10" W	US4LA34M June 18, 2008	13 ft	16 ft	
29° 55' 46.81" N	088° 50' 49.81" W	US4LA34M June 18, 2008	2 ft	5 ft	
29° 55' 56.68" N	088° 55' 58.21" W	US4LA34M June 18, 2008	14 ft	18 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 56' 35.02" N	088° 57' 03.64" W	US4LA34M June 18, 2008	14 ft	17 ft	
29° 56' 51.67" N	089° 02' 09.42" W	US4LA34M June 18, 2008	11 ft	13 ft	
29° 57' 06.70" N	089° 00' 07.40" W	US4LA34M June 18, 2008	12 ft	16 ft	
29° 57' 19.19" N	088° 56' 08.38" W	US4LA34M June 18, 2008	15 ft	18 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 57' 42.07" N	088° 59' 15.13" W	US4LA34M June 18, 2008	14 ft	17 ft	
29° 57' 49.30" N	088° 54' 00.83" W	US4LA34M June 18, 2008	17 ft	20 ft	
29° 58' 16.90" N	088° 55' 09.25" W	US4LA34M June 18, 2008	15 ft	19 ft	
29° 58' 33.42" N	089° 02' 13.16" W	US4LA34M June 18, 2008	11 ft	13 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 58' 34.43" N	088° 53' 05.91" W	US4LA34M June 18, 2008	16 ft	19 ft	
29° 58' 41.45" N	089° 00' 12.46" W	US4LA34M June 18, 2008	13 ft	17 ft	
29° 58' 45.88" N	089° 02' 47.74" W	US4LA34M June 18, 2008	10 ft	13 ft	
29° 58' 53.78" N	088° 54' 57.28" W	US4LA34M June 18, 2008	15 ft	19 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 59' 24.47" N	088° 56' 03.53" W	US4LA34M June 18, 2008	16 ft	19 ft	
29° 59' 40.63" N	088° 59' 13.96" W	US4LA34M June 18, 2008	15 ft	19 ft	
29° 59' 41.96" N	089° 01' 09.26" W	US4LA34M June 18, 2008	17 ft	19 ft	
30° 00' 06.52" N	088° 55' 09.86" W	US4LA34M June 18, 2008	17 ft	19 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
30° 00' 07.74" N	088° 59' 04.42" W	US4LA34M June 18, 2008	15 ft	19 ft	
30° 00' 12.47" N	089° 00' 59.63" W	US4LA34M June 18, 2008	13 ft	15 ft	
30° 00' 37.10" N	089° 00' 11.23" W	US4LA34M June 18, 2008	15 ft	17 ft	
30° 01' 11.51" N	089° 01' 57.00" W	US4LA34M June 18, 2008	11 ft	13 ft	

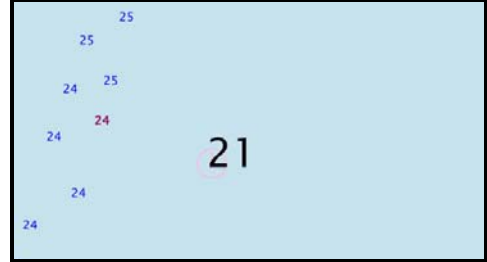

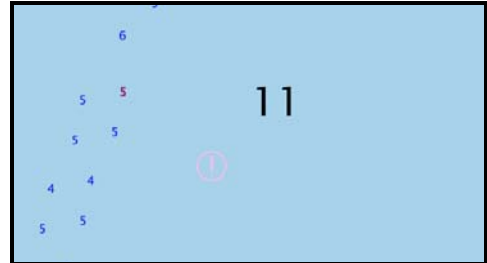
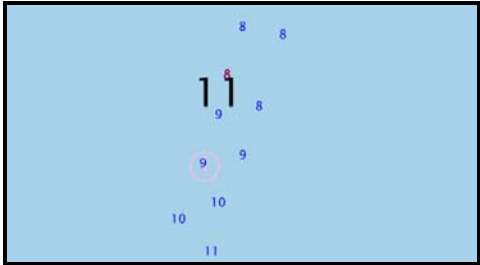
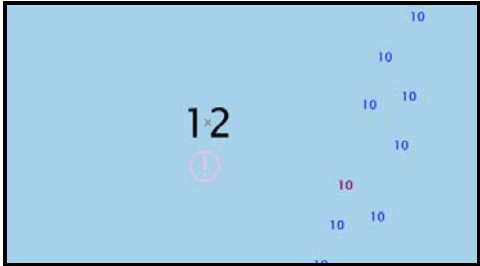
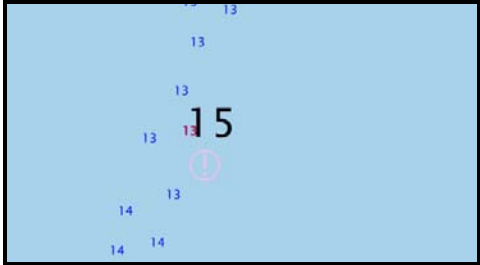
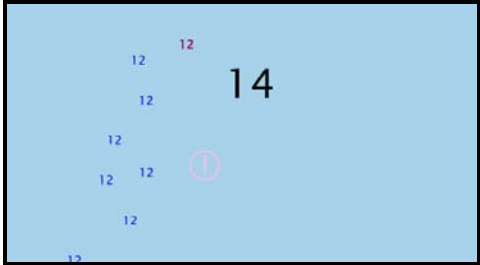
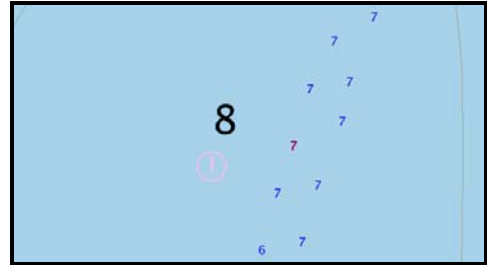
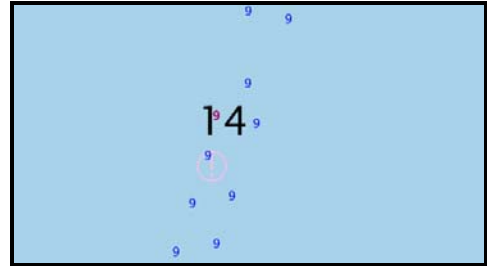
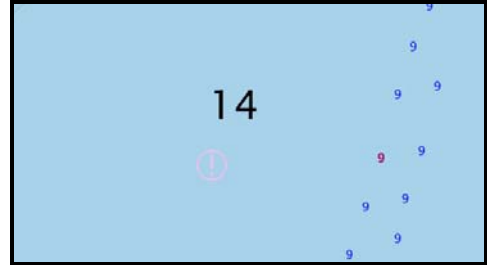
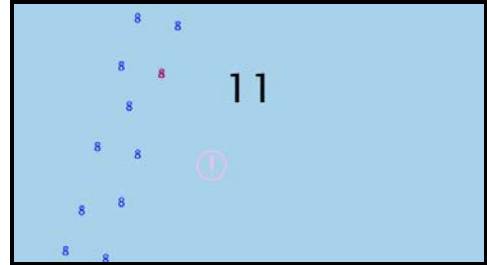
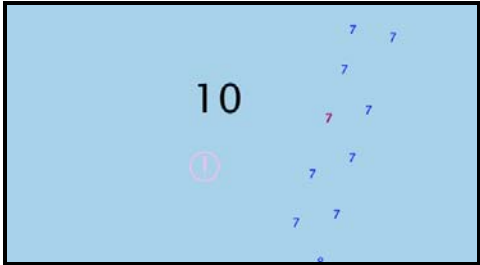
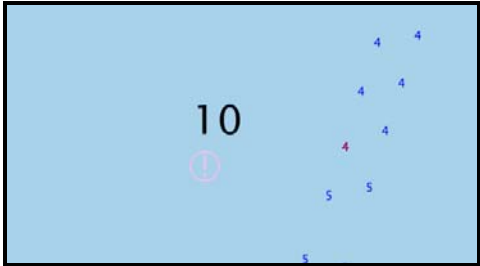
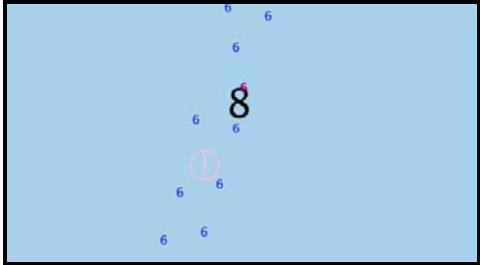

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
30° 01' 21.43" N	088° 56' 01.70" W	US4LA34M June 18, 2008	21 ft	24 ft	
30° 01' 21.49" N	088° 52' 46.67" W	US4LA34M June 18, 2008	19 ft	21 ft	

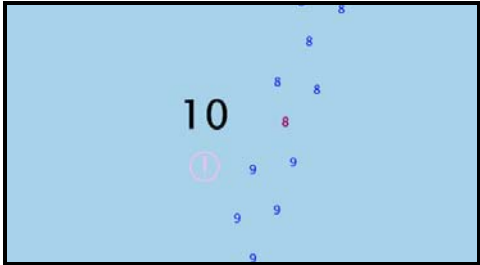
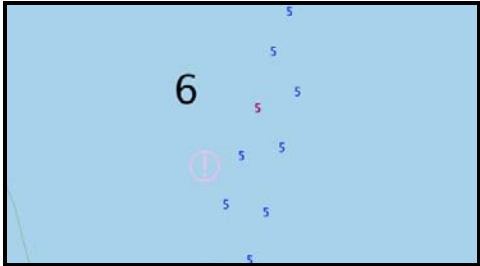
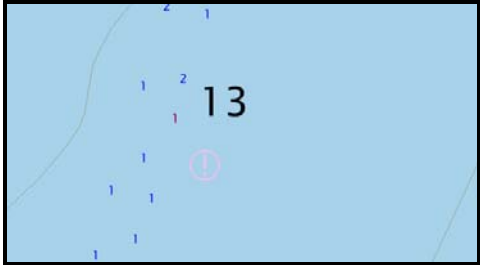
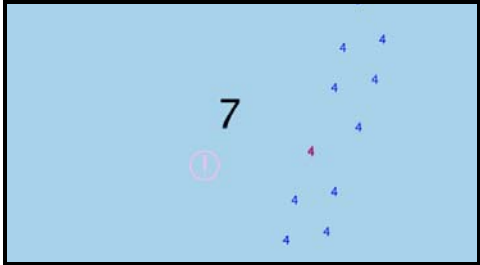
Table 4 - Charted depths are deeper than OPR-J977-TE-08 survey depths. Electronic Navigation Chart (ENC) US4LA34M, May 27, 2008.

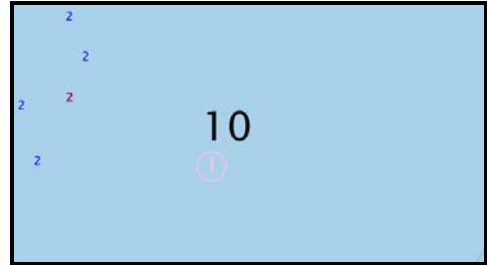
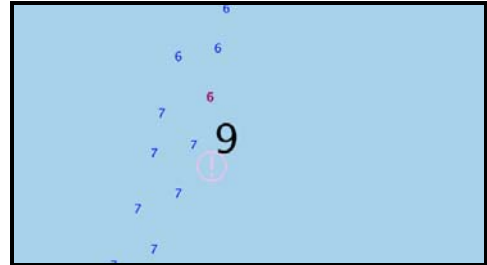
Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 41' 13.76" N	088° 57' 12.37" W	US4LA34M June 18, 2008	11 ft	5 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 41' 55.70" N	088° 56' 58.67" W	US4LA34M June 18, 2008	11 ft	8 ft	 A bathymetric image showing a seafloor profile. The image is labeled '11' in the center. It features several depth contours: 8, 9, 10, and 11. The contours are represented by small numbers and lines. A pink circle with a '1' inside is located near the center of the image.
29° 42' 49.93" N	089° 01' 50.68" W	US4LA34M June 18, 2008	12 ft	10 ft	 A bathymetric image showing a seafloor profile. The image is labeled '12' in the center. It features several depth contours: 10, 11, and 12. The contours are represented by small numbers and lines. A pink circle with a '1' inside is located near the center of the image.
29° 44' 51.41" N	088° 57' 53.24" W	US4LA34M June 18, 2008	15 ft	13 ft	 A bathymetric image showing a seafloor profile. The image is labeled '15' in the center. It features several depth contours: 13, 14, and 15. The contours are represented by small numbers and lines. A pink circle with a '1' inside is located near the center of the image.
29° 45' 48.89" N	088° 56' 15.34" W	US4LA34M June 18, 2008	14 ft	12 ft	 A bathymetric image showing a seafloor profile. The image is labeled '14' in the center. It features several depth contours: 12, 13, and 14. The contours are represented by small numbers and lines. A pink circle with a '1' inside is located near the center of the image.

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 46' 04.85" N	088° 53' 35.02" W	US4LA34M June 18, 2008	8 ft	7 ft	
29° 46' 58.49" N	088° 56' 31.02" W	US4LA34M June 18, 2008	14 ft	9 ft	
29° 47' 27.56" N	088° 56' 20.80" W	US4LA34M June 18, 2008	14 ft	9 ft	
29° 47' 32.23" N	088° 55' 39.36" W	US4LA34M June 18, 2008	11 ft	8 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 05.26" N	088° 56' 07.73" W	US4LA34M June 18, 2008	10 ft	7 ft	
29° 48' 23.96" N	088° 55' 22.10" W	US4LA34M June 18, 2008	10 ft	4 ft	
29° 48' 30.74" N	088° 55' 57.99" W	US4LA34M June 18, 2008	8 ft	6 ft	
29° 48' 54.65" N	088° 55' 11.51" W	US4LA34M June 18, 2008	9 ft	4 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 48' 57.11" N	088° 51' 55.64" W	US4LA34M June 18, 2008	10 ft	8 ft	
29° 49' 56.33" N	088° 54' 49.97" W	US4LA34M June 18, 2008	6 ft	5 ft	
29° 50' 46.93" N	088° 53' 13.51" W	US4LA34M June 18, 2008	13 ft	1 ft	
29° 50' 56.81" N	088° 53' 50.01" W	US4LA34M June 18, 2008	7 ft	4 ft	

Latitude	Longitude	Chart	Charted Depth	Survey Depth	Image
29° 51' 37.21" N	088° 52' 44.08" W	US4LA34M June 18, 2008	10 ft	2 ft	
29° 59' 17.16" N	088° 51' 33.07" W	US4LA34M June 18, 2008	9 ft	6 ft	

Subject: Re: TerraSond DD00140 SD
From: "Mark.T.Lathrop" <Mark.T.Lathrop@noaa.gov>
Date: Mon, 18 May 2009 13:21:56 -0400
To: Vanessa.Self@noaa.gov
CC: Castle E Parker <Castle.E.Parker@noaa.gov>

Vanessa,

The three "D" surveys are single beam only as specified in Attachment 5 of the SOW. Sorry for the confusion.

Mark

Vanessa.Self@noaa.gov wrote:

ATTN: Mark T. Lathrop

Data Acquisition and Control Branch
1315 East West Hwy
Building SSMC3
Silver Spring, MD 20910-3282

SUBJ: Survey D00140 Specifications and Deliverables

The Atlantic Hydrographic Branch has received the data deliverables for the following TerraSond D-surveys: D00140, D00141, and D00142. The review process of survey D00140 has found some major discrepancies between the submitted Statement of Work and the Data Deliverables the subsequent:

1. SOW: Dated 02/25/2008, Updated 07/18/2008. Section 3.1 States that the contractor shall acquire 200% SSS imagery and acoustic data using a shallow water MBES. Data submitted to the Atlantic Hydrographic Branch contains only SBES data.
2. DR: Dated 04/29/2009 states the following:
The SOW for OPR-J977-TE-08 specified a survey of D00140 using a singlebeam echo sounder with survey lines spaced 1000 meters apart. The survey was intended to provide a baseline for a chart adequacy review of the area to determine future charting needs. Discussions with the NOAA Contracting Officers Technical Representative (COTR) during the survey resulted with the survey being downgraded to a reconnaissance. This eliminated the requirement to pursue additional development work in areas where the 2008 survey found significant discrepancies with the charted data.

The field unit did not submit documentation of the change in the original SOW and therefore the alteration of the specifications can't be verified.

AHB would like to clarify and rectify these discrepancies. We are requesting documentation to verify the change as submitted by the contractor. The Atlantic Hydrographic Branch thanks you for your concern and cooperation with this important matter.

Respectfully,

Vanessa R. Self, Physical Scientist
OCS-HSD-Atlantic Hydrographic Branch
439 West York Street
Norfolk, VA 23510

Subject: Re: TerraSond DD00140 SD

From: "Mark.T.Lathrop" <Mark.T.Lathrop@noaa.gov>

Date: Mon, 18 May 2009 14:11:37 -0400

To: Vanessa.Self@noaa.gov

CC: Castle E Parker <Castle.E.Parker@noaa.gov>

Vanessa,

Side scan was never part of the "D" surveys. That is why they are "D" and not "H" surveys. We could have been clearer about that in the SOW but we had extensive discussions with the contractor and all parties were well aware of the requirements.

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Thanks for the expedient response to my e-mail. I need just one additional point of clarity. Attachment 5 of the SOW states that SBES is to be acquired in conjunction with SSS. Was the SSS requirement removed from the SOW for all "D" surveys?

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Vanessa

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From: "Mark.T.Lathrop" <Mark.T.Lathrop@noaa.gov>

Date: Monday, May 18, 2009 1:22 pm

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To: Vanessa.Self@noaa.gov

Cc: Castle E Parker <Castle.E.Parker@noaa.gov>

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/ /

/Vanessa R. Self, Physical Scientist/

/OCS-HSD-Atlantic Hydrographic Branch/

/439 West York Street/

/Norfolk, VA 23510/

/ /



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/Respectfully,/

/ /

/Vanessa R. Self, Physical Scientist/

/OCS-HSD-Atlantic Hydrographic Branch/

/439 West York Street/

/Norfolk, VA 23510/

/ /



This Document is for Office Process use only and is intended to supplement, not supersede or replace, information/recommendations in the Descriptive or Evaluation Reports

AHB COMPILATION LOG

General Survey Information	
REGISTRY No.	HXXXXX
PROJECT No.	
FIELD UNIT	
DATE OF SURVEY	
LARGEST SCALE CHART	XXXXX, edition XX, CCYYMMDD, 1:
ADDITIONAL CHARTS	XXXXX, edition XX, CCYYMMDD, 1:
SOUNDING UNITS	(feet/fathoms)
COMPILER	

Source Grids	File Name
	H:\Compilation\HXXXXX_XXXX_XXXX\AHB_HXXXXX\
	E-SAR Final Products\GRIDS\
	E-SAR Final Products\GRIDS\
	E-SAR Final Products\GRIDS\
Surfaces	File Name
	H:\Compilation\HXXXXX_XXXX-XXXX\AHB_HXXXXX\COMPILE\Working
<i>Combined</i>	HXXXXX_Xm_Combined.hns
<i>Interpolated TIN</i>	\Interpolated TIN\HXXXXX_Xm_InterpTIN.hns
<i>Shifted Interpolated TIN</i>	\Shifted Surface\HXXXXX_Xm_InterpTIN_Shifted.hns
<i>Product Surface</i>	\Product Surface\HXXXXX_Xm_Product_Surface.hns
Final HOBs	File Name
	H:\Compilation\HXXXXX_XXXX-XXXX\AHB_HXXXXX\COMPILE\Final_Hobs\
<i>Survey Scale Soundings</i>	HXXXXX_SS_Soundings.hob
<i>Chart Scale Soundings</i>	HXXXXX_CS_Soundings.hob
<i>Contour Layer</i>	HXXXXX_Contours.hob
<i>Feature Layer</i>	HXXXXX_Features.hob
<i>Meta-Objects Layer</i>	HXXXXX_MetaObjects.hob
<i>Blue Notes</i>	HXXXXX_BlueNotes.hob
<i>ENC Retain Soundings</i>	HXXXXX_ENC_Retain_Soundings.hob

Meta-Objects Attribution	
Acronym	Value
M_COVR	
CATCOV	
SORDAT	
SORIND	
M_QUAL	
CATZOC	
INFORM	Registry Number, Project Number, Vessel
POSACC	
SORDAT	
SORIND	
SUREND	
SURSTA	
DEPARE	

[Type text]

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DRVALV 1	
DRVALV2	
SORDAT	
SORIND	
M_CSCL	
CSCALE	
SORDAT	
SORIND	

SPECIFICATIONS:

- I. COMBINED SURFACE:
 - a. Number of ESAR Final Grids:
 - b. Resolution of Combined (m):

- II. SURVEY SCALE SOUNDINGS (SS):
 - a. Radius
 - b. Shoal biased
 - c. Use Single-Defined Radius (mm at Map Scale): ; Radius Value = 1
 - d. Queried Depth of All Soundings
 - i. Minimum:
 - ii. Maximum:

- III. INTERPOLATED TIN SURFACE:
 - a. Resolution (m):
 - b. Linear
 - c. Shifted value: *[-0.229m (feet), (≤ 10 fathoms)]*
[-1.372m (fathoms), (> 10 fathoms)]

- IV. CONTOURS:
 - a. Use a Depth List: HXXXXXX_NOAA_depth_curves_list.txt
 - b. Line Object: DEPCNT
 - c. Value Attribute: VALDCO

- V. FEATURES:
 - a. Total Number of Features:
 - b. Number of Insignificant Features:

- VI. CHART SURVEY SOUNDINGS (CS):
 - a. Number of ENC CS Soundings:
 - b. Radius
 - c. Shoal biased
 - d. Use Single-Defined Radius: m on the ground
 - i. Radius Value (m):
 - ii. Or use a Sounding Space Range Table (if applicable): HXXXXXX_SSR.txt
 - e. Filter: Interpolated != 1
 - f. Number Survey CS Soundings:

- VII. Notes:

[Type text]

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT to ACCOMPANY
SURVEY D00140 (2009)**

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.

A. AREA SURVEYED

The project area was approximately 281 square nautical miles and was located in Chandeleur Sound, 7 nautical miles west of the Chandeleur Islands, east of the Mississippi River Delta, in the State of Louisiana. The SOW for OPR-J977-TE-08 specified a survey of D00140 using a singlebeam echo sounder with survey lines spaced 1000 meters apart. The survey was intended to provide a baseline for a chart adequacy review of the area to determine future charting needs.

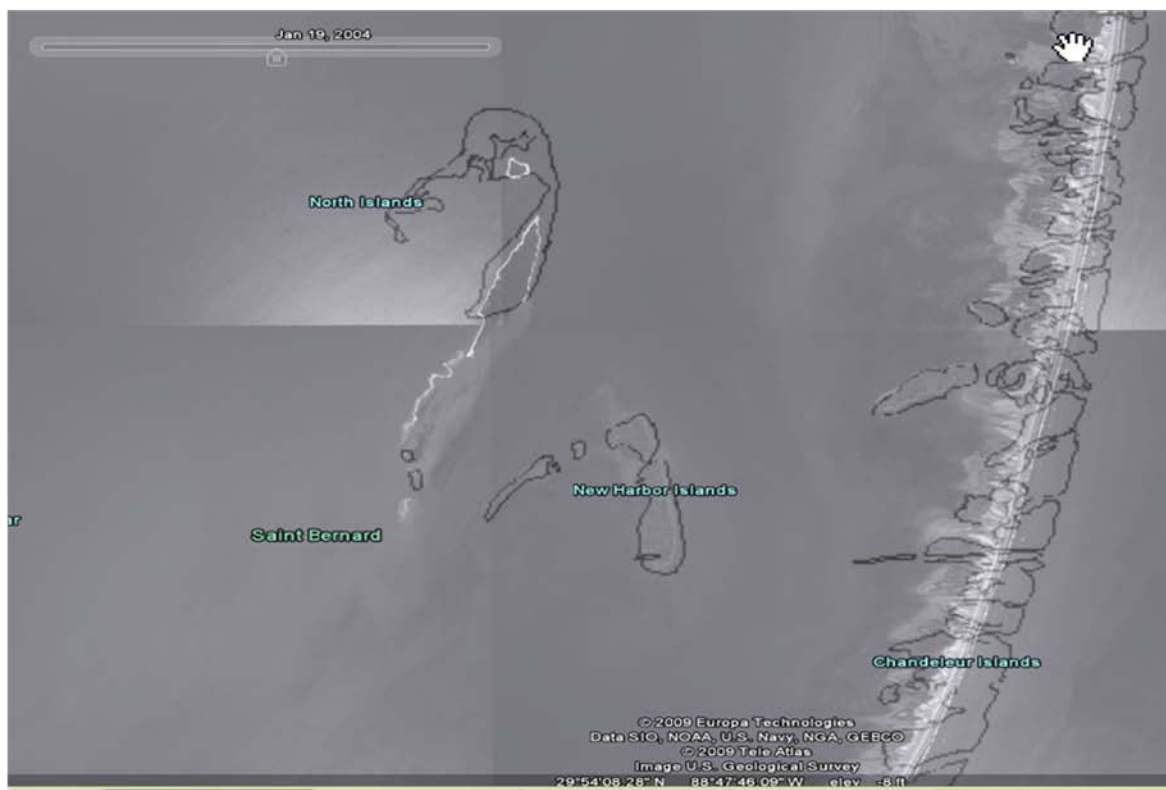
The surveyed area is very dynamic and has experienced a wide range of land loss due to coastal erosion, numerous hurricanes that have impacted the region, and the natural subsidence of the land. In 2005, Hurricanes Katrina and Rita destroyed the receding shoreline of the Chandeleur, New Harbor, and Freemason Islands.

Below is a timeline of the shoreline changes in the Chandeleur, New Harbor, and North Islands. The faint black lines shown in each image is an overlay of the ENC shoreline on the orthoimagery. The timeline shows the changes in the shoreline from 1998 to 2007 compares the natural shoreline to the ENC shoreline.

Chandeleur Islands Jan. 23, 1998



Chandeleur Islands Jan. 24, 2004



Chandeleur Islands Jan. 24, 2005



Chandeleur Islands Nov. 16, 2005



Chandeleur Islands Oct. 11, 2007



Figure 1: The deterioration of the Chandeleur, New Harbor, and Freemason Islands.

The soundings acquired from the survey data were compared to existing sounding data. The resulting comparison showed that the bottom topography of the survey area has change drastically since the last hydrographic survey of the area in 1939.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

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

- HSTP PYDRO version 7.3 r2239
- CARIS HIPS/SIPS version 6.1 SP1 HF 1-6
- CARIS Bathy Manager version 2.1 HF 1-3
- DKART INSPECTOR, version 5.0 Build 732 SP1
- CARIS HOM version 3.3
- CARIS S57 Composer version 1.0

B.2. QUALITY CONTROL

B.2.1. H-Cell

The AHB source depth grid for the survey's nautical chart update as produced at AHB from the field unit's submitted HDCS data. This depth grid was generated at 5m

resolution and the shoal layer was then extracted to produce the final source depth grid. The survey scale selected soundings were extracted from the 5m shoal extracted grid. The selected soundings were generated using a single radius of 1mm at chart scale. The chart scale selected soundings are a subset of the survey scale selected soundings. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth curves were hand drawn at the Atlantic Hydrographic Branch. The depth curves are forwarded to MCD for reference only. The curves were utilized during chart scale sounding selection and quality assurances efforts at AHB. The depth curves are incorporated into the S57 SS Soundings deliverable.

The pre-compilation products or components (Stand Alone HOB files (SAHOB)) are detailed in the Pre-Compile Process Log attached at the end of this document. The SAHOB files included depth curves (DEPCNT), sounding selections (SOUNDG), features (SBDARE), Meta objects (M_COVR, M_QUAL, M_NSYS), and cartographic Blue Notes. The individual SAHOB files were inserted into one BASE Manager feature layer and exported to S57 format in order to create the H-Cell deliverable.

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

Chart compilation was performed by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The D00140 CARIS H-Cell final deliverables include the following products:

D00140_CS.000	1:80,000 Scale	D00140 H-Cell with Chart Scale Selected Soundings, Cartographic Notes, Features, and Seabed areas
D00140_SS.000	1:80,000 Scale	D00140 Selected Soundings and Depth Curves (Survey Scale)

B.22. Junctions

Survey D00140 junctions with two other surveys. These surveys were completed by the field unit in 2008 / 2009. The southern limits of survey D00140 junctions with the northern limits of D00142 (OPR-J977-TE-08) and the westerly limits of survey D00140 junctions with the eastern limits of D00141 (OPR-J977-TE08).

Five meter BASE surfaces were created by both the field unit and AHB for each survey in the area of overlap. CARIS Subset Editor was then used to analyze the difference between sounding values for each sheet at each survey junction. The soundings are in general agreement between the surveys. No adjustments are recommended based on the junction analysis.

C. VERTICAL AND HORIZONTAL CONTROL

The field unit/office personnel applied verified water levels in conjunction with the preliminary tidal zoning which was accepted and approved by N/OPSI CO-OPS as the final zoning for D00140. Sounding datum is Mean Lower Low Water (MLLW). 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 16N. Office H-cell processing of this survey required translating the datum to meet S-57 requirements.

D. RESULTS AND RECOMMENDATIONS

<u>D.1 CHART COMPARISON</u>	<u>11363 (41st Edition, 06/01/2007)</u>
	Corrected through NM 05/09/2009 (91)
	Scale 1:80,000

<u>ENC Comparison</u>	<u>US4LA34M</u>
	Chandeleur and Breton Sounds
	Edition 16
	Application Date 2009-02-11
	Issue Date 2009-04-23
	Chart 11363

D.1.1 Hydrography

The charted hydrography originates from prior partial surveys that were conducted in 1939 and 1949. The prior surveyed hydrography significantly varies from the hydrography that was collected in hydrographic survey D00140. The hydrography associated with the survey area changes frequently as the direct result of sedimentation transportation and indirectly from the impact of hurricanes and other oceanic phenomena. Although the survey D00140 was conducted with 1000 meter line spacing, a thorough review of the data determined that all charted hydrography should be superseded with the current survey data. The determination was made at the Atlantic Hydrographic Branch after reviewing all submitted, ancillary and a metadata datasets.

a. The field unit was not directed to perform wreck and obstruction investigation in the Letter Instructions, therefore all charted features and hazards to navigation were retained as charted. The spatial and feature attributes of the features were carried forward from the ENC US4LA34M.

b. The *dangerous wreck PA* charted in Latitude 29.629 N, Longitude 089.108 W and the *obstruction awash PA* charted in Latitude 29.630 N, Longitude 089.108 W on NOS Chart 11363, 41st edition are less than 0.06 nautical miles in proximity to one another. It is recommended that these features be consolidated into one feature.

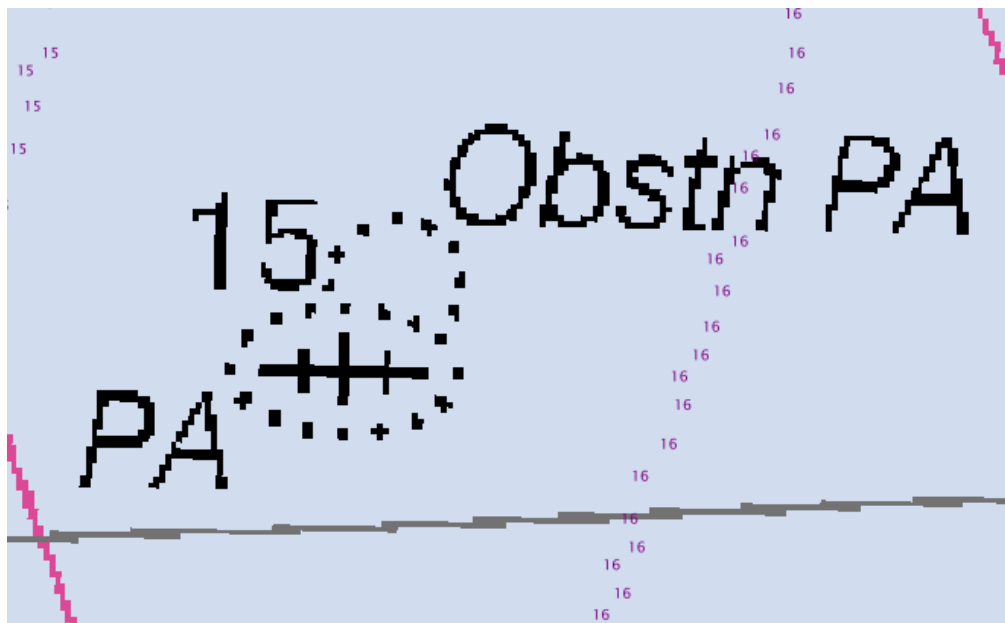


Figure 2: Wreck PA and Obstruction PA (1)

c. The dangerous wreck PA charted in Latitude 29.651 N, Longitude 089.007 W and the obstruction PA charted in Latitude 29.651 N, Longitude 089.007 W on NOS Chart 11363, 41st edition charted in the same latitude and longitude. It is recommended that these features be consolidated into one feature.

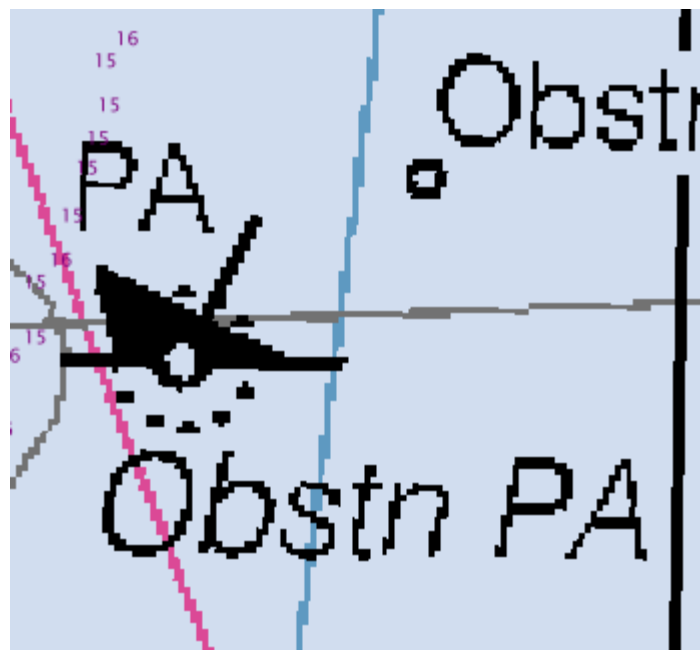


Figure 3: Wreck PA Obstruction PA (2)

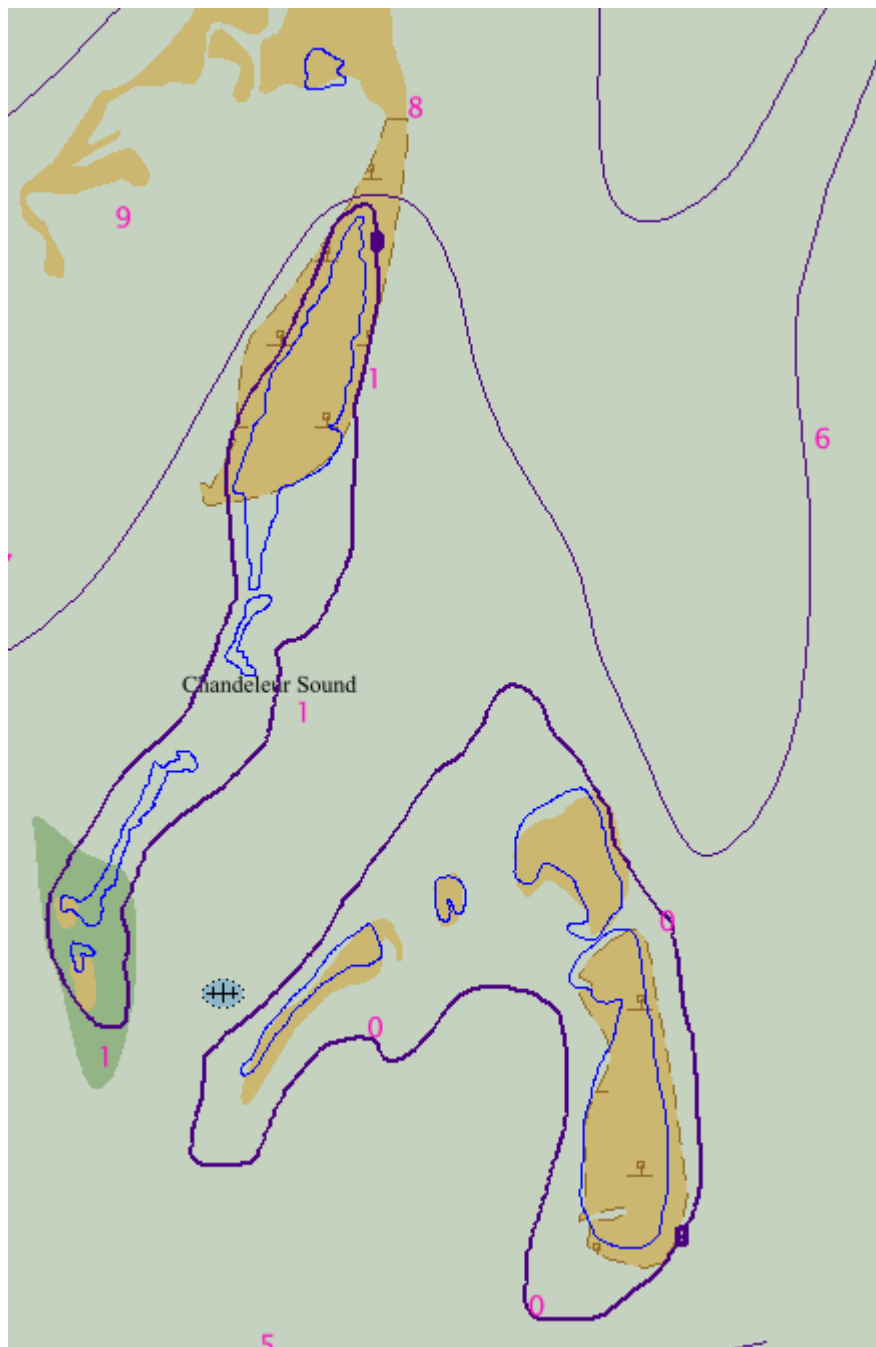


Figure 3: North and New Harbor Islands

d. **North and New Harbor** Islands have changed significantly. These islands were digitized from National Agriculture Imagery Program (NAIP) Orthoimagery, source data 20071011. It is suggested that NOS chart 11363 incorporate the updated digitized shoreline.

e. **Zero foot depth curves** in the present survey area are shown on the D00140_SS Soundings layer. The zero foot depth curves were derived from National Agriculture Imagery Program (NAIP) Orthoimagery, source data 20071011 and are not associated with the field unit's submitted dataset. As with all other depth curves, these zero foot depth curves are submitted to MCD for reference only.

f. **Freemason Island** centrally charted in Latitude 29.800 N, Longitude 089.977 W on NOS Chart 11363, 41st edition has undergone shoreline and position

changes since it was last charted. Digital Orthophoto Quarter Quadrangles (DOQQs), source date 20081109 show the island to be 0.5 miles southeast of the charted position center in Latitude 29.790 N and 089.976W, It is recommended that the position for Freemason Island be updated 0.5 nautical mile to the southeast of the current charted position and that the shoreline be update to reflect the current topography.

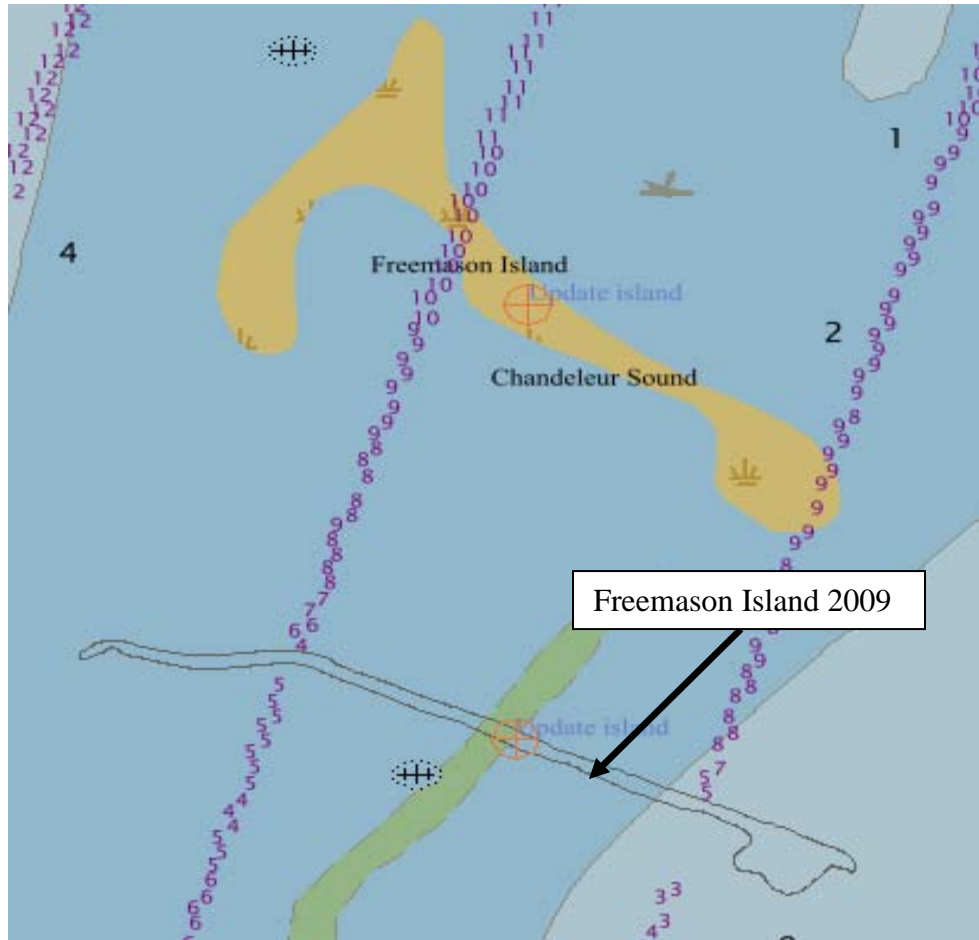


Figure 4: The remnants of the Freemason Island are located 0.5 nautical miles south of the charted island.

g. **A charted shoal** centrally charted in Latitude 29.812 N, Longitude 089.956 W on NOS Chart 11363, 41st edition has been distorted by sedimentation transportation. It is recommended that the shoal that the shoal be updated to reflect the hydrography of the survey.

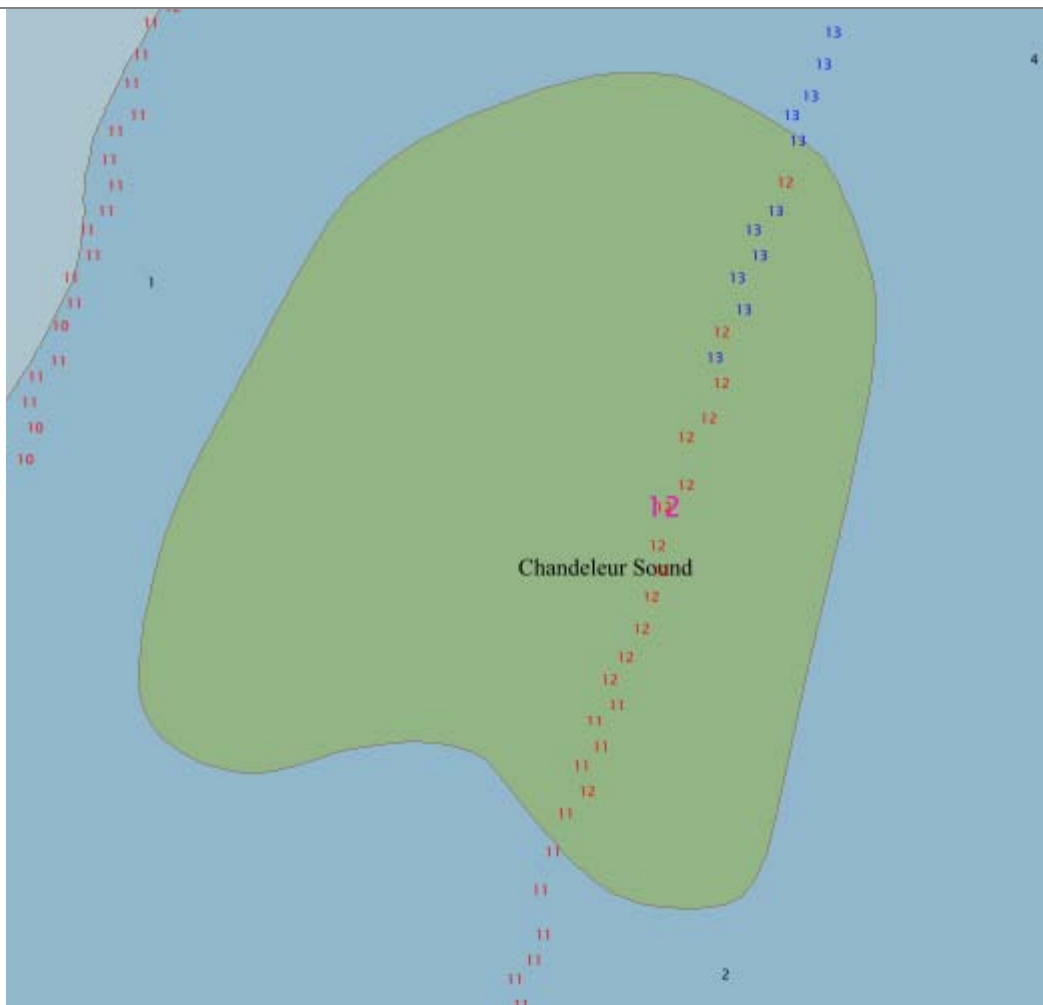


Figure 3: A shoal area located in the Chandeleur Sound (Latitude 29.812 N, Longitude 089.956 W) is in disagreement with the current survey data.

h. **Old Harbor Island Shoal** centrally charted in Latitude 29.757 N, Longitude 089.016 W on NOS Chart 11363, 41st edition has been distorted by sedimentation transportation. It is recommended that the shoal that the shoal be updated to reflect the hydrography of the survey.

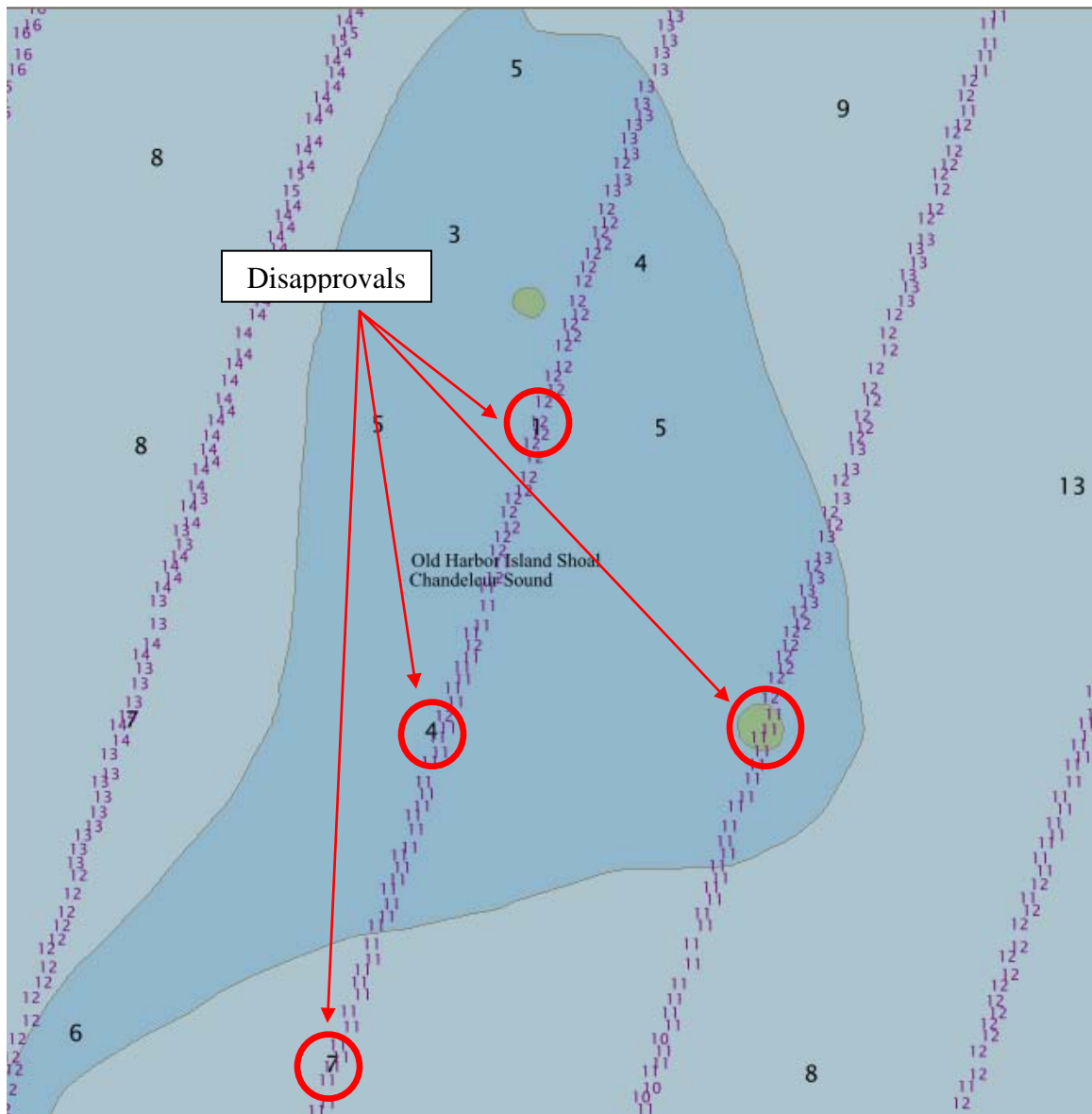


Figure 4: Several soundings/shoals are in disagreement with current survey data.

D.2. ADDITIONAL RESULTS

D.2.1. Aids to Navigation

There are no floating or non-floating aids to navigation located in D00140.

D.3. 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:

D.4. 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 BASE Cell File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further recommendations by the hydrographer.

APPROVAL SHEET
D00140

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation of critical depths, cartographic symbolization, and verification or disproval 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 National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive reviews per the Hydrographic surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

Vanessa R. Self

Physical Scientist

Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: _____

Shepard Smith

Commander, NOAA

Chief, Atlantic Hydrographic Branch