

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.....

*Field No* OPR-J359-KR-18.....

*Registry No.* H13153, H13154, H13155, H13156, H13157,  
H13158, & F00766.....

LOCALITY

*State* Florida.....

*General Locality* Apalachicola.....

*Sublocality* Covers the regions of Cape San Blas Shoals, West of  
Saint Joseph Peninsula, South of Cape San Blas.....

\_\_\_\_\_  
2018  
\_\_\_\_\_

CHIEF OF PARTY

Dean Moyles

LIBRARY & ARCHIVES

**DATE**.....

## Title Sheet (NOAA Form 77-28)

NOAA FORM 77-28 (11-72) <div style="text-align: center; margin-top: 10px;">                     U.S. DEPARTMENT OF COMMERCE                      NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION                 </div> <div style="text-align: center; margin-top: 20px;"> <b>HYDROGRAPHIC TITLE SHEET</b> </div>	REGISTER NO.  <div style="text-align: center; margin-top: 10px;">                     H13153, H13154, H13155,                      H13156, H13157, H13158, &amp;                      F00766                 </div>
<b>INSTRUCTIONS</b> – 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.
State <u>Florida</u>	
General Locality <u>Vicinity of Apalachicola</u>	
Locality <u>Covers the regions of East, Central, West, and South Cape San Blas Shoals, and West of Saint Joseph Peninsula</u> Scale <u>1:20,000 &amp; 1:40:000</u> Date of Survey <u>07/2018 - Present</u> Instructions dated <u>July 11, 2018</u> Project No. <u>OPR-J359-KR-18</u>	
Vessel <u>M/V Pelagos (N893565), R/V Acadiana (692280), M/V MacGinitie (SAMA1083J999)</u>	
Chief of party <u>Dean Moyles</u>	
Surveyed by <u>Moyles, Rokyta, Boutilier, Walker, Stone, Jones, Cain, Kline, Fitzpatrick, Minton, Porter, Careen</u>	
Soundings taken by echo sounder, hand lead, pole <u>Dual Head Reson 7125 (M/V Pelagos, Over the Side Mount), Dual Head Reson 7125 (R/V Acadiana, Over the Side Mount), Dual Head Reson 7125 (M/V MacGinitie, Bow 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 _____	
Soundings in                      METERS at MLLW	
<b>REMARKS:</b> 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-18 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.

During field operations, the M/V Pelagos, R/V Acadiana, and M/V MacGinitie sounding data were initially reduced to MLLW using predicted tidal data from gauge 8728690 (Apalachicola, FL) 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-18 survey.

For additional information, refer to **Appendix I -Tides and Water Levels**.

**Table 1 Tide Gauges**

<b>Gauge</b>	<b>Gauge Type</b>	<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>
8728690	Acoustic	Apalachicola, FL	29° 43.5' N	84° 58.8' W

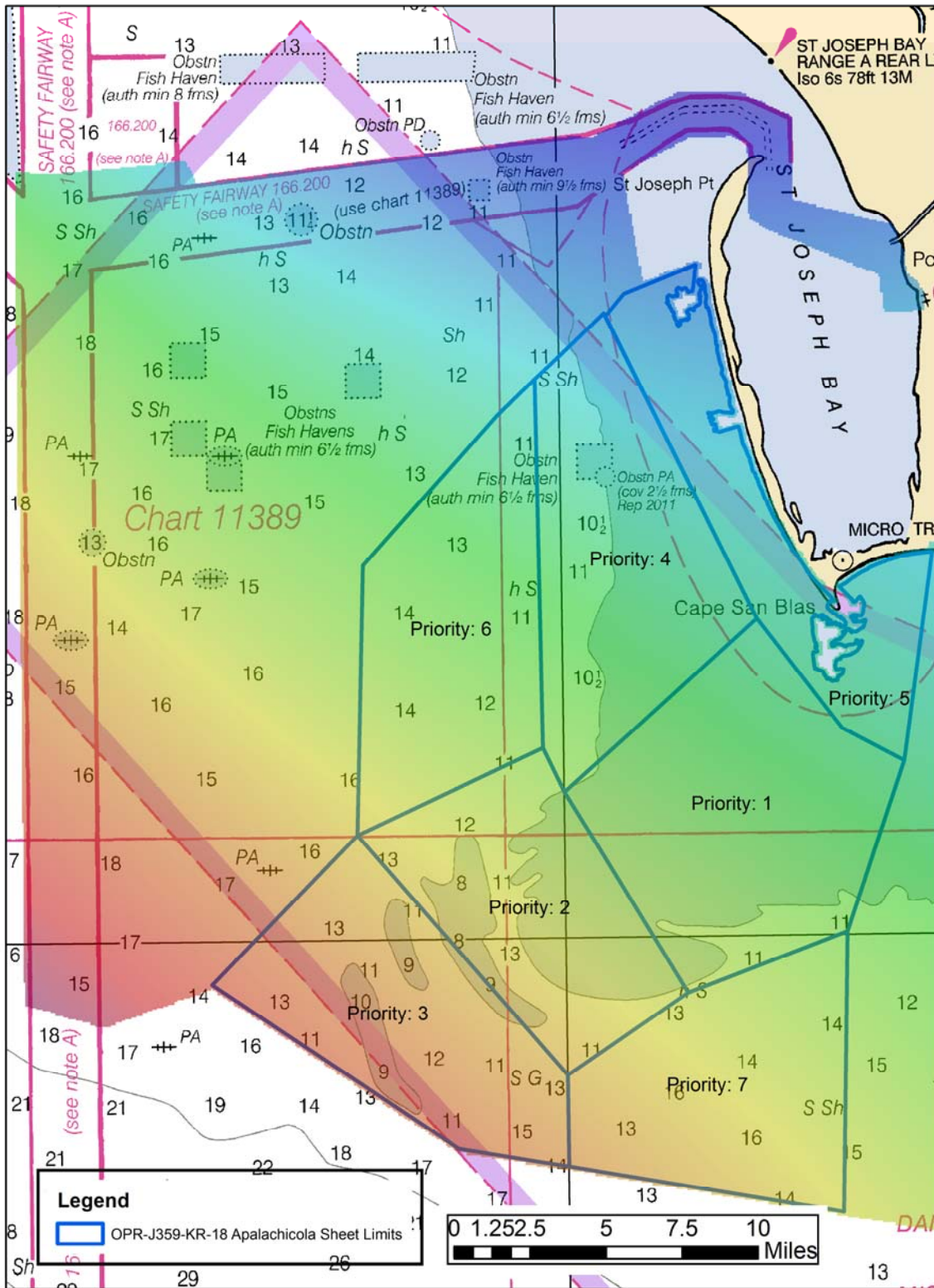


Figure 1 VDatum Grid NAD83 to MLLW



## **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 geostationary 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, R/V Acadiana, and M/V MacGinitie. 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 8.2 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.

## C – Approval Sheet

### Approval Sheet

For

**H13153, H13154, H13155, H13156, H13157, H13158, & F00766**

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.  
April 5, 2019

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Dean Moyles (ACSM Cert. No. 226)  
Senior Hydrographer

Appendix I -Tides and Water Levels

Tide Station: 8728690 Apalachicola, FL

Datums for 8728690, Apalachicola FL

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NOTICE: All data values are relative to the MLLW.

**Elevations on Mean Lower Low Water**  
 Station: 8728690, Apalachicola, FL  
 Status: Accepted (Oct 7 2011)  
 Units: Feet  
 Control Station:

Datum	Value	Description
MHHW	1.61	Mean Higher-High Water
MHW	1.51	Mean High Water
MTL	0.95	Mean Tide Level
MSL	0.91	Mean Sea Level
DTL	0.80	Mean Diurnal Tide Level
MLW	0.40	Mean Low Water
MLLW	0.00	Mean Lower-Low Water
NAVD88	0.76	North American Vertical Datum of 1988
STND	-4.29	Station Datum
GT	1.61	Great Diurnal Range
MN	1.11	Mean Range of Tide
DHQ	0.10	Mean Diurnal High Water Inequality
DLQ	0.40	Mean Diurnal Low Water Inequality
HWI	8.76	Greenwich High Water Interval (in hours)
LWI	2.61	Greenwich Low Water Interval (in hours)
Max Tide	9.33	Highest Observed Tide
Max Tide Date & Time	10/10/2018 18:12	Highest Observed Tide Date & Time
Min Tide	-1.84	Lowest Observed Tide
Min Tide Date & Time	01/18/1981 15:42	Lowest Observed Tide Date & Time
HAT	2.08	Highest Astronomical Tide
HAT Date & Time	10/08/1990 09:18	HAT Date and Time
LAT	-0.96	Lowest Astronomical Tide
LAT Date & Time	01/18/1988 15:00	LAT Date and Time

T.M.: 75  
 Epoch: 1983-2001  
 Datum: MLLW

Datums for 8728690, Apalachicola, FL  
 All figures in feet relative to MLLW

Showing datums for  
 8728690 Apalachicola, FL

Data Units  Feet  Meters

Epoch  Present (1983-2001)  Superseded (1960-1978)

**Tidal Datum Analysis Periods**

01/01/1983 - 12/31/2001

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.**