H11669

NOAA FORM 76-35A
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey: Hydrographic Multibeam & 200% Sidescan

Field No. : Sheet A

Registry No. : H11669

LOCALITY

State: Louisiana

General Locality: Approaches to Vermillion Bay

Sublocality: Approaches to Freshwater Bayou Canal

2009

CHIEFS OF PARTY
Scott Croft, Joseph Burke

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
	HYDROGRAPHIC TITLE SHEET	H11669
		FIELD NUMBER: Sheet A

State: Louisiana

General Locality: Approaches to Vermillion Bay

Locality: Approaches to Freshwater bayou Canal

Scale: 1:20,000 Date of Survey: ~~August 2007~~ to ~~December 2008~~ September 28, 2007 to August 12, 2009

Instructions Dated: Febuary 22, 2007 Project Number: OPR-K387-KR-07

Vessels: *Inez McCall, Captain Blake, C-Ghost* ***and C-Wolf***

Chiefs of Party: Scott Croft, Joseph Burke

Surveyed by: Esther Garatie, Jim Wade, Stephen Kirkland, J. Baker, C. Taylor, Scott Croft, J.W. Burke

Soundings taken by echosounder, hand lead line, or pole: Simrad EM3002 Multibeam Echosounder

Graphic record scaled by: N/A

Graphic record checked by: N/A

Protracted by: N/A Automated plot by: HP 1055 Plotter

Verification by: ~~C&C Technologies Personnel~~ ***Atlantic Hydrographic Branch***

Soundings in: Feet: X Fathoms: _____ Meters: _____ at MLW: _____ MLLW: X

Remarks: Multibeam Hydrographic Survey of Sheet B
Data collection in meters, referenced to MLLW, later converted into feet
200% side scan sonar coverage
UTC time was used exclusively
Grab samples were taken Tidal Station: 8768094 (Calcasieu Pass, LA)
Tidal Zones: WLA 54, 55, 56, 57, 58, 59, 60, WGM 286, 366, 366A, 375, 376, 377
Bold, Red, Italic notes in the DR made during office processing. H-Cell units in ft at MLLW.

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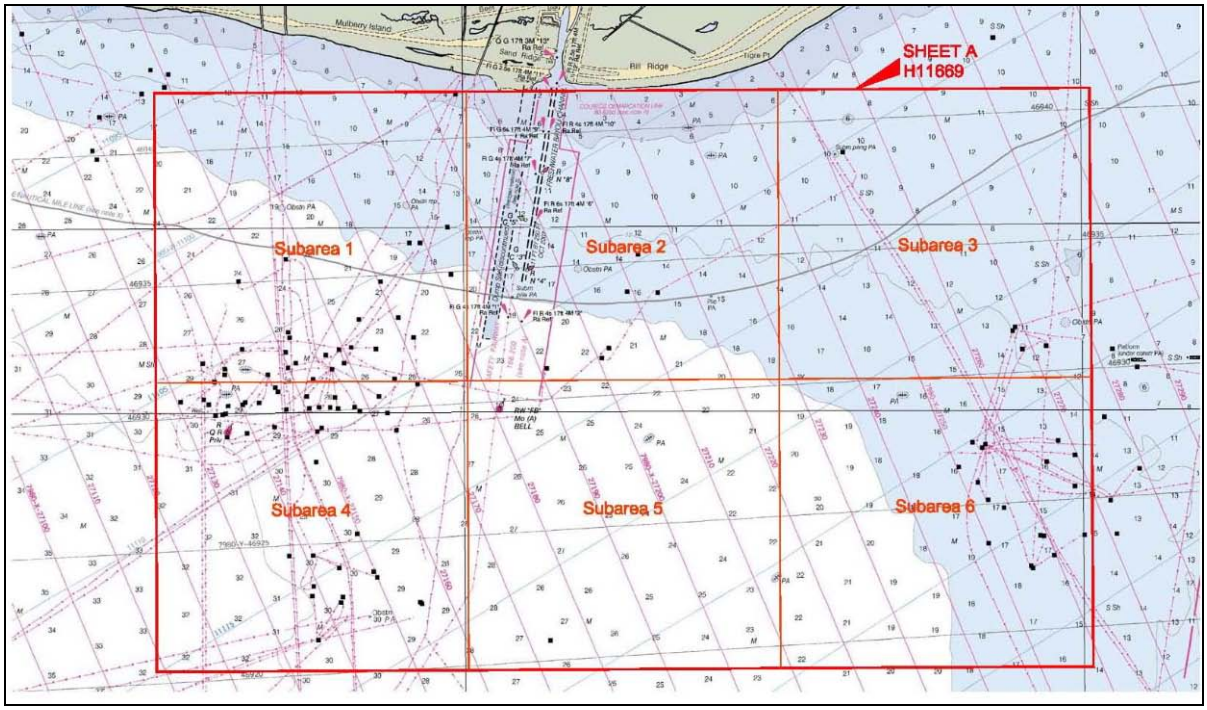
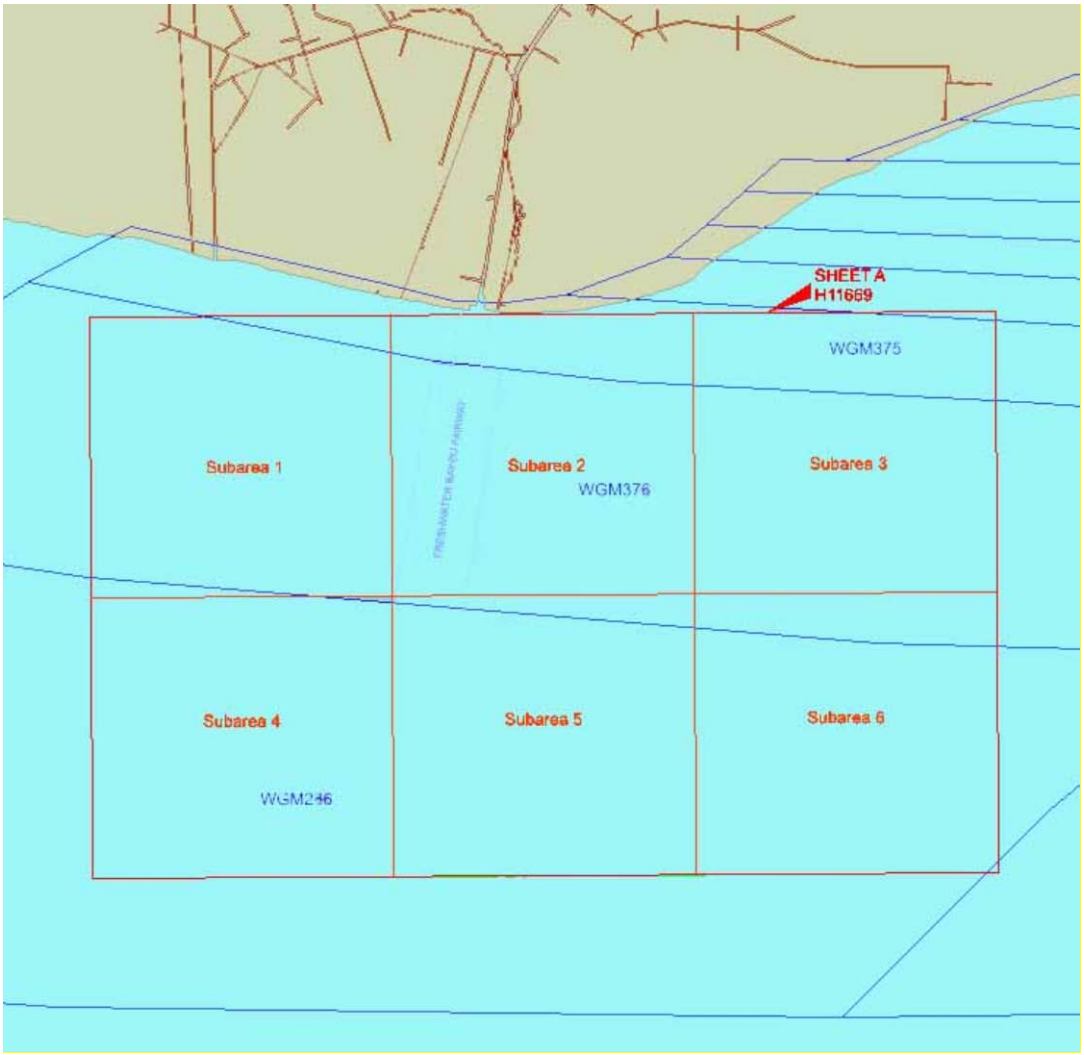
A. AREA SURVEYED

The survey area is located south of Freshwater City, Louisiana in the Gulf of Mexico. The following sketch shows the layout of Sheet A (H11669) of Project (OPR-K387-KR-07) and. Water depths in the survey area range from 1.~~7~~*6* feet to 33.6 feet Mean Lower Low Water (MLLW).



The survey area was broken down into six sub-areas to allow for more efficient data processing and data management. The sub-areas were defined based on the predicted data set sizes prior to survey commencement. Subarea 1 is spilt by tidal zones WGM286, WGM376, and WGM375. Subareas 2 and 3 are split by tidal zones WGM375 and WGM376. Subareas 4, 5, and 6 are split by tidal zones WGM286 and WGM376. Tidal data from the Calcasieu Pass tide station (8768094) was used to process all of the tidal data. The following sketch shows the layout of the tidal zones and subareas.



B. DATA ACQUISITION AND PROCESSING

B.1 EQUIPMENT

System	Manufacturer	Model
Multibeam Sonar	Simrad	EM3002
Side Scan Sonar (Inez McCall)	Klein	5000
Side Scan Sonar (small vessels)	GeoAcustics	
Single Beam Sonar	Echotrac	3200
Motion Sensor (Inez McCall)	POS MV	
Motion Sensor (small vessels)	CODA	F180
Primary Positioning System	CNAV	2050
Secondary Positioning System	CNAV	2050
Tertiary Positioning System	CODA	F180
Sound Speed at Transducer	Endeco	YSI
Sound Velocity Profiler	Seabird	SBE19

See *Data Acquisition and Processing Report for a detailed description of the equipment used for hydrographic operations. ***Data submitted with H-Cell Deliverables.***

Four different vessels were used to collect survey data for this sheet. Those vessels are: the *M/V Inez McCall*, the *M/V C-Ghost*, the *M/V C-Wolf*, and the *M/V Captain Blake*. Descriptions of these vessels are included in the *DAPR submitted in conjunction with this report. ***Data submitted with H-Cell Deliverables.***

The *M/V Inez McCall*, a 33.5-meter vessel, conducted survey operations in subareas 1, 2, 4, 5, and 6. The vessel is 7.5 meters wide with an approximate draft of 2.75 meters. A central reference point was established prior to the survey from which all relevant offsets were measured. Relevant offsets are presented in the following table were X is positive forward, Y is positive starboard, and Z is positive down.

	EM3002 Head	Side Scan Sonar Towpoint	Port POS/MV Antenna	Starboard F180 Antenna	POS/MV MRU
X Offset	14.80 m	-17.976 m	2.99 m	3.044 m	14.976 m
Y Offset	0.0 m	0.0 m	-0.971 m	0.965 m	0.0 m
Z Offset	2.475 m	-2.722 m	-6.50 m	-6.748 m	-1.205 m

The *M/V C-Ghost*, an 8.9-meter vessel, conducted survey operations in subarea 2. The vessel is 2.7 meters wide, with an approximate draft of .5 meters. A central reference point was established prior to the survey from which all relevant offsets were measured. Relevant offsets are presented in the following table were X is positive forward, Y is positive starboard, and Z is positive down.

	EM3002 Head	Side Scan Sonar Towpoint	Port F180 Antenna	Starboard F180 Antenna	F180 MRU
X Offset	-0.06 m	6.657 m	1.027 m	1.027 m	4.494 m
Y Offset	-1.470 m	0.0 m	-0.792 m	0.768 m	0.0 m
Z Offset	-0.730 m	-0.903	-2.519 m	-2.451 m	-0.205 m

The *M/V C-Wolf*, an 8.9-meter vessel, conducted survey operations in subareas 1, 2, and 3. The vessel is 2.7 meters wide, with an approximate draft of .5 meters. A central reference point was established prior to the survey from which all relevant offsets were measured. Relevant offsets are presented in the following table were X is positive forward, Y is positive starboard, and Z is positive down.

	EM3002 Head	Side Scan Sonar Towpoint	Port F180 Antenna	Starboard F180 Antenna	F180 MRU
X Offset	-0.225 m	6.1 m	0.86 m	0.85 m	3.95 m
Y Offset	0.0 m	0.0 m	-0.75 m	0.735 m	0.0 m
Z Offset	0.666 m	-0.66 m	-2.539 m	-2.529 m	-0.07 m

The *M/V Captain Blake*, is a 10.7-meter vessel, conducted survey operations in subarea 2. The vessel is 4.34 meters wide, with an approximate draft of .5 meters. A central reference point was established prior to the survey from which all relevant offsets were measured. Relevant offsets are presented in the following table were X is positive forward, Y is positive starboard, and Z is positive down.

	EM3002 Head	Side Scan Sonar Towpoint	Port F180 Antenna	Starboard F180 Antenna
X Offset	-0.70 m	5.932 m	-1.30 m	1.30 m
Y Offset	-1.289 m	0.0 m	-0.760 m	0.725 m
Z Offset	0.640 m	NA	-3.18 m	-3.18 m

Detailed vessel diagrams and patch test results are presented in the *Data Acquisition and Processing Report. ***Data submitted with H-Cell Deliverables.***

B.2 QUALITY CONTROL

In order to most efficiently carry out this survey, the survey lines were oriented roughly east west throughout the survey area. Line spacing used varied within the survey area depending upon the water depths in order to meet the criteria of 200 percent side scan coverage using Technique 1 as set forth in *Section 6.1 of the "Specifications and Deliverables" document for the majority of the survey. Line spacing was 60 meters in water depths greater than 18 feet. In water depths between 12 feet and 18 feet, a line spacing of 40 meters was used. In water depths less than 12 feet, a line spacing of 30 meters was used. The side scan sonar was operated at a 75 to 50 meters per channel range depending upon the local line spacing. The angular sector on the multibeam was set so that the criterion of two times water depth, as well as all accuracy, resolution, and detection criteria as set forth in *Sections 5.2 and 5.3 of the "Specifications and Deliverables" document, were met. ***Data filed at AHB.***

The internal consistency of the multibeam depth values is quantified in the cross line statistics that were performed at the end of each main line. Cross lines were run prior to the collection of main line data so that quality control statistics could be performed on the data after each line. Based on pre-plot calculations, the total cross line miles was 223 nm, while the total main line miles was 4150 nm. The cross lines comprised about 5% of the total data set as compared to the main scheme lines. Rerun line miles are not included in these totals. As can be seen in the sample statistics found in ***Separates V, the main lines and cross lines depth values showed very good agreement. Each main line was compared to all cross lines for which there was overlapping data. The graphs shown in ***Separates V are a random sample of the graphs that were produced. The graphs show the mean difference, RMS difference, and confidence interval for each beam. The results show that the multibeam data was repeatable with 90% of the soundings within about 8 to 14 centimeters across the swath. ***Data filed with original field records.***

Multibeam quality control procedures are outlined in Section B.1 of the accompanying ***Data Acquisition and Processing Report. ***Data submitted with H-Cell Deliverables.***

Sheet A (H11669) adjoins with Sheet B (H11670), which will be submitted in the winter of 2009. ***See also the Evaluation Report.***

B.3 CORRECTIONS TO ECHO SOUNDINGS

No deviations from the Correction to Echo Soundings section in the ***Data Acquisition and Processing Report occurred. ***Data submitted with H-Cell Deliverables.***

C. VERTICAL AND HORIZONTAL CONTROL

Tide and water level corrections were determined and applied in accordance with Attachment #7 of the Statement of Work. Data from Calcasieu Pass, LA (8768094) and Cypremort Point, LA (8765251) tidal stations were used. The statement of work dictates that tidal correctors from the Freshwater Locks gauge should be used as primary for the entirety of this work area. This gauge could not be used because of poor data quality. As a result, new zones relative to the Calcasieu Pass gauge were established and applied. Tidal zoning as set forth in the Statement of Work was applied. The following table shows the tidal zone and correctors that were used for this sheet. Tidal data were processed using the 1983-01 epoch. ***Tides were applied to all multi beam data in Caris using tidal data downloaded from the NOAA CO-OPS website, and corrected using a tidal zone definition file (.zdf) supplied by NOAA. After reviewing the processed data along the edges of the tidal zones, it was determined that no alterations to the .zdf file were required.***

Tide Zone	Reference Station	Time Corrector (min)	Range Ratio
WGM286	8768094	6	1.04
WGM366	8768094	6	1.02
WGM377	8768094	-6	1.07
WGM366A	8768094	-6	1.04
WGM375	8768094	-6	1.07
WGM376	8768094	0	1.07
WLA49	8765251	-126	1.06
WLA50	8765251	-132	1.06
WLA51	8765251	-84	1.09
WLA53	8768094	72	0.97
WLA54	8768094	54	1.00
WLA52	8768094	84	0.97
WLA60	8768094	0	1.00
WLA55	8768094	36	0.97
WLA59	8768094	6	1.04
WLA58	8768094	12	1.04
WLA57	8768094	24	1.04
WLA56	8768094	30	1.02

The horizontal datum for the survey is the North American Datum of 1983 (NAD 83). The projection is Universal Transverse Mercator (UTM) Zone 15 North. The vertical datum for the soundings is Mean Lower Low Water (MLLW). ***Concur.***

D. RESULTS AND RECOMMENDATIONS *See also the Evaluation Report*

D.1 CHART COMPARISON

D.1.1 CHARTS AND NOTICES TO MARINERS

The following charts were used for comparison purposes.

Chart Number	Scale	Edition	Edition Date
11340	1:458,596	71	Sept 06
11345	1:175,000	33	Jan 06
11349	1:80,000	42	Jan 06

The Local Notices to Mariners were reviewed beginning with Notice 36/07 dated September 5, 2007 through Notice Number 35/08 dated August 27, 2008. During that time, three notice to mariners were issued for the charted area within the survey bounds.

In LNM 40/07 8th district, an add "Visible Obstruction (PA)" (platform) (CGD8 260-07) at position 29°24'29.5"N, 092°21'32.4"W on charts 11340 and 11349 was issued. This notice was issued on October 3, 2007. The Inez McCall surveyed this location on October 2, 2007. At the time of the survey, a jack-up rig was located at 29°24'30.70"N, 092°21'32.694"W. The sidescan record shows that this rig changed position at least once. Considering that jack up platforms are not permanent features, it is recommended that this feature should not be charted. It is also very possible that the jack up platform was there for the purpose of installing new oil and gas infrastructure. It is further recommended that the most up to date list of oil and gas infrastructure be reviewed for any new satellite or

platform at this location. ***Concur with conditions. Do not chart jack-up rig. See Section D.1.4.Item 17 of this Report and D.2.3.e of the Evaluation Report for further recommendations.***

In LNM 49/07 8th district, and add platform (Plains-200-1) at position 29°26'33.652"N, 092°12'00.407"W on charts 11340 and 11349 was issued. An add platform at this same location was issued in LNM 20/08. In LNM 20/08, this platform was named Chevron-182-16. The position of this new platform was confirmed by this survey. ***Only one platform is charted, revise charted platform using present survey position, 29°26'33.553"N, 092°12'00.074"W. See also Section D.2.3. of this Report.***

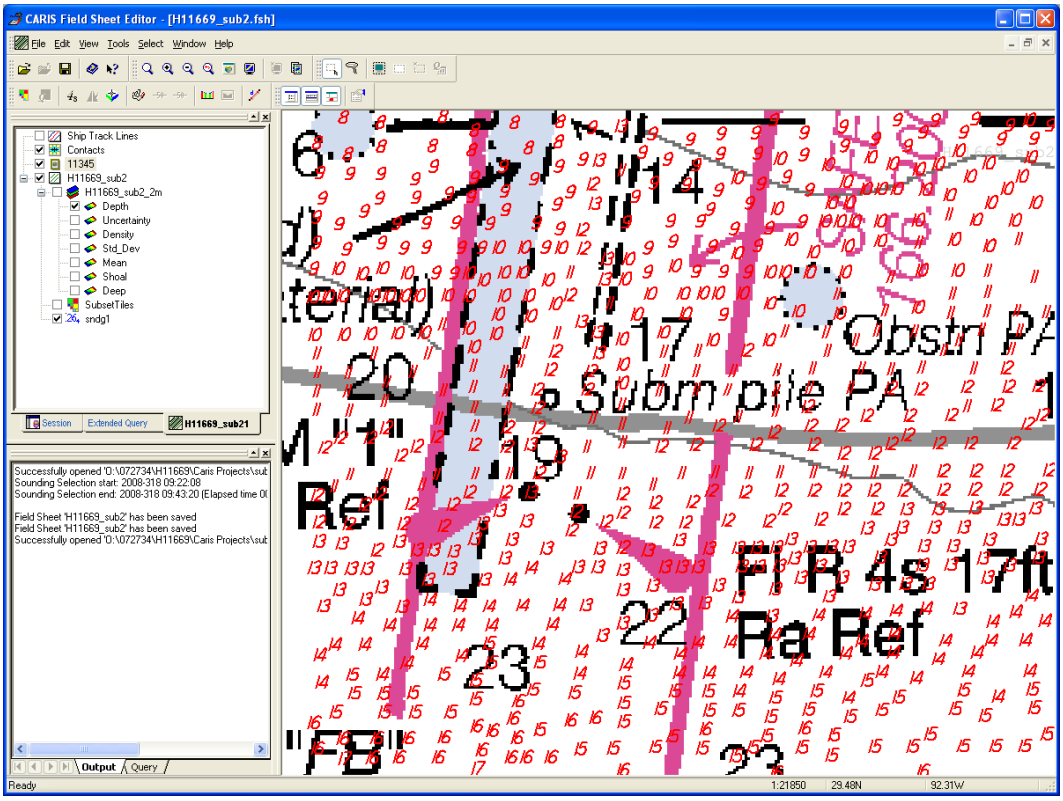
D.1.2 CHARTED SOUNDINGS

11340

There are only four soundings on this chart that overlap with the survey area. Survey soundings are shoaler than charted soundings. The largest discrepancies are found in the Northwest corner of the survey. Survey soundings of 0.5 and 1 fathom are found at the location of a charted depth of 2 fathoms. The following image displays this discrepancy.

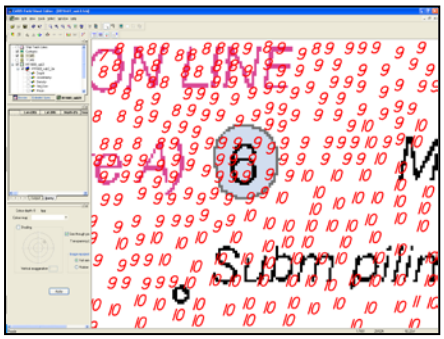
11345

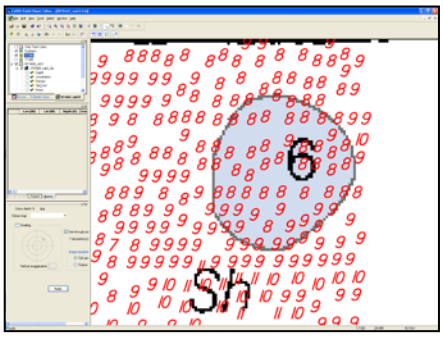
In general, survey soundings are shoaler than charted soundings. The largest discrepancies are found in the northwestern quarter of the survey. ***Soundings in this section of the survey are up to ten feet shoaler than charted. ***Soundings directly adjacent to the southern entrance to the Freshwater Bayou Navigational channel are up to ~~9~~ ***10*** feet shoaler than displayed on the chart. The following image displays the area near the southern entrance to the channel. ****Concur. Update area with present survey data.***



A pair of six-foot shoals in the northeastern quarter of the survey area was disproved. These shoals are located at 29° ~~13' 40"~~ ***31' 12"*** N, 92° ~~31' 12"~~ ***13' 40"*** W and 29° 29' 24" N, 92° 10' 12" W. ***Survey depths at these two locations are nine and eight feet, respectively. Images of these shoals are displayed below.

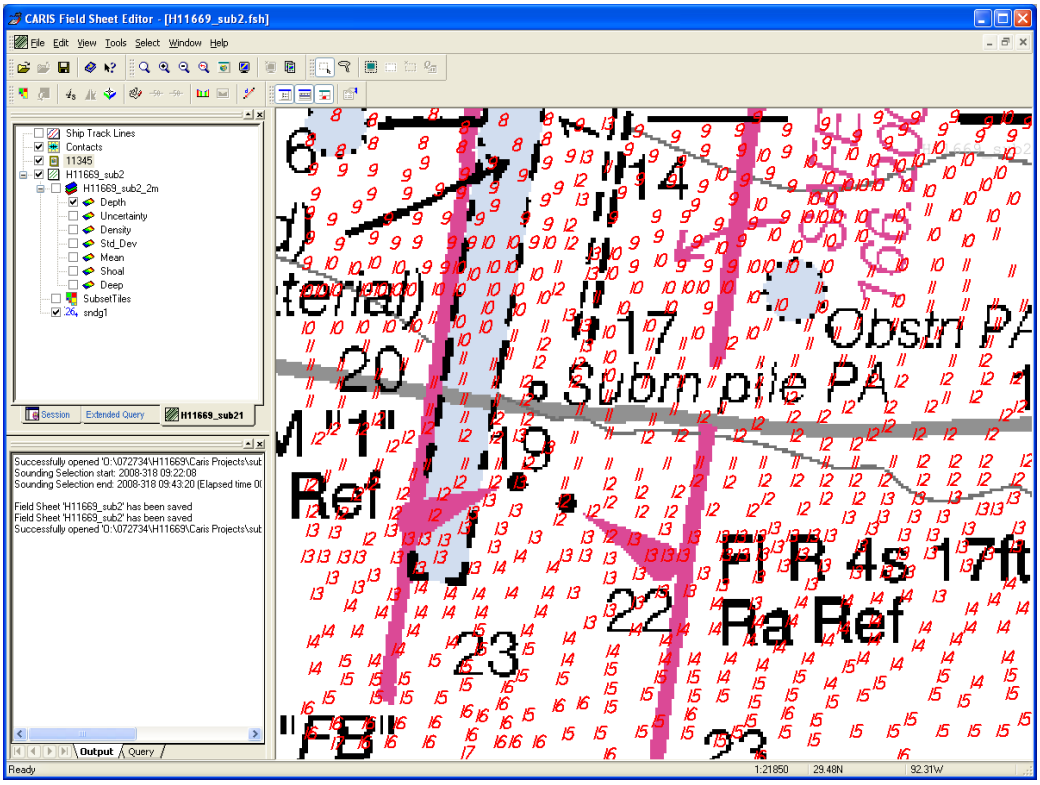
****Concur. Update area with present survey data.***



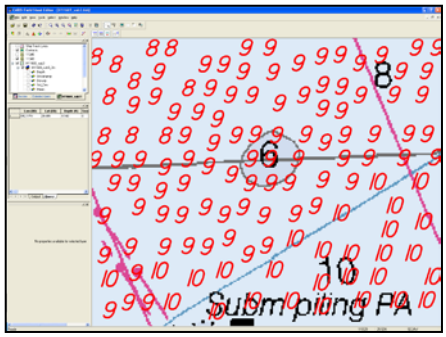


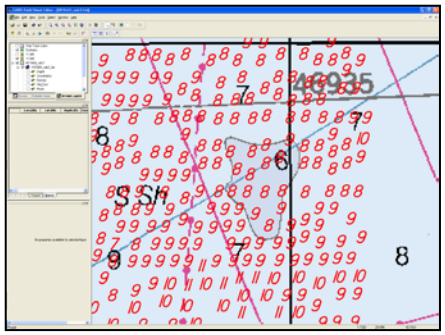
11349

Survey soundings are significantly shoaler than charted soundings. The largest discrepancies are found in the northwestern quarter of the survey. Soundings in this section of the survey are up to ten feet shoaler than charted. Soundings directly adjacent to the southern entrance to the Freshwater Bayou Navigational channel are up to 9 feet shoaler than displayed on the chart. The following image displays the area near the southern entrance to the channel. ***Concur***.



A pair of six-foot shoals in the northeastern quarter of the survey area was disproved. These shoals are ~~located~~ ***charted*** at ~~29° 13' 40"~~ ***29° 31' 30.70"*** N, ~~92° 31' 12"~~ ***92° 13' 45.84"*** W and 29° 29' 24" N, 92° 10' 12" W. Survey depths at these two locations are nine and eight feet, respectively. Images of these shoals are displayed below. ***Concur. Update the areas based on present survey findings.***





D.1.3 SHOALS AND HAZARDOUS FEATURES ***See also Evaluation Report***

There is significant shoaling along the coast relative to the charted depths within the survey area. These shoal areas are discussed in detail in section D.1.2.

Concur.

There are ten limestone reef pads scattered through Vermillion block 31. These reefs were used as foundations for oil and gas infrastructure. A shapefile displaying the positions of these reefs is included with the H11669_sub6 caris project. The following table lists the positions and least depths of these reefs.

Vermillion 31 reef pads			
Latitude	Longitude	Depth (ft)	Platform
29°27'13.98"N	92°11'24.72"W	11	No Platform **
29°27'10.44"N	92°10'57.72"W	10	No platform **
29°26'00.18"N	92°10'29.04"W	12	No Platform **
29°26'04.92"N	92°11'32.82"W	11	No Platform**
29°26'00.3"N	92°09'44.76"W	8	No Platform ***See ER Section D.1.6***
29°26'33.0"N	92°11'41.46"W	12	No Platform**
29°26'30.96N	92°10'57.06"W	10	No Platform**
29°26'42.66"N	92°10'06.66"W	12	VR31 14 *

29°26'49.86"N	92°11'36.6"W	11	VR31 3*
29°26'55.2"N	92°10'23.28"W	NA	VR31 9*

**** Do not chart depths.***

***** Concur. Chart shoal depths from present survey.***

During survey operations three navigationally significant contacts were found. They are discussed in detail in section D.1.5.

D.1.4 AWOIS ITEMS ***See also the Evaluation Report Section D.1.4.***

FULL INVESTIGATIONS

The following sixteen charted AWOIS Items are located within the survey bounds, and were assigned for full investigation. All positions were taken from the LAT83, LONG83 columns of the AWOIS database.

AWOIS 13903

Description: Obstruction PA

Charted Position: 29°30'19"N, 92°22'53"W

Search Radius: 500 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM43/91, and is described as an exposed section of pipeline. No evidence of this obstruction was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur, delete charted dangerous obstruction PA.***

AWOIS 13904

Description: Obstruction

Charted Position: 29°30'19"N, 92°20'56"W

Search Radius: 500 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in February 2004. A local fisherman reported the item to the Louisiana Department of Natural Resources, who reported the item to the local navigation manager, Tim Osborn. It is charted as ~~a~~ ***dangerous*** obstruction rep PA. No evidence of this obstruction was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13905

Description: Obstruction

Charted Position: 29°30'00.79"N, 92°20'00.47"W

Search Radius: 1000 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM48/63. It is described as 130' long pipes that were jettisoned. It is charted as ~~a~~ ***dangerous*** obstruction rep PA. No evidence of this obstruction was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13906

Description: Dixie Bell

Charted Position: 29°31'23.4"N, 92°16'21.6"W

Search Radius: 200 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM13/92 as the dangerous wreck (PA) F/V Dixie Bell. It is charted as a ***dangerous sunken*** wreck PA. No evidence of this wreck was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13907

Description: Obstruction

Charted Position: 29°31'00.79"N, 92°14'00.47"W

Search Radius: 500 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM16/79 as an unlighted cluster of piles. It is charted as ~~a~~ ***dangerous*** submerged ~~pile~~ ***piling*** PA ***and dangerous unknown obstruction on the raster and as a dangerous unknown obstruction on the ENC***. No evidence of these piles was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur with conditions. Remove the piling symbol, note and dangerous unknown obstruction symbol from the raster and remove the dangerous unknown obstruction symbol from the ENC.***

AWOIS 13908

Description: Obstruction

Charted Position: 29°28'36"N, 92°10'16"W

Search Radius: 400 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM20/97 as a downed aircraft. It is charted as a~~n~~ ***dangerous*** obstruction PA. No evidence of this obstruction was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13909

Description: Northwester

Charted Position: 29°27'35"N, 92°12'55"W

Search Radius: 500 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM42/90 as the sunken F/V Northwester. It is charted as a ***dangerous sunken*** wreck PA. No evidence of this wreck was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13910

Description: Obstruction

Charted Position: 29°29'00.00"N, 92°16'00.00"W

Search Radius: 1000 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM45/02 as a submerged pile (PA). It is charted as a pile PA. No evidence of these piles

was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13911

Description: Obstruction

Charted Position: 29°29'00.8"N, 92°19'12.48"W

Search Radius: 500 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM45/82 as a piling with 2 feet visible. It is charted as a***n obstruction*** submerged pile PA. No evidence of this ***obstruction*** submerged pile PA was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Do not concur. The sidescan data in the vicinity of this feature was of very poor quality and could not be used to disprove the existence of this item. It is therefore recommended that the obstruction subm pile PA be retained as charted.***

AWOIS 13912

Description: Lucille

Charted Position: 29°28'00.80"N, 92°23'30.49"W

Search Radius: 1000 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in November 1964, and is described as the 27' F/V Lucille. No evidence of this wreck was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur, remove charted dangerous sunken wreck.***

AWOIS 13913

Description: SALENERGY NO.2

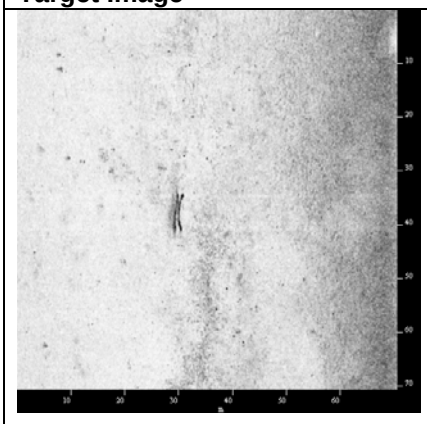
Charted Position: 29°27'38.80"N, 92°23'50.49"W

Search Radius: 500 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM18/79, and is described as a sunken jack-up rig with the legs and helo pad still visible above the water. It is charted as a ***dangerous sunken*** wreck PA. At the time of the survey, there was no visible evidence of this wreck. A contact with no height off bottom was found at the charted location of this wreck PA at 29°27'39.907"N, 92°23'50.857"W. This item was not investigated because it was deemed insignificant to navigation. It is recommended that this wreck PA be removed from the chart, and an obstruction be charted at 29°27'39.907"N, 92°23'50.857"W. ***Concur with conditions. Delete charted dangerous sunken wreck PA. Do not chart obstruction.***

Target Image	Target Info	User Entered Info
	**355/232824P** • Sonar Time at Target: 12/21/2007 17:28:24 • Click Position (Lat WGS84): 29.461085167 • Click Position (Lon WGS84): -92.397460333 • Click Position (Lat NAD27): 29° 27.65168' N • Click Position (Lon NAD27): 092° 23.83941' W • Map Proj: WGS 1984 UTM, Zone 15 North, Meter • Click Position (X): 558,425.54 • Click Position (Y): 3,259,222.76 • Acoustic Source File: C:\072734\H11669\Sonar_Wiz\Sub_4\XTF\4006-4.lbc.xtf • Ping Number: 10176 • Range to Target: 45.52 Meters • Fish Height: 2.89 Meters • Event Number: 45 • Line Name: 4006-4.lbc	**Dimensions** Target Height = 0.00 Meters Target Length: 7.05 Meters Target Shadow: 0.00 Meters Target Width: 1.70 Meters Description: Insignificant Debris

AWOIS 13914

Description: Obstruction

Charted Position: 29°27'23.8"N, 92°24'12.49"W

Search Radius: 200 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in the 8th CGD in 1981 as a new well. No evidence of this well was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13915

Description: Dragonet

Charted Position: 29°27'00.8"N, 92°17'01.47"W

Search Radius: 1000 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in 1960 as the sunken vessel Dragonet. It is charted as a ***dangerous sunken*** wreck PA. No evidence of this wreck was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13916

Description: Unknown

Charted Position: 29°25'01.8"N, 92°14'58.47"W

Search Radius: 400 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in 1960 as a sunken wreck. It is charted as a ***dangerous sunken*** wreck PA. No evidence of this wreck was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13943

Description: Obstruction

Charted Position: 29°29'24.0"N, 92°18'09.0"W

Search Radius: 200 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item was first reported in LNM51/06 as a submerged obstruction (PA). It is charted as ~~a~~n ***dangerous*** obstruction PA. No evidence of this obstruction was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

AWOIS 13945

Description: Unknown

Charted Position: 29°31'0"N, 92°16'***0***1"W

Search Radius: 1000 meters

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item first appears on Aid Proof 27, 6th edition of chart 1277, in 1965. It is charted as a ***dangerous sunken*** wreck PA. No evidence of this wreck was found during the survey. It is recommended that this feature be removed from the chart, and the chart be updated with the current survey. ***Concur.***

Item 17

Description: Obstruction PA

Charted Position: 29°24'29.~~219~~***.499***"N, 92°21'32.~~076~~***.400***"W

Search Radius: Unknown

Investigation Method: 200% Side Scan Sonar, Multibeam Echosounder

Position Determined By: Differential GPS

Investigation Summary: This item is not listed in the AWOIS database. Its position was taken from chart 11349. It is charted as an obstruction PA ***and a pile symbol*** on the 43rd edition of chart 11349, corrected through LNM May 08/07. On the previous version of this chart, an offshore structure was charted at this position. At the time of the survey, a satellite structure (VR46 6) and jack-up barge were located at this position. This structure is listed in the existing infrastructure section D.2.3 of this report. It is recommended that this Obstruction PA be removed from the chart, and an offshore structure symbol be ~~recharted~~ ***added*** at 29°24'30.380"N, 92°21'32.931"W. ***Concur with conditions. This item is charted as a platform in 29°24'28.579"N, 92°21'32.374"W and an obstruction (pile symbol) in 29°24'29.499"N, 92°21'32.400"W on the ENC. Only the Obstn PA note and pile symbol are charted on the raster. It is recommended that the platform be revised to the present survey location on the ENC and the platform be added in the present survey location on the raster. It is further recommended that the Obstn PA note and pile symbol be removed from the raster and ENC. See also Section D.1.1. of this Report.***

D.1.5 INVESTIGATION ITEMS

Additional investigation work was performed for five significant sonar contacts. A set of two to six additional multibeam and side scan lines were run over each of

these targets. After investigation, the following three items where determined to be significant to navigation, and have been recommended for charting.

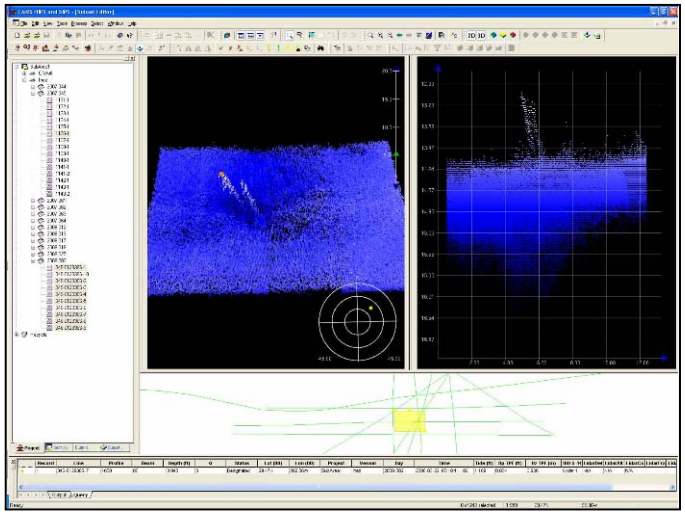
Item 1
Least Depth: 13.048ft

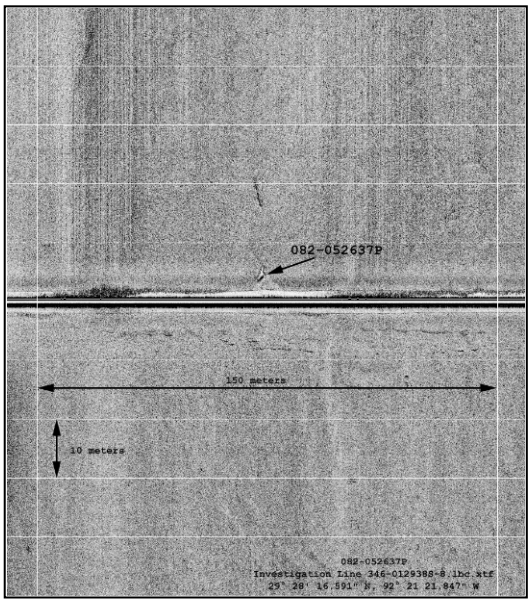
Multibeam Line: 346-012938S-7

Position: 29° 28’ 16.791” N, 92° 21’ 21.874” W (WGS84)

Time Stamp: 2008-03-22 05:18:11.102

Hydrographer’s recommendations: This contact has been marked as a designated sounding within the H11669 Caris project submitted in conjunction with this report. This contact is located approximately 100 meters south east of platform VR26 53. It is recommended that this contact be charted as a 13-foot submerged obstruction at 29° 28’ 16.791” N, 92° 21’ 21.874” W (WGS84). ***Concur. Add a 13 foot dangerous submerged obstruction in the present survey location.***





Item 2
Least Depth: 27.359ft

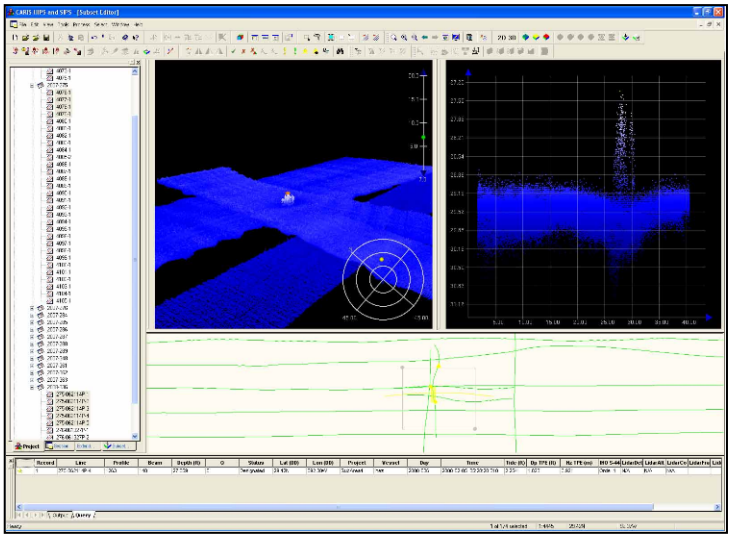
Multibeam Line: 275-062114P-4

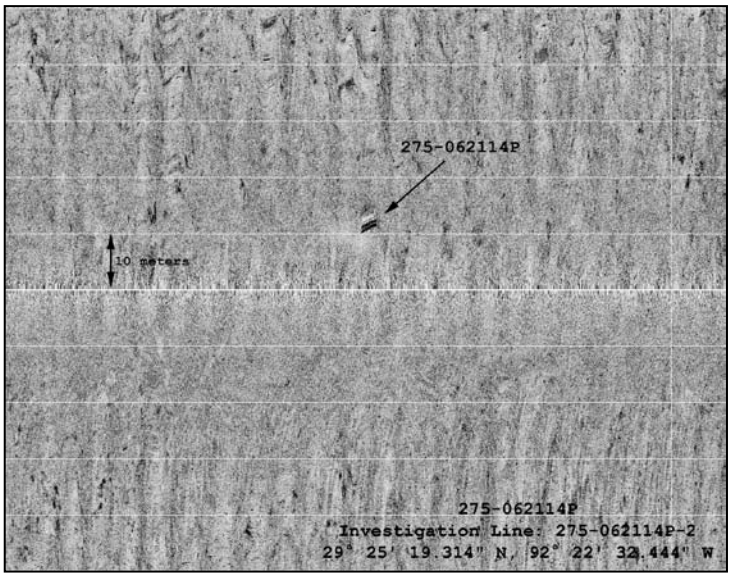
Position: 29° 25’ 19.330” N, 92° 22’ 32.366” W (WGS84)

Time Stamp: 2008-02-05 05:20:28.510

Hydrographer’s recommendations: This contact has been marked as a designated sounding within the H11669 Caris project submitted in conjunction with this

report. It is recommended that this contact be charted as a 27-foot submerged obstruction at 29° 25’ 19.330” N, 92° 22’ 32.366” W (WGS84). ***Concur with conditions. This depth is surrounded by 27-30 feet of water. It is not a danger nor is it an obstruction considering the surroundings soundings. Chart as a 27 foot depth.***





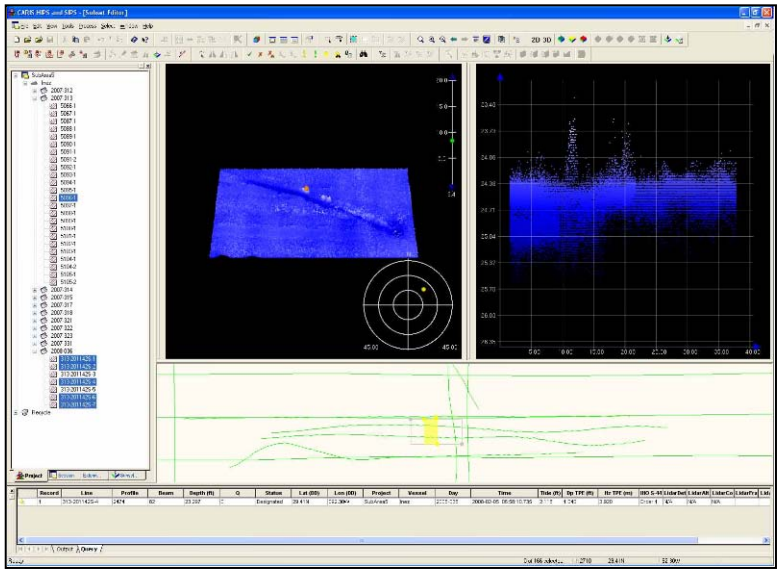
Item 3
Least Depth: 23.297ft

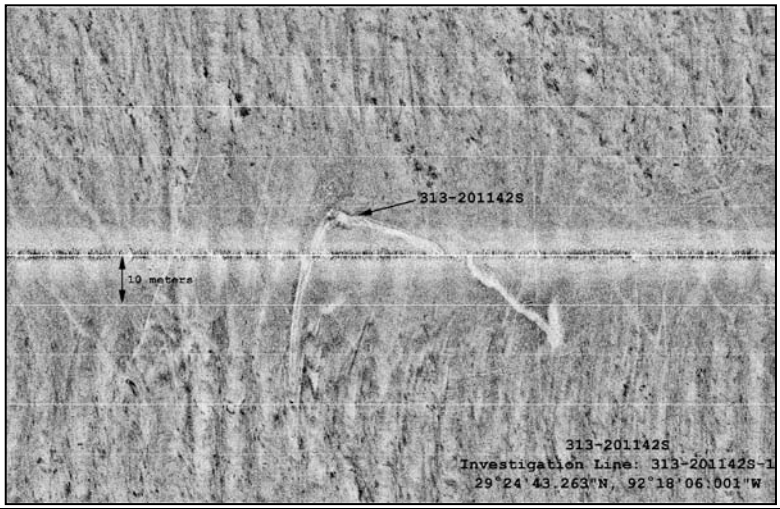
Multibeam Line: 313-201142S-4

Position: 29° 24’ 42.716” N, 92° 18’ 03.664” W (WGS84)

Time Stamp: 2008-02-05 06:19:41

Hydrographer’s recommendations: This contact has been marked as a designated sounding within the H11669 Caris project submitted in conjunction with this report. It is recommended that this contact be charted as a 23-foot submerged obstruction at 29° 24’ 42.716” N, 92° 18’ 03.664” W (WGS84). ***Concur with conditions. This depth is surrounded by 23-25 feet of water. It is not a danger nor is it an obstruction considering the surroundings soundings. Chart as a 23 foot depth.***





D.1.6 DANGER TO NAVIGATION REPORTS

No Danger to Navigation Reports were issued. Do not ***Concur. One DToN was issued during processing at AHB. See Evaluation Report Section D.1.6 and section D.1.3. of this report.***

D.2 ADDITIONAL RESULTS

D.2.1 PRIOR SURVEYS

Comparison with prior surveys was not required under this Task Order. See Section D.1 for comparison to nautical charts. ***Concur.***

D.2.2 AIDS TO NAVIGATION

The following Aids to Navigation where found as charted.

Charted Position		
Latitude	Longitude	Name
29°28'42.922"N	92°19'16.708"W	Green 1 *
29°29'22.140"N	92°18'56.505"W	Red 4 *
29°30'03.950"N	92°18'49.746"W	Red 6 *
29°30'44.890"N	92°18'49.000"W	Green 7 *
29°30'46.206"N	92°18'43.218"W	Red 8 *
29°31'21.378"N	92°18'41.378"W	Green 9 *
29°31'21.120"N	92°18'36.237"W	Red 10 *
29°27'24.880"N	92°19'24.811"W	RW "FB" *

**** Concur. No changes to charting necessary.***

There was a discrepancy between the charted and survey positions of the "Red 2" channel marker. The marker is currently charted at approximately

29°28'39.510"N, 92°19'03.587"W. ***Concur. Defer to MCD for charting decision.***

Survey Position		
Latitude	Longitude	Name
29°28'43~~.818~~***.824***"N	92°19'04~~.406~~***.404***"W	Red 2

The following charted channel markers were not present at the time of the survey. ***Concur, defer to MCD for charting decision.***

Charted Position		
Latitude	Longitude	Name
29°29'24.262"N	92°19'07.428"W	Green 3
29°30'05.725"N	92°18'59.108"W	Green 5

D.2.3 EXISTING INFRASTUCTURE ***See also the Evaluation Report***

The following charted structures were found as charted. ***Concur with conditions.***
Revise charted position to reflect present survey findings.
****Add platform at present survey position.***
***** Delete charted platform, add platform in present survey position.***

Charted Position			
Latitude	Longitude	Structure Type	Structure Name
29°29'15.307"N	92°23'37.655"W	Platform	VR26 47*
29°29'14.956"N	92°21'21.343"W	Satellite	VR26 J *
29°29'20.723"N	92°20'11.086"W	Platform	VR27 3-D *
29°29'32.073"N	92°22'51.930"W	Platform	VR26 F ***see ER D.2.3.a.****
29°29'33.457"N	92°22'52.916"W	Platform	VR26 F Aux ***see ER D.2.3.a.****
29°31'56.131"N	92°25'07.547"W	Platform	VR16 PP1***
29°29'47.794"N	92°20'41.704"W	Platform	VR14 A*
29°27'51.147"N	92°22'28.715"W	Platform	VR26 2***

29°27'55.384"N	92°23'09.655"W	Platform	VR26 29*
29°27'58.806"N	92°22'09.428"W	Platform	VR26 C Aux1** ***see ER D.2.3.b.***
29°27'58.767"N	92°22'07.751"W	Platform	VR26 C Aux2** ***see ER D.2.3.b.***
29°28'02.348"N	92°22'07.548"W	Satellite	VR26 C7** ***see ER D.2.3.b.***
29°28'03.092"N	92°22'49.332"W	Platform	VR26 A***
29°28'01.230"N	92°22'07.599"W	Platform	VR26 C* ***see ER D.2.3.b.***
29°28'06.115"N	92°21'55.341"W	Platform	VR26 T2*
29°28'05.082"N	92°22'42.683"W	Platform	VR26 40*
29°28'12.592"N	92°22'14.331"W	Platform	VR26 33*
29°28'14.614"N	92°22'50.412"W	Platform	VR26 E3*
29°28'17.078"N	92°21'58.009"W	Platform	VR26 B*** ***see ER D.2.3.c.***
29°28'18.114"N	92°21'59.601"W	Platform	VR26 B Aux2** ***see ER D.2.3.c.***
29°28'18.070"N	92°21'25.003"W	Platform	VR26 53*
29°28'18.299"N	92°21'50.583"W	Platform	VR26 I*
29°29'04.660"N	92°17'20.529"W	Satellite	Unknown*
29°29'05.100"N	92°16'54.033"W	Platform	Unknown***
29°28'17.495"N	92°17'40.416"W	Platform	VR28 1*
29°31'02.684"N	92°13'51.665"W	Platform	VR12 1*
29°28'30.790"N	92°11'07.626"W	Satellite	VR30 4*
29°28'14.164"N	92°10'59.638"W	Satellite	VR30 5*
29°28'17.248"N	92°10'35.465"W	Satellite	VR30 6*
29°27'07.568"N	92°22'22.250"W	Platform	VR35 B*
29°27'03.046"N	92°23'49.821"W	Platform	VR36 A*
29°24'56.315"N	92°22'27.143"W	Platform	VR35 3*
29°25'21.809"N	92°22'26.149"W	Platform	VR35 1aux*
29°25'11.724"N	92°22'01.697"W	Platform	VR35 3*
29°25'03.197"N	92°21'25.810"W	Satellite	VR35 10*
29°24'48.508"N	92°22'27.401"W	Platform	VR46 1*
29°24'46.066"N	92°21'58.595"W	Platform	VR46 B*
29°24'41.794"N	92°22'01.754"W	Platform	VR46 2*
29°24'30.380"N	92°21'32.931"W	Satellite	VR46 6****see DR D.1.1. and D.1.4.Item 17***
29°27'10.010"N	92°22'18.207"W	Platform	VR35 C*
29°27'24.361"N	92°21'40.844"W	Platform	VR26 D*
29°27'27.692"N	92°22'52.276"W	Platform	VR26 18***
29°27'27.566"N	92°22'30.364"W	Satellite	VR26 52*
29°27'27.848"N	92°21'47.051"W	Platform	VR26 12*

29°27'28.711"N	92°22'02.419"W	Platform	VR26 4***
29°27'29.961"N	92°23'34.264"W	Platform	VR26 43*
29°27'32.432"N	92°23'31.035"W	Platform	VR26 31*
29°26'43.058"N	92°22'21.693"W	Platform	VR35 A*
29°27'32.611"N	92°23'18.034"W	Platform	VR26 36*
29°27'37.868"N	92°21'23.681"W	Platform	VR26 5*
29°27'37.744"N	92°22'06.466"W	Platform	VR26 11*
29°27'37.672"N	92°22'31.868"W	Platform	VR26 16*
29°27'10.298"N	92°23'02.797"W	Platform	VR35 7*
29°27'07.086"N	92°23'30.370"W	Platform	VR35 5*
29°27'42.128"N	92°23'01.539"W	Platform	VR26 41*
29°27'44.979"N	92°23'02.543"W	Platform	VR26 42*
29°26'17.864"N	92°10'09.290"W	Satellite	VR31 18*
29°26'19.216"N	92°11'41.631"W	Satellite	VR31 13*
29°25'59.980"N	92°11'15.737"W	Satellite	VR31 1*
29°25'35.388"N	92°10'01.911"W	Satellite	VR31 E-1***
29°26'33.553"N	92°12'00.074"W	Satellite	VR31 26*See also D.1.1 of this Report.
29°26'43.414"N	92°10'07.694"W	Satellite	VR31 14*
29°26'55.171"N	92°10'24.256"W	Satellite	VR31 9*
29°26'53.410"N	92°11'34.703"W	Platform	VR31 3*
29°26'50.995"N	92°11'12.592"W	Satellite	VR31 6 **see ER D.2.3.d.
29°26'55.392"N	92°11'47.875"W	Satellite	VR31 24*
29°26'50.602"N	92°11'37.660"W	Satellite	VR31 A-PRD*

Structures found in the following locations are currently uncharted. **** Concur. It is recommended that the following platforms be added to the ENC and raster chart in the present survey location.***

Survey Position			
Latitude	Longitude	Structure Type	Structure Name
29°30'22.809"N	92°21'39.266"W	Satellite	VR15 12*
29°30'33.175"N	92°20'27.513"W	Satellite	VR14 1*
29°27'48.~~091~~*.080*"N	92°23' ~~31.198~~*30.400*"W	Platform	VR26 27*
29°28'02.884"N	92°23'33.694"W	Platform	VR26 30*
29°27'23.901"N	92°23'34.123"W	Platform	VR26 48*
29°27'24.~~543~~*.892*"N	92°23'34.~~735~~*.787*"W	Satellite	VR26 34*
29°27'32.722"N	92°22'00.315"W	Platform	VR26 G*

29°26'18.435"N	92°10'36.220"W	Satellite	VR31 8*
29°26'55.836"N	92°11'35.691"W	Platform	VR31 A*
29°26'58.338"N	92°11'37.198"W	Platform	VR31 A-CMP*

The following is a list of structures that are currently charted, but were no longer present at the time of the survey. ***Concur. It is recommended that the following platforms be deleted from the ENC and raster chart and the area be updated to reflect present survey findings.***

Charted Position	
Latitude	Longitude
29°27'49.326~~0~~***0***"N	92°24'01.48~~9~~***94***"W*
29°28'04.961"N	92°24'13.09~~2~~***86***"W*
29°27'55~~.795~~***.800***"N	92°23'51.74~~7~~***56***"W*
29°28'00.424"N	92°23'51.27~~8~~***0***"W*
29°28'17.13~~7~~***0***"N	92°23'34.63~~2~~***8***"W*
29°28'26.76~~7~~***0***"N	92°22'48.684"W*
29°28'31.406"N	92°22'50~~.200~~***.196***"W*
29°28'42.080"N	92°21'41.29~~6~~***2***"W*
29°27'51.550"N	92°21'07.41~~9~~***6***"W*
29°28'26~~.578~~***.643***"N	92°20'48~~.443~~***.872***"W*
29°28'43.441~~6~~***6***"N	92°21'03.55~~9~~***64***"W*
29°29'46.48~~8~~***3***"N	92°20'52.344***50***"W*
~~29°29'46.488"N~~	~~92°20'52.344"W~~ ***same as above***
29°30'00.005~~1~~***1***"N	92°20'14.961~~4~~***4***"W*
29°31'53.133"N	92°20'06.544***0***"W*
29°27'59.828~~32~~***32***"N	92°18'39.670"W*
29°28'08.306~~10~~***10***"N	92°17'46.450~~46~~***46***"W*
29°29'35.985~~9~~***9***"N	92°17'10.624"W*
29°28'32.423~~30~~***30***"N	92°11'05.145~~54~~***54***"W*
29°27'34.280~~72~~***72***"N	92°24'12.179~~86~~***86***"W*
29°27'30.290~~4~~***4***"N	92°24'07.485~~8~~***8***"W*
29°27'20.867~~2~~***2***"N	92°24'01.016~~08~~***08***"W*
29°27'21.621~~18~~***18***"N	92°23'54.084~~78~~***78***"W*
29°27'22.282"N	92°23'51.258~~2~~***2***"W*
29°27'29.115~~06~~***06***"N	92°23'48.523~~16~~***16***"W*
29°27'27.532~~40~~***40***"N	92°22'20.471~~8~~***8***"W*
29°27'27.366~~0~~***0***"N	92°22'09.644"W*
29°27'22.~~749~~***.752***"N	92°21'14.~~341~~***.346***"W*

29°27'47.~~063~~***.070***"N	92°20'44.779~~2~~***2***"W*
29°27'07.~~735~~***.740***"N	92°21'05.~~518~~***.526***"W*
29°25'21.371~~7~~***7***"N	92°22'49.979"W*
29°25'40.~~071~~***.061***"N	92°21'44.~~043~~***.046***"W*
29°25'07.622~~5~~***5***"N	92°21'28.272~~8~~***8***"W*
29°24'41.~~629~~***.633***"N	92°20'43.~~534~~***.530***"W*
29°24'40.~~044~~***.049***"N	92°20'41.893"W*
29°24'08.330~~3~~***3***"N	92°18'37.~~502~~***.494***"W*
29°26'37.~~586~~***.590***"N	92°10'35.~~336~~***.328***"W*
29°26'05.404"N	92°11'32.~~271~~***.280***"W*
29°25'28.~~494~~***.487***"N	92°11'31.~~931~~***.938***"W*
29°25'35.079~~5~~***5***"N	92°10'41.738"W*
29°25'34.263"N	92°10'38.~~412~~***.406***"W*
29°25'09.133~~7~~***7***"N	92°10'51.022"W*
29°25'06.~~980~~***.977***"N	92°10'49.~~356~~***.350***"W*
29°25'17.~~899~~***.903***"N	92°10'28.394~~8~~***8***"W*

A single charted structure ~~charted~~ at 29°24'09.~~593~~***.863***"N, 92°22'22.~~378~~***.782***"W is actually three separate structures, two platforms and a satellite. ***Concur. *Revise presently charted platform to present survey position and **add the other two platforms, below, found during the present survey.***

Survey Position			
Latitude	Longitude	Structure Type	Structure Name
29°24'11.~~451~~***.449***"N	92°22'22.862"W	Platform	VR46 AB**
29°24'11.~~984~~***.983***"N	92°22'23.407"W	Platform	VR46 Aaux**
29°24'08.~~854~~***.852***"N	92°22'20.900"W	Satellite	VR46 A*

There are eleven piles within the survey area. They were identified at the following locations. ***Concur. *Add the piles in present survey location. ** Pile in close proximity to platform. Add to ENC and add to raster if scale permits. Final disposition of these piles is at the discretion of MCD.***

Survey Position	
Latitude	Longitude
29°30'30.~~056~~***.061***"N	92°21'43.~~283~~***.290***"W*
29°28'02.028"N	92°22'07.~~565~~***.572***"W** ***see ER D.2.3.b.***
29°29'07.~~738~~***.747***"N	92°16'46.~~618~~***.614***"W*
29°29'08.~~544~~***.539***"N	92°16'45.409"W*
29°26'53.~~949~~***.952***"N	92°11'41.~~809~~***.802***"W**

29°26'53.916"N	92°11'41~~.215~~***.208***"W***
29°26'53~~.433~~***.430***"N	92°11'40~~.713~~***.704***"W***
29°26'55~~.978~~***.986***"N	92°11'37~~.421~~***.428***"W***
29°26'25~~.635~~***.638***"N	92°12'04~~.352~~***.356***"W*
29°25'59.698"N	92°11'15~~.316~~***.324***"W***
29°23'41.169"N	92°11'54.133"W*

D.2.4 OTHER PERTINENT INFORMATION

Due to shallow water depths throughout the majority of the survey, a significant number of reruns were required in order to collect usable side scan sonar data.

Navigation Statistics were not calculated for the Captain Blake, C-Ghost, or C-Wolf. These vessels checked in to a known location (typically red navigation marker 16) and performed lead-lines on a daily basis in order to verify the accuracy of both the navigation and bathymetry.

Draft corrections are verified on a daily basis, and entered into the multibeam collection software to be applied in real-time. An incorrect draft value was entered on the C-Wolf between the days of 2008-130 and 2008-193. This error was corrected using the C-Wolf Caris vessel file. ***Concur.***

Much of the C-Wolf multibeam data had a large amount of noise that had to be cleaned prior to BASE surface creation. We first suspected that this noise was caused by the configuration of the transducer on the hull in shallow water. In fact, the noise was a result of a faulty transducer. After reviewing the data, it was decided that the data was of a good enough quality for the purposes of this survey. The transducer was replaced following the completion of this survey. ***Concur***

Several tide zone files were created by CO-OPS to be used for tidal correction of multibeam data collected for this survey. The initial tidal zone files were not used due to the failure of the gauge at the Freshwater Bayou locks (8766072). A new

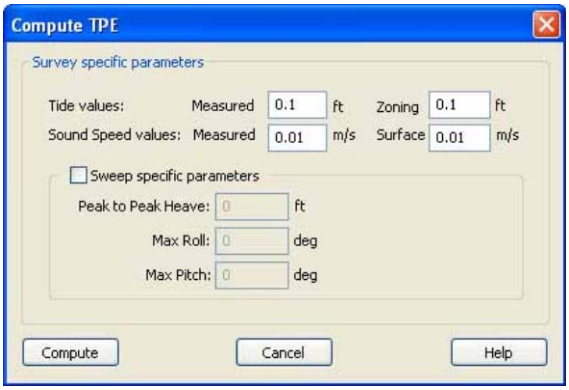
zone file was created that uses the Calcasieu tide gauge (876094) as the primary source for tidal correctors. The final and correct file was named K378KR2007RevCORP.zdf, and is included in the Caris projects submitted in conjunction with this report. ***Concur***

Six separate BASE surfaces were created for this project, one for each subarea. All six BASE surfaces were created at 2-meter resolution. ***Concur***

All of the side scan data collected for this project has been layback corrected. Data should be imported into Caris using fish position and zero layback correction.

S57 feature files for aids to navigation, significant contacts, oil and gas infrastructure, hazardous shoals, and bottom samples have been submitted in a Caris Notebook project. ***Concur***

All TPE values were calculated using the following settings.



REGISTRY NUMBER H11669

This report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of the survey H11669 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and CARIS project have been closely reviewed and are considered complete and adequate as per the Statement of Work.

This report is accompanied by the Data Acquisition and Processing Report for project OPR-K387-KR.

Joseph Burke
Chief of Party
C&C Technologies
January 2009

APPENDIX I

DANGER TO NAVIGATION REPORTS

H11669 Danger to Navigation #1

Registry Number: H11669

State: Louisiana

Locality: Vermillion Bay

Sub-locality: Freshwater Bayou Canal

Project Number: OPR-K387-KR-07

Survey Date: 12/02/2007

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11349	43rd	05/01/2007	1:80,000 (11349_1)	USCG LNM: 10/06/2009 (10/13/2009) NGA NTM: 02/01/2003 (10/24/2009)
11340	73rd	08/01/2008	1:458,596 (11340_1)	[L]NTM: ?
1116A	73rd	08/01/2008	1:458,596 (1116A_1)	[L]NTM: ?
411	52nd	09/01/2007	1:2,160,000 (411_1)	[L]NTM: ?

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

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	8ft Sounding	Shoal	2.56 m	29° 26' 00.6" N	092° 09' 44.3" W	---

1 - Danger To Navigation

1.1) 8ft Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position: 29° 26' 00.6" N, 092° 09' 44.3" W

Least Depth: 2.56 m (= 8.40 ft = 1.399 fm = 1 fm 2.40 ft)

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2007-336.15:16:48.000 (12/02/2007)

GP Dataset: H11669_DtoN#1.xls

GP No.: 1

Charts Affected: 11349_1, 1116A_1, 11340_1, 411_1

Remarks:

Natural rise in the sea floor found during office processing.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11669_DtoN#1.xls	1	0.00	000.0	Primary

Hydrographer Recommendations

Recommend charting 8ft dangerous obstruction at surveyed location.

Cartographically-Rounded Depth (Affected Charts):

8ft (11349_1)

1 ¼fm (1116A_1, 11340_1, 411_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: OBJNAM - 8ft Sounding

QUASOU - 6:least depth known

SORDAT - 20090812

SORIND - US,US,nsurf,H11669

TECSOU - 2,3:found by side scan sonar,found by multi-beam

Office Notes

Recommend to chart 8ft dangerous obstruction at survey location.

Feature Images

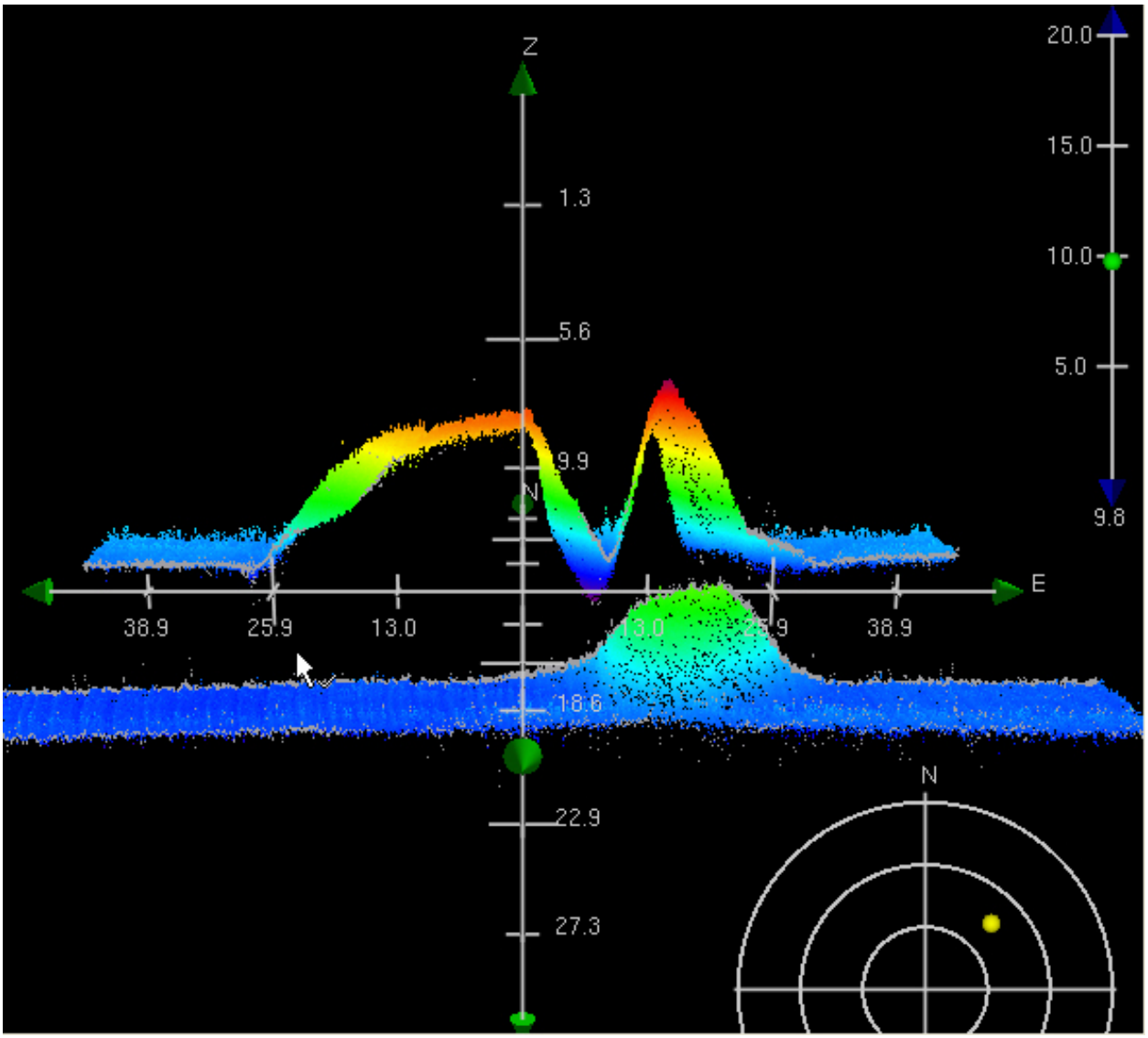


Figure 1.1.1

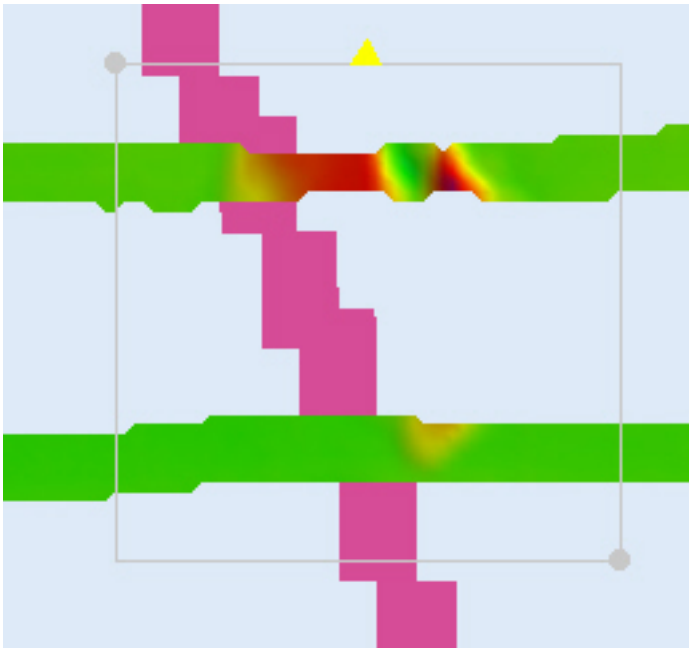


Figure 1.1.2

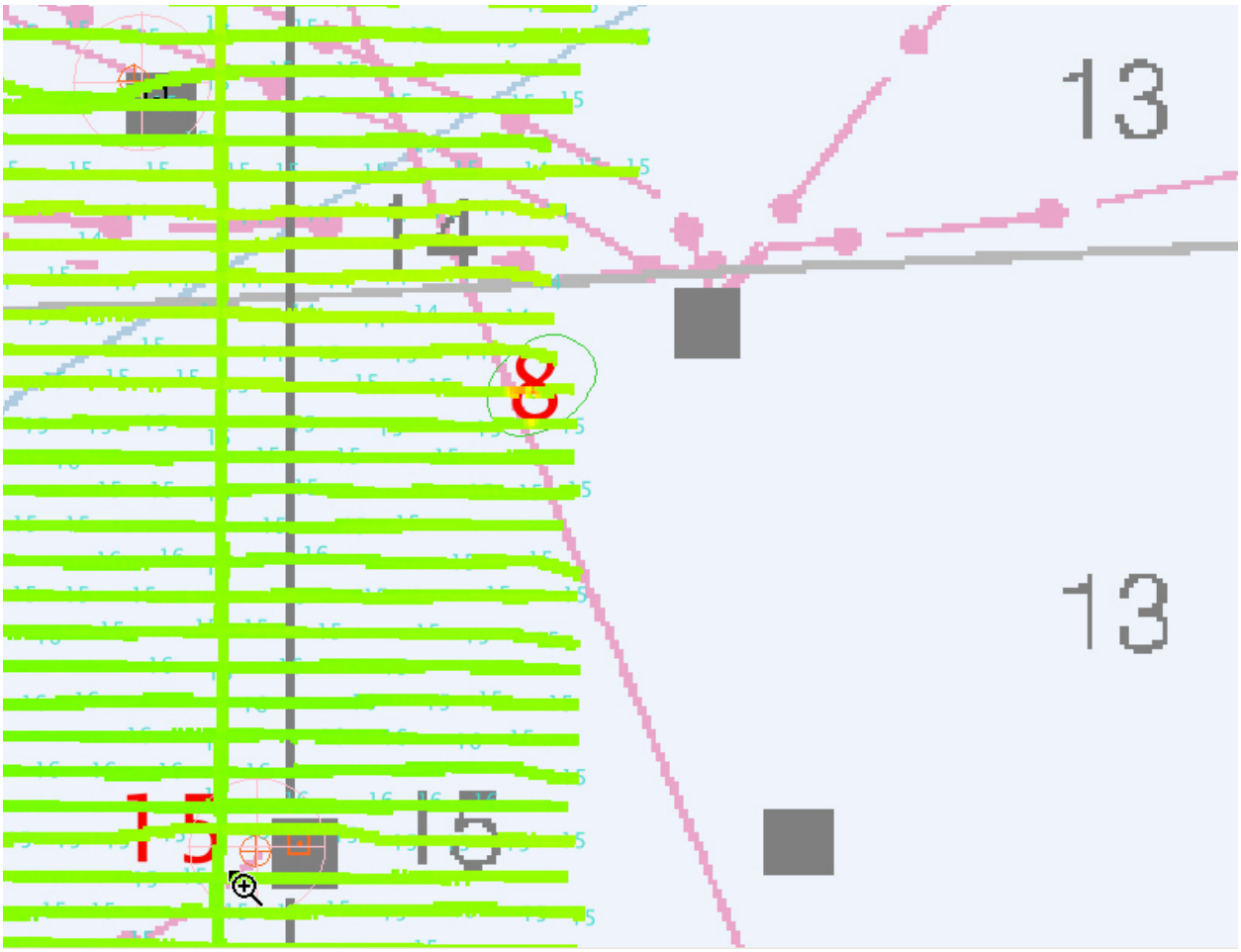


Figure 1.1.3

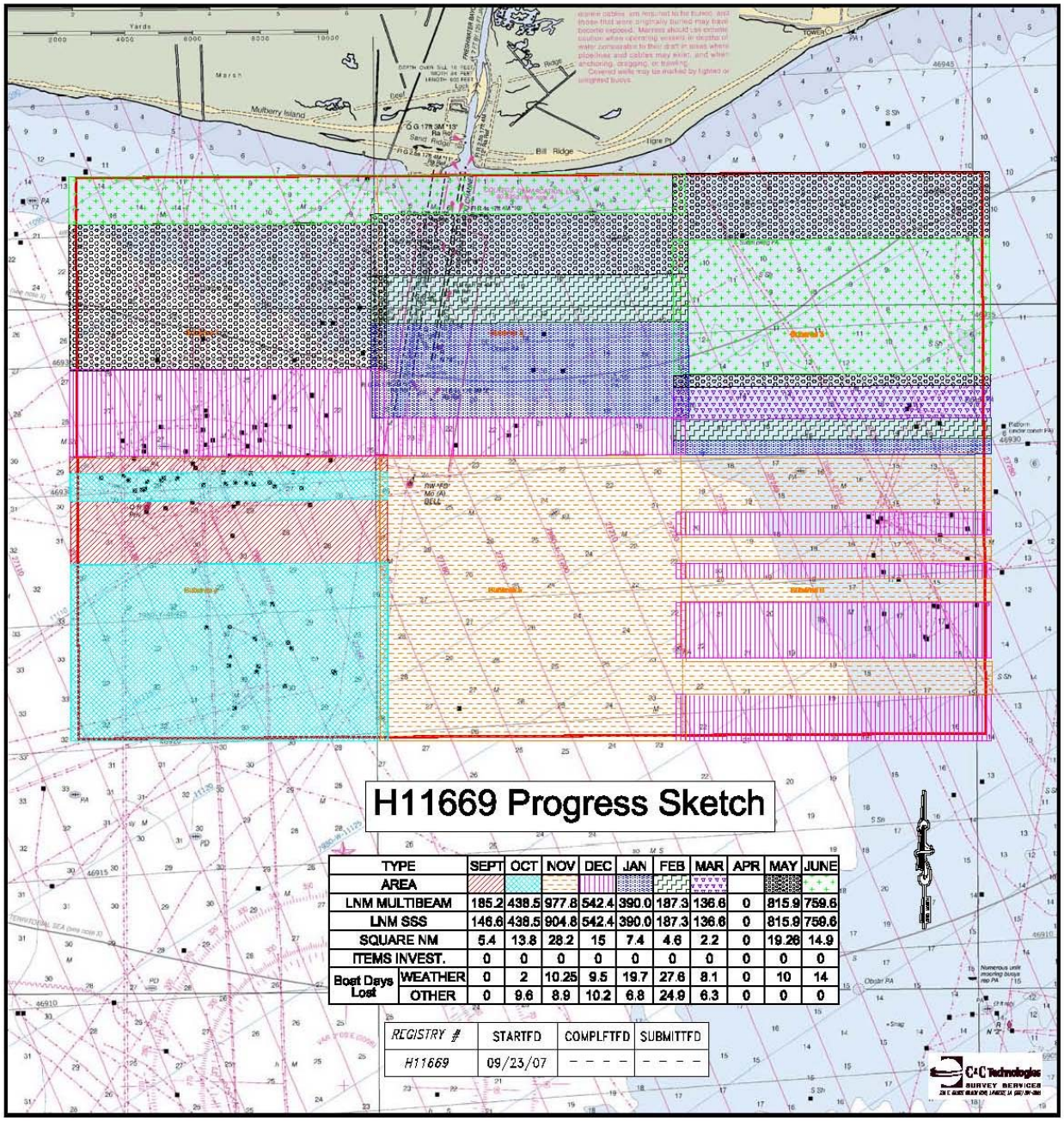
APPENDIX II

LIST OF GEOGRAPHIC NAMES

No new geographic names where found within the survey area. No corrections to the currently charted geographic names within the survey area are needed.

APPENDIX III

PROGRESS SKETCH



TYPE		SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
AREA											
LNM MULTIBEAM		185.2	438.5	977.8	542.4	390.0	187.3	136.6	0	815.9	759.6
LNM SSS		146.6	438.5	904.8	542.4	390.0	187.3	136.6	0	815.9	759.6
SQUARE NM		5.4	13.8	28.2	15	7.4	4.6	2.2	0	19.26	14.9
ITEMS INVEST.		0	0	0	0	0	0	0	0	0	0
Boat Days Lost	WEATHER	0	2	10.25	9.5	19.7	27.6	8.1	0	10	14
	OTHER	0	9.6	8.9	10.2	6.8	24.9	6.3	0	0	0

REGISTRY #	STARTED	COMPLETED	SUBMITTED
H11669	09/23/07	- - - -	- - - -

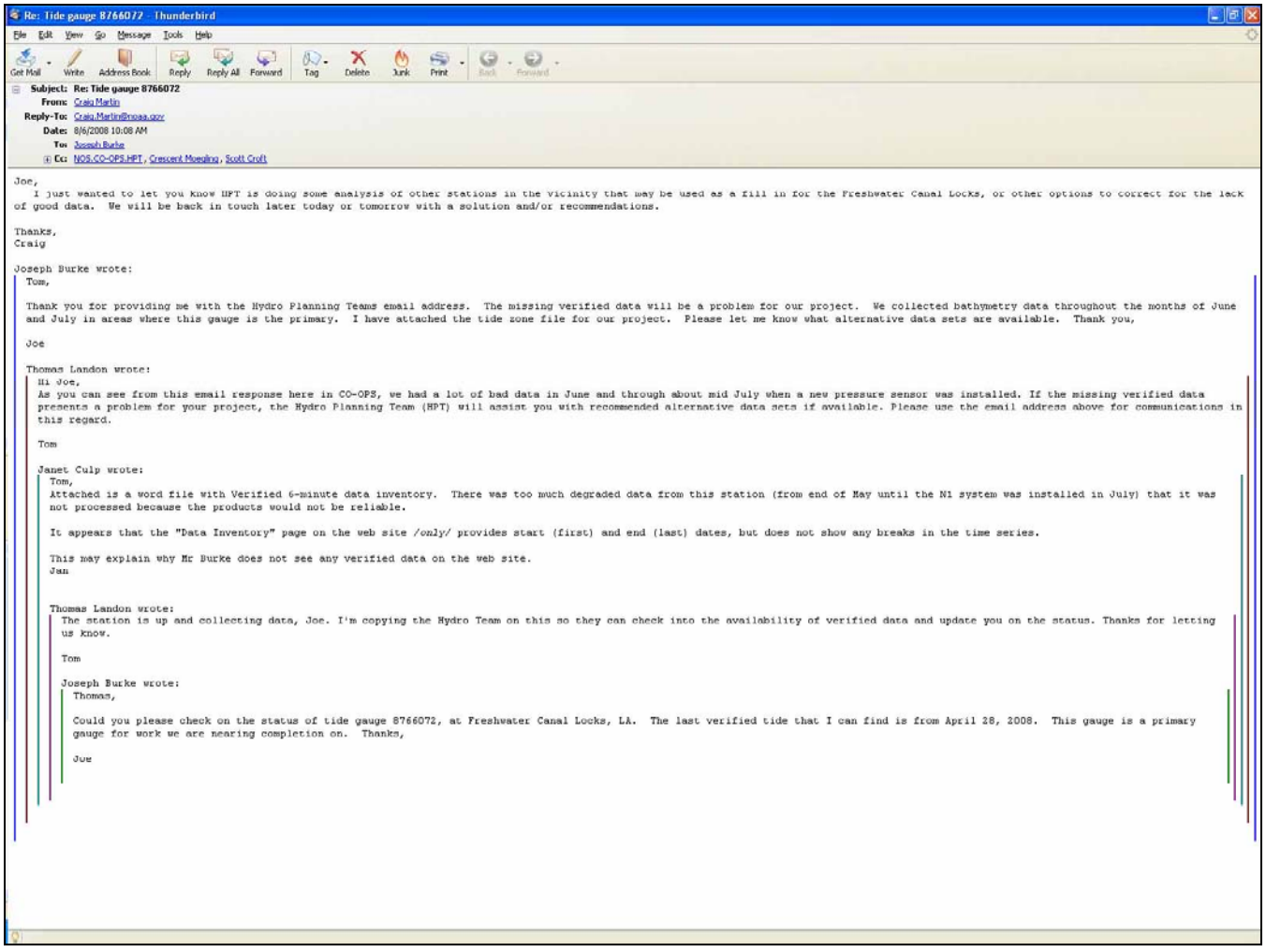
APPENDIX IV

TIDES AND WATER LEVELS

The tidal data applied to all single beam echosounder data was downloaded from the following website:

http://tidesandcurrents.noaa.gov/data_menu.shtml?stn=8768094%20Calcasieu%20Pass,%20LA&type=Historic%20Tide%20Data

The following images display a series of emails outlining the request and receipt of new tidal zoning for project OPR-K387-KR-07.



Re: Tide gauge 8766072 - Thunderbird

File Edit View Go Message Tools Help

Get Mail | Write | Address Book | Reply | Reply All | Forward | Tag | Delete | Junk | Print | Back | Forward

Subject: Re: Tide gauge 8766072
From: Craig Martin
Reply-To: Craig.Martin@noaa.gov
Date: 8/6/2008 10:08 AM
To: Joseph Burke
Cc: NOS.CO-OPS.HPT, Crescent Mooring, Scott Croft

Joe,
I just wanted to let you know HPT is doing some analysis of other stations in the vicinity that may be used as a fill in for the Freshwater Canal Locks, or other options to correct for the lack of good data. We will be back in touch later today or tomorrow with a solution and/or recommendations.

Thanks,
Craig

Joseph Burke wrote:
Tom,

Thank you for providing me with the Hydro Planning Teams email address. The missing verified data will be a problem for our project. We collected bathymetry data throughout the months of June and July in areas where this gauge is the primary. I have attached the tide zone file for our project. Please let me know what alternative data sets are available. Thank you,

Joe

Thomas Landon wrote:
Hi Joe,
As you can see from this email response here in CO-OPS, we had a lot of bad data in June and through about mid July when a new pressure sensor was installed. If the missing verified data presents a problem for your project, the Hydro Planning Team (HPT) will assist you with recommended alternative data sets if available. Please use the email address above for communications in this regard.

Tom

Janet Culp wrote:
Tom,
Attached is a word file with Verified 6-minute data inventory. There was too much degraded data from this station (from end of May until the N1 system was installed in July) that it was not processed because the products would not be reliable.

It appears that the "Data Inventory" page on the web site */only/* provides start (first) and end (last) dates, but does not show any breaks in the time series.

This may explain why Mr Burke does not see any verified data on the web site.
Jan

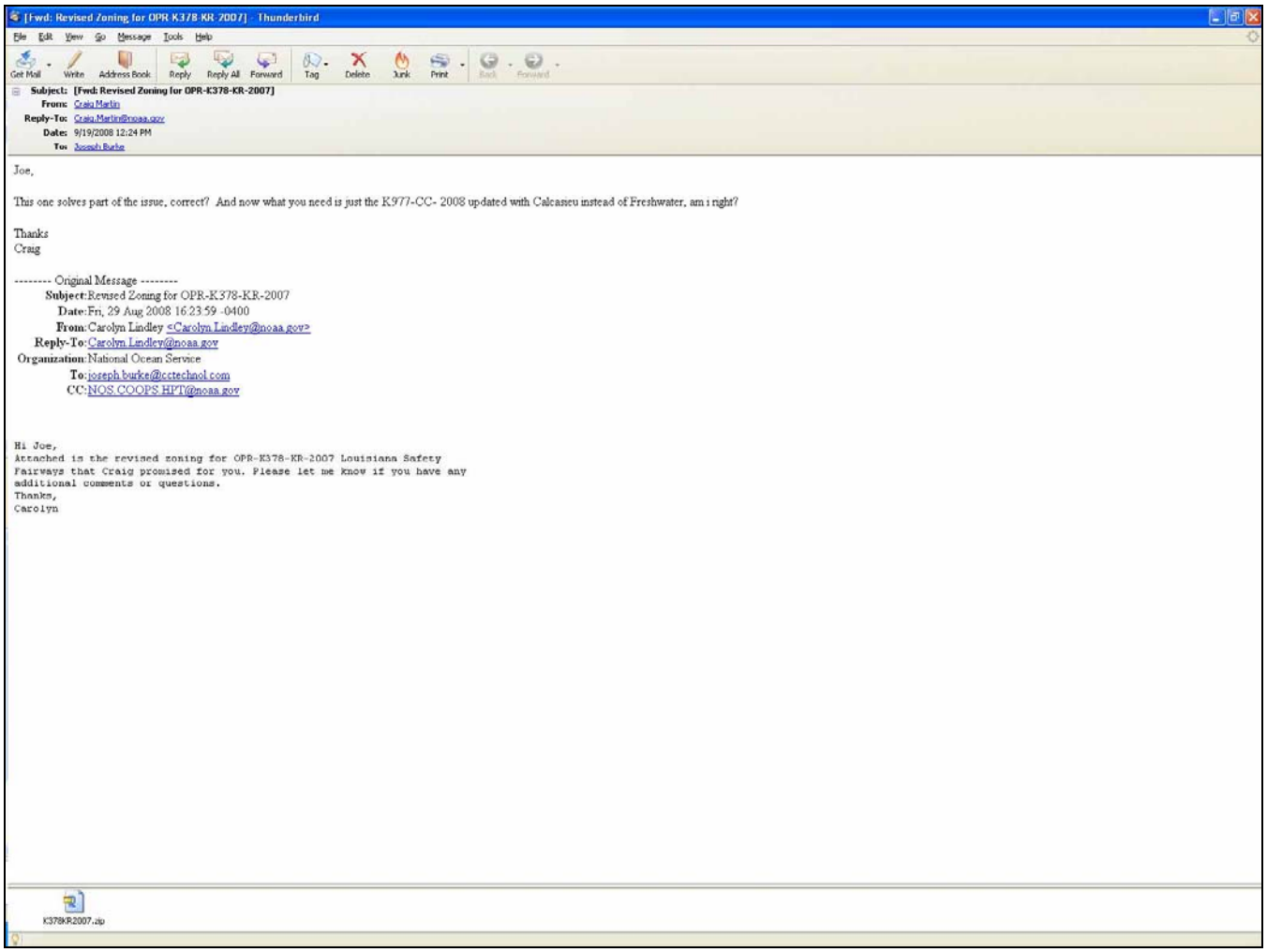
Thomas Landon wrote:
The station is up and collecting data, Joe. I'm copying the Hydro Team on this so they can check into the availability of verified data and update you on the status. Thanks for letting us know.

Tom

Joseph Burke wrote:
Thomas,

Could you please check on the status of tide gauge 8766072, at Freshwater Canal Locks, LA. The last verified tide that I can find is from April 28, 2008. This gauge is a primary gauge for work we are nearing completion on. Thanks,

Joe



[Fwd: Revised Zoning for OPR-K378-KR-2007] - Thunderbird

File Edit View Go Message Tools Help

Get Mail | Write | Address Book | Reply | Reply All | Forward | Tag | Delete | Junk | Print | Back | Forward

Subject: [Fwd: Revised Zoning for OPR-K378-KR-2007]
From: Craig Martin
Reply-To: Craig.Martin@noaa.gov
Date: 9/19/2008 12:24 PM
To: Joseph Burke

Joe,

This one solves part of the issue, correct? And now what you need is just the K977-CC- 2008 updated with Calcasieu instead of Freshwater, am i right?

Thanks
Craig

-------- Original Message --------
Subject: Revised Zoning for OPR-K378-KR-2007
Date: Fri, 29 Aug 2008 16:23:59 -0400
From: Carolyn Lindley <Carolyn.Lindley@noaa.gov>
Reply-To: Carolyn.Lindley@noaa.gov
Organization: National Ocean Service
To: joseph.burke@cctechnol.com
CC: NOS.COOPS.HPTI@noaa.gov

Hi Joe,
Attached is the revised zoning for OPR-K378-KR-2007 Louisiana Safety
Fairways that Craig promised for you. Please let me know if you have any
additional comments or questions.
Thanks,
Carolyn

K378KR2007.zip

APPENDIX V

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDANCE

There are no supplemental survey records or correspondence accompanying this report.

APPENDIX V

AWOIS

~~Fifteen~~ ***16*** AWOIS Items were assigned for full investigation. They are discussed in section D.1.4 of this report.

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT to ACCOMPANY
SURVEY H11669 (2007-2008*)*

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 submitted survey area was broken down into six subareas. Because there were six separate subareas with their own HDCS data in each, AHB was unable to open each subarea as one project in CARIS. As a result, AHB combined all six individual HDCS data into one directory which allowed the entire data project to be processed at the branch. However, because of this the submitted six fieldsheets were outdated and CARIS was unable to recompute or finalize the grids. Therefore, AHB created six new fieldsheets at the same resolution size of 2m. The newly created fieldsheets were approximately the same size as the submitted ones.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

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

CARIS HIPS/SIPS version 6.1 SP2 HF 8
CARIS Bathy Manager version 2.1 SP1
DKART INSPECTOR, version 5.0 Build 732 SP1
CARIS HOM version 3.3 SP3
CARIS S57 Composer version 2.0

B.2. QUALITY CONTROL

B.2.1. H-Cell

The AHB source depth grid for the survey's nautical chart update product entailed the field's original 2m grids, combined at 6 meter resolution. The survey scale selected soundings were extracted from the 6m combined grid. The selected sounding set is approximately 10 to 20 times the number of charted depths. 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 contours were created from an interpolated TIN created from the 6m_InterpTin_Shifted Surface. The depth contours are forwarded to MCD for reference only. The contours were utilized during chart scale sounding selection and quality assurances efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

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 areas (DEPARE), un-surveyed areas (UNSARE), depth contours (DEPCNT), sounding selections (SOUNDG), features (OBSTRN, OFSPLF, PILPNT, SBDARE,) US4LA15M_ENC Features (DMPGRD, DRGARE, OBSTRN, OFSPLF), Meta objects (M_COVR, M_QUAL), and cartographic Blue Notes ($CSYMB).

All of the components with the exception of the sounding selection and depth contours were inserted into one feature layer (including the Bluenotes, as dictated by Hydrographic Technical Directive 2008-8), and this layer was exported into S-57 format in order to create the H-Cell deliverable. Similarly, the sounding selection and depth contours were exported into S-57 format separately, and then both S-57 files were processed in CARIS HOM to convert the metric units to feet/fathoms and feet. The final products are two S-57 files, in Lat/Lon NAD-83, one that contains the chart soundings, all the features, Meta objects, and Bluenotes (H11669_CS.000), and one that contains the sounding selection and depth contours (H11669_SS.000). Finally, quality assurance checks were made utilizing CARIS S-57 Composer version 2.0 validation checks and DKART INSPECTOR, version 5.0 Build 732 SP1, tests.

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

H11669 CARIS H-Cell final deliverables include the following products:

H11669_CS.000	1:80,000 Scale	H11669 H-Cell with Chart Scale Selected Soundings
H11669_SS.000	1:20,000 Scale	H11669 Selected Soundings (Survey Scale)

B.2.2. Junctions

Survey H11669 (2007-2008) junctions with survey H11670 (2007-2008) to the east. Present survey soundings compare within 0 to 2 feet with the junctional survey depths. Present survey depths are from 0 to 12 feet shoaler than charted depths to the west, 0 to 1 feet shoaler to the south and 0 to 8 feet shoaler to the north than charted hydrography.

C. VERTICAL AND HORIZONTAL CONTROL

No Horizontal and Vertical Control Report (HVCR) was submitted for OPR-K387-KR-07, survey H11669.

Final vertical correction processing was completed by the field unit with no additional correction required by Atlantic Hydrographic Branch. The field unit personnel applied verified water levels in conjunction with the preliminary tidal zoning which was accepted as the final zoning for H11669. 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 15.

D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISON **11349 (43rd Edition, May/07)**
Corrected through NM 05/19/2007
Corrected through LNM 05/08/2007
Scale 1:80,000

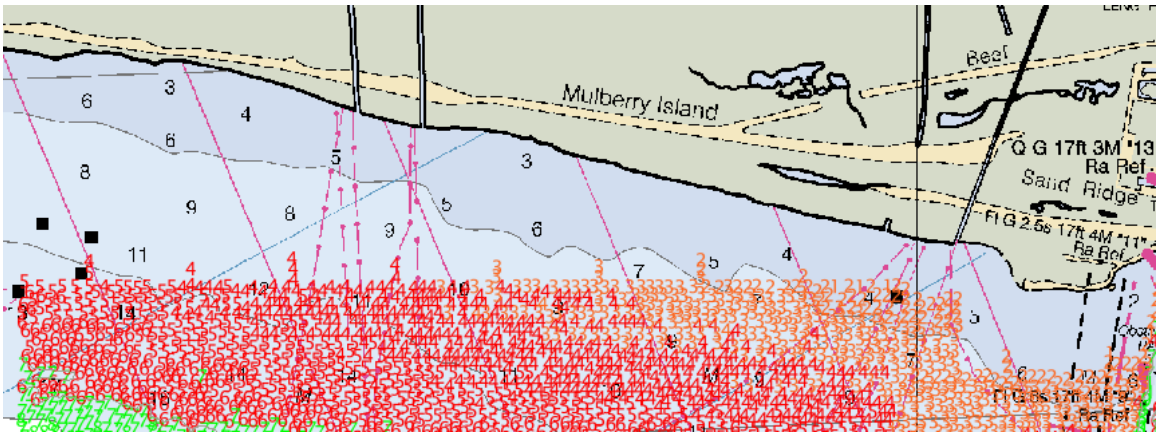
ENC Comparison **US4LA15M**
Vermilion Bay and Approaches
Edition 9
Application Date 2009-09-11
Issue Date 2009-09-11
Chart 11349

D.1.1 Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section "D" and Appendix 1&2 of the Descriptive Report. The following exceptions are noted:

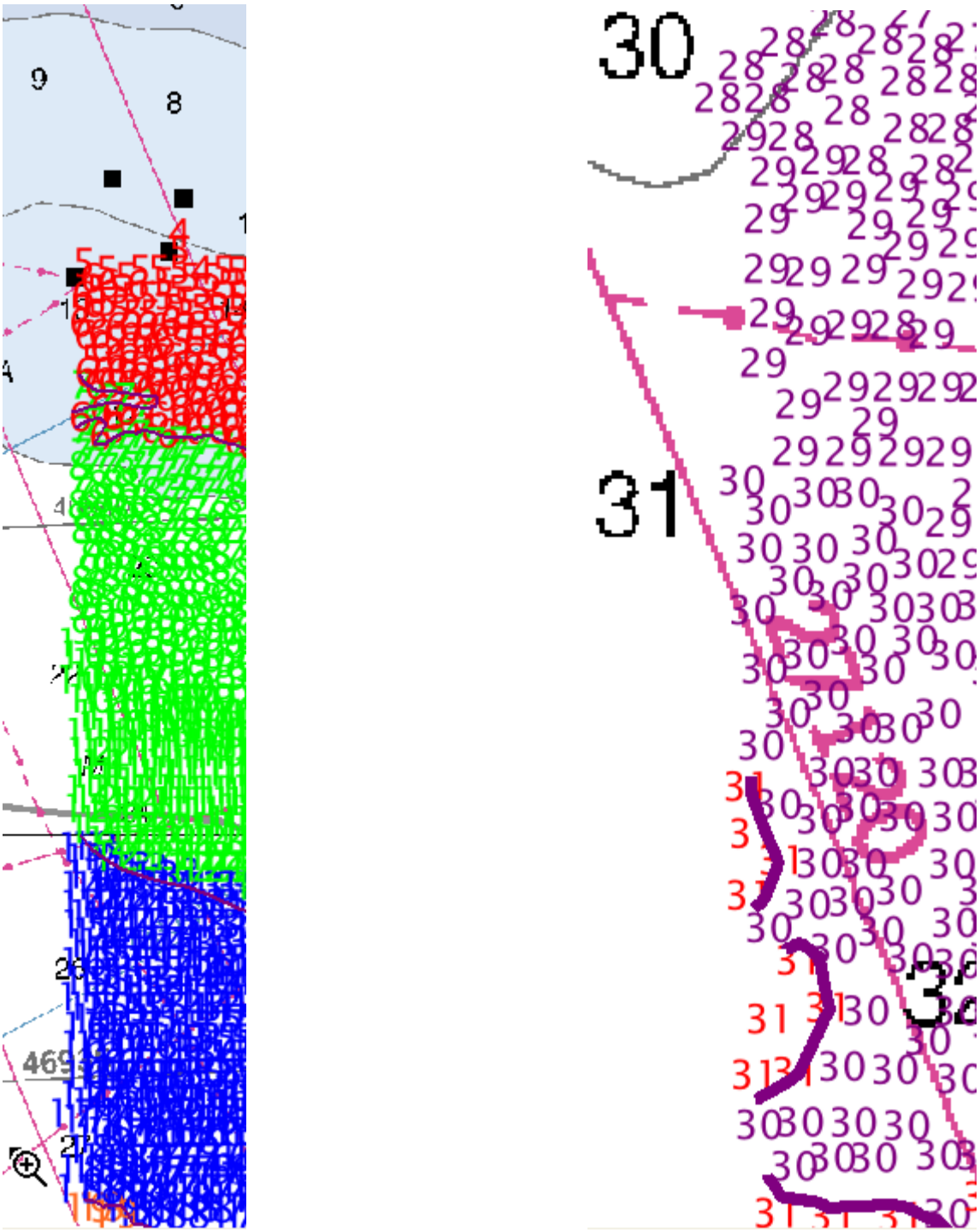
D.1.2 CHARTED SOUNDINGS

On the western limit of the survey, in the area north of the Latitude 29°27'59"N and along the northern limit of the survey, in the area west of the Freshwater Bayou Channel the present survey depths are from 3 to 12 feet shoaler than charted depths. In the area north of the survey limit, it is recommended that charted depths up to the shoreline be deleted and the area be charted as an "un-surveyed area" (UNSARE), to prevent mariners from using the charted depths to try to navigate in this area. (See Below)



In the areas west of the western limit of the present survey, it is recommended that the present survey contours be junctioned with the charted contours to show mariners that the areas are dangerously shoaler than what is presently charted. It is further recommended that these areas be surveyed as soon as possible to eliminate the conflicts between the present survey depths and the charted depths. (See Below)

6 – 18 foot contours 30 foot contour



D.1.3 SHOALS AND HAZARDOUS FEATURES

A dangerous submerged obstruction PA, depth unknown, charted in the vicinity of Latitude 29°31’33.008”N Longitude 92°18’37.422”W, was not listed as an AWOIS Item, nor was it investigated or discussed by the field in the Descriptive Report. The position was taken from the latest edition of raster chart 11349. This item is not listed on the ENC for this area either. The item was not fully investigated by multibeam nor was there side scan sonar coverage in the vicinity of the charted feature. It is recommended that the item be retained as charted on the raster and added to the ENC. A position was created during office processing for this feature.

Another feature, an obstruction PA note and pile symbol, charted in the vicinity of Latitude 29°29’58.723”N Longitude 92°18’56.673”W, was not listed as an AWOIS Item, nor was it investigated or discussed by the field in the Descriptive Report. The above position was taken from the latest edition of raster chart 11349. This item is not on the ENC for this area. The item has multibeam coverage and 200% side scan coverage. A spike was detected on the multibeam coverage over the charted position of the pile but the area was not developed sufficiently so there was not enough data to determine an accurate least depth. It is recommended that the pile symbol and Obstn PA note be deleted from the chart. It is also recommended that the label Obstn and the symbol for an unknown obstruction be charted in Latitude 29°29’59.1116”N Longitude 92°18’56.1997”Won both the raster chart and the ENC.

There are several 11 and 12 foot shoal depths surrounded by 13-16 foot depths, all in the close proximity to new platforms, centered in Latitude 29°26'20.461"N Longitude 92°11'10.550"W. They fall in the area of the reef pads discussed in section D.1.3 of the Descriptive Report. These depths cannot be charted because the platforms are going to be charted. Depth contours have been placed around the shoal depths to indicate the shoals.

D.1.6 DANGER TO NAVIGATION REPORTS

One Dangers to Navigation were found during the present survey. Several Aids were detected and positioned by the field. No changes to charting are necessary. Defer final decision to Marine Chart Division, N/CS3.1, Silver Spring,

An 8 foot depth in Latitude 29°26’00.627"N, Longitude 92°09'44.305"W was found in 14-16 feet of water. This depth is discussed in the DR section D.1.3. as the site of a reef that was used as a foundation for oil and gas infrastructures. The platform is no longer charted in the area. It is recommended that an 8 foot dangerous obstruction be added to the chart in the present survey position. This item was submitted by AHB as DTON #1.

D.2. ADDITIONAL RESULTS

D.2.3 EXISTING INFRASTUCTURE

a. The field found two platforms, one in Latitude 29°29'32.073"N, Longitude 92°22'51.930"W and the other in Latitude 29°29'33.457"N Longitude 92°22'52.916"W. There is only one platform charted on the raster and ENC in the area, in Latitude 29°29'33.526"N, Longitude 92°22'52.216"W. It is recommended that the raster chart and ENC be updated to reflect the present survey findings, chart both platforms in their present survey positions where chart scale allows. Final disposition of these platforms is at the discretion of MCD.

b. The field found four platforms, in Latitude 29°27'58.806"N, Longitude 92°22'09.428"W, Latitude 29°27'58.767"N, Longitude 92°22'07.751"W, Latitude 29°28'02.348"N, Longitude 92°22'07.548"W, and Latitude 29°28'01.230"N Longitude 92°22'07.599"W, and one pile in Latitude 29°28'02.028"N, Longitude 92°22'07.572"W. There is only one platform charted on the raster and ENC in the area, in Latitude 29°27'59.898"N, Longitude 92°22'07.849"W. It is recommended that the raster chart and

ENC be updated to reflect the present survey findings, chart all four platforms and the pile in their present survey positions where chart scale allows. Final disposition of these features is at the discretion of MCD.

c. The field found two platforms, one in Latitude 29°28'18.114"N, Longitude 92°21'59.601"W and the other in Latitude 29°28'17.078"N Longitude 92°21'58.009"W. There is only one platform charted on the raster and ENC in the area, in Latitude 29°28'16.81"N, Longitude 92°22'01.452"W. It is recommended that the raster chart and ENC be updated to reflect the present survey findings, chart both platforms in their present survey positions where chart scale allows. Final disposition of these platforms is at the discretion of MCD.

d. The Descriptive Report, section D.2.3. states that structure satellite VR31 6 in Latitude 29°26'50.995"N, Longitude 92°11'12.592"W is currently charted. However, this feature is not charted on the latest edition of NOS chart 11349 nor is it on the ENC for this area. This platform was found during the present survey, it is therefore recommended that a Platform be added to the chart in the above present survey location.

e. The field found an uncharted platform in Latitude 29°24’30.38”N, Longitude 92°21’32.931”W. This platform is in the vicinity of a charted pile symbol and 30 foot Obstn PA note. The pile and Obstn were disproved by the present survey. It is recommended that the pile symbol and 30 foot Obstn PA note be deleted from the chart and ENC. A platform is on the ENC and should be revised to reflect present survey findings. It is also recommended that the platform be added to the raster chart in the present survey location.

f. The field found an uncharted platform in Latitude 29°29’04.661”N, Longitude 92°20’31.740”W. This item was not mentioned in the Descriptive Report. It is recommended that this platform be added to the ENC and raster chart in the present survey location.

g. Charted platform located in Latitude 29°27’32.40”N, Longitude 92°24’35.48”W was not discussed by field. The line of data passing this platform was converted and the SSS data proves its existence. It is recommended that this platform be retained as charted.

h. Present survey depths in the vicinity of Latitude 29°28'42.388"N, Longitude 92°23'36.998"W are 11 feet shoaler than charted depths. There are several different areas over the survey limits where the present survey depth is 10-15 feet shoaler than the charted depths. Update the chart with present survey data.

k. The charted least depth in the Freshwater Bayou Channel is 10.827 feet. Several conflicts exist with the published controlling depth. A 4.990 foot depth was found in Latitude 29°31’51.031"N, Longitude 92°18'30.150"W, a 6.703 foot depth was found in Latitude 29°31’19.092"N, Longitude 92°18'36.163"W, an 8.465 foot depth was found in Latitude 29°30’56.306"N, Longitude 92°18'40.552"W, an 8.524 foot depth was also found in Latitude 29°31’05.265"N, Longitude 92°18'38.931"W, and a 9.219 foot depth was found in Latitude 29°30’43.065"N, Longitude 92°18'43.316"W. There are also several 10 foot depths inside the channel limits as well. It is recommended that the note on the chart be revised to 5 FT BY 250 FT AUG 2009. It was determined, while processing this survey, that the orientation of the channel, as shown on the chart, is not

correct. The channel appears to be orientated at a more north westerly direction than is charted. It is also recommended that the channel be revised to reflect the orientation and limits as determined by the present survey. Final charting disposition of this channel is at the discretion of MCD**.**

m. The Dump Site (discontinued) centered in Latitude 29°30’20.13"N, Longitude 92°19'14.683"W was investigated by the present survey. No changes to charting are recommended.

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 Chart and Electronic Navigation Chart (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.

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.	***H11669***
PROJECT No.	***OPR-K387-KR-07***
FIELD UNIT	***C&C Technologies***
DATE OF SURVEY	***September 28, 2007 – August 12, 2009***
LARGEST SCALE CHART	***11349 (43rd Edition, May/07), 1:80,000***
ADDITIONAL CHARTS	
SOUNDING UNITS	***Feet***
COMPILER	***Deborah Bland***

Source Grids	***File Name*** ***H:\Compilation\H11669_K387-CC\AHB_H11669\E-SAR Final Products\GRIDS***
	E-SAR Final Products\GRIDS\H11669_AHB1_2m_Final.hns
	E-SAR Final Products\GRIDS\H11669_AHB2_2m_Final.hns
	E-SAR Final Products\GRIDS\H11669_AHB3_2m_Final.hns ***E-SAR Final Products\GRIDS\H11669_AHB4_2m_Final.hns*** ***E-SAR Final Products\GRIDS\H11669_AHB5_2m_Final.hns*** ***E-SAR Final Products\GRIDS\H11669_AHB6_2m_Final.hns***
Surfaces	**File Name** H:\Compilation\H11669_K387-CC\AHB_H11669\COMPILE\Working
Combined	**H11669_AHB_6m_Combined.hns**
Interpolated TIN	\Surfaces\ **H11669_6m _InterpTIN.hns**
Shifted Interpolated TIN	\Surfaces\ **H11669_6m _InterpTIN_Shifted.hns**
Product Surface	
Final HOBs	**File Name** H:\Compilation\H11669_K387-CC\AHB_11669\COMPILE\Final_Hobs
Survey Scale Soundings	**H11669_SS.hob**
Chart Scale Soundings	**H11669_CS_Soundings.hob**
Contour Layer	**H11669_Contours.hob**
Feature Layer	**H11669_Features.hob**
Meta-Objects Layer	**H11669_Meta.hob**
Blue Notes	**H11669_BlueNotes.hob**
ENC Retain Soundings	**H11669_ US4LA15M_ENC_Features_Retain.hob**
Un-surveyed Area	**H11669_UNSARE**

Meta-Objects Attribution	
Acronym	**Value**
M_COVR	
CATCOV	***Coverage Available***
SORDAT	***20090812***
SORIND	***US,US,survy,H11669***
M_QUAL	
CATZOC	***Zone of Confidence U (data not assessed)***
INFORM	***H11669,OPR-K387-KR-07***
POSACC	***10***
SORDAT	***20090812***

SORIND	***US,US,survy,H11669***
SUREND	***20090812***
SURSTA	***20070928***
DEPARE	
DRVALV 1	1.604 ft
DRVALV2	33.576 ft
SORDAT	***20090812***
SORIND	***US,US,survy,H11669***
M_CSCL	
CSCALE	
SORDAT	
SORIND	

SPECIFICATIONS:

I. COMBINED SURFACE:
   a. Number of ESAR Final Grids: 6
   b. Resolution of Combined (m): 6m

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: 1.604 ft
      ii. Maximum: 33.576 ft

III. INTERPOLATED TIN SURFACE:
   a. Resolution (m): 10m
   b. Linear
   c. Shifted value: -0.0229ft *[-0.229m (feet), (≤ 10 fathoms)]*
      [-1.372m (fathoms), (> 10 fathoms)]

IV. CONTOURS:
   a. Use a Depth List: H11669_depth_curves_list.txt
   b. Line Object: DEPCNT
   c. Value Attribute: VALDCO

V. FEATURES:
   a. Total Number of Features: 141
   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):
   e. Filter: Interpolated != 1
   f. Number Survey CS Soundings: 389

VII. Notes:

APPROVAL SHEET
H11669

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth contours, disposition 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.

Deborah A. Bland

Digitally signed by Deborah A. Bland
DN: cn=Deborah A. Bland, o=Atlantic Hydrographic Branch, ou=NOAA/NOS, email=Deborah.A.Bland@NOAA.gov, c=US
Date: 2009.11.25 10:50:42 -05'00'

Deborah A. Bland
Cartographer
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: Richard T. Brennan

Richard T. Brennan
I am approving this document
2009.11.30 15:52:29 -05'00'

Richard Brennan
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Kathleen Jamison

Digitally signed by Kathleen Jamison
Reason: AWOIS/SURF check
Date: 2009.12.15 15:04:37 -05'00'