

National Conference on Beach Preservation Technology

Enhancing Coastal Project Data Management through the Implementation of OpenGround - Everglades Harbor Case Study

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U.S. Army Corps of Engineers, Jacksonville District

Working Today to Build a Better Tomorrow

February 6, 2025



US Army Corps
of Engineers®





WHY DATA MANAGEMENT MATTERS?



- Effective coastal data management is crucial for compliance and security, data quality, and decision making.
- This study explores geotechnical data management to enhance efficiency and accuracy in coastal projects.
- Case study is a Regional Sediment Management (RSM) project, but the methods can also be used for beach projects.

Location Details		Field Geological Descriptions				
Location ID	Depth Top (ft)	Depth Base (ft)	Description	Legend Code	USCS	
VB-EH24-01	0.00	1.30	SHELL; mostly sand to gravel-sized s...			
VB-EH24-01	1.30	3.10	No Recovery			
VB-EH24-02	0.00	1.60	POORLY GRADED SAND (SP); mostly...	SP	SP	
VB-EH24-02	1.60	2.60	POORLY GRADED SAND WITH SILT (...)	SM		
VB-EH24-02	2.60	3.60	SILTY SAND (SM); mostly fine quartz...	SM	SM	
VB-EH24-02	3.60	4.40	SANDY SILT (ML); mostly low plastici...	ML	ML	
VB-EH24-02	4.40	5.20	LIMESTONE; mostly sand to gravel-si...	Limestone		

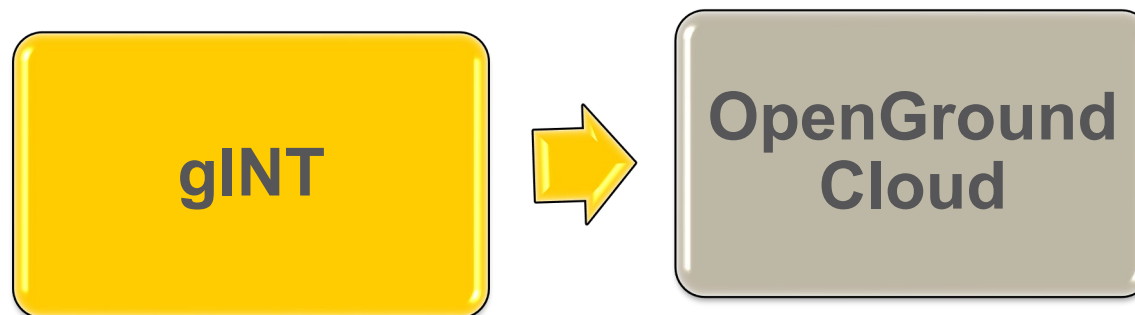


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PREVIOUS GEOTECHNICAL SOFTWARE



- USACE used gINT software over 20 yrs.
- Challenges encountered:
 - Multiples files of the same project
 - Local accessibility
- USACE transitioned from the gINT geotechnical software to OpenGround Cloud (OGC).
- Moving from a Local to a National Database.





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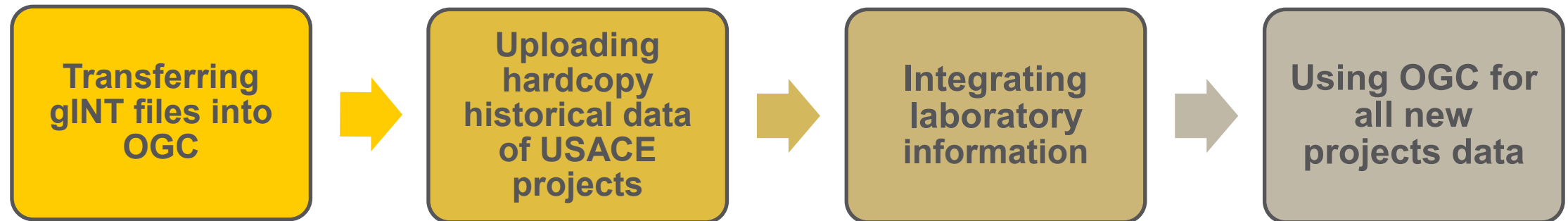
OPENGROUND CLOUD (OGC)



OpenGround® Cloud
CONNECT Edition



- OGC is a cloud-based data management software developed by Bentley Systems.
- Enhances efficiency and accuracy handling geotechnical data.
- In 2020, USACE started to implement OGC.
- Our process:



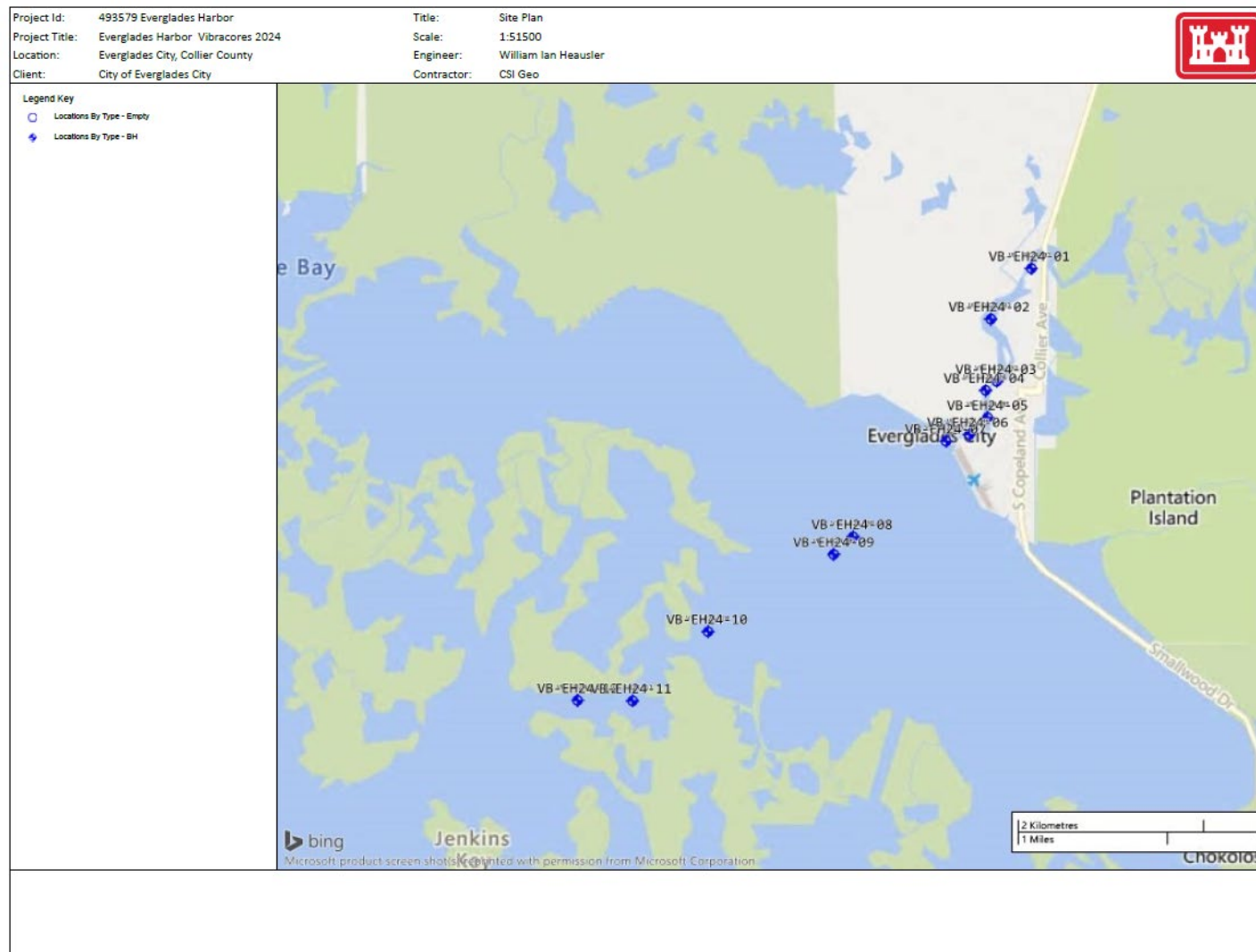


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OPEN GROUND CLOUD - CAPABILITIES



- **Accessibility – National database**
- **Fosters Collaboration – Team privileges for editing and visualization.**
- **GIS component integrated**
 - **Uses boring information to generate a map.**
 - **Viewing and printing capabilities.**





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OPEN GROUND CLOUD - EXTENSIONS



OpenGround® Cloud

Installed Apps

[Update All](#)



Professional

v10.0.1.2649 [Release Notes](#)

LAUNCH



Excel Extension

v10.0.1.1778 [Release Notes](#)

LAUNCH



Data Entry

v10.0.1.2649 [Release Notes](#)

LAUNCH

Project	Data	Scheduling	Mapping	Preferences	Configuration	Help
Project Details	Project Access	Audit Log	Create Team	Manage Teams	Manage Snapshots	Create Snapshot
Settings	Teams	Backups	Documents	Maintenance	Exit	
Location Details						
All Data						
Summary						
Historic Projects (0)						
Location Details (12)						
Shift (0)						
Geological Information						
Hole Construction						
Insitu Tests						
Monitoring						
Samples and Lab Tests						
Options						
Reports						
Geology						
Statistics						
Summary						
Validation						
Location ID	Location Type	Status	Northing (ft)	Easting (ft)	Longitude Decimal (-)	Latitude Decimal (-)
VB-EH24-01	BH		558492.00	529862.00	-81.384123	25.869630
VB-EH24-02	BH		556698.00	528430.00	-81.388461	25.864682
VB-EH24-03	BH		554481.00	528663.00	-81.387733	25.858585
VB-EH24-04	BH		554165.00	528249.00	-81.388989	25.857712
VB-EH24-05	BH		553199.00	528360.00	-81.388643	25.855055
VB-EH24-06	BH		552595.00	527654.00	-81.390784	25.853387
VB-EH24-07	BH		552362.00	526869.00	-81.393169	25.852740
VB-EH24-08	BH		548975.00	523537.00	-81.403269	25.843393
VB-EH24-09	BH		548352.00	522884.00	-81.405249	25.841674
VB-EH24-10	BH		545618.00	518376.00	-81.418929	25.834112
VB-EH24-11	BH		543167.00	515673.00	-81.427122	25.827345
VB-EH24-12	BH		543190.00	513777.00	-81.432887	25.827391

Data Entry

Help

Profile

SAJ-SAM Borehole

Step

Location Details

Profile

Navigation

Step 1 of 8

Actions

Refresh

Secondary Units

Quick Log

Switch Profile

Bulk Update

Replicate Location

View All

View Selected

Upload

Close

Location Details

Location ID

Location Type

Status

Northing (ft)

Easting (ft)

Longitude Decimal (-)

Latitude Decimal (-)

Click here to add new item

VB-EH24-01

BH

558492.00

529862.00

-81.384123

25.869630

VB-EH24-02

BH

556698.00

528430.00

-81.388461

25.864682

VB-EH24-03

BH

554481.00

528663.00

-81.387733

25.858585

VB-EH24-04

BH

554165.00

528249.00

-81.388989

25.857712

VB-EH24-05

BH

553199.00

528360.00

-81.388643

25.855055

VB-EH24-06

BH

552595.00

527654.00

-81.390784

25.853387

VB-EH24-07

BH

552362.00

526869.00

-81.393169

25.852740

VB-EH24-08

BH

548975.00

523537.00

-81.403269

25.843393

VB-EH24-09

BH

548352.00

522884.00

-81.405249

25.841674

VB-EH24-10

BH

545618.00

518376.00

-81.418929

25.834112

VB-EH24-11

BH

543167.00

515673.00

-81.427122

25.827345

VB-EH24-12

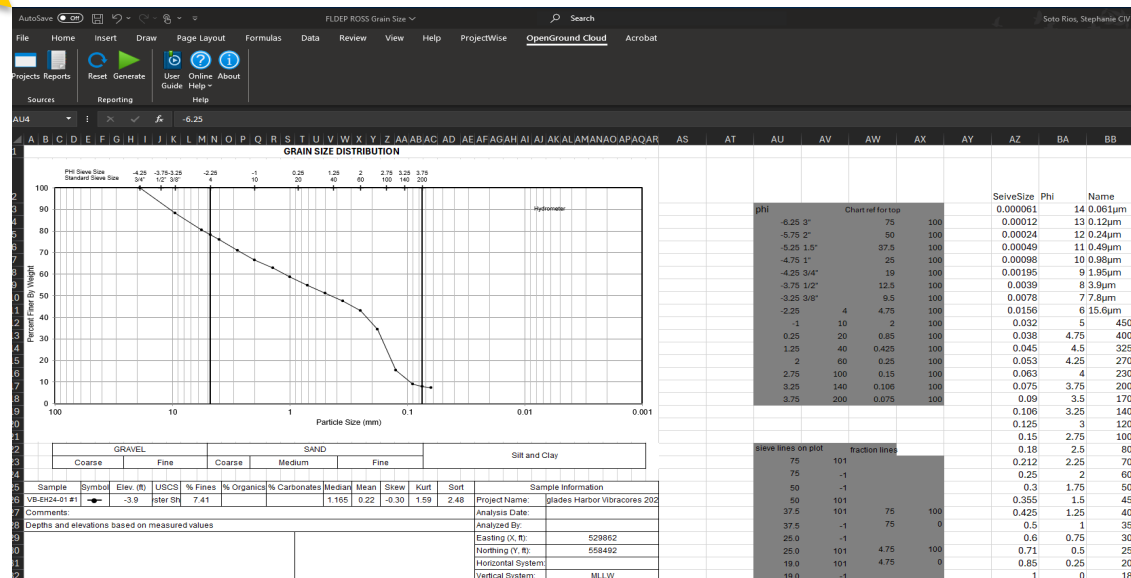
BH

543190.00

513777.00

-81.432887

25.827391





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STUDY AREA: EVERGLADES HARBOR



- Everglades Harbor is a USACE Operation & Maintenance Project
- Location: City of Everglades, Collier County, FL
- Regional Sediment Management (RSM) Project
- Everglades Harbor federal channel is 8-foot deep and 60 feet wide.
- Length of project is about 9.2 miles.



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STUDY AREA: CITY OF EVERGLADES



- Known as "Stone Crab Capital of the World"
- Population: 352
(2020 Collier County Population & Demographics)
- City devoted to commercial and sports fishing and tourism



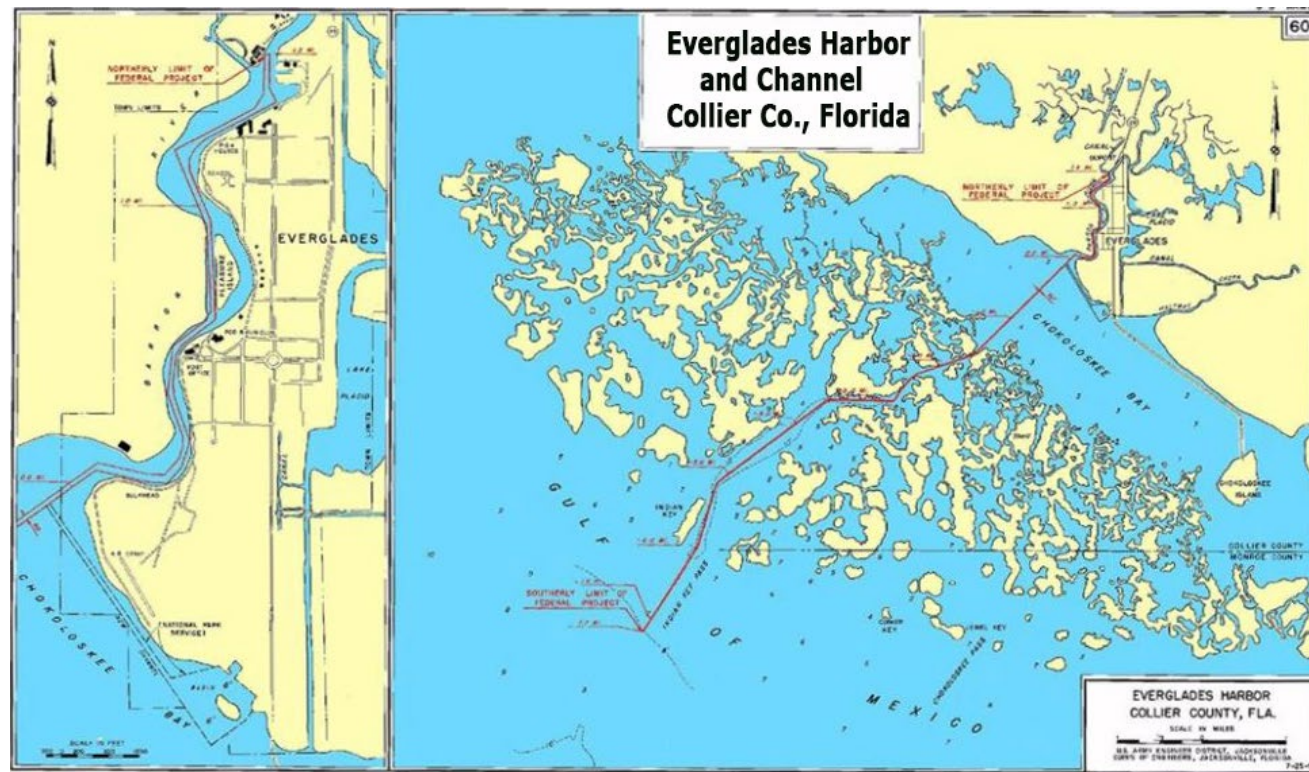


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STUDY AREA: EVERGLADES HARBOR



- The federal channel was first dredged in 1963 and have not been dredged since.
- Navigation restriction resulting from shoaling.
- Local fishing and tourism industry being impacted.
- Maintenance dredging scheduled in 2027.





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GEOTECHNICAL INVESTIGATION

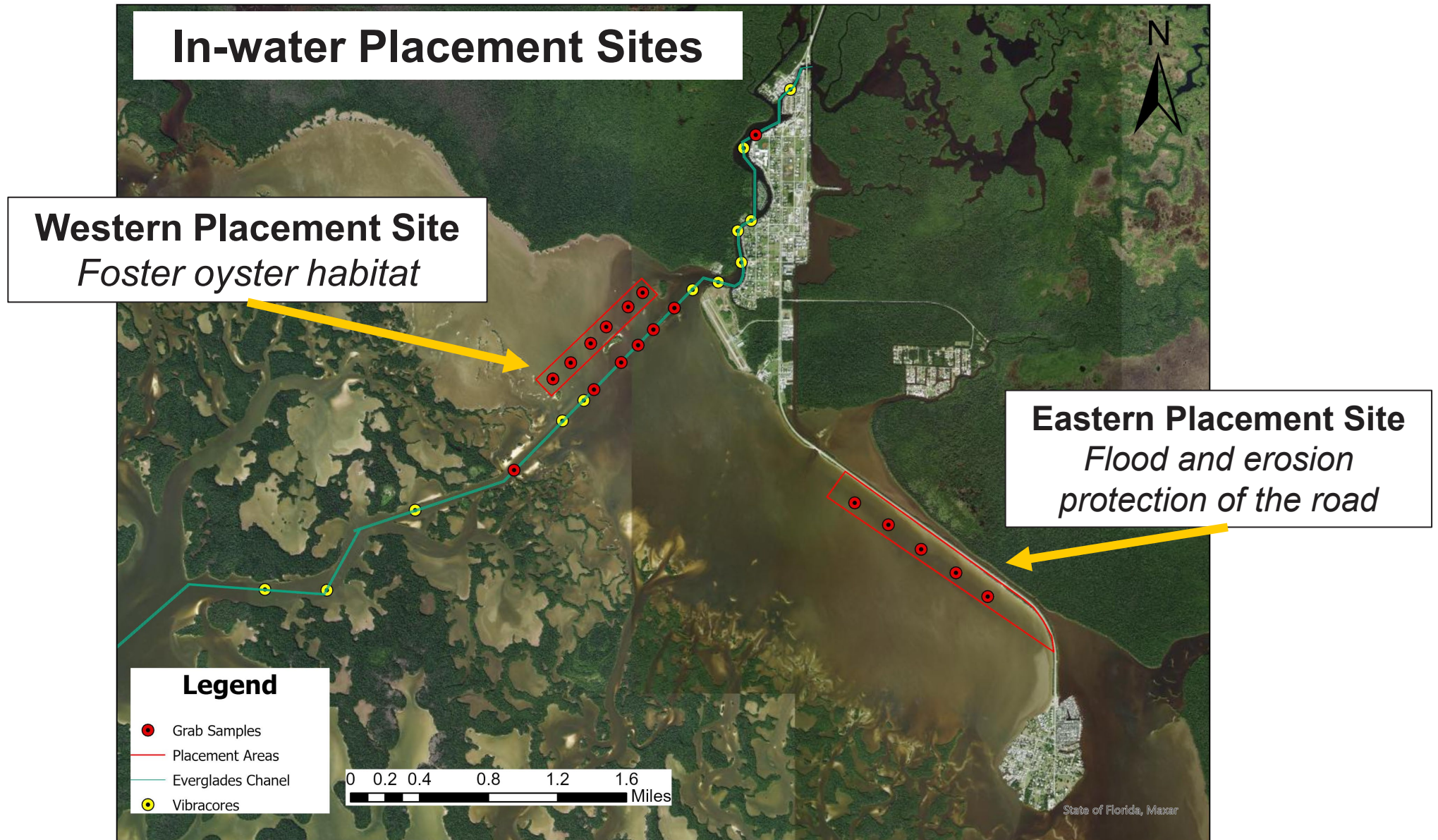


- A total of 12 vibracores and 8 surficial samples were collected.
- Characterize dredged material.
- Vibracores were only considered for this study.



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GEOTECHNICAL INVESTIGATION





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DATA MANAGEMENT – OPENGROUND CLOUD





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Data Entry



Professional

v10.0.1.2649 [Release Notes](#)

- Creating project

OpenGround Cloud Professional

System Mapping Preferences Help **Grid Tools**

Create Project Open Project Zoom to Project Reload Data CSV Export Clear Sorts Clear Filters Bulk Update Toggle Current Project Access Set Location Reset Location Bulk Update Coord. Systems Edit Project Delete Project Setup Project

Actions Settings

Projects

Project ID	Project title	Office	Vertical Datum	Location Type	Status	Category	Location of site
493579 Everglades Harbor	Everglades Harbor Vibracores 2024	Jacksonville, FL	MLLW	Northing/Easting	Open	Harbor/Channel	Everglades City, Collier Co...

- Project Information

Location Details										
Location ID	Location Type	Status	Northing (ft)	Easting (ft)	Longitude Decimal (-)	Latitude Decimal (-)	Low Water Datu... (ft)	Gage Reading (ft)	Barge Deck Height (ft)	Elevation (ft)
VB-EH24-01	BH		558492.00	529862.00	-81.384123	25.869630				-3.40
VB-EH24-02	BH		556698.00	528430.00	-81.388461	25.864682				-5.20
VB-EH24-03	BH		554481.00	528663.00	-81.387733	25.858585				-6.30
VB-EH24-04	BH		554165.00	528249.00	-81.388989	25.857712				-4.80
VB-EH24-05	BH		553199.00	528360.00	-81.388643	25.855055				-5.70



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Data Entry



- Laboratory data entry

USACE Template - Lab Importer 20241204																										
General Information																										
Laboratory Company/ Location	Location ID	Sample Reference	Sample Type	Sample ID	Moisture Content (%)	Visual USCS Symbol	Visual USCS Group Name	LL	PL	Non Plastic	% passing 3/4"	% passing 2"	% passing 1/2"	% passing 3/8"	% passing 3/16"	% passing 1/4"	% passing #10	% passing #20	% passing #40	% passing #60	% passing #100	% passing #200	% passing #425	% passing #600	% passing #840	% passing #1060
VB-EH24-	0.5	1									100	88.39	80.58	78.31	76.88	71.05	66.50	62.82	58.65	54.30	51.17					
VB-EH24-	0.5	1									100	100.00	99.92	99.88	99.78	99.65	99.33	98.96	97.90	95.43	87.15					
VB-EH24-	2	2									100	100.00	99.96	99.95	99.82	99.56	99.26									
VB-EH24-	3	3									100	100.00	99.62	98.85	98.55	97.19	96.19									
VB-EH24-	4	4									100	100.00	99.83	99.28	98.93											
VB-EH24-	1	1									100	100.00	70.21	60.55	58.22	56.25	51.59	48.01								
VB-EH24-	2	2									100	80.00	67.41	63.99	60.34	54.91	50.62									
VB-EH24-	1	1									39.08	35.74	33.37	31.97	31.30	30.23	29.04									
VB-EH24-	2	2									77.55	62.92	53.83	58.66	57.19	55.28	52.92									
VB-EH24-	3	3									94.46	67.84	58.72	56.12	53.88	49.81	46.21									
VB-EH24-	1	1									96.76	91.66	87.52	86.57	85.32	83.22	81.20									
VB-EH24-	2	2									90.11	76.29	73.29	71.99	71.10	69.42	67.82									
VB-EH24-	3	3									37.35	78.04	68.18	66.49	64.86	61.59	58.38									
VB-EH24-	3.5	4									100	80.23	63.85	60.84	58.28	53.15	49.68									
VB-EH24-	1	1									88.91	82.39	78.02	74.46	73.32	71.80	70.63									
VB-EH24-	2	2									100	99.05	96.88	96.44	95.90	94.52	93.30									
VB-EH24-	0.5	1									88.13	72.65	67.27	65.34	63.34	59.35	56.51									
VB-EH24-	15	2									100	96.83	98.13	97.88	97.70	97.47	97.18									
VB-EH24-	3	3									100	99.82	99.55	99.49	99.49	99.35	99.24									
VB-EH24-	4.2	4									100	100.00	99.86	99.86	99.86	99.86	99.85									
VB-EH24-	5	5									100	100.00	99.99	99.99	99.96	99.91	99.74									
VB-EH24-	0.5	1									100	99.30	98.91	98.84	98.76	98.43	97.48									
VB-EH24-	15	2									100	99.82	99.55	99.49	99.49	99.35	99.24									
VB-EH24-	2.5	3									100	100.00	99.86	99.86	99.86	99.86	99.85									
VB-EH24-	3.5	4									100	100.00	99.91	99.88	99.71	99.39										
VB-EH24-	4.5	5									100	100.00	99.83	99.83	99.83	99.73	99.54									
VB-EH24-	1	1									100	99.08	97.36	96.73	96.64	93.35	89.16									
VB-EH24-	2	2									100	96.29	91.71	89.85	86.67	80.61	72.39									
VB-EH24-	3	3									100	99.03	94.34	92.41	89.40	84.50	79.01									
VB-EH24-	3.6	4									100	99.50	98.85	98.55	97.97	96.97	96.07									
VB-EH24-	0.5	1									96.46	94.42	90.52	88.65	86.56	81.00	73.77									
VB-EH24-	15	2									91.47	78.82	73.39	70.07	67.73	63.88	59.10									
VB-EH24-	2.5	3									100	98.00	95.10	93.54	92.05	88.07	84.92									
VB-EH24-	3.5	4									100	99.38	96.07	94.37	92.11	89.07	86.40									
VB-EH24-	4.5	5									95.22	94.39	93.72	93.14	92.70	91.80	90.93									
VB-EH24-	1	1									100	98.78	92.08	89.11	84.04	73.43	60.83									
VB-EH24-	2	2									92.34	90.21	84.83	83.11	80.96	75.58	67.53									
VB-EH24-	3	3									100	96.33	93.78	91.67	86.17	82.06	73.84									
VB-EH24-	4	4									100	92.68	88.88	86.24	82.21	73.07	63.22									
VB-EH24-	5	5									100	96.68	95.95	94.71	92.07	85.50	76.79									
VB-EH24-	1	1									100	96.61	93.62	91.07	88.51	81.74	73.60									
VB-EH24-	2	2									100	98.03	95.81	94.79	92.48	85.46	75.83									
VB-EH24-	3	3									100	100.00	98.49	94.59	91.36	80.47	67.09									
VB-EH24-	4	4									100	97.19	94.30	92.81	90.58	85.24	77.06									

- A USACE approved template
- Used to import lab data into the Dataforensics Cloud.

Dataforensics Cloud

Client

Projects

Sampling Plans

Lab Data Converter

Application

Help

Settings

pLog Cloud

Lab Converter

New Lab Data File

Manage Templates

View Status of OpenGround Uploads

Global Filter

Name	Last Edited	Notes	Office Name
Clear Visitor Control Center	2025-01-14T21:06:35.41		Alaska
Armourdale Pilot Hole Data	2025-01-14T19:43:12.44	PBI Gordon Pilot Hole Drilling Lab Data	Kansas City
raven glen	2025-01-13T19:54:48.6		Chicago



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Data Entry
v10.0.1.2649 [Release Notes](#)

Data Entry

Help

Profile

SAJ-SAM Borehole

Step

Soil and Rock Descriptions

Profile

VB-EH24-02 - BH - 5.6

Field Geological Description

Depth Top (ft)	Depth Base (ft)	Description	Geology Code	Boundary	Legend Code
0.00	1.60	POORLY GRADED SAND (SP); mostly...			SP
1.60	2.60	POORLY GRADED SAND WITH SILT (...)			SM
2.60	3.60	SILTY SAND (SM); mostly fine quartz...			SM
3.60	4.40	SANDY SILT (ML); mostly low plastici...			ML
4.40	5.20	LIMESTONE; mostly sand to gravel-si...			Limestone
5.20	5.60	No Recovery			

Navigation

Step 5 of 8

Actions

RefreshSecondary UnitsQuick LogSwitch ProfileBulk UpdateReplicate Location

Documents

View AllView SelectedUploadClose

Data Entry

VB-EH24-02 - BH - 5.6

Show Location Grid

Page 1 of 1 (6 of 6)									
Field Geol Rock SAJ - SAM Soil Descriptions									
Minor Percent1	Minor Constituen...	Minor Percent2	Minor Constituen...	Minor Percent3	Minor Constituen...	Additional Description	Percent Gravel	Percent Sand	Percent Fines
trace	silt					10YR 6/1 gray	0	99	1
						POORLY GRADED SAND WITH SILT (...)			
little	wood					(alternating sand & silt layers), 10YR...	1	73	26
some	fine sand					few fine to medium-grained sand-si...	0	47	53
						LIMESTONE; mostly sand to gravel-s...			
						No Recovery			



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- **Reporting for coastal purposes included:**
 - **Boring Logs**
 - **Fence Diagrams**
 - **Gradation Curve**
 - **Granularmetric Report**
- **Important for visualization and understanding data results.**



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Data Entry



Data Management



Reporting

BORING LOG



Professional

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Boring Designation VB-EH24-02													
DRILLING LOG		DIVISION South Atlantic		INSTALLATION SAJ		Sheet 1 of 1							
1. PROJECT Everglades Harbor Vibracores 2024				10. COORDINATE SYSTEM NAD 1983 StatePlane Florida East FIPS 0901 Feet		VERTICAL MLLW							
2. HOLE NUMBER VB-EH24-02				3. DRILLING AGENCY Everglades City, Collier County		LOCATION COORDINATES N: 556698.00 E: 528430.00		LOCATION METHOD:					
4. NAME OF DRILLER Palmer McClellan				11. DATE BORING May 29 2024		STARTED May 29 2024		COMPLETED May 29 2024					
5. EQUIPMENT				12. HAMMER TYPE		EFFICIENCY (%)							
6. DIRECTION OF BORING				DEG FROM VERTICAL		BEARING		13. SIZE AND TYPE OF BIT					
7. THICKNESS OF OVERBURDEN				5.6'		14. ELEVATION SURFACE		-5.2'					
8. DEPTH DRILLED INTO ROCK				5.6'		15. ELEVATION GROUND WATER							
9. TOTAL DEPTH OF BORING				5.6'		16. TOTAL NUMBER CORE BOXES							
				17. SIGNATURE AND TITLE OF INSPECTOR									
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Sample No.	Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
-6.80	1.60		POORLY GRADED SAND (SP); mostly fine quartz SAND; trace silt, 10YR 6/1 gray	100	1	0	99	1				SP	Vibracore
-7.80	2.60		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine-grained sand-sized quartz, little wood debris, few silt, 10YR 4/1 dark gray	100	2	0	95	5				SP-SM	Vibracore
-8.80	3.60		SILTY SAND (SM); mostly fine quartz SAND; dark gray, little wood, (alternating sand & silt layers), 10YR 4/1 dark gray	100	3	1	73	26				SM	Vibracore
-9.60	4.40		SANDY SILT (ML); mostly low plasticity FINES; fine quartz SAND; some fine sand, few fine to medium-grained sand-sized limestone, 10YR 7/1 light gray	100	4	0	47	53				ML	Vibracore
-10.40	5.20		LIMESTONE; mostly sand to gravel-sized limestone, little fine to medium sand-sized quartz, 10YR 7/1 light gray	100									Vibracore
-10.80	5.60		No Recovery	0									
Borehole finished at 5.6													

USACE FORM 1836

Boring Designation

VB-EH24-02

Sheet 1 of 1

Boring Designation VB-EH24-02													
DRILLING LOG		DIVISION South Atlantic		INSTALLATION SAJ		Sheet 1 of 1							
1. PROJECT Everglades Harbor Vibracores 2024				10. COORDINATE SYSTEM NAD 1983 StatePlane Florida East FIPS 0901 Feet		VERTICAL MLLW							
2. HOLE NUMBER VB-EH24-02				3. DRILLING AGENCY Everglades City, Collier County		LOCATION COORDINATES N: 556698.00 E: 528430.00		LOCATION METHOD:					
4. NAME OF DRILLER Palmer McClellan				11. DATE BORING May 29 2024		STARTED May 29 2024		COMPLETED May 29 2024					
5. EQUIPMENT				12. HAMMER TYPE		EFFICIENCY (%)							
6. DIRECTION OF BORING				DEG FROM VERTICAL		BEARING		13. SIZE AND TYPE OF BIT					
7. THICKNESS OF OVERBURDEN				5.6'		14. ELEVATION SURFACE		-5.2'					
8. DEPTH DRILLED INTO ROCK				5.6'		15. ELEVATION GROUND WATER							
9. TOTAL DEPTH OF BORING				5.6'		16. TOTAL NUMBER CORE BOXES							
				17. SIGNATURE AND TITLE OF INSPECTOR									
ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Sample No.	Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
-6.80	1.60		POORLY GRADED SAND (SP); mostly fine quartz SAND; trace silt, 10YR 6/1 gray	100	1	0	99	1				SP	Vibracore
-7.80	2.60		POORLY GRADED SAND WITH SILT (SP-SM); mostly fine-grained sand-sized quartz, little wood debris, few silt, 10YR 4/1 dark gray	100	2	0	95	5				SP-SM	Vibracore
-8.80	3.60		SILTY SAND (SM); mostly fine quartz SAND; dark gray, little wood, (alternating sand & silt layers), 10YR 4/1 dark gray	100	3	1	73	26				SM	Vibracore
-9.60	4.40		SANDY SILT (ML); mostly low plasticity FINES; fine quartz SAND; some fine sand, few fine to medium-grained sand-sized limestone, 10YR 7/1 light gray	100	4	0	47	53				ML	Vibracore
-10.40	5.20		LIMESTONE; mostly sand to gravel-sized limestone, little fine to medium sand-sized quartz, 10YR 7/1 light gray	100									Vibracore
-10.80	5.60		No Recovery	0									
Borehole finished at 5.6													



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Data Entry



Data
Management



Reporting

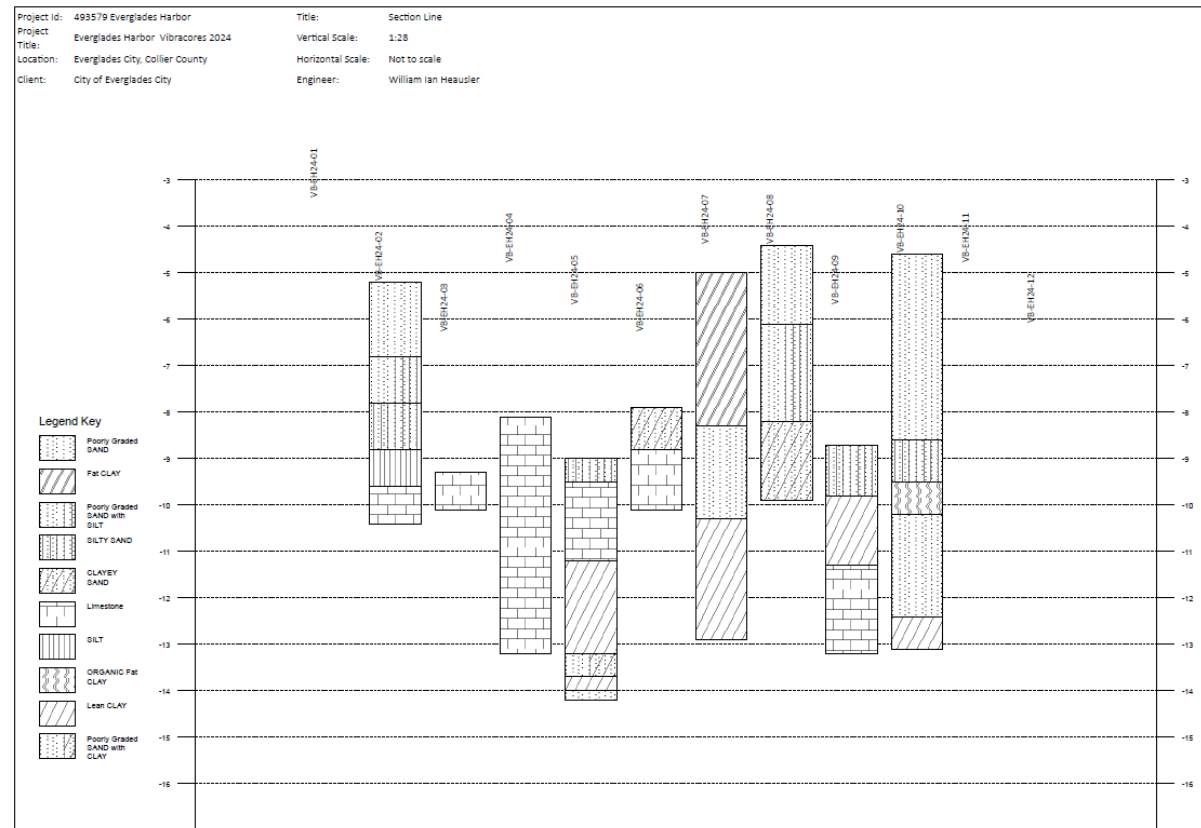
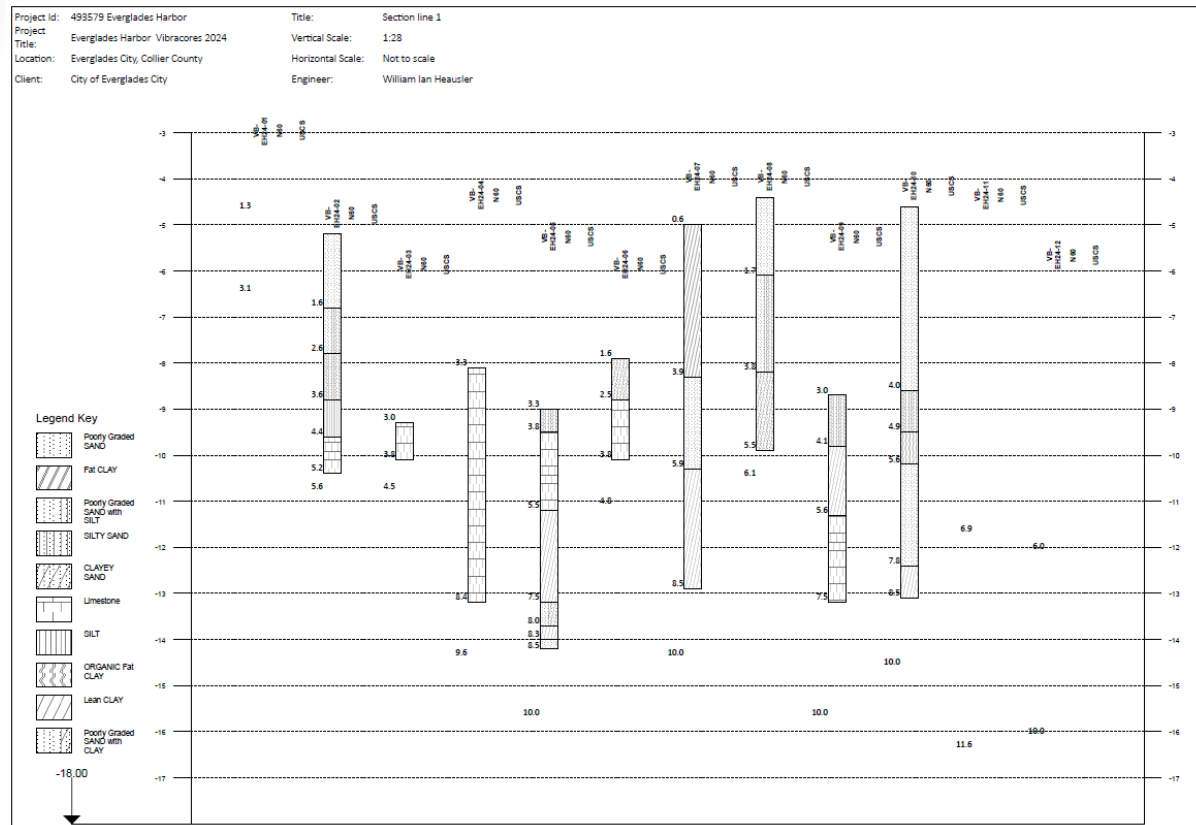
FENCE DIAGRAM



Professional

v10.0.1.2649

[Release Notes](#)





U.S. ARMY

Data Entry



Data Management



Reporting

GRANULARMETRIC REPORT



Excel Extension
v10.0.1.1778 [Release Notes](#)

Granularmetric Report					
Depths and elevations based on measured values					
Project Name:		Everglades Harbor Vibracores 2024			
Sample Name:		VB-EH24-03; 3			
Analysis Date:					
Analyzed By:					
Easting (ft):		522884	Northing (ft):		548352
Coordinate System:		Depth Midpoint: 3.25 ft			
Lab	Shell	Munsell:	Laboratory Name:		
USCS:					
Percent Cobble	Percent Gravel	Percent Sand	Percent Fines	Remarks:	
0.00	7.59	86.71	5.70		
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	% Passing Sieve		
3/4	-4.25	19.00	100.00		
3/8	-3.25	9.50	99.03		
3.5	-2.50	5.60	94.34		
#4	-2.25	4.75	92.41		
#5	-2.00	4.00	89.40		
#7	-1.50	2.80	84.50		
#10	-1.00	2.00	79.01		
#14	-0.50	1.40	72.48		
#18	0.00	1.00	66.93		
#25	0.50	0.71	62.05		
#35	1.00	0.50	56.48		
#45	1.50	0.36	47.37		
#60	2.00	0.25	32.90		
#80	2.50	0.18	20.05		
#120	3.00	0.13	8.58		
#170	3.50	0.09	6.03		
D10	D15	D30	D50	D60	D85
0.13	0.16	0.23	0.40	0.63	2.92
Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.66	1.20	1.81	-0.55	2.16



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Data Entry



Data Management

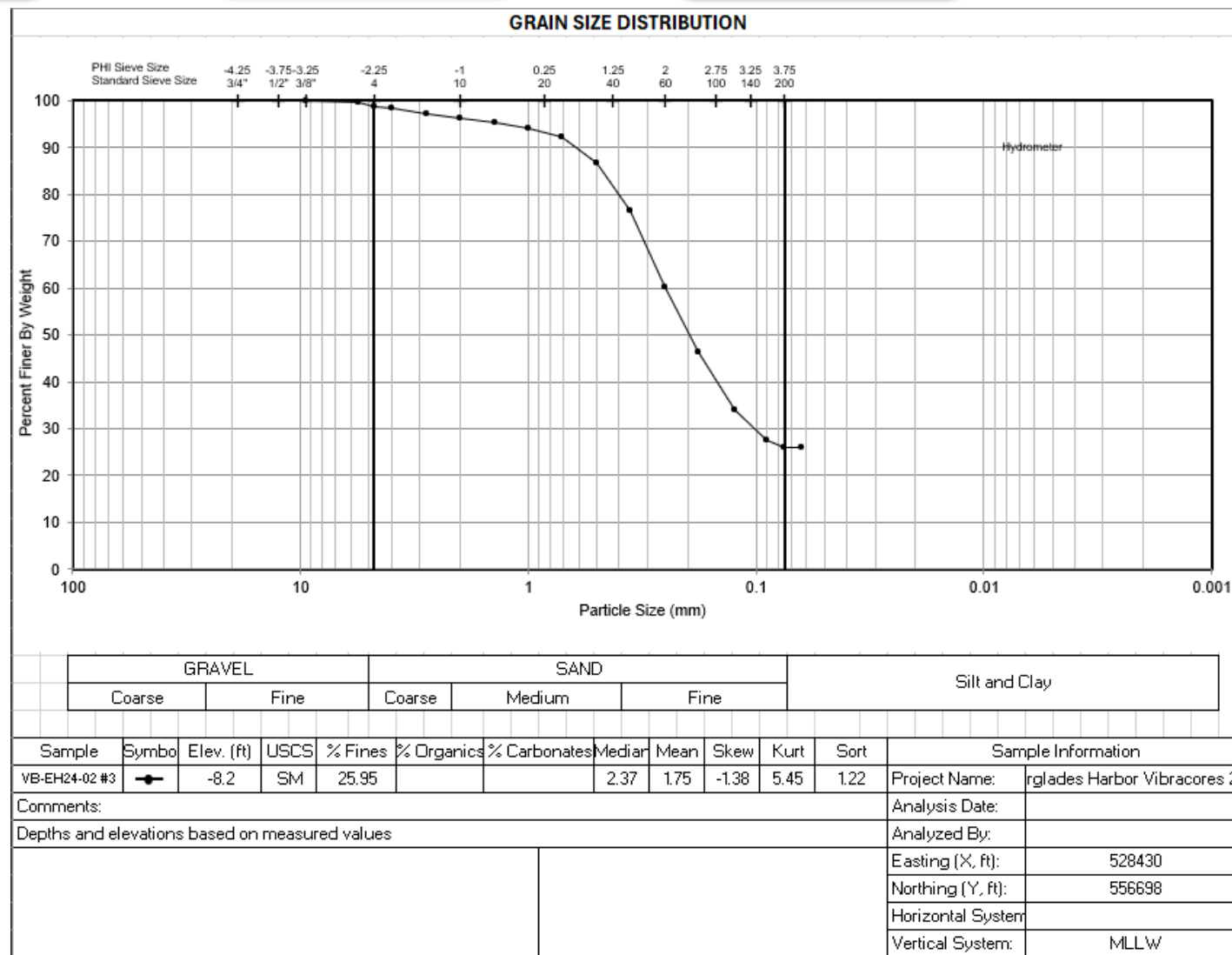


Reporting

GRADATION CURVE



Excel Extension
v10.0.1.1778 [Release Notes](#)







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SUMMARY



- **Effective coastal data management is crucial for the success of projects.**
- **Everglades Harbor is one of first Jacksonville's District coastal projects to use OGC.**



Advantages:	Disadvantages:
<ul style="list-style-type: none">• Accessible• Foster collaboration• Visualization• Reporting	<ul style="list-style-type: none">• Significant updates in progress• Learning curve



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NEXT STEPS



- **Testing and reviewing reporting information to generate SAJ approved templates.**
- **Ongoing communication with OGC team (Dataforensics) on improvement and accomplishing needs.**
 - **Contractors access for uploading laboratory data**
- **Adopting process for other Jacksonville District coastal projects.**





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THANK YOU!

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