

Cover Sheet (NOAA Form 76-35A)

NOAA FORM 76-35A

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

Horizontal and Vertical Control Report

Type of Survey HYDROGRAPHIC-Navigable Area Survey

Field No OPR-J359-KR-19

Registry No. H13281, H13282, H13283, H13284, H13285,
H13286, H13287, H13288, H13289

LOCALITY

State Florida

General Locality Northwest Gulf of Mexico

Sublocality Indian Pass to East Pass in the vicinity of
Apalachicola, FL.

2019

CHIEF OF PARTY

Dean Moyles

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DATE.....

Title Sheet (NOAA Form 77-28)

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTER NO. H13281, H13282, H13283, H13284, H13285, H13286, H13287, H13288, H13289
HYDROGRAPHIC TITLE SHEET		FIELD NO. Fugro Pelagos, Inc.
INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office		
State <u>Florida</u>		
General Locality <u>Northwest Gulf of Mexico</u>		
Locality <u>Covers the regions from East Pass to Indian Pass near Apalachicola, FL</u>		
Scale <u>1:20,000 & 1:40:000</u> Date of Survey <u>07/2019 – 11/2019</u>		
Instructions dated <u>June 20, 2019</u> Project No. <u>OPR-J359-KR-19</u>		
Vessel <u>M/V Pelagos (N893565), M/V Go Liberty (9555761)</u>		
Chief of party <u>Dean Moyles</u>		
Surveyed by <u>Moyles, Rokyta, Boutilier, Stone, Walker, Minton, Porter, Careen, Byas, Green, Coe, Burch, Munene</u>		
Soundings taken by echo sounder, hand lead, pole <u>Dual Head Reson T-50 (M/V Pelagos, Over the Stern Mount), Dual Head Reson 7125 (M/V Pelagos, Over the Stern Mount), Dual Head Reson 7125 (M/V Go Liberty, Over the Side Mount)</u>		
Graphic record scaled by <u>Fugro Personnel</u>		
Graphic record checked by <u>Fugro Personnel</u>		
Protracted by <u>N/A</u> Automated plot by <u>N/A</u>		
Verification by <u>Atlantic Hydrographic Branch</u>		
Soundings in <u>METERS</u> at MLLW		
REMARKS: The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. ALL TIMES ARE RECORDED IN UTC.		
FUGRO PELAGOS INC. 6100 HILLCROFT STREET HOUSTON, TX 77081		

A – Vertical Control

Multibeam vertical control for OPR-J359-KR-19 was provided by way of an Ellipsoidal Reference System which was reduced to MLLW using a separation model created with NOAA’s VDatum v3.6.1 (Figure 1 and Table 1).

During field operations, the M/V Pelagos and M/V Go Liberty sounding data were initially reduced to MLLW using a zero-tide file and merged in CARIS HIPS.

Vessel GPS data was post-processed using the Applanix POSPac PP-RTX routine to create an SBET file. Following creation, the SBETs were then applied to the data in CARIS HIPS, replacing the real-time GPS navigation position with a post-processed GPS position. The separation model was created with NOAA’s VDatum v3.6.1 and applied in CARIS HIPS using the GPS tide function to reduce the post processed ellipsoidal heights to MLLW.

VDatum reduced tidal data were used for all final CUBE Surfaces, soundings, and S-57 feature files.

There were no unusual tidal conditions to note during the OPR-J359-KR-19 survey.

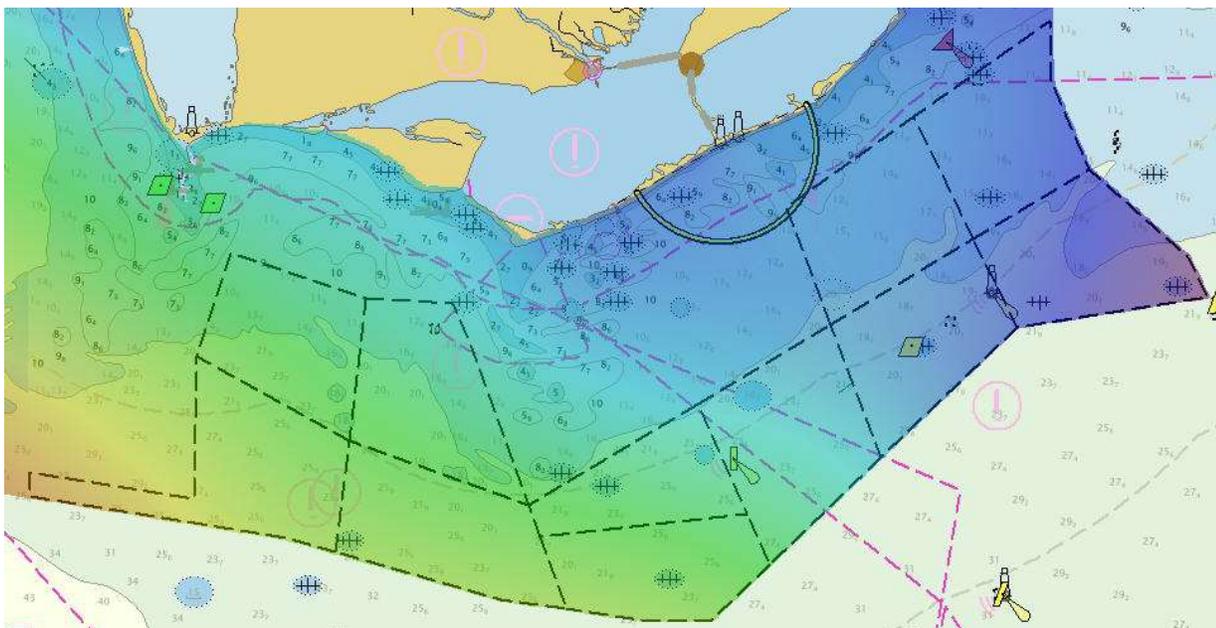


Figure 1. VDatum grid NAD83 to MLLW

VDatum Software Version	VDatum v3.6.1
Geoid	2012
Regional Area	FL apalach, AL/FL gom, FL joseph
Regional Area Version	8301
Separation Uncertainty	10.1cm

Table 1. VDatum specifications



B – Horizontal Control

The horizontal control datum for this survey is NAD83. Horizontal data for all vessels was collected in the ITRF00 coordinate system and exported to NAD83 in post processing.

For real-time data collection, the POS/MV units were configured to accept Fugro's Marinestar G2 corrections. Marinestar G2 service is a real-time GPS and GLONASS Precise Point Positioning (PPP) service providing refined satellite 'clock and orbit' data to any GNSS receiver with a valid subscription. Signals on the L-band with corrections are broadcasted by geo-stationary satellites and are received by the integrated GNSS/L-band antenna. The unit outputs corrected positions at 1 Hz to the POS units where they are integrated with inertial data. A position for the top-center of the IMU is generated, providing a horizontal accuracy of 10cm and a vertical accuracy of 15cm.

This position was logged concurrently with the bathymetry from WinFrog and the POS file using Fugro Pelagos PosMvLogger for the M/V Pelagos and M/V Go Liberty. For multibeam data, the real-time solution was later replaced with a POSpac PP-RTX post-processed solution that was applied in CARIS HIPS as an SBET.

PP-RTX is a GNSS aided-inertial module built into POSpac MMS 8.3 that provides centimeter level post processed positioning accuracies without the use of a local reference station. It uses a global network of roughly 100 stations tracking multiple positioning satellites to provide the raw data necessary to resolve ambiguities and provide ephemeris corrections which are available within 1 hour of data collection over the internet.

To ensure solution accuracy, each SBET was reviewed for quality before being applied to the data. Ideally, solutions had a separation difference under ten centimeters and were in a fixed solution for the period of acquisition. Additionally, PDOP values were confirmed to be under 3.0 and the number of satellites tracked more than five. If a solution was found to fail one or more checks, the processing project would undergo greater scrutiny and additional reprocessing until it was of sufficient quality to be applied to the data. Refer to the Data Acquisition and Processing Report for additional information on system calibrations and checks.

Approval Sheet

For

**H13281, H13282, H13283, H13284, H13285, H13286, H13287,
H13288, H13289**

As Chief of Party, Field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Horizontal and Vertical Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete, and no additional work is required.

Approved and forwarded,

Dean Moyles, (NSPS/THSOA Cert. No. 226)
Senior Hydrographer
Fugro Pelagos, Inc.
January 20, 2020



Appendix I -Tides and Water Levels

No Tides were applied to survey data.



PP-RTX

POSPac MMS™ (Mobile Mapping Suite) was used for Post Processing of all vessel horizontal and vertical positioning data. POSPac includes a post-processed implementation of Trimble's CenterPoint RTX service (Trimble's approach to PPP), which has been integrated with Applanix's IN-Fusion GNSS Aided inertial processing algorithm. PP-RTX provides centimeter level positioning worldwide, without reference stations. This proves particularly valuable in remote areas as it does not require access to CORS stations, or installation and maintenance of a local base station. Using real-time data from a global reference station infrastructure of approximately 100 stations to provide the raw data necessary for analyses and processing, it provides ephemeris corrections within 1 hour which can be used to post process navigation data.



Appendix II – Horizontal Control

No ground control stations were used.