

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

**VERTICAL AND HORIZONTAL CONTROL
REPORT**

<i>Type of Survey</i>	Navigable Area
<i>Project No.</i>	OPR-K354-TC-05
<i>Registry No.</i>	H11286, H11288, H11290, H11415, H11468, H11475

LOCALITY

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

2005

CHIEFS OF PARTY

Edward A. Owens, Castle E. Parker, David A. Sinson

NOAA TIME CHARTER

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DATE

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

**VERTICAL AND HORIZONTAL CONTROL REPORT
TITLE SHEET**

Project Number: **OPR-K354-TC-05**

State/Territory: **Louisiana**

General Locality: **Gulf of Mexico**

Surveys: **H11286, H11288, H11290, H11415, H11468, H11475**

Dates of Surveys: **01/25/05 to 08/30/05 for H11286**
07/23/05 to 08/30/05 for H11288
04/03/05 to 07/31/05 for H11290
01/13/05 to 04/21/05 for H11415
04/07/05 to 08/23/05 for H11468
05/16/05 to 08/25/05 for H11475

Sub-locality of Surveys: **10 NM SW of Point au Fer H11286**
18 NM SSW of Point au Fer H11288
26 NM SW of Point au Fer H11290
36 NM SW of Point au Fer H11415
23 NM SSW of Point au Fer H11468
26 NM SW of Point au Fer H11475

Instructions Dated: **12/17/04**

Vessel: **Ocean Services Ship R/V Davidson**

Chiefs of Party: **Edward A. Owens, Castle E. Parker, David A. Sinson**

Surveyed by: **SAIC Personnel**

A. VERTICAL CONTROL

Throughout this project, the operating National Water Level Observation Network (NWLON) tide station at Eugene Island, LA (876-4311) served as the control for datum determination. Installation and initial leveling of subordinate stations was performed by CO-OPS/FOD personnel. No tidal stations were established by the field unit. Tide station information is summarized in the following table.

STATION NUMBER	STATION NAME	LATITUDE	LONGITUDE
843-4311	Eugene Island, LA	29° 22' 18" N	091° 23' 06" W
877-1510	Galveston Pleasure Pier, TX	29° 17' 06" N	094° 47' 18" W

Tidal datum for this survey is Mean Lower Low Water (MLLW). Predicted water levels and preliminary tide zoning were provided with the Project Instructions. Observed water level data were sent via e-mail. These water level data and preliminary zoning were applied to bathymetry data in Caris Hips. Following survey operations, verified tidal data for this survey were concatenated into one file and applied to all sounding data. (All times for tidal data are in UTC.) A copy of the Request for Approved Tides is included in Appendix IV of the Descriptive Report. No changes were made to the height, time corrections or zoning from the Hydrographic Survey Letter Instructions.

Unusual conditions existed for the vertical control of this project. At 2054 UTC on August 16th, the U.S. Coast Guard Eugene Island light tower was removed by a private sector firm under contract to the Coast Guard. The Eugene Island water level station was mounted to this light tower. The contractor recognized the NOAA water level gauge and contacted the Navigation Services Division's Gulf Coast Navigation Manager and who was informed of this event. Correspondence concerning the removal of this water level station is located in Appendix V.

Final approved (verified) tides with final tide zoning were applied during processing at the Atlantic Hydrographic Branch. A request for delivery of final approved (verified) tides for this survey was forwarded to N/OPS1 on October 3, 2005 in accordance with the FPM and project letter instructions. As stated in the Approved Tide Note, final water levels will have Eugene Island (876-4311) as the primary gauge prior to August 16th and Galveston Pleasure Pier (877-1510) as the primary gauge subsequent to August 16th. A copy of the Approved Tide Note is located in Appendix IV.

After application of approved tides to the survey, a tidal artifact was discovered during processing at Atlantic Hydrographic Branch. This artifact occurred on August 16th, the day

the water level station was destroyed, and is thought to be related to the destruction of the station. Predicted water levels from Eugene Island (876-4311) were applied to all data acquired on August 16th, 2006 to correct this tide bust problem.

Due to the relatively shallow water depths within the common areas, the sea state and water levels were affected by weather conditions. Depending on the seasonal local weather systems with regard to wind direction, velocity, and fetch, the water levels were affected by these meteorological influences within the common survey area. These conditions should have been reflected in the recorded water levels.

Hurricane Katrina also affected the water levels during the final days of the survey. The most accurate data was not recorded due to the loss of the Eugene Island tidal station. However, the dates of survey time period prior and post Katrina were minimal during times of elevated storm surges.

Tidal zoning for this survey is consistent with the Letter Instructions. The following time and height correctors were applied to tidal data during processing:

For hydrography in the area of Louisiana Coast, LA, Eugene Island, LA (876-4311), is the reference station for predicted tides. Predictions may be retrieved in one month increments over the Internet from the CO-OPS Home Page at <http://www.co-ops.nos.noaa.gov/> and then clicking on "Predictions." Predictions are six-minute time series data relative to MLLW in metric units on Greenwich Mean Time. Apply the following time and height correctors to the predicted tides at Eugene Island, LA (876-4311) during the acquisition and preliminary processing phases of this project for correcting all sounding data.

<u>Zone Name</u>	<u>Time Corrector(mins)</u>	<u>Range Ratio</u>	<u>Predicted Reference</u>
WGM95	+36	x0.79	876-4311
WGM263	+48	x0.76	876-4311
WGM264	+54	x0.76	876-4311
WGM265	+60	x0.76	876-4311
WGM266	+66	x0.76	876-4311
WGM276	+60	x0.84	876-4311
WGM277	+54	x0.84	876-4311
WGM278	+48	x0.86	876-4311
WGM279	+42	x0.86	876-4311
WGM280	+36	x0.86	876-4311
WGM281	+24	x0.89	876-4311
WGM282	+18	x0.91	876-4311
WGM283	+6	x0.94	876-4311
WGM284	0	x0.99	876-4311
WGM289	+42	x0.79	876-4311

WGM367	+12	x0.94	876-4311
WGM368	+18	x0.91	876-4311
WGM369	+30	x0.84	876-4311
CGM216	+66	x0.66	876-4311
CGM253	+60	x0.69	876-4311

NOTE: The tide corrector values referenced to Eugene Island, LA (876-4311) are provided in the zoning file “K354TC2005CORP” for this project and are in the fourth set of correctors designated as TS4. Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a MapInfo representation of west longitude.

NOTE: For time corrections, a negative (-) time correction indicates that the time of tide in that zone is earlier than (before) the predicted tides at the reference station, whereas, a positive (+) time correction indicates that the time of tide in that zone is later than (after) the predicted tides at the reference station. For height corrections, the water level heights relative to MLLW at the reference station are multiplied by the range ratio to estimate the water level heights relative to MLLW in the applicable zone.

B. HORIZONTAL CONTROL

No horizontal control stations were established for this survey.

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacons at English Turn, LA (293 kHz), and Galveston, TX (296 kHz), were used during this survey.

Horizontal dilution of precision (HDOP) and the positional dilution of precision (PDOP) were monitored by all survey platforms during data acquisition. HDOP and PDOP values never exceeded 4.00, and adequate satellite coverage was maintained throughout the survey. There were no unusual methods for operating the positioning equipment, and no equipment malfunctions or unusual atmospheric conditions detrimentally affecting the data quality.

C. APPROVAL SHEET

OPR-K354-TC-05

Gulf of Mexico

Louisiana

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

Respectfully,

Approved and Forwarded: _____

Castle E. Parker
Physical Scientist, NOAA
Lead Hydrographer

Edward A. Owens
Physical Scientist, NOAA
Lead Hydrographer