H10647

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Side Scan Sonar

Field No. ACOE95-C065

Registry No. H10647

LOCALITY

State Florida

General Locality St. Johns River

Locality Drummond Point to Commondare Point

1998

CHIEF OF PARTY
Richard J. Sawyer

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H - 10647

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

FIELD NO.

State FLORIDA

General locality ST. JOHNS RIVER, JACKSONVILLE

Locality DRUMMOND POINT TO COMMONDARE POINT

Scale 1:10,000 Date of survey 09/18/95 - 09/27/95

Instructions dated 30 JUNE, 1995 Project No. OPR-G364-CN

Vessel ARC LAUNCH RED WITCH & LAUNCH BLUE WITCH

Chief of party RICHARD J. SAWYER

Surveyed by ARC SURVEYING HYDROGRAPHIC PARTY

Soundings taken by echo sounder, hand lead, pole RESON 9001

Graphic record scaled by

Graphic record checked by

Protracted by Automated plot by HP DesignJet 2500CP Plotter

Verification by Atlantic Hydrographic Branch Personnel

Soundings in ~~fathoms~~ ~~feet~~ METERS & DECIMETERS feet at MLW MLLW

REMARKS: Notes in the Descriptive Report were made in red during office processing

AWOIS/SURF ✓ 5/25/99 SJV

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1976—665-661/1222 REGION NO. 6

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY H-10647
FIELD NO. ACOE 95-C065
SCALE: 1:10,000
1995
ARC SURVEYING & MAPPING, INC. PARTY
CHIEF OF PARTY: RICHARD J. SAWYER

A. PROJECT

This project was conducted by Arc Surveying & Mapping, Inc. (Arc) and was executed through Contract No. DACW17-95-D-0007 with the U.S. Army Corps of Engineers, Jacksonville District (ACOE). Hydrographic Project Instructions OPR-G364-CN , dated June 30, 1995, developed by the National Oceanic and Atmospheric Administration (NOAA) were submitted to Arc and utilized for the development and execution of hydrographic surveying services required by ACOE Survey No. 95-C065.

A review of the Hydrographic Project Instructions was performed in a meeting in August, 1995, between C. Brian Greenawalt, Lieutenant Commander, NOAA, Francis Woodward, O&M Technical Support Section , ACOE, and Richard J. Sawyer of Arc. The purpose of this project is to acquire multibeam sounding data, side scan sonar imagery (in selected areas), and related supporting data, within predetermined areas of the St. Johns River and its approaches. The data collected from these surveys will be used to review conditions on existing nautical charts and associated navigational products and may be used for updating purposes.

B. AREA SURVEYED

The survey area includes a portion of the St. Johns River located within Duval County, Florida, in the vicinity of Jacksonville. Five (5) separate locations lying between Drummond Point, to one (1) mile west of Commodore Point, were identified as having high priority within the context of national charting needs.

The geographic limits of the hydrographic survey areas and their associated multibeam line spacing and side scan coverage are illustrated in table A.

Location	Geographic Limits	Multibeam Line Spacing	Side Scan Coverage
(3) Drummond Range (East of)	North-30^24'00"N South-30^23'30"N East-81^36'25"W West-81^36'55"W	30 meters	none
(4) Trout River Cut Range (Westerly side)	North-30^24'55"N South-30^22'45"N East-81^37'25"W West-81^38'00"W	30 meters	none
(5) Anchorage Area F	North-30^22'30"N South-30^21'30"N East-81^36'50"W West-81^37'10"W	30 meters	200 %
(1) Terminal Channel (Easterly Side)	North-30^21'35"N South-30^20'25"N East-81^36'40"W West-81^37'10"W	30 meters	none
(2) Commodore Point (West of)	North-30^18'15"N South-30^18'55"N East-81^37'40"W West-81^38'52"W	30 meters	none

Table A

C. SURVEY VESSELS

Arc survey vessel *Red Witch,* a 21-foot MonArk, was used to collect all multibeam hydrographic data and velocity casts within all survey locations. Arc survey vessel *Blue Witch,* a 28-foot Silver Ship, was utilized for side scan operations within location five (5), Anchorage Area F. There were no mechanical problems encountered with either vessel during the duration of the survey.

During the field test of the multibeam configuration, on board the vessel *Red Witch,* a slight vibration was noted in the over-the-side mount used with the Reson Seabat 9001 transducer head. Modifications were made to the mount, relocating it aft of its original location approximately 0.5 meters, to an area better reinforced on the existing vessel bulkhead.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Multibeam data acquisition and vessel guidance were performed using Coastal Oceanographics *HYPACK* software system. This is a powerful PC Computer based package capable of generating, viewing, and plotting planned survey track lines while providing navigation guidance to the helm. The latest *Windows* version of *HYPACK* was configured on a 486, 100 MHZ IBM PC. The IBM PC is equipped with a four (4) port multi IO board for sensor logging and a 450 MB hard drive for data storage. A Traker 250 MB tape drive was used for daily data backup on board the survey vessel.

Multibeam data processing was performed using *HYSWEEP,* also developed by Coastal Oceanographics. *HYSWEEP* is a sweep editing software package capable of applying corrections logged during surveying operations in the way of heave, pitch, and roll data, navigation data, and heading data. In addition corrections for tide, draft, and water velocity are corrected for during the editing process within *HYSWEEP.*

Predicted tidal data was applied to all sweep data along with static and dynamic draft values during the sweep editing process. Static draft was logged daily by measuring the depth of the sonar head relative to the water surface. Dynamic draft was determined by differential leveling techniques that established a squat table for various RPM and current conditions.
* Approved tides and zoning were applied during office processing
Velocity cast were performed at the beginning and end of each survey day. Velocity measurements were calculated with a Odom *Digibar,* lowered at five meter intervals to within five meters of the Sea floor. An average sound velocity was entered in the Resson System during survey operations. A sound velocity table was created with *HYPACK* and applied to the sweep data during the editing process.

During the editing process, before data is sorted for mapping purposes, suspect areas of possible obstructions are analyzed to determine minimum depth and maximum size.

E. SONAR EQUIPMENT

Delph-Sonar Acquisition and Processing System
EG&G 272T Side Scan Sonar Tow Fish with 50 meter towcable.
Dolch Computer System, with Exabyte 8505 8mm Tape System
AU-32 Processing Board and Supporting Software.
Oyo Model 612 Thermal Plotter (16 Shades)

F. SOUNDING EQUIPMENT

Innerspace model no. 448 echo sounder (ser. No. 110)
Reson SEABAT 9001 multi-beam system.(ser. No. 208220)

G. CORRECTIONS TO SOUNDINGS

The average speed of sound through water was determined by use of an Odom Digibar sound velocity profiler. Daily casts were made prior to the start, and immediately following, survey operations in each of the areas 3-7. The resulting average was applied to the multi-beam soundings. The casts were positioned in the approximate center of each of the survey areas. Standard bar checks were made at the same times and locations to verify the calibration of the Innerspace 448 fathometer used to collect single beam data. The static draft of the single beam transducer is 0.9'. The static draft of the Reson 9001 used to collect the multi-beam data was 0.87m. Dynamic draft was defined by standard leveling techniques and applied accordingly. Heave, pitch, and roll was monitored by an on-board TSS mod.320 motion reference unit.

H. CONTROL STATIONS See also the Evaluation Report

Horizontal datum for this project is Florida State Plane, NAD83, meters. Differential base stations were setup on COE control monument no. "STJO210" (third-order, class 1) for area 7, COE control monument "STJO175" (third-order, class 1) for areas 6 and 5, COE control monuments "LYONS PARK" (third-order, class 1) for areas 4 and 3.

I. HYDROGRAPHIC POSITIONING CONTROL

Positioning control for this area was achieved by using DGPS technology. The survey vessel was outfitted with a Trimble model 4000SE GPS receiver (ser. # 3404A04928). Differential corrections were calculated by a Trimble 4000SE GPS receiver (ser. #3404A4519) at the control station, and broadcasted by radio telemetry to the survey vessel via Pacific Crest data transmission radios. The corrections were then applied to the GPS position calculated on the survey vessel in real-time. The survey vessel's GPS unit was interfaced with an onboard Austin 486 DX 50 laptop computer running Coastal Oceanographics' "HYPACK" navigation and data acquisition program. To verify the accuracy of the positioning system the survey vessel's GPS antenna was positioned over a COE control monument adjacent the survey area. The survey vessel's calculated position was then compared to the published position of the monument. Results of this daily check indicated an absolute error of less than 1 meter. Other than an occasional, and brief, loss of differential corrections the system proved very reliable.

The design of the boat's multi-beam transducer mount facilitated the positioning of the GPS antenna directly over the nader beam eliminating the need for offsets.

J. SHORELINE See also the Evaluation Report

Not Applicable. Shoreline verification was not included in this project.

K. CROSSLINES

The ratio of cross lines to main scheme- lines was typically 5 to 1. Cross lines were arranged to intersect main-scheme lines at 90 degree angles. No significant discrepancies were found at the crossings.

L. JUNCTIONS See also the Evaluation Report

Not applicable. No Junction was required.

M. COMPARISON WITH PRIOR SURVEYS See also the Evaluation Report

Not applicable. No comparison with prior surveys was required.

N. COMPARISON WITH THE CHART See also the Evaluation Report

O. <Not Used>

P. AIDS TO NAVIGATION

Not applicable. No investigation of aids to navigation was required.

Q. STATISTICS (areas 3-7)

Survey vessel	RED WITCH
lineal Kilometers of sounding lines	134.9
square kilometers of hydrography	0.50
days of production	9
days of weather downtime	1
days of mechanical , electronic or operational. downtime	2
tide stations	0

velocity casts 12

R. <Not Used>

S. RECOMMENDATIONS

None

T. REFERRAL TO REPORTS

None

APPENDICES

A. DANGER TO NAVIGATION REPORTS

No dangers to navigation were detected by this survey

B. <Not Used>

C. LIST OF HORIZONTAL CONTROL STATIONS

Station Name	Latitude	Longitude	Antenna Height	Source
STJO175	30-21-26.119	081-37-10.278		USCOE
JUDOCK	30-21-14.509	081-36-42.930		USCOE
STJO210	30-19-01.204	081-38-47.835		USCOE
LYONS PARK	30-22-42.505	081-37-16.871		USCOE
FUEL	30-24-03.045	081-25-19.564		USCOE

D. <Not Used>

E. TIDE NOTES

Tide correctors for this survey were calculated by a spline curve interpolation of NOAA tide prediction data.
At mid-tide cycle, river currents ran approximately 4 knots.

F. <Not Used>

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 11, 1996

HYDROGRAPHIC SECTION: Hydrographic Surveys Division, (Headquarters)

HYDROGRAPHIC PROJECT: OPR-G364-CN

HYDROGRAPHIC SHEET: H-10647

LOCALITY: St. John's River, Fl. - Drummond Point to One Mile West of Commodore Point

TIME PERIOD: September 21 - 27, 1995

TIDE STATION USED: 872-0242 Long Branch, St. Johns River, Fl.
Lat. 30° 21.5'N Lon. 81° 37.2'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -1.86 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.7 ft.

REMARKS: RECOMMENDED ZONING

Area 3 (bounded by polygon points)

Longitude (west)	Latitude (north)
81.595	30.409167
81.6025	30.406667
81.623056	30.395556
81.625	30.390833
81.619444	30.396389
81.609444	30.400833
81.603056	30.403333
81.592778	30.408889

Apply a -6 minute correction to times and a X1.18 range ratio to heights using Long Branch, Fl. (872-0242).

Area 4 (bounded by polygon points)

Longitude (west)	Latitude (north)
81.623611	30.398333
81.628611	30.394722
81.632222	30.388333
81.633056	30.383611
81.633611	30.383611
81.633333	30.383056
81.632222	30.383333
81.629444	30.381111
81.623611	30.398333

Apply a -6 minute correction to times and a X1.13 range ratio to heights using Long Branch, Fl. (872-0242).

Area 5 (bounded by polygon points)

Longitude (west)	Latitude (north)
81.613889	30.363611
81.615833	30.368056
81.617222	30.370833
81.620556	30.368889
81.620556	30.3675
81.615833	30.363889
81.616389	30.361667
81.613611	30.361944

Times and heights are direct on Long Branch, Fl. (872-0242).

Area 6 (bounded by polygon points)

Longitude (west)	Latitude (north)
81.616389	30.361667
81.621111	30.338056
81.611944	30.345556
81.613611	30.361944

Times and heights are direct on Long Branch, Fl. (872-0242).

Area 7 (bounded by polygon points)

Longitude (west)	Latitude (north)
81.628611	30.317222
81.633333	30.316944
81.640833	30.319444
81.644444	30.316389
81.634444	30.3125
81.629444	30.312222
81.625556	30.312778

Apply a +24 minute correction to times and a X0.88 range ratio to heights using Long Branch, Fl. (872-0242).

Notes:
1. Times are tabulated in Greenwich Mean Time.
2. Data for Long Branch, Fl. (872-0242) are temporarily stored in file #672-0242.
3. Latitude and longitude are in decimal degrees.

William M. Gibson

CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10647

Name on Survey	A On Chart No. 11491	B On Previous Survey No.	C On U.S. Quadrangle Maps	D From Local Information	E On Local Maps	F P.O. Guide or Map	G Rand McNally Atlas	H U.S. Light List	K	
BARTRAM ISLAND	X		X							1
BROWARD POINT TURN	X									2
CHASEVILLE	X		X							3
COMMODORE POINT	X		X							4
DRUMMOND CREEK	X		X							5
DRUMMOND POINT	X		X							6
DRUMMOND POINT RANGE	X									7
FLORAL BLUFF (ppl)	X		X							8
FLORIDA (title)	X		X							9
JACKSONVILLE	X		X							10
MILLER CREEK	X		X							11
REDDIE POINT	X		X							12
SOUTH JACKSONVILLE	X		X							13
SAINT JOHNS RIVER	X		X							14
SAINT NICHOLAS	X		X							15
TERMINAL CHANNEL	X									16
TROUT RIVER	X		X							17
TROUT RIVER RANGE	X									18
										19
										20
										21
										22
										23
										24
										25

Approved:

Chief Geographer

MAR 16 1999

NOAA FORM 76-155 SUPERSEDES C&GS 197

05/19/99

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10647

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	1505
NUMBER OF SOUNDINGS	1505

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	2	03/05/99
VERIFICATION OF FIELD DATA	22	03/10/99
EVALUATION AND ANALYSIS	4	
FINAL INSPECTION	36	04/09/99
COMPILATION	94	05/19/99
TOTAL TIME	158	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 04/28/99

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10647 (1995)

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.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Hydrographic Processing System
NADCON, version 2.10
MicroStation 95, version 5.05
SiteWorks, version 2.01
I/RAS B, version 5.01
NOA-HPS Convertor
Zig-Zag Decimator

The smooth sheet was plotted using an Hewlett Packard DesignJet 2500CP plotter.

H. CONTROL STATIONS

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.862 seconds (26.533 meters or 2.65 mm at the scale of the survey) north in latitude, and 0.661 seconds (17.652 meters or 1.76 mm at the scale of the survey) east in longitude.

J. SHORELINE

No photogrammetric source data was available for this project. Shoreline for the present survey originates with National Ocean Service (NOS) chart 11491, (29th Edition, Jan. 4/97). The shoreline is shown in brown on the smooth sheet and is for orientation purposes only.

L. JUNCTIONS

There are no junctional surveys to the north or to the south. Present survey depths are in harmony with the charted hydrography to the north and to the south.

M. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

N. COMPARISON WITH CHART 11491 (30th EDITION, Jan 31/98)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes no chart comparisons in sections N.,O. or S. of the Descriptive Report. Attention is directed to the following:

1. The charted Subm Dols PA in the vicinity of Latitude 30°23'03"N, Longitude 81°37'51"W originates with an unknown source and were neither investigated nor addressed by the hydrographer. It is recommended that these features be retained at there presently charted locations and the notation revised to a existent doubtful (ED).

2. A charted note 28ft (8^5m) rep 1983 in the vicinity of Latitude 30°22'57"N, Longitude 81°37'50"W, originates with an unknown sources and was neither verified nor disproved by the field unit. The field unit found depths from 32 to 39 feet in this area. No change in charting is recommended.

The present survey is adequate to supersede the charted hydrography within the common area.

U. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar survey. No additional work is recommended.

V. 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.

The following NOS Chart was used for compilation of the present survey:

11491 (30th Edition, Jan. 31/98).

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10647

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Robert R. Hill Date: 4-28-99

Robert R. Hill Jr.
Cartographer
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Andrew L. Beaver Date: 4/30/99

Andrew A. Beaver,
LCDR, NOAA
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Samuel P. DeBow, Jr. Dated: June 10, 1999

Samuel P. De Bow, Jr.
Commander, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10647

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
11491	5-10-99	Robert Hill	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.