

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

HORIZONTAL AND VERTICAL CONTROL REPORT

<i>Type of Survey</i>	Hydrographic
<i>Project</i>	S-K977-KR-07-DEA
<i>Contract No</i>	DG133C-05CQ-1078
<i>Task Order No</i>	T0004
<i>Time Frame</i>	July 2007 - October 2007

LOCALITY

<i>State</i>	Louisiana
<i>General Locality</i>	Gulf of Mexico

2007

CHIEF OF PARTY

Jonathan L. Dasler, David Evans and Associates, Inc.

LIBRARY & ARCHIVES

DATE _____

HYDROGRAPHIC TITLE SHEET

H11683
H11684

INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD No
David Evans and Associates, Inc.

State Louisiana

General Locality Gulf of Mexico

Sub-Locality Bastian Bay to West Bay

Scale 1:10,000 Date of Survey July 2, 2007 to October 9, 2007

Instructions dated April 16, 2007 Project No. S-K977-KR-07-DEA

Vessel R/V Taku, R/V Chinook

Chief of party Jonathan L. Dasler, PE (OR) , PLS (OR,CA)

Surveyed by Jonathan Dasler, Jason Creech, Shyla Allen, Michael Hill

Soundings by echo sounder, hand lead, pole RESON 8101, Odom MkIII and CV-100, EdgeTech 4200-FS and 4200-HFL

Graphic record scaled by N/A

Graphic record checked by N/A Automated Plot N/A

Verification by _____

Soundings in Meters at MLLW

REMARKS: All times are UTC.

The purpose of this contract is to detect and map marine debris for the Gulf of Mexico Marine Debris Project and to provide NOAA with modern, accurate hydrographic survey data with which to update the nautical charts of the assigned area.

SUBCONSULTANTS: ZEPHYR MARINE, P.O. Box 1575, Petersburg, AK 99833

EMC Inc., 209 Main Street, Greenwood, MS 38930

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Acronyms and Abbreviations

ASV	Autonomous Surface Vehicle
CO-OPS	Center for Operational Oceanographic Products and Services
DEA	David Evans and Associates, Inc.
DGPS	Differential Global Positioning System
GOMMDP	Gulf of Mexico Marine Debris Project
HSD	Hydrographic Surveys Division
kHz	kilo Hertz
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD83	North American Datum of 1983
NOS	National Ocean Service
NWLON	National Water Level Observation Network
POS/MV	Position and Orientation System for Marine Vessels
R/V	Research Vessel
USCG	United States Coast Guard
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator

Horizontal and Vertical Control Report

S-K977-KR-07-DEA

Mississippi Delta, Louisiana

Year 2007

R/V Taku

R/V Chinook

David Evans and Associates, Inc

Lead Hydrographer: Jonathan L. Dasler, P.E., P.L.S.

INTRODUCTION

This report applies to surveys H11683 and H11684 located in the vicinity of the Mississippi River Delta, Louisiana which are part of the Gulf of Mexico Marine Debris Project (GOMMDP). These contract surveys were performed under S-J977-KR-07-DEA as specified in the Statement of Work dated April 16, 2007. In general, survey methods meet or exceed requirements as defined in the National Ocean Service (NOS) *Hydrographic Surveys Specifications and Deliverables (April 2007)*. Coverage requirements of 200% side scan sonar (SSS) with concurrent single beam sonar were met.

A. VERTICAL CONTROL

The tidal datum for this project is chart datum, Mean Lower Low Water (MLLW) and Mean High Water (MHW). All soundings are referenced to MLLW. No heights were referenced as part of this project. All data (tidal, position, attitude, sonar, survey logs, etc.) were collected in Coordinated Universal Time (UTC).

A1. Tide and Water Level Corrections

The Tide and Water Level Data and Predicted Tidal Zoning requirements in the *Statement of Work* specified Pilot Station East, LA (876-0922) gauge as the primary tide gauge for this project. The Tides and Water Levels requirement is included in Appendix I.

The National Water Level Observation Network (NWLON) tide gauge at Pilot Station East, LA (876-0922) recorded numerous data spikes during survey operations. Center for Operational Oceanographic Products and Services (CO-OPS) staff were made aware of this issue and informed DEA hydrographers that the data spikes are a known issue with the gauge and result from the heavy shipping traffic in the area. Pilot Station East, LA data were applied as downloaded from the CO-OPS website with no modification to the water levels.

Zoning was accomplished using reference station 876-0922 using the provided zoning scheme from CO-OPS and is presented in Table 1. David Evans and Associated modified the NOAA supplied zone definition file in order to accommodate several survey lines that extended slightly outside of the zoning boundary. The geographic extent of zone CGM386 was modified in order to encompass the missing survey data.

Table 1. Tide Zones

Zone	Reference Station	Corrector(min.)	Ratio
CGM198	8760922	-6	X 1.02
CGM201	8760922	-6	X 1.10
CGM371	8760922	+6	X 1.06
CGM374	8760922	+18	X 1.10
CGM375	8760922	+6	X 1.10
CGM376	8760922	0	X 1.06
CGM378	8760922	+30	X 0.85
CGM382	8760922	+30	X 0.93
CGM383	8760922	+24	X 0.93
CGM386	8760922	+30	X 1.02
CGM387	8760922	+24	X 1.02
CGM388	8760922	+18	X 1.02
CGM392	8760922	+12	X 1.14
CGM393	8760922	+18	X 1.10
CGM418	8760922	+18	X 1.10
CGM198A	8760922	-6	X 1.06

It is difficult to associate a precise vertical error due to tides. Errors observed are a composite from various sources such as measurement error, tides, heave, refraction, transducer draft, and settlement and squat. Small vertical offsets may be observed in the data; however there are no areas that exceed the maximum allowable error of 20 cm to 45 cm for water levels.

The Final Tide Note is included in Appendix III.

B. HORIZONTAL CONTROL

No permanent control stations were established during this survey period.

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Position data consist of both geographic coordinates and projected coordinates. Projected coordinates are in meters using the Universal Transverse Mercator (UTM) Zone 16 projection. All horizontal positioning for soundings followed the *Statement of Work*, April 16, 2007, and the *NOS Hydrographic Surveys Specifications and Deliverables*, April 2007.

B1. Differential Corrections

The Research Vessels (*R/V Taku* and *Chinook*) used Differential Global Positioning Systems (DGPS) for navigation and acquired differential corrections from the U.S. Coast Guard (USCG) Maritime DGPS Service. The beacon at English Turn, Louisiana (broadcast site ID 814 at 293 kilo Hertz) was used for the entirety of the survey.

B2. Positioning System Confidence Checks

The primary positioning system aboard the *R/V Taku* was an Applanix POS/MV320 version 4, (Serial Number 2048). A secondary positioning system consisting of a Trimble DSM132 DGPS receiver (Serial Number 0224093932) was used during the survey to provide real-time quality control aboard the *R/V Taku*. The primary positioning system aboard the *R/V Chinook* was a Trimble SPS750 MAX DGPS receiver (Serial Number 58904-66) with a Trimble DSM132 DGPS receiver (Serial Number 224092892) used for secondary positions. All receivers used DGPS corrections from English Turn, Louisiana.

A weekly comparison between positions from the primary and the secondary positioning system of each research vessel was documented while the vessel was stationary in port. After accounting for antenna offsets the greatest computed difference between the two positions was 0.94 meters for the *R/V Taku* and 0.38 meters for the *R/V Chinook*, which are well within the National Ocean Service (NOS) specification of hydrographic positioning.

C. APPROVAL SHEET



DAVID EVANS
AND ASSOCIATES INC.

LETTER OF APPROVAL

S-K977-KR-07-DEA
Horizontal and Vertical Control Report

This report and the accompanying data are respectfully submitted.

Field operations contributing to the accomplishment of S-K977-KR-07-DEA were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and associated data have been closely reviewed and are considered complete and adequate as per the Statement of Work.

Jonathan L. Dasler, PE (OR), PLS (OR,CA)
Lead Hydrographer

Jason Creech
Lead Hydrographer

David Evans and Associates, Inc.
October 2007