NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey **Hydrographic**

Registry No. **H11590**

LOCALITY

State/Territory Florida

General Locality Port Canaveral

Sub-locality Cape Canaveral

2006-07

CHIEF OF PARTY
David B. Elliott - Team Leader

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28U.S. DEPARTMENT OF COMMERCE (11-72)NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION **HYDROGRAPHIC TITLE SHEET**	REGISTRY NUMBER: **H11590**
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 NUMBER: N/A

State/Territory:	**Florida**		
General Locality:	**Port Canaveral**		
Sub-Locality:	**Cape Canaveral (Southeast Shoal)**		
Scale:	**1:10,000**	Date of Survey: 08 Nov, 2006 to 16 Aug, 2007	
Instructions Dated:	**14 Sep. 2006**	Project Number:	**OPR-H320-NRT2-06**
Vessel:	**NOAA Launch 1210**		
Chief of Party:	**David B. Elliott - Team Leader**		
Surveyed by:	**David Elliott, Robert Ramsey, Frank Younger & Aurel Piantanida (NRT2 personnel)**		
Soundings by:	**ODOM Echtotrac CV**		
Graphic record scaled by:	**N/A**		
Graphic record checked by:	**N/A**		
Protracted by:	**N/A**	Automated Plot:	**N/A**
Verification by:	**Atlantic Hydrographic Branch Personnel**		
Soundings in:	**Meters at MLLW**		

Remarks:

1) All Times are UTC.

2) This is a basic Hydrographic Survey under the Navigable Area Concept.

3) Projection is UTM Zone 17.

Red, bold, italic comments were added during office review.

TABLE OF CONTENTS

DESCRIPTIVE REPORT

to accompany

OPR-H320

HYDROGRAPHIC SURVEY
H11590

Scale of Survey: 1:10,000
Year of Survey: 2006-07
Navigation Response Team 2 - Launch 1210
David B. Elliott - Team Leader

A. AREA SURVEYED

This hydrographic survey was conducted in accordance with Port Letter Instructions for project OPR-H320-NRT-06, Canaveral and Ponce De Leon. The instructions are dated Sept. 14, 2006.

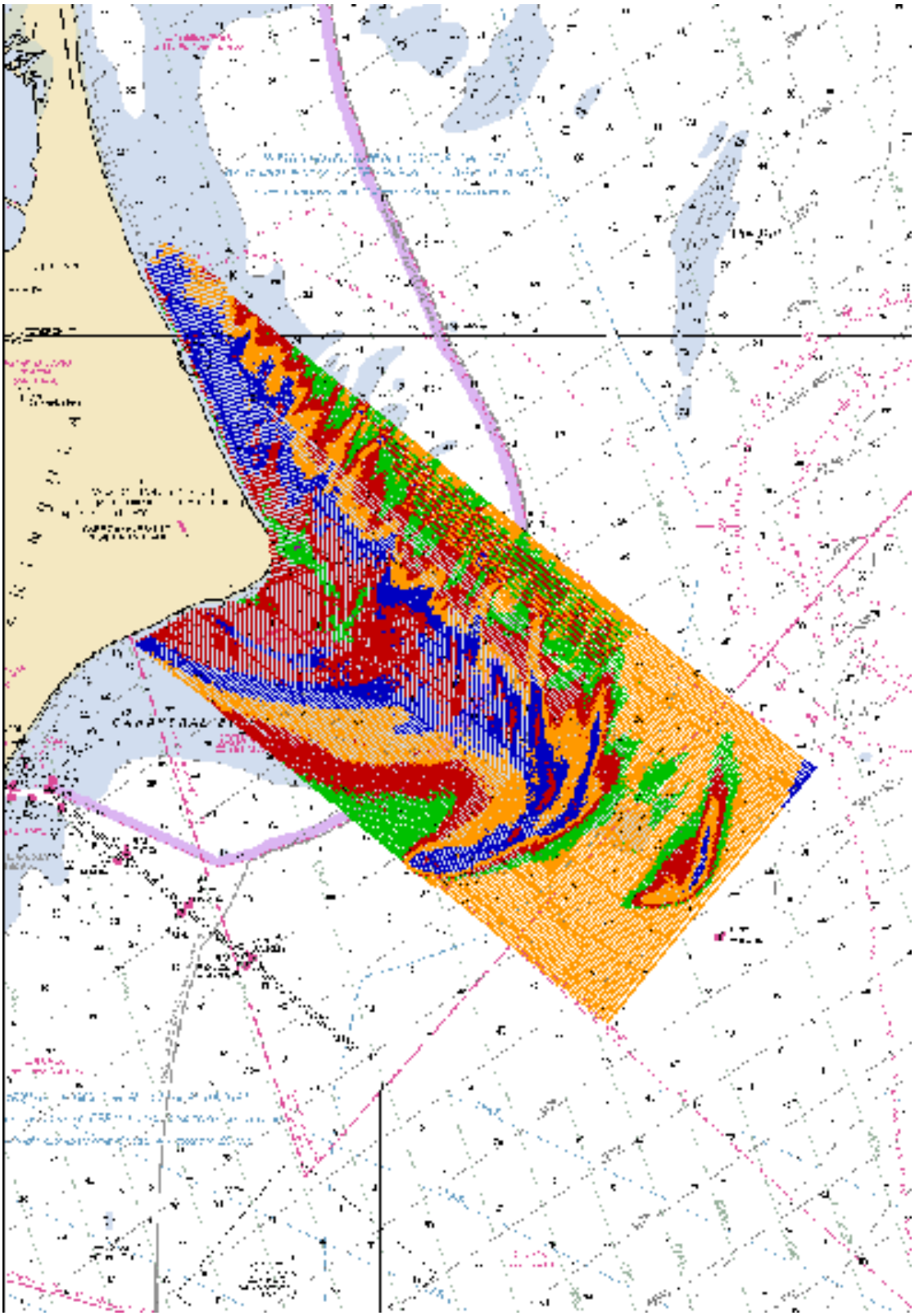
The purpose of this project is to collect new hydrography in the vicinity of Port Canaveral, and Ponce De Leon Inlet, FL. These surveys are from requests obtained by the Regional Navigation Manager. Results from the contemporary hydrography and investigations will also serve as a chart evaluation for NOS Electronic Nautical Charts (ENC). The hydrographic data from this project will help ensure navigational safety through updated critical nautical charts and provide new information for emergency response organizations to use in the event of a marine casualty or coastal storm.

This survey primarily covered the charted geographic region known as “Southeast Shoal” at Cape Canaveral, FL.

Survey Dates: Nov 8, 2006 (DN: 321) to Aug. 16, 2007 (DN: 228)

Survey limits are displayed graphically in the chartlet on the following page .

Total LNM of SB & SSS = 828.0
Total Crosslines = 56.0
Bottom Samples = 25
Total Sq NM = 18



B. DATA ACQUISITION AND PROCESSING

B.1. EQUIPMENT

Data were acquired by Navigation Response Team 2 and survey Launch 1210. The vessel was configured as described in the Data Acquisition and Processing Report (DAPR) for this project. Major data acquisition systems are summarized below.

NOAA launch 1210, a 30-foot SeaArk with a draft of 0.5 meters, was used to collect all survey data. There were no unusual vessel configurations or problems encountered with the vessel.

An ODOM EchotracCV, Fathometer, was used to collect all echo soundings on this survey.

A Klein 3000 side scan sonar, was used throughout this survey. The side scan sonar equipment was used to investigate AWOIS items.

A Trimble DGPS Beacon Receiver was used as the primary navigation station on launch 1210.

A Trimble Pathfinder ProXRS was used for all ENC high accuracy positioning and establishment of calibration points.

The Instruments used for determining corrections for the speed of sound through the water column were an ODOM Digibar Ser # 98295-020606 and a Seabird-Seacat Velocity Profiler, model 19-03, Ser# 198671-1477. CTD casts are downloaded and processed in the Velociwin program supplied by the Hydrographic Systems and Technology Program (HSTP).

B.2. QUALITY CONTROL

Following the Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables Manual, June 14, 2006 has ensured the integrity of the survey data for H11590.

Differential GPS (DGPS) was used for all hydrographic data acquired on this survey. DGPS performance checks were conducted in accordance with FPM 3.4.4 by comparing the DGPS position of the vessel to a high accuracy (1st order) calibration point weekly. ***Refer to the Evaluation Report.***

Echo Sounder Control

Lead line comparisons were conducted weekly and compared to the digital depth and draft. ***Refer to the Evaluation Report.***

Side Scan Sonar Quality Control

Daily confidence checks were conducted by observing side scan imagery in the vicinity of known contacts, such as buoys or sand waves. Side scan data were considered satisfactory if these contacts could be distinguished throughout the entire range of the side scan trace. The confidence checks were performed daily at 100/500 kHz.

A coverage of 200% was obtained wherever possible in the required survey areas and where water depth and/or hazards permitted. Side scan sonar coverage was conducted to the 12-foot depth curve and single beam reduced line spacing was performed in other areas where warranted. The towfish was deployed off the starboard quarter of the vessel, which proved very stable. Distorted images caused by strong tidal currents, or sea state, were seen periodically. Significant contacts and shadows were processed with Caris HIPS/SIPS to determine the height off the bottom. The significant contacts were then compared by position, as well as common depth and relationship to channels to determine if further investigations were needed. All areas surveyed were track line/swath line plotted to insure complete coverage.

The system frequencies used were 100 kHz and 500 kHz. The recorder was set on one of either 50/75/100-meter range scales. There were no water depths greater than 35 meters.

When operating in shoaler waters (e.g. less than 30 meters deep), a short tow was required for the Klein system. When cable-out was approximately 4 meters or less, minor degradation of the side scan imagery resulted from the Odom EchoTrack CV2 echosounder. Traces were noted due to cross-talk between the two systems.

Junctions

This survey junctions with H11531 (2006) to the south and H11533 (2007) to the east, both of which are NOAA Ship Rude surveys. Survey depths compared favorably within two to three feet in most regions. This survey also junctions with the following prior surveys:

H08343 – 1953 – North & South
H08344 – 1956 – North, South & East

B.3. CORRECTIONS TO ECHO SOUNDING

Velocwin SV and cast GP's have been inserted into the final Pydro PSS as suggested in the Field Procedures Manual.

There is one deviation to be discussed in this section.

Tide Note for Survey H-11590:

Trident Pier, station 872-1604 had missing data for periods of this survey, which resulted in the secondary gauge 872-1147 being utilized as the primary. Likewise Trident gauge became unstable in the view of the field Hydrographer over protracted periods after April 2007. This resulted in all data collected after 04/01/2007 to utilized 872-1147 as the primary. The H320NRT22006CORP-rev.zdf file was used for zoning in these instances, with the following exceptions:

DN:219 08/07/2007 utilized Station 872-1604 as primary.

Note: All days stated as using 872-1604 as the Primary gauge, likewise, used H320NRT22006CORP.zdf

C. VERTICAL AND HORIZONTAL CONTROL

The Instruments used for determining corrections for the speed of sound through the water column were an ODOM Digibar and a Seabird-Seacat Velocity Profiler. CTD casts are downloaded and processed in the Velociwin program supplied by the Hydrographic Systems and Technology Program (HSTP). Corrections were applied to the sounding plot using the Carris HIPS.

Field soundings are corrected by preliminary acoustic water level data from NOAA/CO-OPS. The Real Time Actual 6 min Tides are downloaded from: "http://co-ops.nos.noaa.gov/data_res.html", for all gauges required in the given projects defined by the ZDF file provided in the project letter, and instruction. Tide values are downloaded in blocks of data that covers the Times of Hydrography, and saved in a text file format. The MapInfo program is then used with the "HYDRO_MI" pre-Survey function, of "Create Cowlis", this function converts the text file into a Caris tide file (.tid).

All elevations and soundings on survey H11590 are based on MLLW unless otherwise specified.

A Request for Approved Tides letter was sent to <smooth.tides@noaa.gov> on August 29, 2007. (Appendix IV). ***Verified water levels and final zoning were applied during office review.***

Horizontal Control

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 17. The control reference station used for this survey was the USCG DGPS Beacon.

Horizontal dilution of precision (HDOP) was monitored on Hypack daily on the survey platform. The value never exceeded 2.5 HDOP, and adequate satellite coverage was maintained throughout the survey period. All positioning equipment was operated in a manner consistent with the manufacturer's requirements and as described in the DAPR. There were no equipment malfunctions which affected the positional quality of the data.

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

There are three charts affected by this survey:

Chart Number	Edition	Edition Date	Scale
11476	21st	July 01, 2006	1:80,000
11481	6th	Nov. 01, 2006	1:25,000
11484	23rd	Sept 1, 2006	1:80,000

ENC Cell	Last Updated	Corresponding Chart	Edition
US5FL81M	Mar 01, 2006	11481	3

Refer to the Evaluation Report

General Agreement with Charted soundings

In general survey soundings compared reasonably well with the charted soundings, however there are discrepancies within six to ten feet in many regions. All charted soundings should be superseded by this survey. ***Concur.***

The following is a list of comparisons between the survey data and charted shoals or potentially hazardous features as well as notable sounding discrepancies on the chart:

1) The offshore 18 foot shoal at 28° 23' 49.81" N, 080° 25' 47.42" W, has migrated due east approximately 370 meters and extended to the north approximately 470 meters. The shoal depth is now 14 feet at 28° 23' 39.91"N, 080° 25' 39.36"W.

2) There are numerous shoals and bars at the "Southeast shoal" that have moved and changed in shape and size.

3) An isolated 18 foot sounding at 28° 25' 16.42" N, 080° 30' 31.24" W, does not exist.

4) An isolated 17 foot sounding was found seaward of the above mentioned 18 foot sounding at 28° 24' 59.36" N, 080° 30' 05.11" W.

5) An isolated 6 foot sounding at 28° 26’ 31.27” N, 080° 32’ 26.55” W, is now reflecting depths of eight to nine feet.

The following is a list of comparisons with controlling depths, tabulated depths and reported depths of maintained channels:

None

AWOIS Item Investigations

There were four AWOIS items within the survey limits for H11590, Sheet “A”. The three “assigned” items were investigated with 200% Side Scan Sonar and VBES. One item (239) was for informational purposes only. The detailed documentation for these features can be found in the PSS in Pydro and the AWOIS database record and Appendix V.

The AWOIS item search results are as follows:

Record #	**Method**	**Recommendation**
239	Visual at MLLW	Does not exist, Remove from chart. ***Concur.***
13312	SSS/VBES	No wreck exists, Remove from chart. ***Concur.***
13313	SSS/VBES	No wreck exists, Remove from chart. ***Concur.***
53438	SSS/VBES	No wreck exists, Remove from chart. ***Concur.***

The following is a list of charted features that were investigated on H11590 that contain the label PA, ED, PD or Rep that were not assigned as AWOIS:

None

Note: There were numerous submerged obstructions identified by side scan sonar. They were developed with VBES and ten meter line spacing. None of these features were deemed significant due to their height off bottom and sounding depth correlation. Most of these submerged obstructions are abandoned buoy blocks of one cubic meter. There were five in the vicinity of Yellow Can “D”, and one in the vicinity Lighted Red Nun “4”. They pose no danger to navigation. ***Concur.***

Dangers to Navigation

There were no DTONS within the confines of H11590.

D. 2. ADDITIONAL RESULTS

Aids to Navigation and Other Detached Positions

Navigation Aids serve their intended purpose. Charted positions should be superseded by new survey positions. ***Refer to Appendix II.***

Ferry Routes

There are no Ferry routes within the confines of H11590.

Submarine Cables and Pipelines

There are two submerged cables on H11590 and they are adequately charted. ***Defer to MCD for charting disposition of cables.***

Bridge

There are no bridges within the confines of H11590.

Bottom Samples

There were twenty-five bottom samples taken on the charted descriptions throughout H11590. All of these samples compared to the charted descriptions and no changes are recommended. ***No supporting documentation was submitted with the DR.***

E. APPROVAL SHEET

OPR-H320-NRT2-06/07
Cape Canaveral, FL
Survey Registry No. H11590

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

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Submitted by: David B. Elliott 2007.08.30 18:54:01 Z

David B. Elliott - Team Leader
Navigation Response Team 2

APPENDIX I: DTON REPORTS

H11590 has no DtoNs.

APPENDIX II: SURVEY FEATURE REPORT

The following are item investigation reports detailing three groups of features:

a) AWOIS Items
b) Significant Uncharted Features
c) Non-AWOIS Charted Features & Notes

H11590 AWOIS Features

Registry Number: H11590

State: Florida

Locality: Port Canaveral

Sub-locality: Cape Canaveral

Project Number: OPR-H320-NRT2-06

Survey Date: 08/14/2007

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11481	6th	11/01/2006	1:25,000 (11481_1)	USCG LNM: 11/25/2008 (01/13/2009) NGA NTM: 07/31/1999 (01/24/2009)
11476	21st	07/01/2006	1:80,000 (11476_1)	USCG LNM: 11/25/2008 (01/13/2009) NGA NTM: 04/24/1999 (01/24/2009)
11484	23rd	09/01/2006	1:80,000 (11484_1)	USCG LNM: 09/25/2007 (01/13/2009) NGA NTM: 04/24/1999 (01/24/2009)
11480	39th	09/01/2005	1:449,659 (11480_1)	[L]NTM: ?
11460	40th	09/01/2005	1:466,940 (11460_1)	[L]NTM: ?
11451	32nd	03/01/2005	1:495,362 (11451_17)	[L]NTM: ?
11009	37th	07/01/2004	1:1,200,000 (11009_1)	[L]NTM: ?
411	51st	12/01/2006	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	ELVIRA GASPAR	AWOIS	[no data]	[no data]	[no data]	---
1.2	UNKNOWN	AWOIS	[no data]	[no data]	[no data]	---
1.3	UNKNOWN	AWOIS	[no data]	[no data]	[no data]	---
1.4	1568/1 Awois#53438 South	Wreck	1.47 m	28° 29' 41.2" N	080° 32' 28.9" W	53438

1 - DR_AWOIS

1.1) AWOIS #239 - ELVIRA GASPAR

No Primary Survey Feature for this AWOIS Item

Search Position: 28° 27' 01.0" N, 080° 31' 59.2" W

Historical Depth: [None]

Search Radius: 0

Search Technique: ##

Technique Notes: [None]

History Notes:

00239■DESCRIPTION■ 24 NO.844; TRAWLER, 185 GT,SUNK 11/22/44 BY MARINE CASUALTY; POSITION ■ ACCURACY 1-3 MILES ■ 61 11/22/44 ■■SURVEY REQUIREMENTS■NOT DETERMINED■■OPR-H320-NRT2-06, H11590,2007: The reported feature shows no signs of existance; and due to the information provided, and the reported GP, it is doubtful that any meaningful resolution exist. ■■The Hydrographer recommends that this feature be removed from any charts, and purged from the AWOIS data base.(RWR)

Survey Summary

Charts Affected: 11481_1, 11476_1, 11484_1, 11480_1, 11460_1, 11451_17, 11009_1, 411_1

Remarks:

OPR-H320-NRT2-06, H11590,2007: The reported feature shows no signs of existance; and due to the information provided, and the reported GP, it is doubtful that any meaningful resolution exist.

Feature Correlation

Address	Feature	Range	Azimuth	Status
AWOIS	AWOIS # 239	0.00	000.0	Primary

Hydrographer Recommendations

The Hydrographer recommends that this feature be removed from any charts, and purged from the AWOIS data base.(RWR)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Office Notes

Concur with clarification. The feature position is ~130m inland from the shoreline.

1.2) AWOIS #13312 - UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 28° 27' 17.6" N, 080° 28' 18.6" W

Historical Depth: [None]

Search Radius: 350

Search Technique: S2,ES,SD

Technique Notes: [None]

History Notes:

UNKNOWN SOURCE -- PD WRECK NOW CHARTED IN POSITION: 28°27'17.64" N 080°28'18.57" W (NAD 83). UPDATED 7/1/2005 JCM.■■OPR-H320-NRT2-06, H-11590,2007. 200% SSS coverage was accomplished over the required search are, resulting with NO contacts found.■■Remove the charted feature from the charts.RWR

Survey Summary

Charts Affected: 11481_1, 11476_1, 11484_1, 11480_1, 11460_1, 11451_17, 11009_1, 411_1

Remarks:

200% SSS coverage was accomplished over the required search are, resulting with NO contacts found.

Feature Correlation

Address	Feature	Range	Azimuth	Status
AWOIS	AWOIS # 13312	0.00	000.0	Primary

Hydrographer Recommendations

Remove the charted feature from the charts.

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Office Notes

Concur with clarification. No significant contacts were found.

1.3) AWOIS #13313 - UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 28° 26' 42.0" N, 080° 29' 18.0" W

Historical Depth: [None]

Search Radius: 350

Search Technique: S2,ES,SD

Technique Notes: [None]

History Notes:

LNM 44/84 (USCG DISTRICT 7) -- 73 FT TRAWLER HAS BEEN REPORTED SUMBERGED IN APPROXIMATE POSITION: 28-26-42 N, 80 29 18 W (NAD 83). UPDATED 7/1/2005 JCM.■■OPR-H320-NRT2-06, H-11590,2007. 200% SSS coverage was accomplished over the required search are, resulting with NO contacts found.■■Remove the charted feature from the charts.RWR

Survey Summary

Charts Affected: 11481_1, 11476_1, 11484_1, 11460_1, 11451_17, 11009_1, 411_1

Remarks:

200% SSS coverage was accomplished over the required search are, resulting with NO contacts found.

Feature Correlation

Address	Feature	Range	Azimuth	Status
AWOIS	AWOIS # 13313	0.00	000.0	Primary

Hydrographer Recommendations

Remove the charted feature from the charts.

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Office Notes

Concur with clarification. No significant contacts were found.

1.4) 1568/1 Awois#53438 South

Primary Feature for AWOIS Item #53438

Search Position: 28° 29' 42.8" N, 080° 32' 28.9" W

Historical Depth: [None]

Search Radius: 350

Search Technique: S2,ES,SD

Technique Notes: [None]

History Notes:

****UNKNOWN SOURCE-- ADDED TO CHART BY UNKNOWN SOURCE BEFORE 1969.■■OPR-H320-NRT2-06, H-11590,2007. 200% SSS coverage identified the remains of the wreck, in two major portions.■■Recommend retain as charted.RWR

Survey Summary

Survey Position: 28° 29' 41.2" N, 080° 32' 28.9" W

Least Depth: 1.47 m (= 4.82 ft = 0.804 fm = 0 fm 4.82 ft)

TPU (±1.96σ): **THU (TPEh)** ±-1.000 m ; **TVU (TPEv)** ±-1.000 m

Timestamp: 2007-226.16:39:06.432 (08/14/2007)

Survey Line: h11590 / nrt2_1210_sb / 2007-226 / 005_1636

Profile/Beam: 1568/1

Charts Affected: 11484_1, 11480_1, 11460_1, 11451_17, 11009_1, 411_1

Remarks:

[None]

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11590/nrt2_1210_sb/2007-226/005_1636	1568/1	0.00	000.0	Primary
h11590/nrt2_1210_klein3000hf_200sss/2007-226/sss070814165200	0001	4.73	325.6	Secondary
h11590/nrt2_1210_sb/2007-226/005_1636	1605/1	7.27	185.1	Secondary (grouped)
h11590/nrt2_1210_klein3000hf_100sss/2007-226/sss070814163600	0001	9.48	184.1	Secondary
AWOIS	AWOIS # 53438	50.92	179.1	Secondary

Hydrographer Recommendations

Retain as charted

Cartographically-Rounded Depth (Affected Charts):

5ft (11484_1, 11451_17)

0 ¾fm (11480_1, 11460_1, 11009_1, 411_1)

S-57 Data

Geo object 1:	Wreck (WRECKS)
Attributes:	TECSOU - 1,2:found by echo-sounder,found by side scan sonar
	VALSOU - 1.470 m

Office Notes

Concur with clarification. The feature is the least depth on a charted dangerous wreck of unknown depth. Delete the charted dangerous wreck of unknown depth, and chart the current feature as a dangerous wreck of known depth.

Feature Images

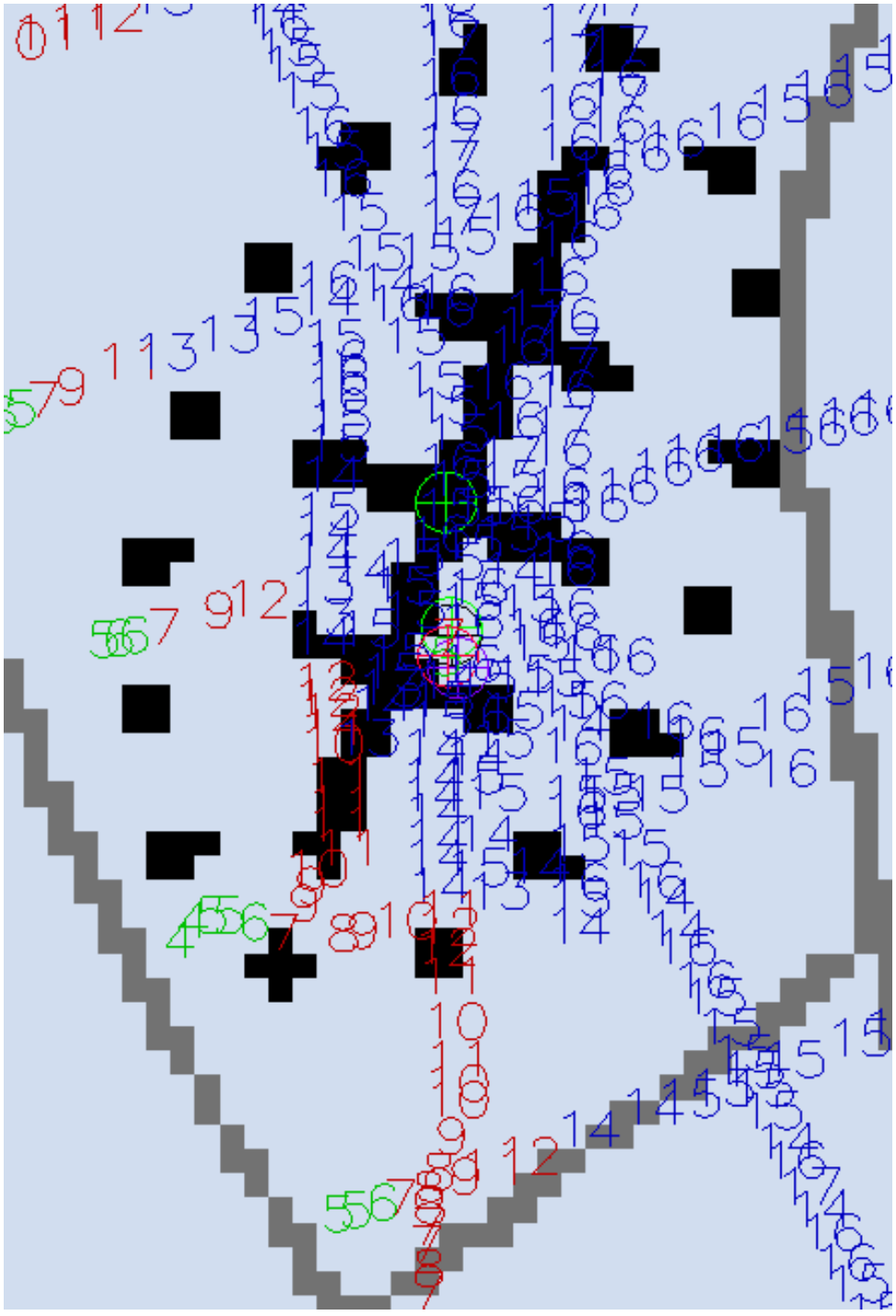
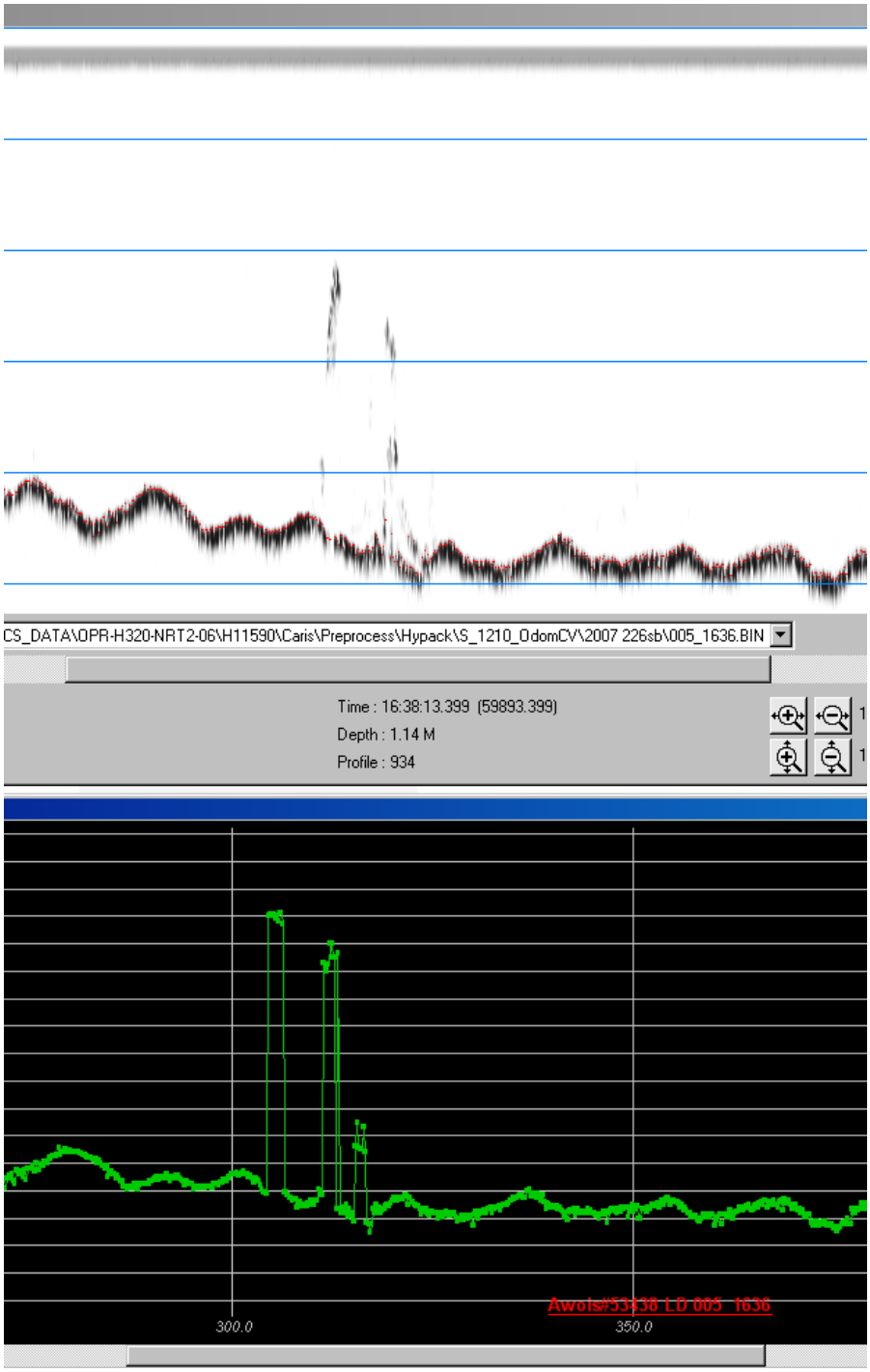


Figure 1.4.1

[Image file h:/compilation/h11590_h320-nrt2/ahb/pss/sb snagit/awois# 53438 sss 1.png does not exist.]

[Image file h:/compilation/h11590_h320-nrt2/ahb/pss/sb snagit/awois# 53438 sss 2.png does not exist.]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Time : 16:38:13.399 (59893.399)
Depth : 1.14 M
Profile : 934
Awois#53438 LD 005_1636
300.0
350.0

Figure 1.4.2

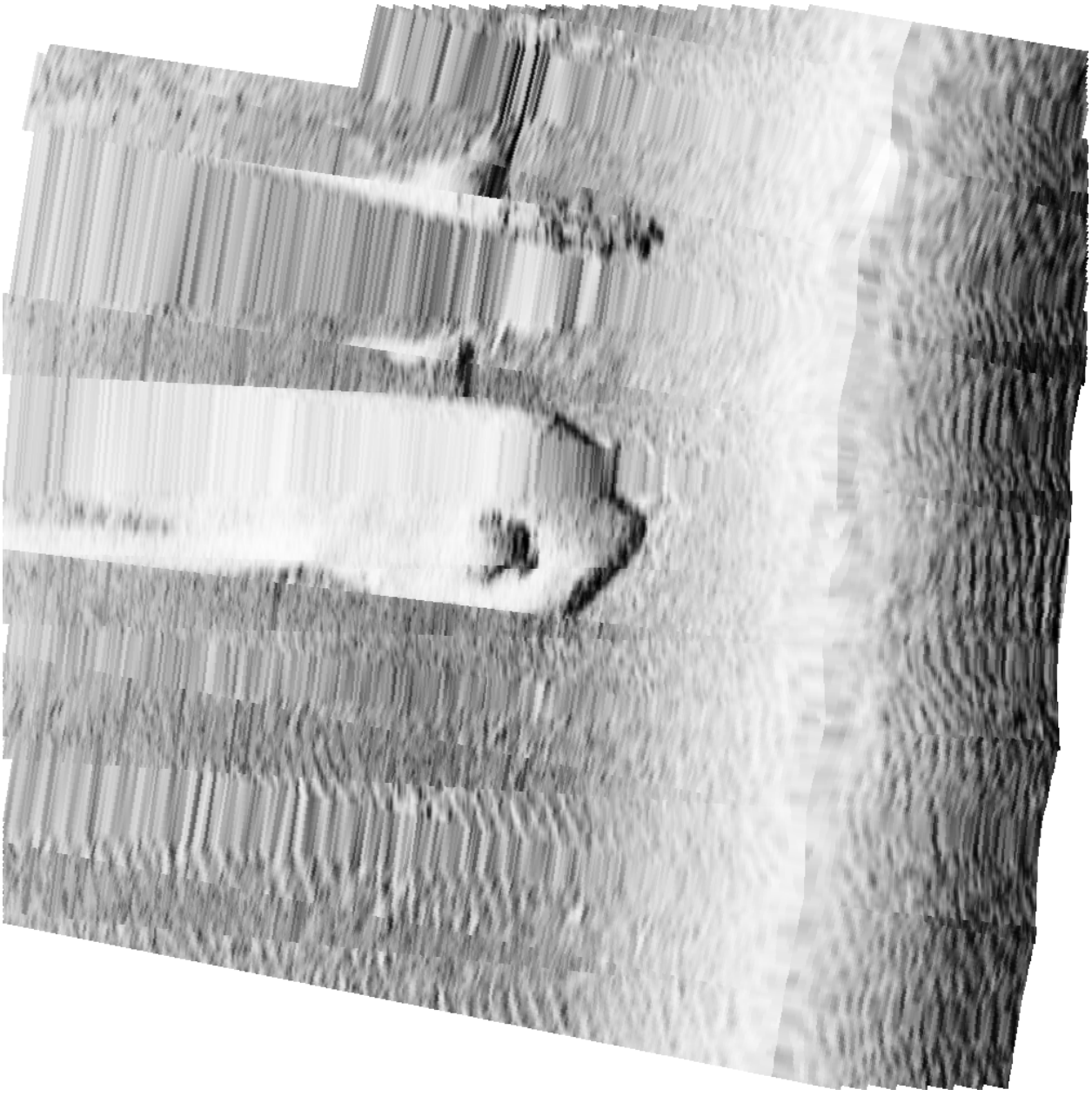


Figure 1.4.3

H11590 Charted Features

Registry Number: H11590
State: Florida
Locality: Port Canaveral
Sub-locality: Cape Canaveral
Project Number: OPR-H320-NRT2-06
Survey Date: 08/16/2007

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11481	6th	11/01/2006	1:25,000 (11481_1)	USCG LNM: 11/25/2008 (01/13/2009) NGA NTM: 07/31/1999 (01/24/2009)
11476	21st	07/01/2006	1:80,000 (11476_1)	USCG LNM: 11/25/2008 (01/13/2009) NGA NTM: 04/24/1999 (01/24/2009)
11484	23rd	09/01/2006	1:80,000 (11484_1)	USCG LNM: 09/25/2007 (01/13/2009) NGA NTM: 04/24/1999 (01/24/2009)
11480	39th	09/01/2005	1:449,659 (11480_1)	[L]NTM: ?
11460	40th	09/01/2005	1:466,940 (11460_1)	[L]NTM: ?
11451	32nd	03/01/2005	1:495,362 (11451_17)	[L]NTM: ?
11009	37th	07/01/2004	1:1,200,000 (11009_1)	[L]NTM: ?
411	51st	12/01/2006	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	YC Bouy " D" USCG LL#640	Shoal	11.65 m	28° 27' 37.6" N	080° 28' 08.5" W	---

1 - DR_Charted

1.1) YC Bouy " D" USCG LL#640

Survey Summary

Survey Position: 28° 27' 37.6" N, 080° 28' 08.5" W

Least Depth: 11.65 m (= 38.22 ft = 6.369 fm = 6 fm 2.22 ft)

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

Timestamp: 2007-228.13:30:27.000 (08/16/2007)

DP Dataset: h11590 / nrt2_1210_dpnonechosounder / 2007-228 / 08162007 aton

Profile/Beam: 1/1

Charts Affected: 11481_1, 11476_1, 11484_1, 11480_1, 11460_1, 11451_17, 11009_1, 411_1

Remarks:

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11590/nrt2_1210_dpnonechosounder/2007-228/08162007 aton	1/1	0.00	000.0	Primary
h11590/nrt2_1210_klein3000hf_200sss/2007-219/sss070807143600	0001	12.47	319.7	Secondary
h11590/nrt2_1210_klein3000hf_100sss/2007-205/sss070724175200	0001	15.54	298.7	Secondary

Hydrographer Recommendations

QUA: GPSmode=2, SVs=9, HDOP=1.00

Cartographically-Rounded Depth (Affected Charts):

38ft (11481_1, 11476_1, 11484_1, 11451_17)

6 ¼fm (11480_1, 11460_1, 11009_1, 411_1)

S-57 Data

Geo object 1: Buoy, special purpose/general (BOYSPP)

Attributes: BOYSHP - 2:can (cylindrical)

CATSPM - 1:firing danger area mark

COLOUR - 6:yellow

CONRAD - 1:radar conspicuous

INFORM - Cape Canaveral Danger Zone

OBJNAM - Y C "D"

Office Notes

Defer to MCD for charting disposition. The surveyed position of the Y C "D" buoy is ~75m from the charted position.

Feature Images

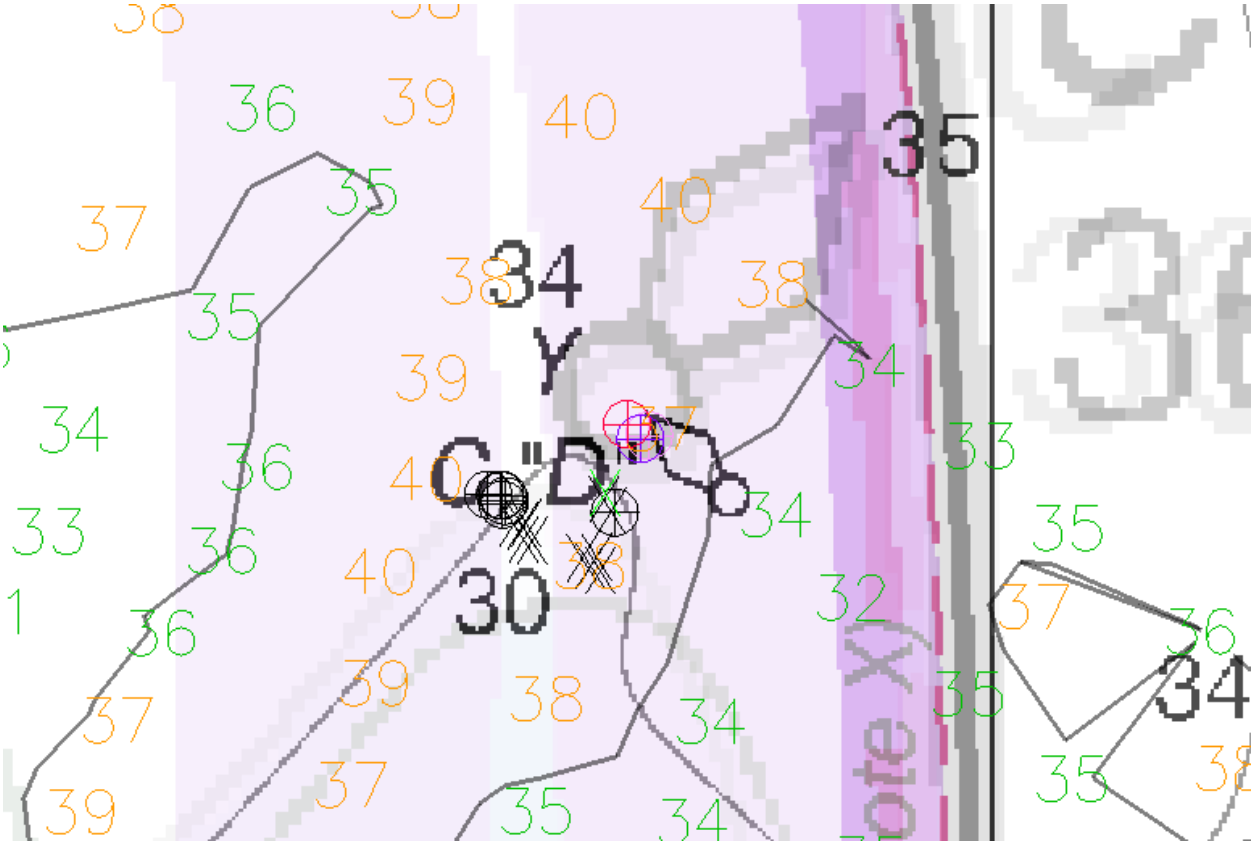


Figure 1.1.1

APPENDIX III: PROGRESS SKETCH

No progress sketch was submitted.

APPENDIX IV: TIDES AND WATER LEVELS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA NRT-2 (N/CS53x2)
800 Scallop Dr, c/o Cape Marina
Cape Canaveral, FL 32920

August 29, 2007

MEMORANDUM FOR: Chief, Requirements and Development Division, N/OPS1

FROM: D.B. Elliott, NOAA NRT-2 (N/CS53x2)

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final zoning in MapInfo and .MIX format
3. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

NOAA/NOS/Atlantic Hydrographic Branch
N/CS33, Building #2
439 West York Street
Norfolk, VA 23510
ATTN: Chief AHB

These data are required for the processing of the following hydrographic survey:

Project No.:	OPR-H320-NRT2-06
Registry No.:	H11590
State:	Florida
Locality:	Port Canaveral
Sublocality:	Cape Canaveral

Attachments containing:

1) an Abstract of Times of Hydrography,
2) digital MID MIF files of the track lines from Pydro

cc: N/CS33

Year_DOY	Min Time	Max Time
2006_312	14:35:01	18:34:31
2006_352	14:44:55	18:14:48
2007_016	14:39:00	18:49:32
2007_018	14:52:00	14:52:00
2007_022	13:54:21	14:45:00
2007_023	13:40:20	18:02:24
2007_024	13:34:13	18:42:48
2007_039	15:35:26	19:00:49
2007_065	14:04:44	18:41:50
2007_072	12:52:35	15:55:20
2007_093	12:39:09	18:40:27
2007_094	13:11:45	15:21:29
2007_099	13:42:00	19:04:37
2007_100	12:59:09	17:14:26
2007_102	13:36:27	17:25:56
2007_108	12:52:00	18:42:44
2007_163	13:21:00	17:35:22
2007_164	13:16:08	18:08:33
2007_170	14:41:00	17:53:16
2007_192	12:57:00	18:19:03
2007_193	13:40:56	18:33:03
2007_194	13:58:25	17:29:22
2007_204	13:59:00	18:14:56
2007_205	13:01:51	18:36:51
2007_206	12:34:23	18:27:22
2007_219	13:40:00	20:11:36
2007_220	12:58:25	17:42:59
2007_221	12:57:01	19:10:05
2007_222	12:59:22	18:31:54
2007_225	12:35:51	18:39:00
2007_226	12:56:47	18:10:11
2007_227	12:37:50	18:03:42
2007_228	12:45:25	14:38:21

UNITED STATES DEPARMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : September 14, 2007

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-H320-NRT2-2006
HYDROGRAPHIC SHEET: H11590

LOCALITY: Cape Canaveral, FL

TIME PERIOD: November 8 - 18, 2006
January 16 - August 16, 2007

TIDE STATION USED: 872-1604 Trident Pier, FL
Lat. 28° 24.9'N Long. 080° 35.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.105 meters

TIDE STATION USED: 872-1147 Ponce De Leon,FL
Lat. 29° 03.8' N Long. 080° 54.9' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.880 meters

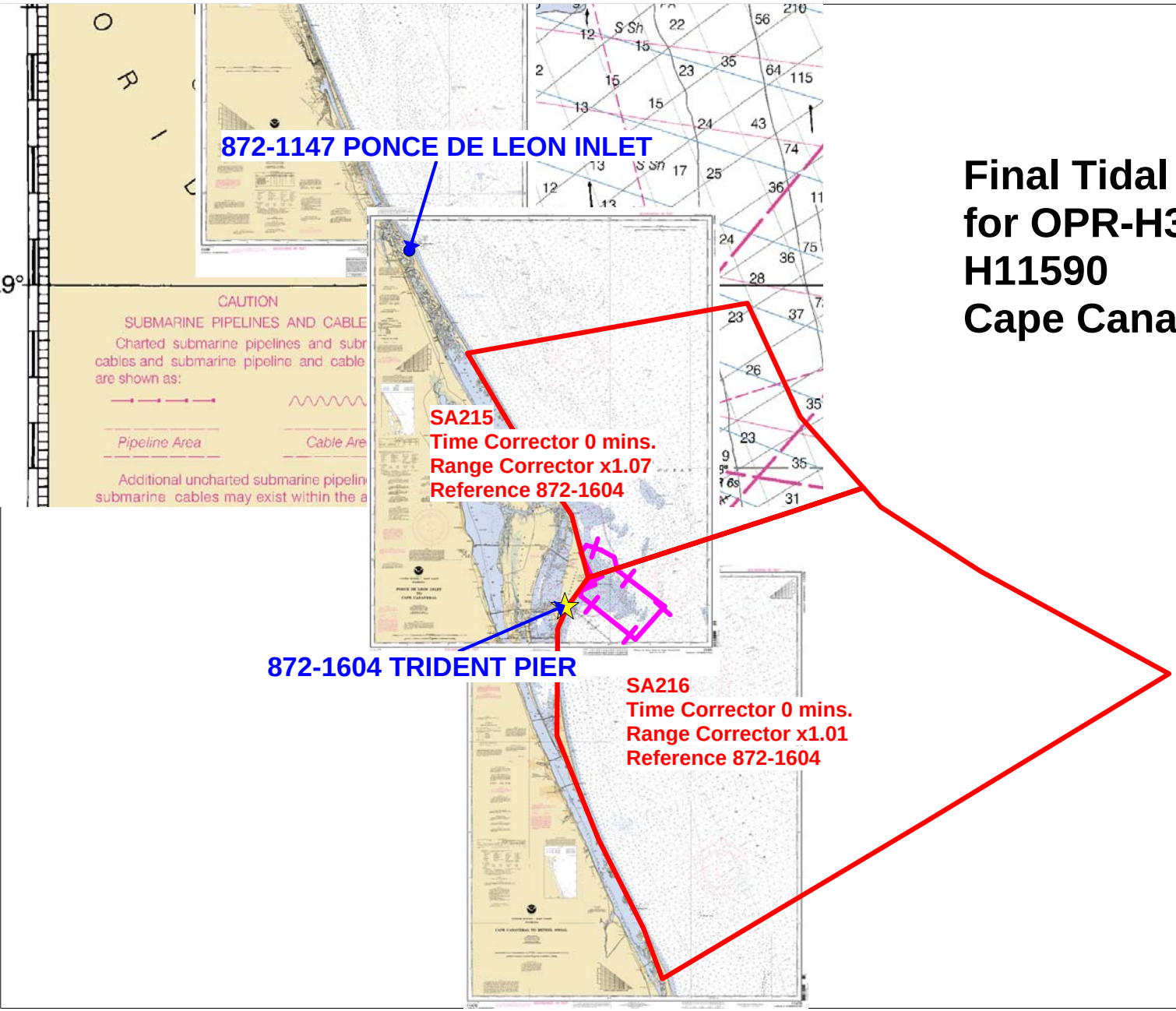
REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SA215 & SA216

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector file (*.ZDF). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

_____
CHIEF, PRODUCTS AND SERVICES DIVISION



Final Tidal Zoning for OPR-H320-NRT2-2006 H11590 Cape Canaveral, FL

APPENDIX V: SUPPLEMENTAL RECORDS & CORRESPONDENCES

U.S. Coast Pilot 4, 37th Ed., 2005
Chapter 10, Page 409 - Paragraph 44 through Page 413 – Paragraph 101
Reviewed through LNM 20/06, CGD7

Chart 11484

(44)

From Ponce de Leon Inlet to False Cape the coast is straight. The 5-fathom curve is about 0.5 mile offshore for a distance of 24 miles. Beyond this distance dangerous shoals, wrecks, and numerous fish havens will be found up to 15 miles offshore.

(45)

Ponce de Leon Inlet (see chart 11485) is 53 miles southward of St. Augustine Light and 41 miles northwestward of Cape Canaveral Light. It is used by both recreational and small commercial vessels bound for New Smyrna Beach or Daytona Beach, as well as others entering for an anchorage.

(46)

Ponce de Leon Inlet Light (29º04'48"N., 80º55'42"W.), 159 feet above the water, is shown from a red brick conical tower on the north side of the inlet.

(47)

The inlet, protected at the entrance by jetties, is entered through a channel that leads over a bar and through the jetties. The outer end of the north jetty is marked by a light, and the inner end of the jetty is awash. In June 2002, severe shoaling existed across the entire channel. Mariners are advised that due to constant shifting of the channel, passage through the inlet is not recommended; buoys marking the channel may not be marking the best water. Safe navigation is also hampered by numerous recreational fishing vessels that anchor inside the north jetty. Local knowledge and extreme caution is advised. To prevent silting, a weir is at the inshore end of the north jetty and an impoundment basin is close southward. The current through the inlet is strong. It is reported that the average ebb is 3 knots, however, this can increase to 5 or 6 knots with southeasterly winds. The mean range of tide is 2.3 feet, and high water occurs about the same time as at Mayport.

(48)

Inside the inlet, three channels lead to the Intracoastal Waterway; northward through Halifax River, westward through **Rockhouse Creek**, and southeastward through Indian River North. The channels through Halifax River and Indian River North are marked by buoys. In July 2003, the controlling depth was 4.5 feet (6.3 feet at midchannel); thence in 1986, the midchannel controlling depth in Rockhouse Creek was 7 feet; thence in July 2003, the controlling depth was 12.0 feet to the Intracoastal Waterway by way of Indian River North.

(49)

Ponce de Leon Inlet Coast Guard Station is on the south side of the entrance to Ponce de Leon Inlet. Supply and repair facilities inside the inlet are described in chapter 12.

(50)

The Intracoastal Waterway is just inside the entrance to Ponce de Leon Inlet, passing through Halifax River from the north and Indian River North from the south.

(51)

About 10 miles southward of Ponce de Leon Inlet is **Turtle Mound,** a prominent hill 50 feet high. It is under the protection of the Florida State Historical Society. The original Indian name was **Mount of Surruque**. It was charted on Florida maps in 1564. Spanish galleons stopped here for repairs, wood, and water.

(52)

Eldora is a fishing camp 11.5 miles southward of Ponce de Leon Inlet.

(53)

False Cape, about 7.5 miles northward of Cape Canaveral Light, is the name given to a small part of the coast which it resembles when seen from seaward.

(54)

The **John F. Kennedy Space Center** and the **Cape Canaveral Air Force Station** occupy most of **Canaveral Peninsula** and **Merritt Island,** the large land areas between the ocean and the Banana and Indian Rivers, from Mosquito Lagoon on the north to Port Canaveral on the south. The huge Vehicle Assembly Building at the center, said to be one of the world's largest buildings, is visible far from shore. When closer in, other buildings and the mobile service towers at the cape are also conspicuous from all directions.

(55)

Trawlers or other vessels should exercise caution while dragging the ocean floor within a 40-mile radius of Cape Canaveral because missile debris containing unexploded ordnance exists in the area.

(56)

Ordnance disposal personnel occasionally detonate explosives on the beaches in the vicinity of the cape.

(57)

Cape Canaveral, where the coast makes a sharp bend westward, is low and sandy. The shore in the vicinity of the cape is constantly moving eastward. **Cape Canaveral Light** (28°27'37"N., 80°32'36"W.), 137 feet above the water, is shown from a white and black horizontally banded conical tower 1 mile inshore from the cape.

(58)

A **Security Zone** has been established to include certain land and water areas at Port Canaveral and adjacent areas at Kennedy Space Center and Cape Canaveral Air Force Station. (See **165.1 through 165.7, 165.30, 165.33, 165.701, and 165.705**, chapter 2, for limits and regulations.) During certain operations the Security Zone may be temporarily expanded. (See Local Notice to Mariners.)

Comment [RWR1]: The "not recommended" note should be removed.

Comment [RWR2]: Buoys were positioned that accurately mark the channel "at present". These buoy are continually repositioned by the USCG ATON team at Station Ponce Inlet.

Comment [RWR3]: Remove this silting weir reference, as it does not exist.

Comment [RWR4]: Two channels lead to the ICW, one to the south and one through the Inlet Harbor to the North.

Comment [RWR5]: Rockhouse Creek is not navigable, to any vessels, drafting more than 3 feet at mllw, as this pass is shoaled in at the east.

Comment [RWR6]: In 2007 Survey H-11591 survey data should supercede all sounding remarks at this point.

Comment [RWR7]: Current charts reflect a Security Zone restricting access from shore to 3LNM seaward, throughout much of this area. Refer to the charts notices.

Comment [RWR8]: This Lighthouse was positioned during the survey F-00520, 2007 to high order accuracy.

(59)

Shoals extend 13 miles north and northeast from Cape Canaveral; mariners should use care when in the vicinity of the shoals. The outer shoals consisting of **Hetzel Shoal, Ohio Shoal,** and **The Bull** have a least depth of 11 feet. The inner shoals consisting of **Chester Shoal** and **Southeast Shoal** have depths of 2 to 18 feet. A lighted whistle buoy is 2.5 miles northeast of Hetzel Shoal. A lighted buoy is off the southeast end and along the south side of Southeast Shoal. In a heavy sea the shoals are marked by breakers, but with a smooth sea there is nothing to indicate them except their relative positions to Cape Canaveral Light and the lighted buoys. Only small light-draft vessels in calm seas should pass inside the outer shoals.

(60)

Several wrecks are east of Cape Canaveral within 13 miles of the shore. They have been cleared by a wire drag to a least depth of 43 feet. An unmarked sunken wreck is north of Ohio Shoal in about 28°39.7'N., 80°23.3'W.

(61)

The effect of the Gulf Stream may be expected well in on the shoals, and this should be kept in mind in approaching the cape from the south. In approaching the cape, stay in at least 15 fathoms from the south and at least 13 fathoms from the north to avoid the shoals.

(62)

A **danger zone** for missile testing extends 3 miles offshore from False Cape to the entrance to Port Canaveral. (See **334.590**, chapter 2, for limits and regulations.) **Canaveral Bight,** on the south side of the cape, is in the danger zone.

Charts 11478, 11481

(63)

Port Canaveral (Canaveral Harbor) is 4 miles southwest of Cape Canaveral Light and 150 miles south of the entrance to the St. Johns River. The city of **Cape Canaveral** is just southward of the port. The principal commodities handled in the harbor are petroleum products, cement, asphalt, salt, general cargo, citrus products, and newsprint. Commercial party fishing vessels, cruise ships, and many pleasure crafts operate from the port.

COLREGS Demarcation Lines

(64)

The lines established for Port Canaveral are described in **80.727**, chapter 2.

Channels

(65)

A U.S. Navy project for Port Canaveral provides for an entrance channel 44 feet deep to East Basin, thence 41 feet in East Basin. A Federal project provides for a channel 40 feet deep from East Basin to Middle Basin, thence 35 feet deep in Middle Basin, thence 31 feet deep from Middle Basin to West Basin, and thence 31 feet in West Basin. The harbor is maintained at or near project depths. (See Notice to Mariners and latest edition of chart for controlling depths.) The entrance to the harbor is protected by jetties. The approach channel is marked by white **310°** lighted range and lighted buoys; the entrance channel between the jetties is marked by a green **270°** lighted range, a light, and lighted and unlighted buoys. The entrance to East Basin is marked by a red **325°30'** lighted range. Canaveral Barge Canal leads westward to Banana River and the Intracoastal Waterway from the western end of the harbor just west of West Basin entrance. (See also chart 11484 and chapter 12.)

Comment [RWR9]: NO unlighted buoys exist, all are lighted.

Caution

(66)

The National Marine Fisheries Service has advised that the sea turtles and manatees which inhabit the Port Canaveral area are considered to be threatened and endangered species. In order to protect these turtles and manatees, its is requested that excursions from the centerline of the approach and entrance channels be held to a minimum.

North Atlantic Right Whales

(67)

Approaches to Port Canaveral lie within designated critical habitat for endangered North Atlantic right whales (See **50 CFR 226.203(c)**, chapter 2). The area is a calving ground from, generally, December through March. It is illegal to approach right whales closer than 500 yards. (See **50 CFR 224.103(c)**, chapter 2 for limits, regulations, and exceptions.) Special precautions may be needed to protect and avoid these animals. (See North Atlantic right whales, indexed as such, chapter 3.)

(68)

Small craft should stay clear of large vessels entering, leaving, or maneuvering in the harbor.

Dangers

(69)

The Navy pier on the east side of Middle Basin is within a **restricted area**, and East Basin is within a **danger zone**. (See **334.530 and 334.600**, chapter 2, respectively, for limits and regulations.)

Comment [RWR10]: ALL areas north of the harbor channel are within defined Security Zones A, B; and a restricted are in the East side of Middle Basin. West Basin has a total Security zone in effect when Cruise Ships are in.

Weather, Port Canaveral and vicinity

(70)

Tropical cyclones are a threat from about June through November. There are roughly four peak periods within this season. A slight maximum occurs in early June while more defined peaks occur in early August, early September and mid-

October. The probability of at least one occurrence of gales from a tropical cyclone in 1 year is about 36 percent while the chance of two occurrences drops to 6 percent.

(71)

Windspeeds of 17 knots or more are most likely from October through April when they occur 3 to 7 percent of the time at Cape Canaveral and 10 to 17 percent of the time at Patrick Air Force Base, about 13 miles south of the port. Thunderstorms are observed on about 70 days annually with a peak of 10 to 15 days per month from June through September. These are most likely during the late afternoon and early evening. Visibility is generally good, outside of showers. However, in December, January, and February, visibility drops below 0.5 mile (0.9 km) on about 2 to 4 days per month; they usually improve by midmorning. Temperatures only reach 90°F (32.2°C) or more on about 16 to 18 days annually but climb into the 80's (27.2° to 32.2°C) range on a little less than 200 days each year. Freezing temperatures are recorded just once or twice per year, on the average.

Pilotage, Port Canaveral

(72)

A State pilot is compulsory for all foreign flag vessels and all U.S. vessels under registry with a draft of 7 feet or greater. Certain U.S. vessels under enrollment are required to carry a federal pilot. A state pilot is required for all vessels over 500 gross tons docking or undocking at Canaveral Port Authority docks, unless specifically exempted by the Port Director. Pilotage for U.S. and foreign naval vessels is provided in accordance with an agreement between the U.S. Navy and the Canaveral Pilots Association. All Canaveral Pilots Association pilots are fully licensed by the state and federal governments.

(73)

Canaveral Pilots Association office is in a white mobile home at 9060 Herring Street, Port Canaveral, Florida. The mailing address is: P.O. Box 0816, Cape Canaveral, Florida 32920-0816; telephone 321-783-4645 (office and residences), FAX 321-783-6268 (office only). The office monitors VHF-FM radiotelephone channel 12. Pilot service is available to all vessels. Canaveral Pilots Association serves the channels and basins of Port Canaveral; the pilots also dock and undock vessels.

(74)

The Canaveral Pilots Association has two pilot boats, PILOT 1 and PILOT 2, both 40 feet long with a black hull and white superstructure and the word PILOT on the side. The pilot boats display a white light over a red light at night and the International Code flag HOTEL by day. Pilots board about 1 mile southeast of Canaveral Harbor Approach Channel Lighted Whistle Buoy 3 (28°22'30"N., 80°31'48"W.) unless special arrangement for boarding elsewhere has been made. Vessels should maintain a speed of about 6 to 8 knots and provide a pilot ladder about 1 meter above the water.

(75)

Arriving vessels should advise the Port Authority, telephone 321-783-7831, and the pilots if they are close to or at the maximum allowable draft and/or if they have any defects or special needs. Port Authority will assign berths and provide line handlers. Pilots will arrange for tug services.

(76)

Request for pilot service by FAX is discouraged, as the pilot station is not staffed 24 hours daily. Arrangements can be made by telephone directly or through the Canaveral Port Authority. A 24 hours ETA notice is requested. When working, pilots use VHF-FM channel 12, and the boats monitor channels 12 and 16.

(77)

Reduced visibility affects pilot service. Operational guidelines (not in this text) established pursuant to Florida law and in conjunction with marine interests in the port state that vessels are not to maneuver on the channels and basins of the port if visibility is less than 0.5 nautical mile.

(78)

The Canaveral Pilots Association participates in the North Atlantic right whale Early Warning System. (See North Atlantic right whales, indexed as such, chapter 3.)

Towage

(79)

Three conventional tugs, two 2,000 hp and one 2,150 hp, and one tractor tug 3,600 hp are available at the port. All tugs monitor VHF-FM channels 12 and 16.

Quarantine, customs, immigration, and agricultural quarantine

(80)

(See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(81)

Quarantine is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(82)

Port Canaveral is a **customs port of entry.**

(83)

Port Canaveral Coast Guard Station is at the northeast corner of West Basin.

Harbor regulations

(84)

The Canaveral Port Authority has jurisdiction and control over port areas and facilities not under the control of the federal government. Vessels are ranked for movement priority. Emergency movements are first priority. Naval vessels engaged in demonstration and shakedown operations and regularly calling cruise ships have second priority. Generally all other vessels move on a first come, first served basis. Port regulations are contained in the Port Authority tariff. In addition, Operational

Guidelines for the port have been promulgated by the Port Authority in consultation with the U.S. Coast Guard, U.S. Navy, U.S. Army Corps of Engineers, other interested parties and the pilots. Copies of both publications are available from Canaveral Port Authority, P.O. Box 267, Cape Canaveral, Florida 32920-0267; see pilotage (previously mentioned) for telephone number. The Port Authority enforces regulations and assigns berths.

(85)

Radio transmissions are not allowed during missile launchings.

Wharves

(86)

Port Canaveral has commercial berths owned by the Port Authority. Middle and West Basins are used by commerical vessels as well as at the north and south sides of the Inner Reach; cruise ships usually berth in the West Basin. Canaveral Port Authority maintains an internet website at www.portcanaveral.org. This internet site provides descriptions of port facilities and maximum allowable drafts. Pilots also provide information on allowable drafts. Information about facilities is also published in the U.S. Army Corps of Engineers Port Series No. 16 (See appendix for address.)

(87)

Facilities on the south side of Inner Reach:

(88)

Canaveral Port Authority, Cruise Terminals Nos. 2 and 3 Wharf (28°24'33"N., 80°36'00"W.): 1,403-foot face; 31.5 to 33 feet alongside; deck height, 10.5 feet; mooring cruise vessels; boarding passengers; owned and operated by Canaveral Port Authority.

(89)

Canaveral Port Authority, Cruise Terminals No. 4 (28°24'33"N., 80°35'46"W.): 750-foot face; 31.5 to 33 feet alongside; deck height, 10.5 feet; mooring cruise vessels; boarding passengers; owned and operated by Canaveral Port Authority. (Cruise Terminals 2, 3 and 4 form a continuous berth, 2,153 feet long.)

(90)

Canaveral Port Authority, South Cargo Piers 1, 2, and 3 (28°24'36"N., 80°36'20"W.): 1,615-foot face; 34 feet alongside; deck height, 10 feet; 108,000 square feet covered storage; 26 acres open storage; 2.5 million cubic feet cold storage; pipelines extend to storage tanks, 257,000-barrel capacity; roll-on/roll-off ramp at the east end of Pier 1; receipt and shipment of general cargo; receipt and shipment of petroleum products at Pier 3; receipt of paper products, asphalt; shipment of perishable food commodities; bunkering vessels; mooring pilot boats; owned by Canaveral Port Authority and operated by Canaveral Port Authority; Coastal Fuels Marketing, Inc.; and Mid-Florida Warehouses, Ltd.

(91)

Canaveral Port Authority, Tanker Berth No. 1 (28°24'34"N., 80°36'32"W.): 45-foot face; 340 feet of berthing space with dolphins; 36 to 38 feet alongside; deck height, 10 feet; storage silo for 32,000 tons of cement; pipelines extend from wharf to storage tanks, 257,000-barrel capacity; receipt of petroleum products; asphalt, and cement; bunkering vessels; owned by Canaveral Port Authority and operated by Coastal Fuels Marketing, Inc.; Transtate Industrial Pipeline Systems, Inc.; and Continental Cement of Florida, Inc.

(92)

Canaveral Port Authority, Tanker Berth No. 2 (28°24'34"N., 80°36'37"W.): 65-foot face; 340 feet of berthing space with dolphins; 38 feet alongside; deck height, 10 feet; pipelines extend from wharf to storage tanks, 250,000-barrel capacity; receipt and shipment of No. 6 fuel oil; owned by Canaveral Port Authority and operated by Transtate Industrial Pipeline Systems, Inc., and Exceltech Corp.

(93)

Canaveral Port Authority, South Cargo Pier 4 (28°24'32"N., 80°36'40"W.): 400-foot face; 400 feet of berthing space; 38 feet alongside; deck height, 10 feet; open storage area at rear for about 25,000 tons of salt; receipt and shipment of general cargo; receipt of salt and paper products; shipment of perishable food commodities; owned by Canaveral Port Authority and operated by Canaveral Port Authority; Mid-Florida Freezer Warehouses, Ltd., and Cargill, Inc., Salt Division. (Tanker Berths 1 and 2, and South Cargo Piers 4 and 5 form a continuous berth, 1,247 feet long.)

(94)

Facilities on the north side of Inner Reach:

(95)

Canaveral Port Authority, North Cargo Piers 1 and 2 (28°24'45"N., 80°36'43"W.): 1,260-foot face; 1,350 feet of berthing space with dolphins; 38 feet alongside; deck height, 10 feet; crawler cranes to 165 tons; roll-on/roll-off ramp at north end; receipt of containerized and roll-on/roll-off general cargo; receipt of salt; owned by Canaveral Port Authority and operated by Canaveral Port Authority; Morton International, Inc., and Mid-Florida Freezer Warehouses, Ltd.

(96)

Canaveral Port Authority, North Cargo Pier 3 (28°24'39"N., 80°36'47"W.): 400-foot face; 400 feet of berthing space; 32 feet alongside; deck height, 10 feet; 600,000 square feet covered storage; receipt and shipment of general cargo; mooring vessels; owned and operated by Canaveral Port Authority.

(97)

CSR Rinker Materials Corp., Port Canaveral, North Cargo Pier 4 (28°24'39"N., 80°36'56"W.): 400-foot face; 400 feet of berthing space; 34 feet alongside; deck height, 10 feet; one traveling gantry ship unloader, 400 tons per hour rate; silos, 42,000 ton capacity; receipt of cement; mooring vessels; owned by Canaveral Port Authority and operated by CSR Rinker Materials Corp.

(98)

Canaveral Port Authority, Cruise Terminal 5 (northwest corner of West Basin): 565 feet of berthing space; 35 feet alongside; 59,000 square feet embarkation and baggage facility; mooring cruise vessels; boarding passengers; owned and

operated by Port Canaveral Authority.

(99)

Canaveral Port Authority, Cruise Terminal 8 (south of Cruise Terminal 5): 800 feet of berthing space; 35 feet alongside; 70,000 square feet embarkation and baggage facility; mooring cruise vessels; boarding passengers; owned and operated by Port Canaveral Authority.

(100)

Canaveral Port Authority, Cruise Terminal 10 (south of Cruise Terminal 8): 724 feet of berthing space; 33.5 feet alongside; 75,000 square feet embarkation and baggage facility; mooring cruise vessels; boarding passengers; owned and operated by Port Canaveral Authority.

Communications

(101)

Good State highways connect to U.S. Route 1 and Interstate 95. The Florida East Coast Railway cargo facility, on the mainland, is 10 miles from the port.

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT to ACCOMPANY
SURVEY H11590 (2007)

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.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

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

HSTP PYDRO version 8.7 r2586
CARIS HIPS/SIPS version 6.1 SP2 HF 1-4
CARIS Bathy Manager version 2.1 SP1 HF 1-8
DKART INSPECTOR, version 5.0 Build 707
CARIS HOM version 3.3
CARIS S57 Composer version 1.0

B.2. QUALITY CONTROL

No supporting documentation pertaining to the DGPS position checks or lead-line comparisons reported in the DR was submitted with the DR or DAPR.

The image quality of numerous SSS lines was significantly degraded (see Figs. 1 & 2 below). In certain areas, object detection capability was severely comprised in the outer ranges. In other areas, object detection overall was marginal, but acceptable. Image quality over assigned AWOIS items was good and adequate to support charting recommendations. Additionally, most of the SSS lines were not beam pattern corrected, which also affected image quality (see Fig. 3).

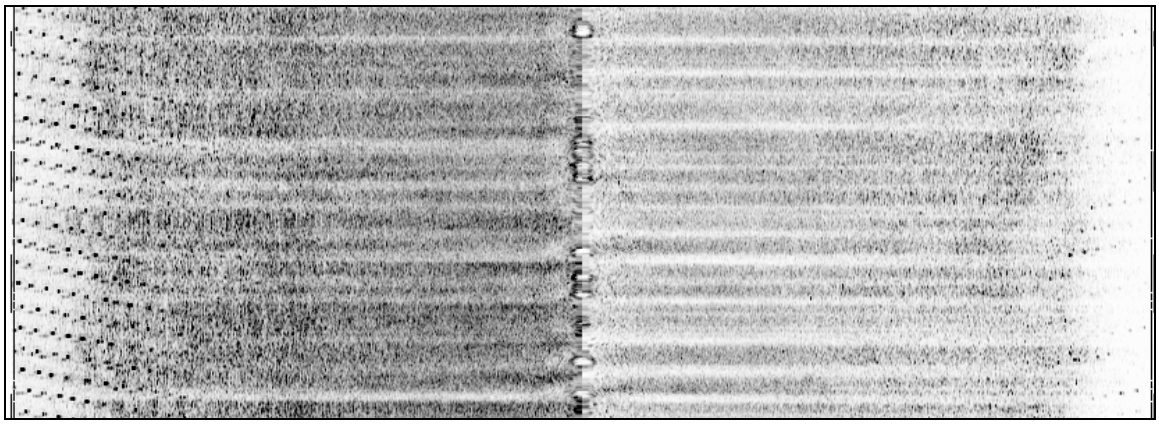


Figure 1: Motion artifacts and outer-range interference

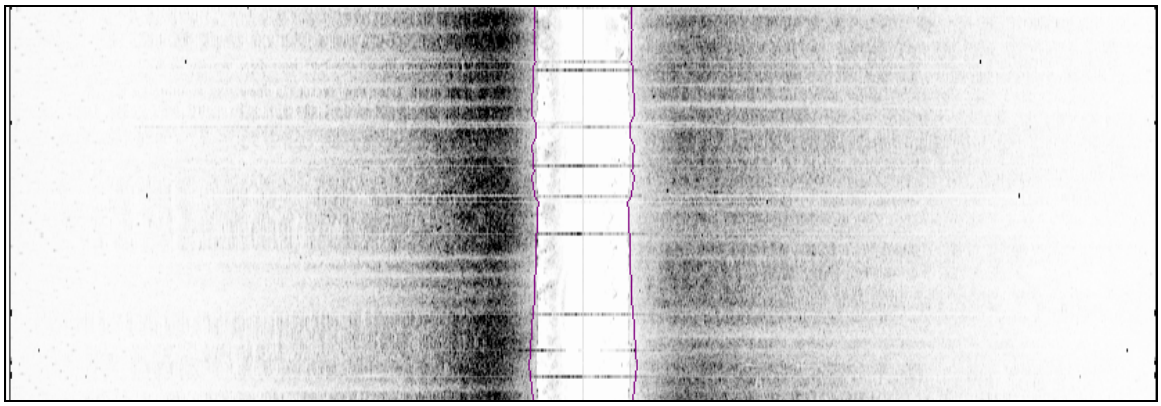


Figure 2: Noise in water column

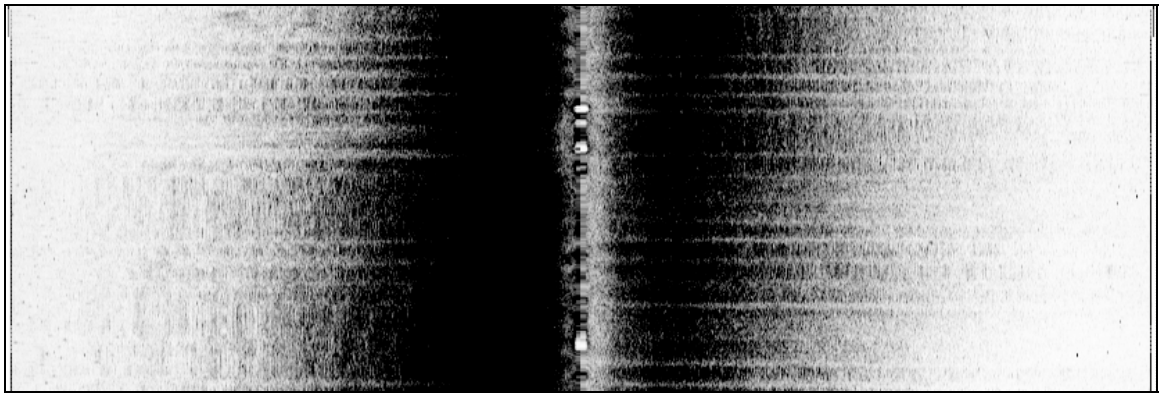


Figure 3: Un-beam pattern corrected data

B.2.1. H-Cell

The source of bathymetry for the H-Cell is the 2-m resolution swath-weighted BASE surface *AHB_H11590_VBES_2m_EXTRACT.hns,* which consists of the extracted shoal layer from *AHB_H11590_VBES_2m.hns* and an extended uncertainty layer. The uncertainty of each grid node is assumed to be the acceptable IHO order 1 error for that depth.

The SS sounding layer was generated using a shoal-biased, 100-meter radius selection criteria.

The contours in the H-Cell were created from a TIN (triangulated irregular network) generated from the SS sounding layer. The contours were generated at the *.75-ft values and then renamed to the *.00-ft values to maintain NOAA rounding-logic parity with the SS soundings

The SBDARE objects from the ENC within the survey limits were included in the H-Cell.

The H11590 CARIS H-Cell final deliverables include the following products:

H11590_CS.000	1:25,000 Scale	H11590 H-Cell with chart-scale selected soundings, features, and bluenotes
H11590_SS.000	n/a	H11590 Selected Soundings

C. VERTICAL AND HORIZONTAL CONTROL

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 17. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements.

D. RESULTS AND RECOMMENDATIONS

The following charts were used during compilation.

RNC	*Scale*	*Edition*	*Updated through LNM*
11481	1:25,000	6	01/13/09
11476	1:80,000	21	01/13/09
11484	1:80,000	23	01/13/09

ENC	*Edition*	*Update*	*Issue Date*
US5FL82M	10	0	20090206
US4FL80M	4	0	20080428

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, except for the following:

1. The easternmost tip of Cape Canaveral is inadequately charted. As seen in Figure 4, bathymetry data were acquired over a charted landmass. The H-Cell contains a COALNE (coastline) object to reflect the recommended shoreline modification. The COALNE object was drawn with reference to both the survey tracklines and 0.5-meter resolution USGS orthoimagery flown in 2006. Positioning of the roads visible in the orthoimagery appears to be consistently offset from the corresponding charted roads, which calls into question the overall positioning of the orthoimagery; however, the position of the Cape Canaveral lighthouse in the orthoimagery has excellent agreement with the charted lighthouse. Regardless of the positional accuracy of the roads visible in the orthoimagery, the AHB compiler recommends that the shoreline should be modified to reflect the extent of the survey bathymetry data. The orthoimagery metadata is appended to this Evaluation Report.

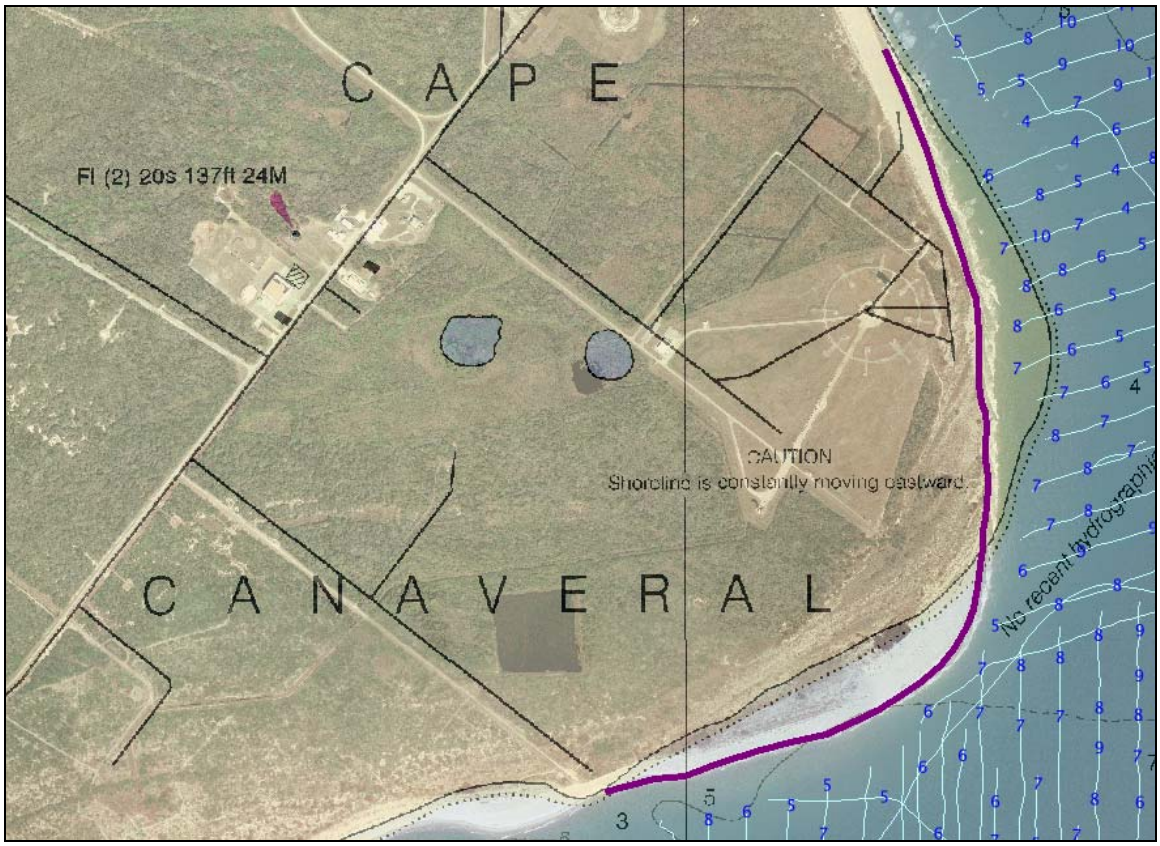


Figure 4 : R NC 11481 overlain w ith transp arent o rthoimagery, surve y tr ack lines (cya n l ines), survey-scale soundings, and recommended shoreline modification (purple line).

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 Charts and Electronic Navigation Charts (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.

USGS High Resolution Orthoimagery for Coastal Florida

Metadata also available as

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 2007
Title: USGS High Resolution Orthoimagery for Coastal Florida
Geospatial_Data_Presentation_Form: SDE raster digital data
Series_Information:
Series_Name: Atlantic Coastal Imagery
Issue_Identification: 2006
Publication_Information:
Publication_Place: Sioux Falls, SD
Publisher: USGS
Other_Citation_Details:
For more detailed information on this data, please contact:

Aerials Express, LLCSales Representative7855 River Parkway, Suite 211Tempe, AZ 85284Telephone: 480-777-9909Fax: 480-777-9966Email spetersen@AerialsExpress.com

Online_Linkage: <http://seamless.usgs.gov>
Description:
Abstract:
"Aerial imagery is a critical geospatial data component in identyfing, planning, and preparing for the protection of the US and its people. This dataset includes approximately 78,000 square miles of coverage along or near the Gulf Coast and the Atlantic coastline, terminating north of Wilmington, North Carolina. The imagery was collected in 2006 using aircraft to produce a 0.5 meter pixel resolution. It is color and ortho-rectified."
Purpose:
"The dataset was collected to insure digital imagery coverage of the urban areas along

the coastlines most prone to hurricane forces and devastation. The coverage allows all government entities an inter operable common operating picture during a critical event or in pre or post planning."

Supplemental_Information:

The data obtained through The Seamless Server is considered to be the "best available" data from USGS. Historical data and other data may be obtained by contacting Customer Services, Center for Earth Resources Observation & Science, at 1-800-252-4547. Information in quotation marks, initial processing steps, accuracy reports, and source information is taken directly from the original metadata.Spatial-specific information not available

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2006

Currentness_Reference: ground condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Irregular

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate:-80.53908715

East_Bounding_Coordinate:-80.52088059

*North_Bounding_Coordinate:*28.47654765

*South_Bounding_Coordinate:*28.45924447

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: digital spatial data

Theme_Keyword: 0.50 meter orthoimage

Theme_Keyword: rectified image

Theme_Keyword: orthophoto

Theme_Keyword: natural color orthophoto

Theme_Keyword: orthoimage

Theme_Keyword: image map

Theme_Keyword: imagery

Theme_Keyword: GeoTIFF

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Category

Theme_Keyword: imageryBaseMapsEarthCover

Theme_Keyword: 010

Theme_Keyword: geoscientificInformation

Theme_Keyword: 008

Theme_Keyword: location

Theme_Keyword: 013

Theme:

Theme_Keyword_Thesaurus: American Society of Photogrammetry and Remote Sensing

Theme_Keyword: National Standards for Spatial Digital Accuracy (NSSDA)

Place:

Place_Keyword_Thesaurus:

U.S. Department of Commerce, 1995, Countries, dependencies, areas of special sovereignty, and their principal administrative divisions, Federal Information

Processing Standard 10-4,): Washington, D.C., National Institute of Standards and Technology

Place_Keyword: United States
Place_Keyword: U.S.
Place_Keyword: US

Place:

Place_Keyword_Thesaurus:

U.S. Department of Commerce, 1987, Codes for the identification of the States, the District of Columbia and the outlying areas of the United States, and associated areas (Federal Information Processing Standard 5-2): Washington, D.C., National Institute of Standards and Technology

Place_Keyword: FL

Place:

Place_Keyword_Thesaurus: Geographic Names Information System
Place_Keyword: Brevard County, Florida
Place_Keyword: Indian River County, Florida
Place_Keyword: St. Lucie County, Florida
Place_Keyword: Okeechobee County, Florida
Place_Keyword: Martin County, Florida
Place_Keyword: Clay County, Florida
Place_Keyword: Bradford County, Florida
Place_Keyword: Alachua County, Florida
Place_Keyword: Putnam County, Florida
Place_Keyword: Flagler County, Florida
Place_Keyword: Volusia County, Florida
Place_Keyword: Marion County, Florida
Place_Keyword: Gilchrist County, Florida
Place_Keyword: Levy County, Florida
Place_Keyword: Citrus County, Florida
Place_Keyword: Sumter County, Florida
Place_Keyword: Lake County, Florida
Place_Keyword: Seminole County, Florida
Place_Keyword: Orange County, Florida
Place_Keyword: Hernando County, Florida
Place_Keyword: Pasco County, Florida
Place_Keyword: Hillsborough County, Florida
Place_Keyword: Polk County, Florida
Place_Keyword: Osceola County, Florida
Place_Keyword: Pinellas County, Florida
Place_Keyword: Manatee County, Florida
Place_Keyword: Hardee County, Florida
Place_Keyword: Highlands County, Florida

Access_Constraints:

Any downloading and use of these data signifies a user's agreement to comprehension and compliance of the USGS Standard Disclaimer. Insure all portions of metadata are read and clearly understood before using these data in order to protect both user and USGS interests.

Use_Constraints:

There is no guarantee of warranty concerning the accuracy of the data. Users should be aware that temporal changes may have occurred since this data set was collected and that some parts of this data may no longer represent actual surface conditions. Users should not use this data for critical applications without a full awareness of its limitations. Acknowledgement of the originating

agencies would be appreciated in products derived from these data. Any user who modifies the data is obligated to describe the types of modifications they perform. User specifically agrees not to misrepresent the data, nor to imply that changes made were approved or endorsed by the U.S. Geological Survey. Please refer to <http://www.usgs.gov/privacy.html> for the USGS disclaimer.

Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Services Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science
Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
Country: USA
Contact_Voice_Telephone: 605/594-6151
Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605/594-6933
Contact_Facsimile_Telephone: 605/594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The USGS point of contact is for questions relating only to the data display from this web site. For questions regarding data content and quality or for product availability by the general public, refer to the original processor.Skyla PetersenAerials Express, LLCSales Representative7855 River Parkway, Suite 211Tempe, AZ 85284Telephone: 480-777-9909Fax: 480-777-9966Email spetersen@AerialsExpress.com

Data_Set_Credit:
Aerials Express, LLC, Jerry Landis, Bill Landis, Kevin Fowkes, Skyla Petersen, Brad Mattison

Security_Information:
Security_Classification_System: None
Security_Classification: Unclassified
Security_Handling_Description: N/A

Native_Data_Set_Environment:
Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.1.0.722

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: N/A
Logical_Consistency_Report: The photography was acquired using a film camera.
Completeness_Report:
"Imagery is seamless and nearly cloud free. Ocean water has been colorized to mask out most light reflections and color issues."
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

"The horizontal positional accuracy and the assurance of that accuracy depend, in part, on the accuracy of the data inputs to the rectification process. The positions of existing USGS photoidentifiable ground control were evaluated on the Geotiff image and compared with their ground values in order to determine an overall accuracy for the final Urban Area. After image coordinate measurement was completed, a radial RMSE was calculated for the entire block. This value is an estimate of the horizontal accuracy of the tile expressed in meters. Aerials Express does not warrant horizontal accuracy to exceed that of 5.0 meters at 90% (NMAS for 1:12000-scale products)."

Quantitative_Horizontal_Positional_Accuracy_Assessment:

Horizontal_Positional_Accuracy_Value: 5.0

Horizontal_Positional_Accuracy_Explanation:

Federal Geographic Data Committee, 1998, Geospatial Positioning Accuracy Standard, Part 3, National Standard for Spatial Data Accuracy, FGDC-STD-007.3-1998

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report: N/A

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Aerials Express, LLC

Publication_Date: unpublished material

Title: Aerial Photography

Geospatial_Data_Presentation_Form: remote-sensing image

Publication_Information:

Publication_Place: Sioux Falls, SD

Publisher: U.S. Geological Survey

Type_of_Source_Media: Hard Drive

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 200603

Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: PHOTO

Source_Contribution: Provides the imagery for the orthorectification process.

Process_Step:

Process_Description:

"The production process starts when the film is received from the processing lab. The process is broken into four phases: scanning, Automatic-Triangulation, Color Balancing, Seamlines, and quality control.Scanning

Much is determined in the first step of scanning. It is important that this step is done correctly in order for the remaining steps to run smoothly. It is for this reason that a ZEISS Photo Scan photogrammetric scanner is used to perform all scanning in-house. This provides complete control for both resolution and color balance at the start of the process.

Automatic Triangulation and Rectification We use Intergraph's Image Station Auto-Triangulaton (ISAT) system that works hand-in-hand with IMU/ABGPS data to match photos together. It is an automated process to create automatic tie

points between photos. The process uses a bundle adjustment to tighten the accuracy of the tie points. Upon good AT results, we then use a DEM to rectify the photos with Intergraph's Image Station Ortho Pro (ISOP) software. Color Balancing and Seamline Generation

After rectification an overall tone balancing using ER MAPPER Software is applied to the aerial photo project. Seamlines or a stitching process are then assigned between each image to ensure a more seamless mosaic. The mosaic is then tiled into tiff images.

Quality Control

Aerials Express takes great care in the tone and color balance of the imagery. The ER Mapper software provides the automatic color correction of the imagery in batch mode. As a final review, Adobe Photoshop is used to correct color and image density where stitching is not able to fully disguise the match lines. The final step in this process is to color balance the entire image file to the best color, which gives the photography a completely natural look.

Production Process for ADS40 LEICA DIGITAL IMAGERY

Data processing of ADS40 imagery and metadata is a streamlined digital workflow process utilizing commercial softcopy photogrammetric software including Applanix POSPAC, Leica GPro, ORIMA, SOCET SET and Orthovista.

The ADS40 sensor GPS/IMU position and attitude data is directly processed through three separate but continuous steps: Applanix POSPAC for data extracting, POSGPS for data orientation, and POSProc for creating a Smoothed Best Estimate of Trajectory (SBET) for each flight lift. The post-processed GPS data output is displayed onto the flight profile plot, which clearly shows the RMS values of the combined forward and reverse run separations, C/A Code and Carrier Phase. The output IMU data is also verified by a PDOP plot and its value compared to an acceptable threshold range.

The processing of ADS40 images is run on Leica GPRO and ORIMA for bundle adjustment. The image is linked to the local coordinate system through the corresponding GPS/IMU SBET data with correct position and orientation. The residual of the tie-points are displayed instantly to reflect the accuracy of the processed data. After the bundle adjustment, ORIMA automatically displays the unit weight standard deviation, the RMS of tie points and the accuracy of the sensor position and orientation. The iteration process on the bundle adjustment is based on the selected parameters to ensure the data integrity and accuracy is within the project specification. The software also provides the measurement of reliability for variance and co-variance component analysis. This ensures the processed data is statistically satisfied on the application demand.

The triangulation process involves automatic measurement of tie points. All operations are performed using the graphical working environment of ORIMA.

For automatic tie point measurement, the Auto Point Measurement (APM) from Orima, using a very dense point measuring algorithm adapted for the ADS40, is called directly. Highest quality orientation results are obtained by a combined bundle adjustment. The Combined Adjustment Program CAP-A has been extended to handle all types of observations required for ADS40. The observations are image coordinates, and position and attitude values from GPS and IMU computed by the IMU/GPS post-processing software. The post-processing includes the transformation of the raw data into the reference image frame used for the aerial triangulation. The resultant values of this transformation are the same as orientation elements of standard photogrammetry procedures and results.

"The use of the high precision GPS/IMU data combined with these traditional triangulation techniques gives rise to a very robust and flexible system. The adjustment process can determine calibration, datum deficiencies, errors in GPS and more precisely register the imagery to ground control. It should be noted that very little ground control is required. Owing to the GPS/IMU data, ground control is essentially unnecessary." Hinsken, et al, Program author of Orima.

Raw imagery is checked and radiometric balanced in a parallel process that utilizes custom gradient correction software and the Leica GPRO Tonal Transfer Curve (TTC) application. While operators are refining a good AT result, others are carefully reviewing the imagery for good color band balance, contrast and tone.

Once both processes have passed rigid AT and QC milestones, the imagery bands, red, green and blue or NIR, red, and green are rectified to an RGB or CIR product. These orthos are passed to the mosaic team for QC, seam line placement and tiling using the vigorous interactive capabilities of Orthovista software.

For this project, the latest available National Elevation Dataset NED surface model is used for rectification."

Process_Date: 200606
Process_Step:
Process_Description:
The original coastal metadata were imported and updated for display through the Seamless Data Distribution System at <http://seamless.usgs.gov> The metadata are available in several formats: HTML, TEXT, XML, FAQ and SGML.
Process_Date: 200709
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Service Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science

Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
Country: USA
Contact_Voice_Telephone: 605-594-6151
Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605-594-6933
Contact_Facsimile_Telephone: 605-594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The USGS point of contact is for questions relating only to the data display and download from this web site. For questions regarding data content and quality, refer to original processor.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 200000
Column_Count: 136000
Vertical_Count: 1

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 17
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -81.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.500000
Ordinate_Resolution: 0.500000
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000

Denominator_of_Flattening_Ratio: 298.257222
Vertical_Coordinate_System_Definition:
Altitude_System_Definition:
Altitude_Datum_Name: North American Vertical Datum of 1988
Altitude_Resolution: 1.000000
Altitude_Distance_Units: meters
Altitude_Encoding_Method:
Explicit elevation coordinate included with horizontal coordinates

---

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
"Geotiff Images 4000 meters by 4000 meters distributed by county." For color-infrared and natural color DOQs, a digital number from zero to 255 will be assigned to each pixel but that number will refer to a color look-up table which will contain the RGB red, blue and green (RGB) values, each from zero to 255, for that digital number. Areas where the rectification process is incomplete due to incomplete data (i.e., lack of elevation data, gaps), are represented with the numeric value of zero.
Entity_and_Attribute_Detail_Citation:
U.S. Department of the Interior, U.S. Geological Survey, 1999, Standards for Digital Orthoimagery: Reston, VA

Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Services Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science
Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
Country: USA
Contact_Voice_Telephone: 605/594-6151
Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605/594-6933
Contact_Facsimile_Telephone: 605/594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The USGS point of contact is for questions relating only to the data display and download from this web site. For questions regarding data content and quality, refer to the original processor.
Resource_Description: Downloadable Data

Distribution_Liability:
Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made by the USGS regarding the use of the data on any other system, nor does the act of distribution constitute any such warranty. Data may have been compiled from various outside sources. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification. The USGS shall not be liable for any activity involving these data, installation, fitness of the data for a particular purpose, its use, or analyses results.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: Arc/Info Export Format and/or ArcView Shapefile
Format_Version_Number: ArcGIS 9.1
Format_Specification: ASCII
Transfer_Size: 0.001
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: <http://seamless.usgs.gov>
Access_Instructions:
The URL <http://seamless.usgs.gov> provides a map interface that allows for data downloads within a customer defined area of interest. Zoom tools are available that can be used to investigate areas of interest on the map interface. The download tool allows the customer to capture layers from the map, utilizing the Seamless Data Distribution System process for downloading. A request summary page is then generated with the download layers listed. By clicking the "download" button on the summary page, a zipped file will be generated that can be saved on the customer's computer. The file can then be unzipped and imported into various user software applications.
Online_Computer_and_Operating_System: Not available for dissemination
Fees: None
Turnaround: Variable

Technical_Prerequisites:
ESRI ArcGIS Suite and/or Arc/Info or other compatible software, and supporting operating systems.

Available_Time_Period:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 2007
Ending_Date: unknown

Metadata_Reference_Information:
Metadata_Date: 20070917
Metadata_Contact:
Contact_Information:

Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Services Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science
Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
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Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605/594-6933
Contact_Facsimile_Telephone: 605/594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The above is the contact information for the USGS Center for Earth Resources Observation and Science in Sioux Falls, SD. This is the digital data storage and distribution center for the USGS. Metadata information can also be obtained through online services using The National Map Viewer, at <http://nationalmap.usgs.gov>
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None
Metadata_Use_Constraints: None
Metadata_Security_Information:
Metadata_Security_Classification_System: None
Metadata_Security_Classification: Unclassified
Metadata_Security_Handling_Description: None
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

Generated by mp version 2.8.6 on Mon Sep 17 09:53:43 2007

USGS High Resolution Orthoimagery for Coastal Florida

Metadata also available as

Metadata:

Identification_Information:
Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 2007
Title: USGS High Resolution Orthoimagery for Coastal Florida
Geospatial_Data_Presentation_Form: SDE raster digital data
Series_Information:
Series_Name: Atlantic Coastal Imagery
Issue_Identification: 2006
Publication_Information:
Publication_Place: Sioux Falls, SD
Publisher: USGS
Other_Citation_Details:
For more detailed information on this data, please contact:

Aerials Express, LLCSales Representative7855 River Parkway, Suite 211Tempe, AZ 85284Telephone: 480-777-9909Fax: 480-777-9966Email spetersen@AerialsExpress.com

Online_Linkage: <http://seamless.usgs.gov>
Description:
Abstract:
"Aerial imagery is a critical geospatial data component in identyfing, planning, and preparing for the protection of the US and its people. This dataset includes approximately 78,000 square miles of coverage along or near the Gulf Coast and the Atlantic coastline, terminating north of Wilmington, North Carolina. The imagery was collected in 2006 using aircraft to produce a 0.5 meter pixel resolution. It is color and ortho-rectified."
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"The dataset was collected to insure digital imagery coverage of the urban areas along

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Supplemental_Information:

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Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2006

Currentness_Reference: ground condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Irregular

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate:-80.53908715

East_Bounding_Coordinate:-80.52088059

*North_Bounding_Coordinate:*28.45924447

*South_Bounding_Coordinate:*28.44194129

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: digital spatial data

Theme_Keyword: 0.50 meter orthoimage

Theme_Keyword: rectified image

Theme_Keyword: orthophoto

Theme_Keyword: natural color orthophoto

Theme_Keyword: orthoimage

Theme_Keyword: image map

Theme_Keyword: imagery

Theme_Keyword: GeoTIFF

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Category

Theme_Keyword: imageryBaseMapsEarthCover

Theme_Keyword: 010

Theme_Keyword: geoscientificInformation

Theme_Keyword: 008

Theme_Keyword: location

Theme_Keyword: 013

Theme:

Theme_Keyword_Thesaurus: American Society of Photogrammetry and Remote Sensing

Theme_Keyword: National Standards for Spatial Digital Accuracy (NSSDA)

Place:

Place_Keyword_Thesaurus:

U.S. Department of Commerce, 1995, Countries, dependencies, areas of special sovereignty, and their principal administrative divisions, Federal Information

Processing Standard 10-4,): Washington, D.C., National Institute of Standards and Technology

Place_Keyword: United States
Place_Keyword: U.S.
Place_Keyword: US

Place:

Place_Keyword_Thesaurus:

U.S. Department of Commerce, 1987, Codes for the identification of the States, the District of Columbia and the outlying areas of the United States, and associated areas (Federal Information Processing Standard 5-2): Washington, D.C., National Institute of Standards and Technology

Place_Keyword: FL

Place:

Place_Keyword_Thesaurus: Geographic Names Information System
Place_Keyword: Brevard County, Florida
Place_Keyword: Indian River County, Florida
Place_Keyword: St. Lucie County, Florida
Place_Keyword: Okeechobee County, Florida
Place_Keyword: Martin County, Florida
Place_Keyword: Clay County, Florida
Place_Keyword: Bradford County, Florida
Place_Keyword: Alachua County, Florida
Place_Keyword: Putnam County, Florida
Place_Keyword: Flagler County, Florida
Place_Keyword: Volusia County, Florida
Place_Keyword: Marion County, Florida
Place_Keyword: Gilchrist County, Florida
Place_Keyword: Levy County, Florida
Place_Keyword: Citrus County, Florida
Place_Keyword: Sumter County, Florida
Place_Keyword: Lake County, Florida
Place_Keyword: Seminole County, Florida
Place_Keyword: Orange County, Florida
Place_Keyword: Hernando County, Florida
Place_Keyword: Pasco County, Florida
Place_Keyword: Hillsborough County, Florida
Place_Keyword: Polk County, Florida
Place_Keyword: Osceola County, Florida
Place_Keyword: Pinellas County, Florida
Place_Keyword: Manatee County, Florida
Place_Keyword: Hardee County, Florida
Place_Keyword: Highlands County, Florida

Access_Constraints:

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Point_of_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Services Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science
Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
Country: USA
Contact_Voice_Telephone: 605/594-6151
Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605/594-6933
Contact_Facsimile_Telephone: 605/594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The USGS point of contact is for questions relating only to the data display from this web site. For questions regarding data content and quality or for product availability by the general public, refer to the original processor.Skyla PetersenAerials Express, LLCSales Representative7855 River Parkway, Suite 211Tempe, AZ 85284Telephone: 480-777-9909Fax: 480-777-9966Email spetersen@AerialsExpress.com

Data_Set_Credit:
Aerials Express, LLC, Jerry Landis, Bill Landis, Kevin Fowkes, Skyla Petersen, Brad Mattison

Security_Information:
Security_Classification_System: None
Security_Classification: Unclassified
Security_Handling_Description: N/A

Native_Data_Set_Environment:
Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.1.0.722

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: N/A
Logical_Consistency_Report: The photography was acquired using a film camera.
Completeness_Report:
"Imagery is seamless and nearly cloud free. Ocean water has been colorized to mask out most light reflections and color issues."
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:

"The horizontal positional accuracy and the assurance of that accuracy depend, in part, on the accuracy of the data inputs to the rectification process. The positions of existing USGS photoidentifiable ground control were evaluated on the Geotiff image and compared with their ground values in order to determine an overall accuracy for the final Urban Area. After image coordinate measurement was completed, a radial RMSE was calculated for the entire block. This value is an estimate of the horizontal accuracy of the tile expressed in meters. Aerials Express does not warrant horizontal accuracy to exceed that of 5.0 meters at 90% (NMAS for 1:12000-scale products)."

Quantitative_Horizontal_Positional_Accuracy_Assessment:

Horizontal_Positional_Accuracy_Value: 5.0

Horizontal_Positional_Accuracy_Explanation:

Federal Geographic Data Committee, 1998, Geospatial Positioning Accuracy Standard, Part 3, National Standard for Spatial Data Accuracy, FGDC-STD-007.3-1998

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report: N/A

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: Aerials Express, LLC

Publication_Date: unpublished material

Title: Aerial Photography

Geospatial_Data_Presentation_Form: remote-sensing image

Publication_Information:

Publication_Place: Sioux Falls, SD

Publisher: U.S. Geological Survey

Type_of_Source_Media: Hard Drive

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 200603

Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: PHOTO

Source_Contribution: Provides the imagery for the orthorectification process.

Process_Step:

Process_Description:

"The production process starts when the film is received from the processing lab. The process is broken into four phases: scanning, Automatic-Triangulation, Color Balancing, Seamlines, and quality control.Scanning

Much is determined in the first step of scanning. It is important that this step is done correctly in order for the remaining steps to run smoothly. It is for this reason that a ZEISS Photo Scan photogrammetric scanner is used to perform all scanning in-house. This provides complete control for both resolution and color balance at the start of the process.

Automatic Triangulation and Rectification We use Intergraph's Image Station Auto-Triangulaton (ISAT) system that works hand-in-hand with IMU/ABGPS data to match photos together. It is an automated process to create automatic tie

points between photos. The process uses a bundle adjustment to tighten the accuracy of the tie points. Upon good AT results, we then use a DEM to rectify the photos with Intergraph's Image Station Ortho Pro (ISOP) software. Color Balancing and Seamline Generation

After rectification an overall tone balancing using ER MAPPER Software is applied to the aerial photo project. Seamlines or a stitching process are then assigned between each image to ensure a more seamless mosaic. The mosaic is then tiled into tiff images.

Quality Control

Aerials Express takes great care in the tone and color balance of the imagery. The ER Mapper software provides the automatic color correction of the imagery in batch mode. As a final review, Adobe Photoshop is used to correct color and image density where stitching is not able to fully disguise the match lines. The final step in this process is to color balance the entire image file to the best color, which gives the photography a completely natural look.

Production Process for ADS40 LEICA DIGITAL IMAGERY

Data processing of ADS40 imagery and metadata is a streamlined digital workflow process utilizing commercial softcopy photogrammetric software including Applanix POSPAC, Leica GPro, ORIMA, SOCET SET and Orthovista.

The ADS40 sensor GPS/IMU position and attitude data is directly processed through three separate but continuous steps: Applanix POSPAC for data extracting, POSGPS for data orientation, and POSProc for creating a Smoothed Best Estimate of Trajectory (SBET) for each flight lift. The post-processed GPS data output is displayed onto the flight profile plot, which clearly shows the RMS values of the combined forward and reverse run separations, C/A Code and Carrier Phase. The output IMU data is also verified by a PDOP plot and its value compared to an acceptable threshold range.

The processing of ADS40 images is run on Leica GPRO and ORIMA for bundle adjustment. The image is linked to the local coordinate system through the corresponding GPS/IMU SBET data with correct position and orientation. The residual of the tie-points are displayed instantly to reflect the accuracy of the processed data. After the bundle adjustment, ORIMA automatically displays the unit weight standard deviation, the RMS of tie points and the accuracy of the sensor position and orientation. The iteration process on the bundle adjustment is based on the selected parameters to ensure the data integrity and accuracy is within the project specification. The software also provides the measurement of reliability for variance and co-variance component analysis. This ensures the processed data is statistically satisfied on the application demand.

The triangulation process involves automatic measurement of tie points. All operations are performed using the graphical working environment of ORIMA.

For automatic tie point measurement, the Auto Point Measurement (APM) from Orima, using a very dense point measuring algorithm adapted for the ADS40, is called directly. Highest quality orientation results are obtained by a combined bundle adjustment. The Combined Adjustment Program CAP-A has been extended to handle all types of observations required for ADS40. The observations are image coordinates, and position and attitude values from GPS and IMU computed by the IMU/GPS post-processing software. The post-processing includes the transformation of the raw data into the reference image frame used for the aerial triangulation. The resultant values of this transformation are the same as orientation elements of standard photogrammetry procedures and results.

"The use of the high precision GPS/IMU data combined with these traditional triangulation techniques gives rise to a very robust and flexible system. The adjustment process can determine calibration, datum deficiencies, errors in GPS and more precisely register the imagery to ground control. It should be noted that very little ground control is required. Owing to the GPS/IMU data, ground control is essentially unnecessary." Hinsken, et al, Program author of Orima.

Raw imagery is checked and radiometric balanced in a parallel process that utilizes custom gradient correction software and the Leica GPRO Tonal Transfer Curve (TTC) application. While operators are refining a good AT result, others are carefully reviewing the imagery for good color band balance, contrast and tone.

Once both processes have passed rigid AT and QC milestones, the imagery bands, red, green and blue or NIR, red, and green are rectified to an RGB or CIR product. These orthos are passed to the mosaic team for QC, seam line placement and tiling using the vigorous interactive capabilities of Orthovista software.

For this project, the latest available National Elevation Dataset NED surface model is used for rectification."

Process_Date: 200606
Process_Step:
Process_Description:
The original coastal metadata were imported and updated for display through the Seamless Data Distribution System at <http://seamless.usgs.gov> The metadata are available in several formats: HTML, TEXT, XML, FAQ and SGML.
Process_Date: 200709
Process_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Service Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science

Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
Country: USA
Contact_Voice_Telephone: 605-594-6151
Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605-594-6933
Contact_Facsimile_Telephone: 605-594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The USGS point of contact is for questions relating only to the data display and download from this web site. For questions regarding data content and quality, refer to original processor.

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 200000
Column_Count: 136000
Vertical_Count: 1

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 17
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -81.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.500000
Ordinate_Resolution: 0.500000
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000

Denominator_of_Flattening_Ratio: 298.257222
Vertical_Coordinate_System_Definition:
Altitude_System_Definition:
Altitude_Datum_Name: North American Vertical Datum of 1988
Altitude_Resolution: 1.000000
Altitude_Distance_Units: meters
Altitude_Encoding_Method:
Explicit elevation coordinate included with horizontal coordinates

---

Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
"Geotiff Images 4000 meters by 4000 meters distributed by county." For color-infrared and natural color DOQs, a digital number from zero to 255 will be assigned to each pixel but that number will refer to a color look-up table which will contain the RGB red, blue and green (RGB) values, each from zero to 255, for that digital number. Areas where the rectification process is incomplete due to incomplete data (i.e., lack of elevation data, gaps), are represented with the numeric value of zero.
Entity_and_Attribute_Detail_Citation:
U.S. Department of the Interior, U.S. Geological Survey, 1999, Standards for Digital Orthoimagery: Reston, VA

Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Services Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science
Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
Country: USA
Contact_Voice_Telephone: 605/594-6151
Contact_Voice_Telephone: 1-800-252-4547
Contact_TDD/TTY_Telephone: 605/594-6933
Contact_Facsimile_Telephone: 605/594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The USGS point of contact is for questions relating only to the data display and download from this web site. For questions regarding data content and quality, refer to the original processor.
Resource_Description: Downloadable Data

Distribution_Liability:
Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made by the USGS regarding the use of the data on any other system, nor does the act of distribution constitute any such warranty. Data may have been compiled from various outside sources. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification. The USGS shall not be liable for any activity involving these data, installation, fitness of the data for a particular purpose, its use, or analyses results.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: Arc/Info Export Format and/or ArcView Shapefile
Format_Version_Number: ArcGIS 9.1
Format_Specification: ASCII
Transfer_Size: 0.001
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: <http://seamless.usgs.gov>
Access_Instructions:
The URL <http://seamless.usgs.gov> provides a map interface that allows for data downloads within a customer defined area of interest. Zoom tools are available that can be used to investigate areas of interest on the map interface. The download tool allows the customer to capture layers from the map, utilizing the Seamless Data Distribution System process for downloading. A request summary page is then generated with the download layers listed. By clicking the "download" button on the summary page, a zipped file will be generated that can be saved on the customer's computer. The file can then be unzipped and imported into various user software applications.
Online_Computer_and_Operating_System: Not available for dissemination
Fees: None
Turnaround: Variable

Technical_Prerequisites:
ESRI ArcGIS Suite and/or Arc/Info or other compatible software, and supporting operating systems.

Available_Time_Period:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 2007
Ending_Date: unknown

Metadata_Reference_Information:
Metadata_Date: 20070917
Metadata_Contact:
Contact_Information:

Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Position: Customer Services Representative
Contact_Address:
Address_Type: mailing and physical address
Address: USGS Center for Earth Resources Observation & Science
Address: 47914 252nd Street
City: Sioux Falls
State_or_Province: SD
Postal_Code: 57198-0001
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Contact_Facsimile_Telephone: 605/594-6589
Contact_Electronic_Mail_Address: custserv@usgs.gov
Hours_of_Service: 0800 - 1600 CT, M - F (-6h CST/-5h CDT GMT)
Contact_Instructions:
The above is the contact information for the USGS Center for Earth Resources Observation and Science in Sioux Falls, SD. This is the digital data storage and distribution center for the USGS. Metadata information can also be obtained through online services using The National Map Viewer, at <http://nationalmap.usgs.gov>
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Access_Constraints: None
Metadata_Use_Constraints: None
Metadata_Security_Information:
Metadata_Security_Classification_System: None
Metadata_Security_Classification: Unclassified
Metadata_Security_Handling_Description: None
Metadata_Extensions:
Online_Linkage: <http://www.esri.com/metadata/esriprof80.html>
Profile_Name: ESRI Metadata Profile

Generated by mp version 2.8.6 on Mon Sep 17 09:53:43 2007

APPROVAL SHEET
H11590

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation 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 review per the Hydrographic Surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

Nicholas A. Forfinski

Nicholas A. Forfinski
Physical Scientist
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: __

Digitally signed by Shepard Smith
DN: cn=Shepard Smith, o=NOAA, ou=AHB, email=shep.smith@noaa.gov, c=US
Date: 2009.02.11 16:23:15 -05'00'

CDR Shepard M. Smith, NOAA
Chief, Atlantic Hydrographic Branch

Christopher Hare
AWOIS/SURF Check
2009.02.12 11:32:26 -05'00'