



Surveyor's Report

Hydrographic Survey

Survey No. 21-081

St Johns Co Ebb & Flood Shoals AD Survey FY21

St Augustine, Florida

James Allison, Geodesist, USACE Jacksonville District

Location: Project is located in St Augustine, Florida.

Date: Survey was performed 04 February, 2021, 03 and 05, 19 March, 06 – 08, 19 – 20 April 2021, 12 May 2021

Access: There were no access issues for the duration of this project.

Personnel: SB-36: Boat Captain: Greg Keener; System Operator: James Allison, Chad Harralson
 SB-Wells: Boat Captain: Eric Boe, Chad Scheler; System Operator: James Allison

Datum: Horizontal coordinates are based on the state plane coordinate system for the East zone of Florida (SPC-FL-E), and referenced to the North American Datum of 1983. Elevations are referenced to North American Vertical Datum of 1988 (NAVD88).

KTD File: N/A

Instruments: The following instruments were used for data collection:

SB - 36	
Data Collection Software	HYPACK 2020
Sounder	Ross Smart Sounder 835 operating at 28 and 200 kHz
Positioning	Applanix Wavemaster v5 Trimble R8 Receiver / TDL450H Radio Modem
IMU	Applanix POSMV WaveMaster

SB - WELLS	
Data Collection Software	HYPACK 2020
Sounder	Impact Subsea ISA-500 operating at 500 kHz
Positioning	R2Sonic I2NS Trimble R10 Receiver / TDL450H Radio Modem
IMU	Applanix POSMV WaveMaster

CONTROL USED					
STATION	PID	EASTING	NORTHING	ELEV (NAVD88)	ELEV (MLLW)
872 0554 B TIDAL	DL5712	-	-	12.65'	15.54'
RAMP RESET	BBCB11	558,370.19'	2,027,838.76'	4.06'	

Field Procedures: This survey was performed utilizing Real-Time Kinematic (RTK) GPS with a base receiver established at survey monument “RAMP RESET” (PID: BBCB11) for the entire project. See Appendix 1 for additional station information.

A tide staff previously set from survey monument “872 0554 B TIDAL”, located on a wooden piling on the nearest wooden dock south of the monument, was used to verify RTK tides prior to surveying.

Bar checks were performed prior to survey operations to verify draft and sound velocity corrections. Sound velocity corrections were also verified using a Valeport Swift SVP.

Field Conditions: See Logsheets.

Data Processing: Hydrographic data was processed and sounding spikes were removed immediately upon completion of the survey. No statistical anomalies were noted for the entire project. (*See Appendix 3 for additional information.*)

Special Note: The offshore shallow areas of this project are extremely dynamic and challenging to survey. Extensive efforts must be planned around weather events and tidal cycles for survey efforts to be successful. It also should be noted the Saint Augustine Inlet shoals have been historically challenging to survey as well due to the stated conditions above.

MAP SHEET NOTES:

REFER TO SURVEY NO. 21-081.

ALL ELEVATIONS ARE BELOW THE CHART DATUM UNLESS PROCEEDED BY A (+) SIGN.

AIDS TO NAVIGATION WERE LOCATED AS PART OF THIS SURVEY.

PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE EAST ZONE OF FLORIDA AND REFERENCED TO THE CURRENT REALIZATION OF THE NORTH AMERICAN DATUM OF 1983, (NAD83), BASED ON THE NOAA NATIONAL SPATIAL REFERENCE SYSTEM (NSRS).

THIS SURVEY WAS PERFORMED USING REAL-TIME KINEMATIC GPS POSITIONING WITH THE FOLLOWING REFERENCE BASE LOCATIONS:

*REFERENCE BASE LOCATED AT "RAMP RESET" (PID: BBCB11)

DEPTHS DEPICTED BY THIS SURVEY ARE REFERENCED TO NAVD88.

*NOAA TIDAL STATION 872-0554 FOR THE ENTIRE PROJECT (PID: DL5712)

VERTICAL MEASUREMENTS WERE MADE USING A ROSS SMART SOUNDER DUAL FREQUENCY 28/200 KHZ SINGLE BEAM TRANSDUCER.

<u>SURVEY VESSEL</u>	<u>DATE OF SURVEY</u>	<u>CUT</u>
SB - 36	04 FEBRUARY 2021	EBB SHOAL
SB - 36	03 MARCH 2021	IWW CUT SJ-28 STA 13+00 THRU 33+47, CUT SJ-28A STA 00+00 THRU 09+00, FLOOD SHOAL PART1, EBB SHOAL PART2
SB - 36	05 MARCH 2021	FLOOD SHOAL PART2
SB - 36	19 MARCH 2021	FLOOD SHOAL PART 3, EBB SHOAL PART 3
SB-36	06 APRIL 2021	EBB SHOAL
SB WELLS	07 - 08 APRIL 2021	EBB SHOAL
SB WELLS	19 APRIL 2021	EBB SHOAL
SB WELLS	20 APRIL 2021	DAVIS SHOAL
SB - 36	12 MAY 2021	EBB SHOAL

THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED ABOVE AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS AT THAT TIME. THIS CHART IS SOLELY FOR THE DISTRIBUTION OF AVAILABLE DEPTHS AT THE TIME OF SURVEY.

SURVEY ACCURACY STANDARDS, QUALITY CONTROL, AND QUALITY ASSURANCE REQUIREMENTS WERE FOLLOWED DURING THIS SURVEY IN ACCORDANCE WITH USACE EM 1110-2-1003, HYDROGRAPHIC SURVEYING, 30 NOV 2013.

APPENDIX 1

RAMP RESET™ (PID: BBCB11)

PID: BBCB11
Designation: RAMP RESET
Stamping: RAMP-RESET 2010 JAX. DIST.
Stability:
Setting: Massive retaining walls
Mark Condition: G
Description: RECOVERED ON NOV. 16, 2018
Observed: 2018-11-16T06:42:00Z more obs 2010-08-30
Source: OPUS - page5 1603.24



Close-up View

REF_FRAME: NAD_83(2011)		EPOCH: 2010.0000		SOURCE: NAVD88 (Computed using GEOID18)		UNITS: m		SET PROFILE		DETAILS	
LAT: 29° 54' 41.03136" ± 0.004 m						UTM 17 SPC 901(FL E)					
LON: -81° 18' 31.25916" ± 0.003 m						NORTHING: 3309007.582m 618086.490m					
ELL HT: -27.382 ± 0.017 m						EASTING: 470201.745m 170191.574m					
X: 836117.969 ± 0.005 m						CONVERGENCE: -0.15392778° -0.15392778°					
Y: -5469599.061 ± 0.015 m						POINT SCALE: 0.99961095 0.99995214					
Z: 3161850.423 ± 0.006 m						COMBINED FACTOR: 0.99961525 0.99995644					
ORTHO HT: 1.239 ± 0.047 m											

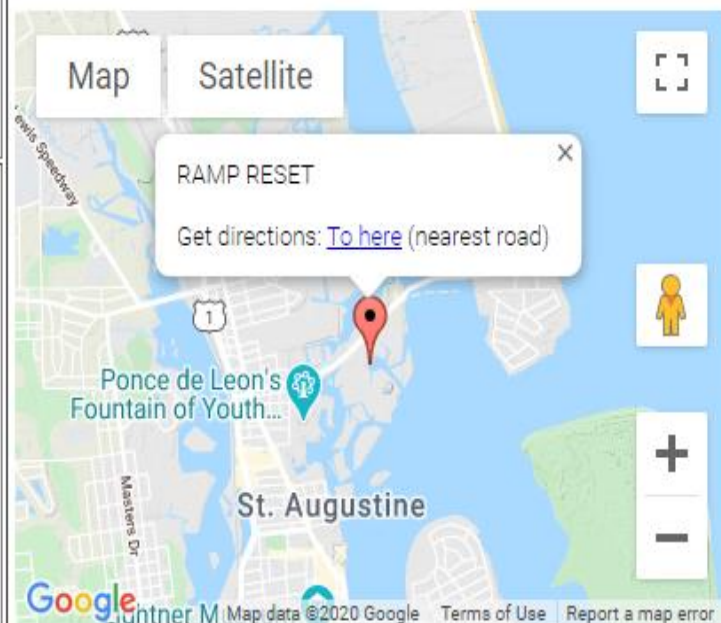
CONTRIBUTED BY

[rudolphe.konou](#)

[Florida Department of Environmental Protection](#)



Horizon View



APPENDIX 2

NOAA TIDE STATION 872-0554 FOR THE ENTIRE PROJECT
 TIDE STAFF LOCATED ON A WOODEN PILING SET FROM "872 0554 B TIDAL"

The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.12.5.9
Starting Datasheet Retrieval...
1      National Geodetic Survey,      Retrieval Date = JULY 10, 2020
DL5712
*****
DL5712  TIDAL BM      -   This is a Tidal Bench Mark.
DL5712  DESIGNATION  -   872 0554 B
DL5712  PID          -   DL5712
DL5712  STATE/COUNTY-   FL/ST JOHNS
DL5712  COUNTRY      -   US
DL5712  USGS QUAD    -   SAINT AUGUSTINE (2018)
DL5712
DL5712                                *CURRENT SURVEY CONTROL
DL5712

DL5712* NAD 83(1986) POSITION- 29 55 00.1      (N) 081 18 00.1      (W)
HD_HELD2
DL5712* NAVD 88 ORTHO HEIGHT -      3.856 (meters)      12.65 (feet) ADJUSTED
DL5712

DL5712  GEOID HEIGHT      -      -28.625 (meters)
GEOID18
DL5712  DYNAMIC HEIGHT    -      3.850 (meters)      12.63 (feet) COMP
DL5712  MODELED GRAVITY    -      979,323.5 (mgal)      NAVD
88
DL5712
DL5712  VERT ORDER        -   FIRST      CLASS II
DL5712
DL5712.The horizontal coordinates were established by autonomous hand held
GPS
DL5712.observations and have an estimated accuracy of +/- 10 meters.
DL5712.
DL5712.The orthometric height was determined by differential leveling and
DL5712.adjusted by the NATIONAL GEODETIC SURVEY
DL5712.in January 2010.
DL5712
DL5712.No vertical observational check was made to the station.
DL5712
DL5712.Significant digits in the geoid height do not necessarily reflect
accuracy.
DL5712.GEOID18 height accuracy estimate available here.
DL5712
DL5712.This Tidal Bench Mark is designated as VM 17744
DL5712.by the CENTER FOR OPERATIONAL OCEANOGRAPHIC PRODUCTS AND SERVICES.

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DL5712

DL5712.Click [photographs](#) - Photos may exist for this station.

DL5712

DL5712.The dynamic height is computed by dividing the NAVD 88
 DL5712.geopotential number by the normal gravity value computed on the
 DL5712.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DL5712.degrees latitude (g = 980.6199 gals.).

DL5712

DL5712.The modeled gravity was interpolated from observed gravity values.

DL5712

DL5712;	North	East	Units	Estimated Accuracy
DL5712;SPC FL E	- 618,671.	171,029.	MT	(+/- 10 meters HH2

GPS)

DL5712

DL5712_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RMP7103809592 (NAD 83)

DL5712

DL5712 SUPERSEDED SURVEY CONTROL

DL5712

DL5712.No superseded survey control is available for this station.

DL5712

DL5712_MARKER: DJ = TIDAL STATION DISK

DL5712_SETTING: 36 = SET IN A MASSIVE STRUCTURE

DL5712_SP_SET: BRIDGE WALKWAY

DL5712_STAMPING: 0554 B 1996

DL5712_MARK LOGO: NOS

DL5712_MAGNETIC: N = NO MAGNETIC MATERIAL

DL5712_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL

DL5712_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR

DL5712+SATELLITE: SATELLITE OBSERVATIONS - February 11, 2020

DL5712

DL5712	HISTORY	- Date	Condition	Report By
DL5712	HISTORY	- 1996	MONUMENTED	FLDEP
DL5712	HISTORY	- 20070426	GOOD	FLDEP
DL5712	HISTORY	- 20200211	GOOD	USPSQD

DL5712

DL5712 STATION DESCRIPTION

DL5712

DL5712'DESCRIBED BY FL DEPT OF ENV PRO 2007 (JLM)

DL5712'THE MARK IS ABOUT 2.0 MI (3.2 KM) EAST OF SAINT AUGUSTINE, IN SECTION
 DL5712'4, TOWNSHIP 7 SOUTH, RANGE 30 EAST.

DL5712'

DL5712'TO REACH THE MARK FROM THE JUNCTION OF STATE HIGHWAY 16 (GREEN COVE
 DL5712'SPRINGS ROAD) AND U.S. HIGHWAY 1 (PONCE DE LEON BOULEVARD) ON THE
 DL5712'NORTH SIDE OF SAINT AUGUSTINE, GO SOUTH ON U.S. HIGHWAY 1 (PONCE DE
 DL5712'LEON BOULEVARD) FOR 0.55 MI (0.9 KM) TO THE JUNCTION OF WEST SAN
 DL5712'CARLOS AVENUE (STATE HIGHWAY A1A NORTH) ON THE LEFT, TURN LEFT ON

WEST

DL5712'SAN CARLOS AVENUE AND GO EAST FOR 0.1 MI (0.2 KM) TO THE T-JUNCTION
 OF

DL5712'SAN MARCO AVENUE (STATE HIGHWAY A1A NORTH), TURN LEFT ON SAN MARCO

DL5712'AVENUE (STATE HIGHWAY A1A NORTH) AND GO NORTH FOR ABOUT 100.0 FT

(30.5

DL5712'M) TO THE JUNCTION OF MAY STREET (STATE HIGHWAY A1A NORTH) ON THE

DL5712'RIGHT, TURN RIGHT ON MAY STREET (STATE HIGHWAY A1A NORTH) AND GO EAST



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DL5712'FOR 1.85 MI (3.0 KM) TO THE T-JUNCTION OF STATE ROAD A1A (COASTAL
DL5712'HIGHWAY), TURN RIGHT ON STATE ROAD A1A (COASTAL HIGHWAY) AND GO SOUTH
DL5712'FOR ABOUT 100.0 FT (30.5 M) TO THE JUNCTION OF POPLAR AVENUE ON THE
DL5712'RIGHT, TURN RIGHT ON POPLAR AVENUE AND GO WESTERLY FOR 0.15 MI (0.2
DL5712'KM) TO THE INTERSECTION OF VILANO ROAD ON THE RIGHT, TURN RIGHT ON
DL5712'VILANO ROAD AND GO WEST FOR 0.3 MI (0.5 KM) TO THE END OF VILANO ROAD
DL5712'AND THE VILANO BEACH FISHING PIER, NOW BY WALKING GO WEST ON THE
DL5712'FISHING PIER FOR 684.0 FT (208.5 M) TO THE MARK ON THE RIGHT A NOS
DL5712'DISK SET FLUSH IN THE CONCRETE WALKWAY ON THE NORTHWEST END OF THE
DL5712'VILANO BEACH FISHING PIER.

DL5712'

DL5712'LOCATED ABOUT 684.0 FT (208.5 M) WEST OF THE EAST END OF THE PIER,
DL5712'32.0 FT (9.8 M) NORTHEAST OF 872 0554 AQUA TRAK (TIDE GAGE), 11.0 FT
DL5712'(3.4 M) NORTH OF THE CENTERLINE OF THE FISHING PIER AND 4.0 FT (1.2

M)

DL5712'EAST OF THE NORTHWEST END OF THE PIER.

DL5712

DL5712

STATION RECOVERY (2020)

DL5712

DL5712'RECOVERY NOTE BY US POWER SQUADRON 2020 (TJH)

DL5712'RECOVERED IN GOOD CONDITION.

*** retrieval complete.



T I D A L D A T U M S

Tidal datums at VILANO BEACH (ICWW) based on:

LENGTH OF SERIES: 10 MONTHS
 TIME PERIOD: October 2003 - July 2004
 TIDAL EPOCH: 1983-2001
 CONTROL TIDE STATION: 8720218 BAR PILOTS DOCK, ST JOHNS RIVER

Elevations of tidal datums referred to Mean Lower Low Water (MLLW), in METERS:

MEAN HIGHER HIGH WATER	MHHW	=	1.449
MEAN HIGH WATER	MHW	=	1.347
North American Vertical Datum	NAVD88	=	0.880
MEAN SEA LEVEL	MSL	=	0.710
MEAN TIDE LEVEL	MTL	=	0.701
MEAN LOW WATER	MLW	=	0.054
MEAN LOWER LOW WATER	MLLW	=	0.000

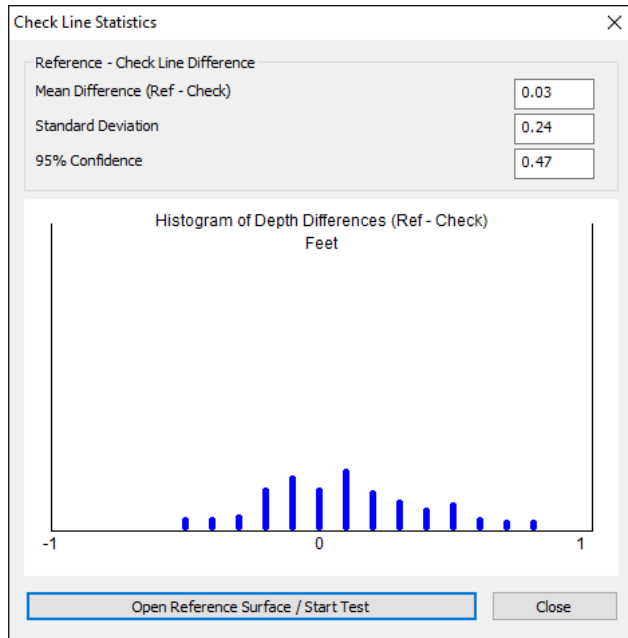
North American Vertical Datum (NAVD88)

Bench Mark Elevation Information In METERS above:

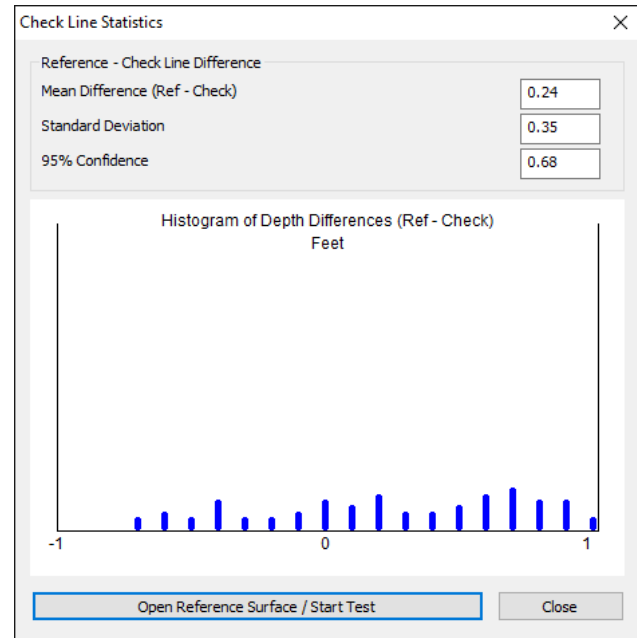
Stamping or Designation	MLLW	MHW
0554 A 1996	2.451	1.104
78 79 A 39 RM NO 1	2.997	1.650
0554 B 1996	4.728	3.381
78 79 A38	4.157	2.810
78 79 A39	3.032	1.685

APPENDIX 3

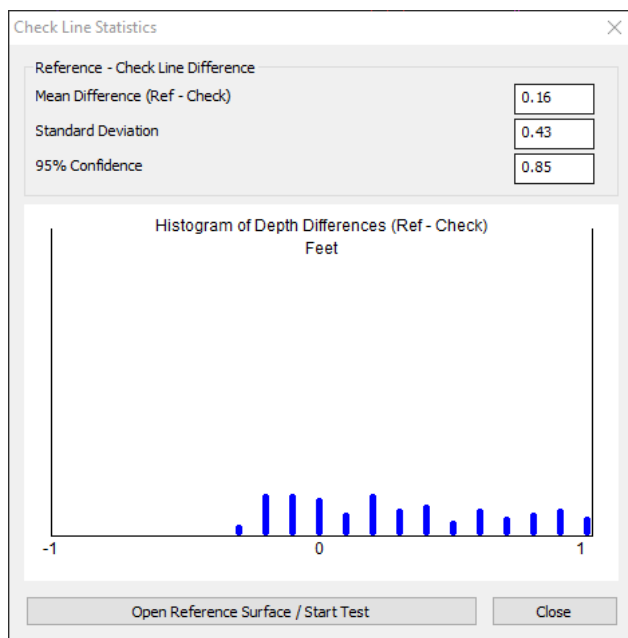
IWW Cut SJ-28 Checkline Stats



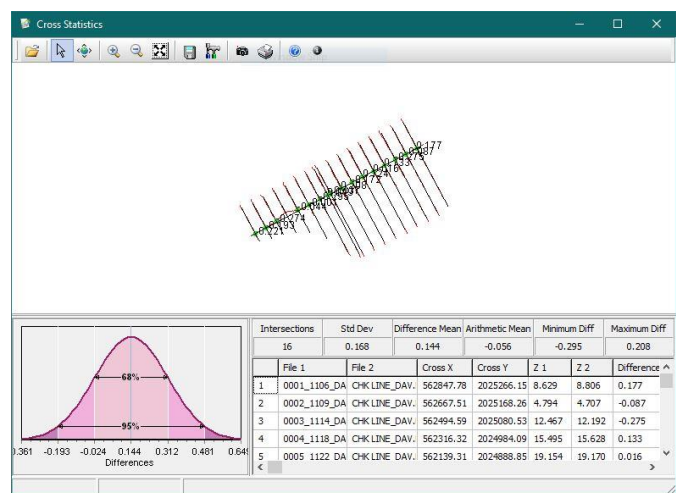
IWW Cut SJ-28A Checkline Stats



Flood Shoal Checkline Stats

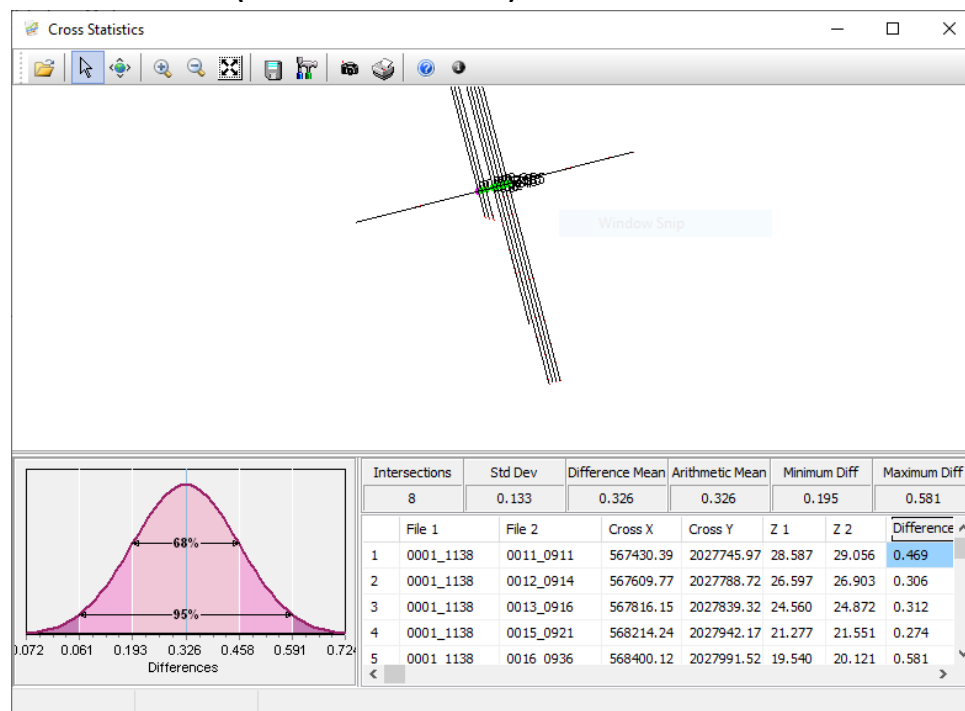


Davis Shoal Stats

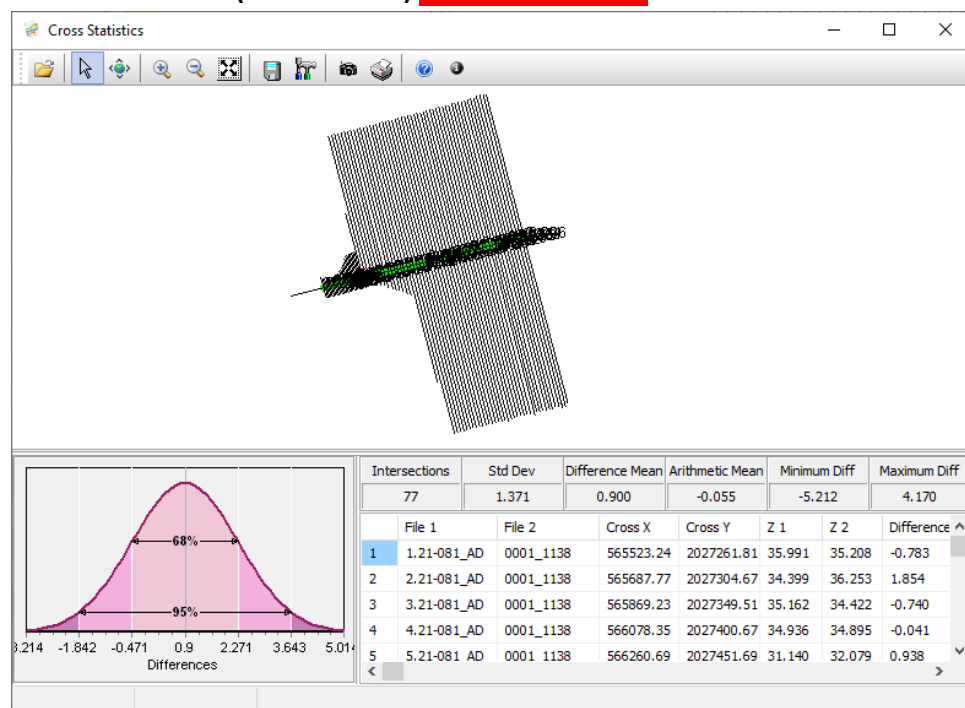




EBB SHOAL STATS (12 MAY 2021 SURVEY)



EBB SHOAL STATS (ALL SURVEYS) *SEE NOTE BELOW



STATS FOR ALL OF EBB SHOAL ARE HIGHER THAN NORMAL DUE TO TIME BETWEEN CHECK LINE SURVEY AND CROSS SECTIONS NOT SURVEYED ON 12MAY2021.