National Conference on Beach Preservation Technology

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

Stephanie Soto, *Geologist*, Elimar Torres-Padilla, *Geologist*, Barbara Nist, *P.G*

U.S. Army Corps of Engineers, Jacksonville District

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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	

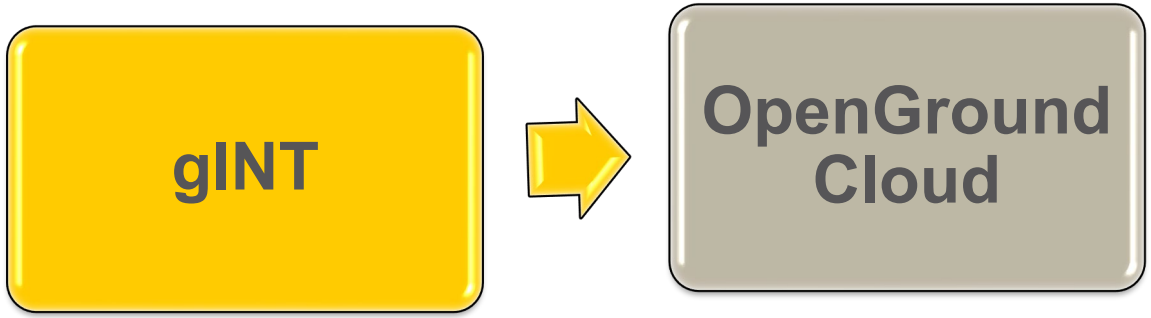
PREVIOUS GEOTECHNICAL SOFTWARE

- USACE used gINT software over 20 yrs.

- Challenges encountered:
  - Multiples files of the same project
  - Local accessibility

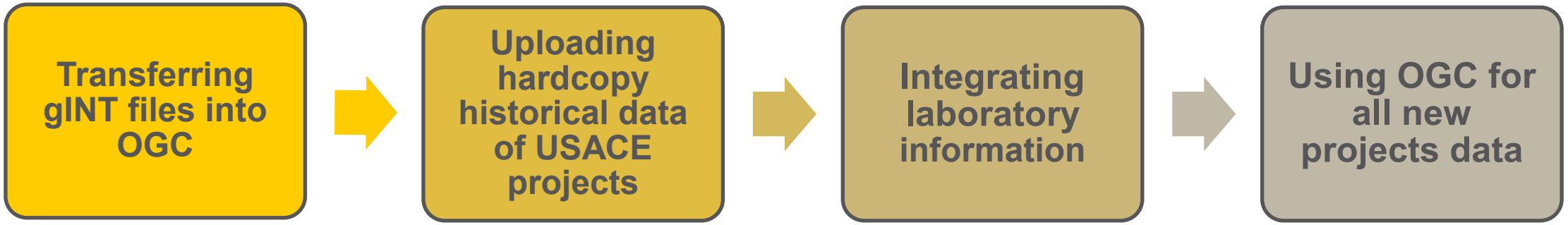
- USACE transitioned from the gINT geotechnical software to OpenGround Cloud (OGC).

- Moving from a Local to a National Database.



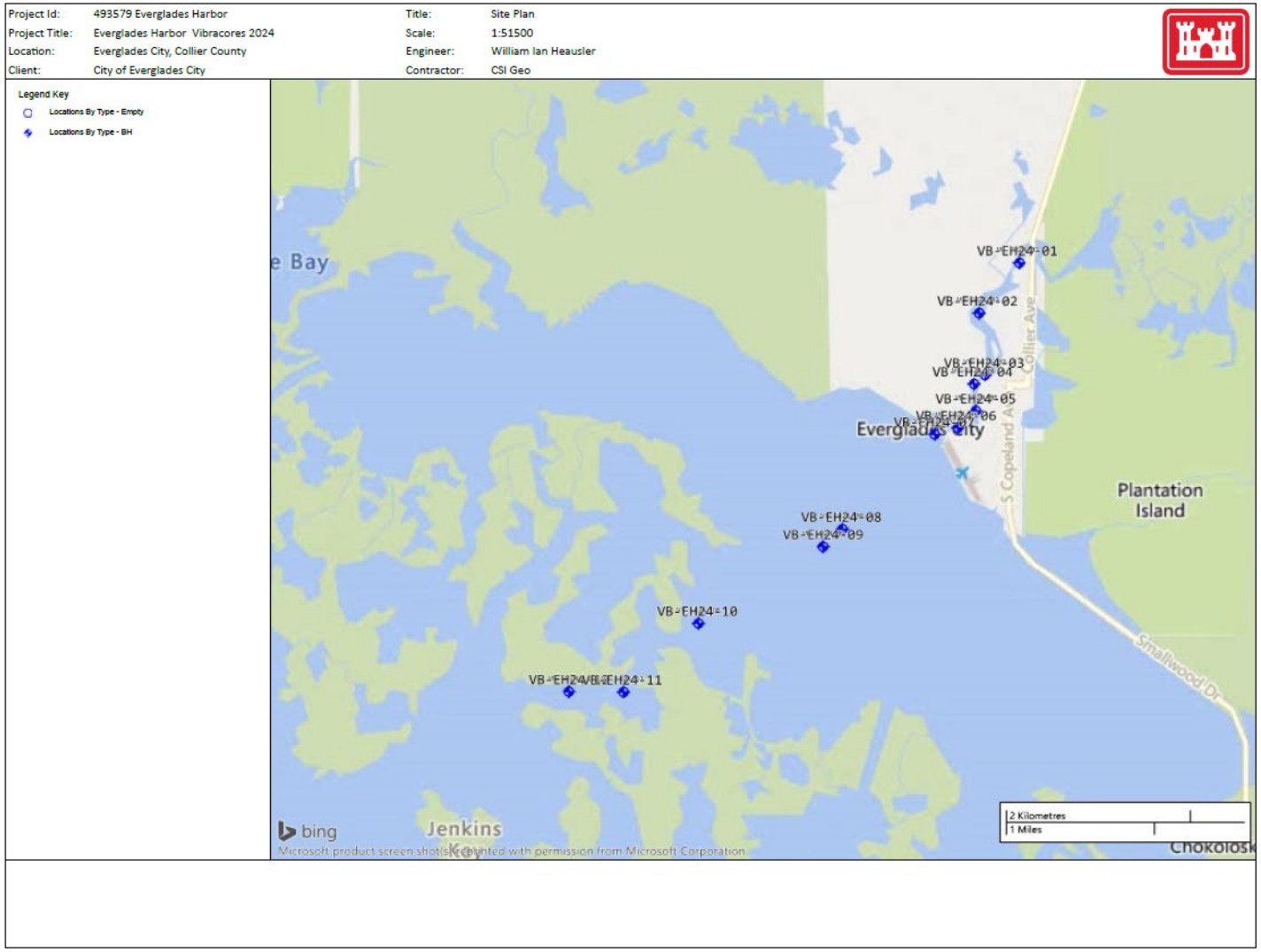
OPENGROUND CLOUD (OGC)

- 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:



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.**



OPEN GROUND CLOUD - EXTENSIONS

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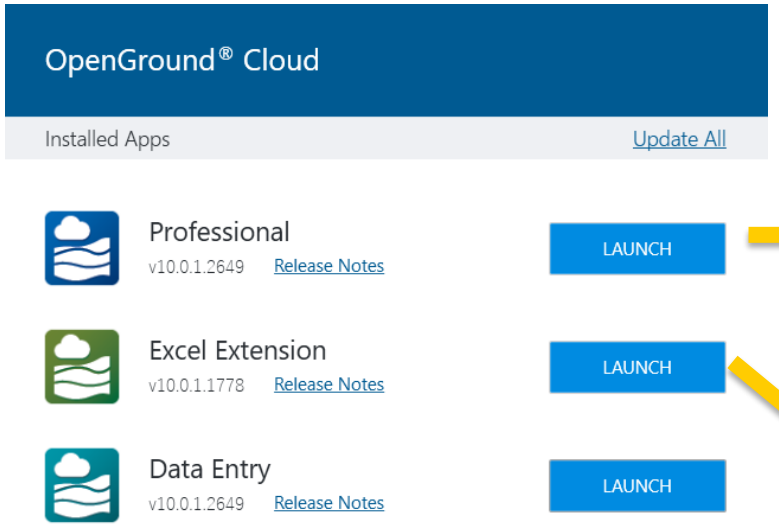
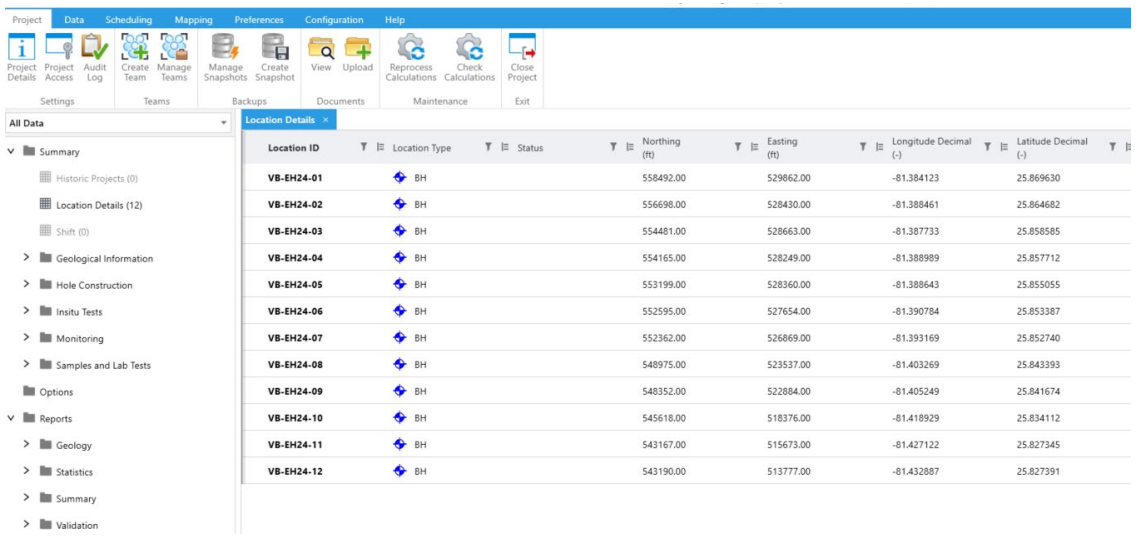
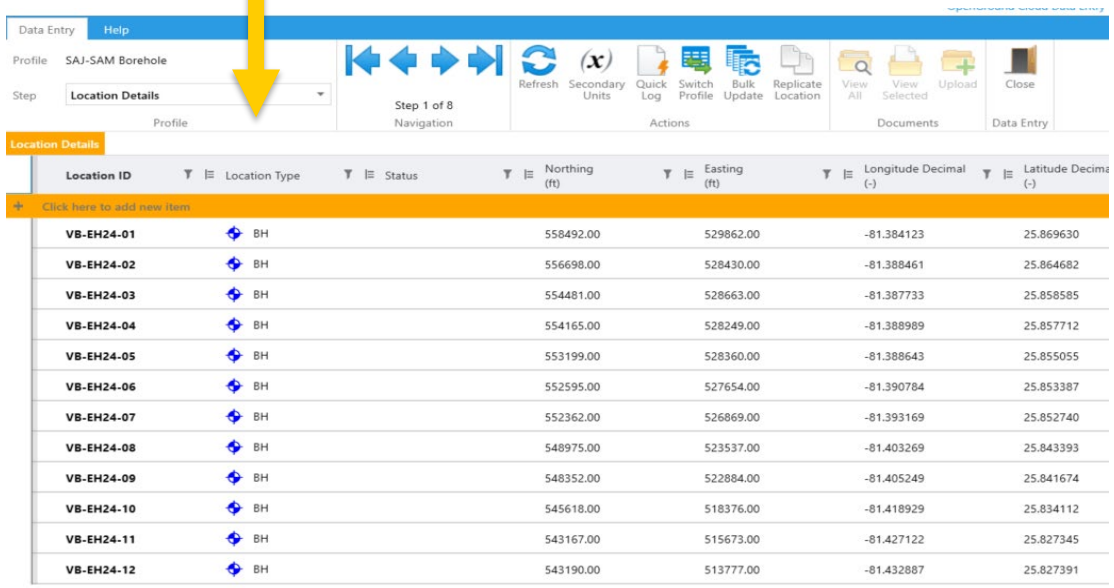
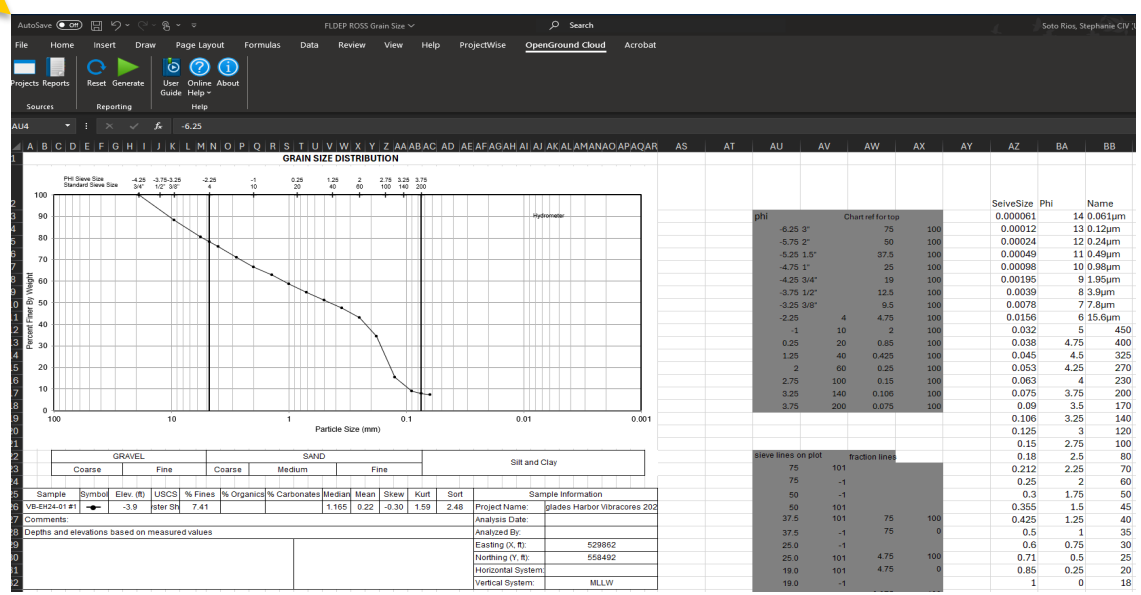








STUDY AREA: EVERGLADES HARBOR

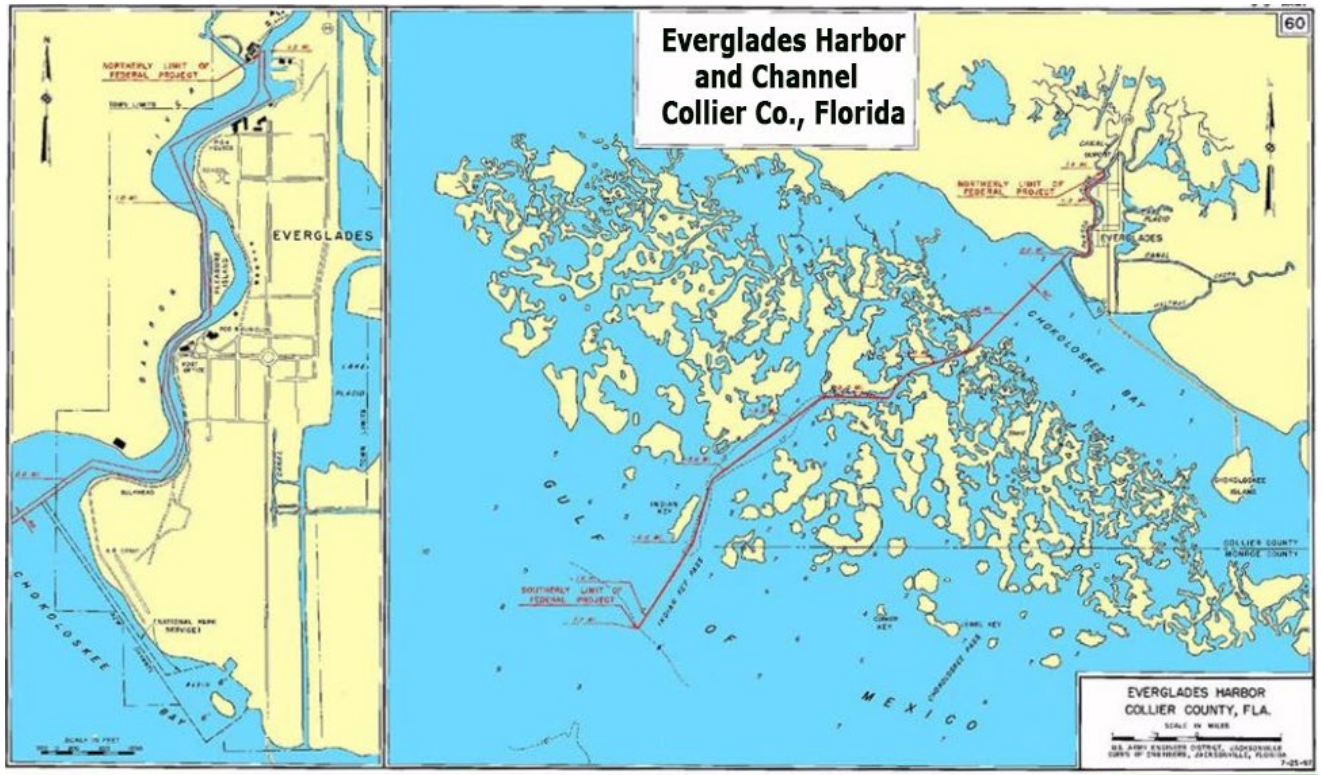
- Everglades Harbor is a USACE Operation & Maintenance Project
- Location: City of Everglades, Collier County, FL
- Regional Sediment Management (RSM) Project
- Everglades Harbor federal channel is 8-foot deep and 60 feet wide.
- Length of project is about 9.2 miles.

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

STUDY AREA: EVERGLADES HARBOR

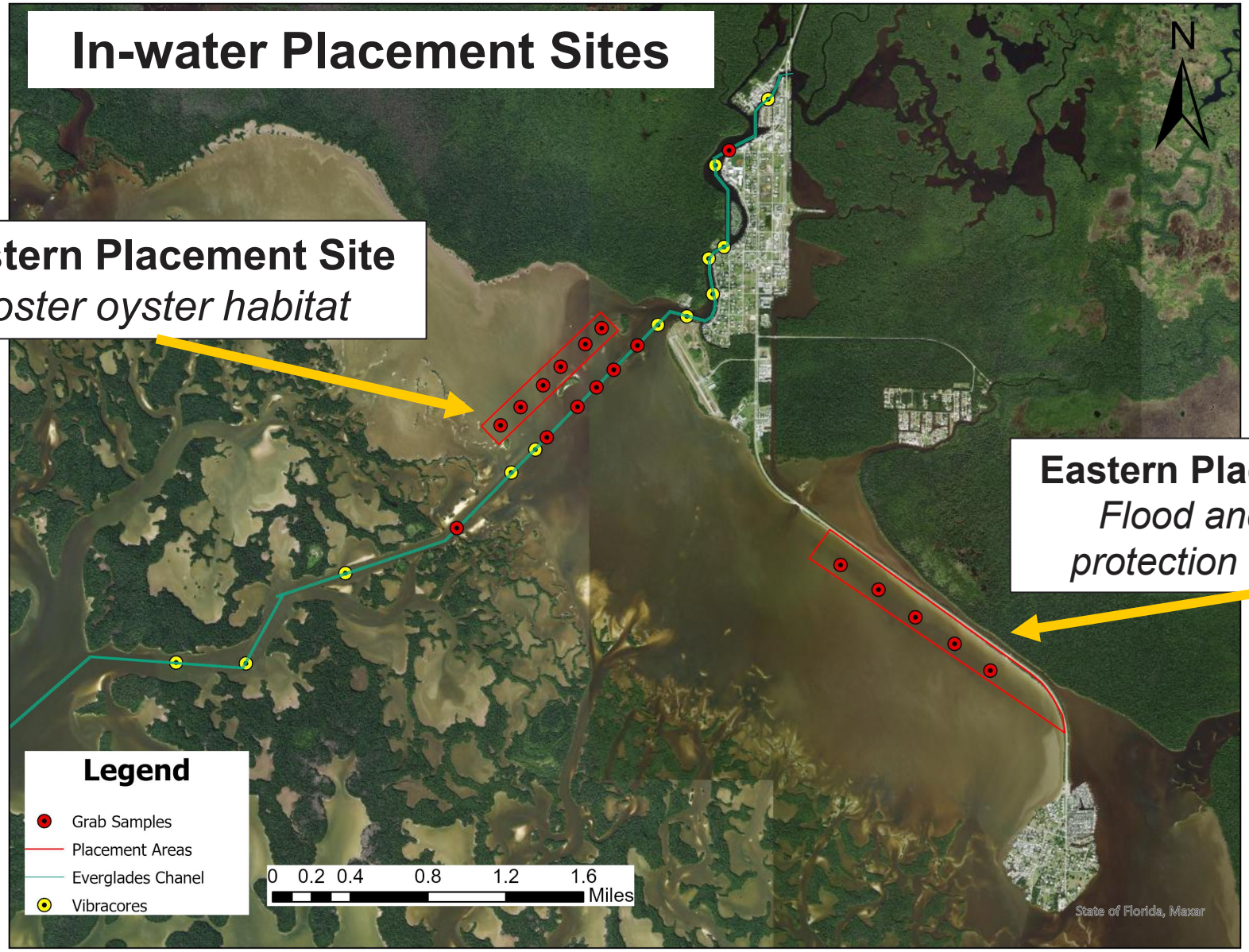
- The federal channel was first dredged in 1963 and have not been dredged since.
- Navigation restriction resulting from shoaling.
- Local fishing and tourism industry being impacted.
- Maintenance dredging scheduled in 2027.



GEOTECHNICAL INVESTIGATION

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

GEOTECHNICAL INVESTIGATION



DATA MANAGEMENT – OPENGROUND CLOUD

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Data Entry

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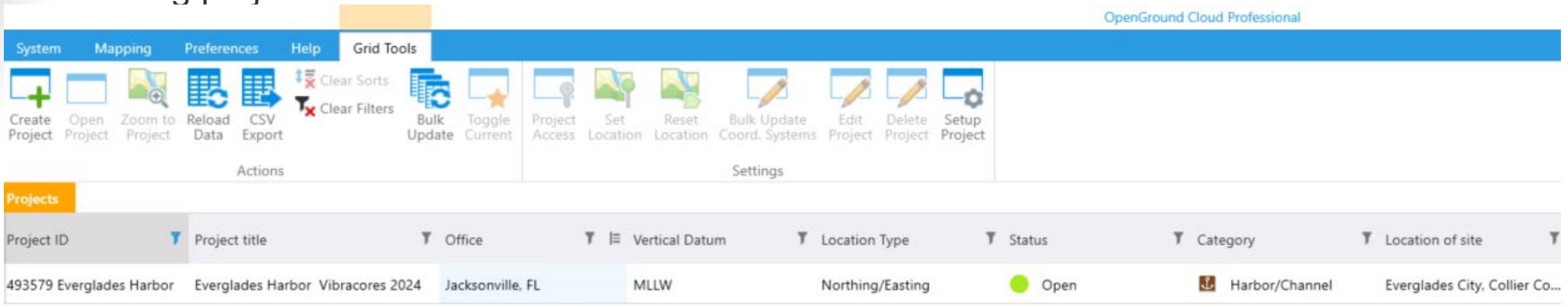
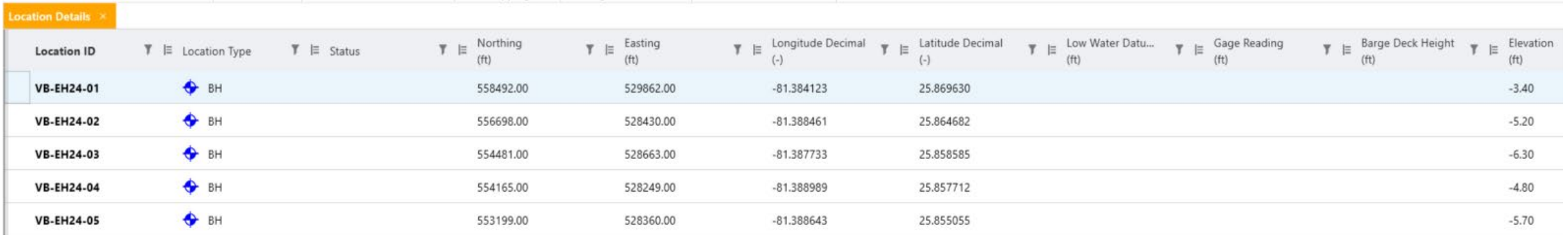
- Creating project



- Project Information



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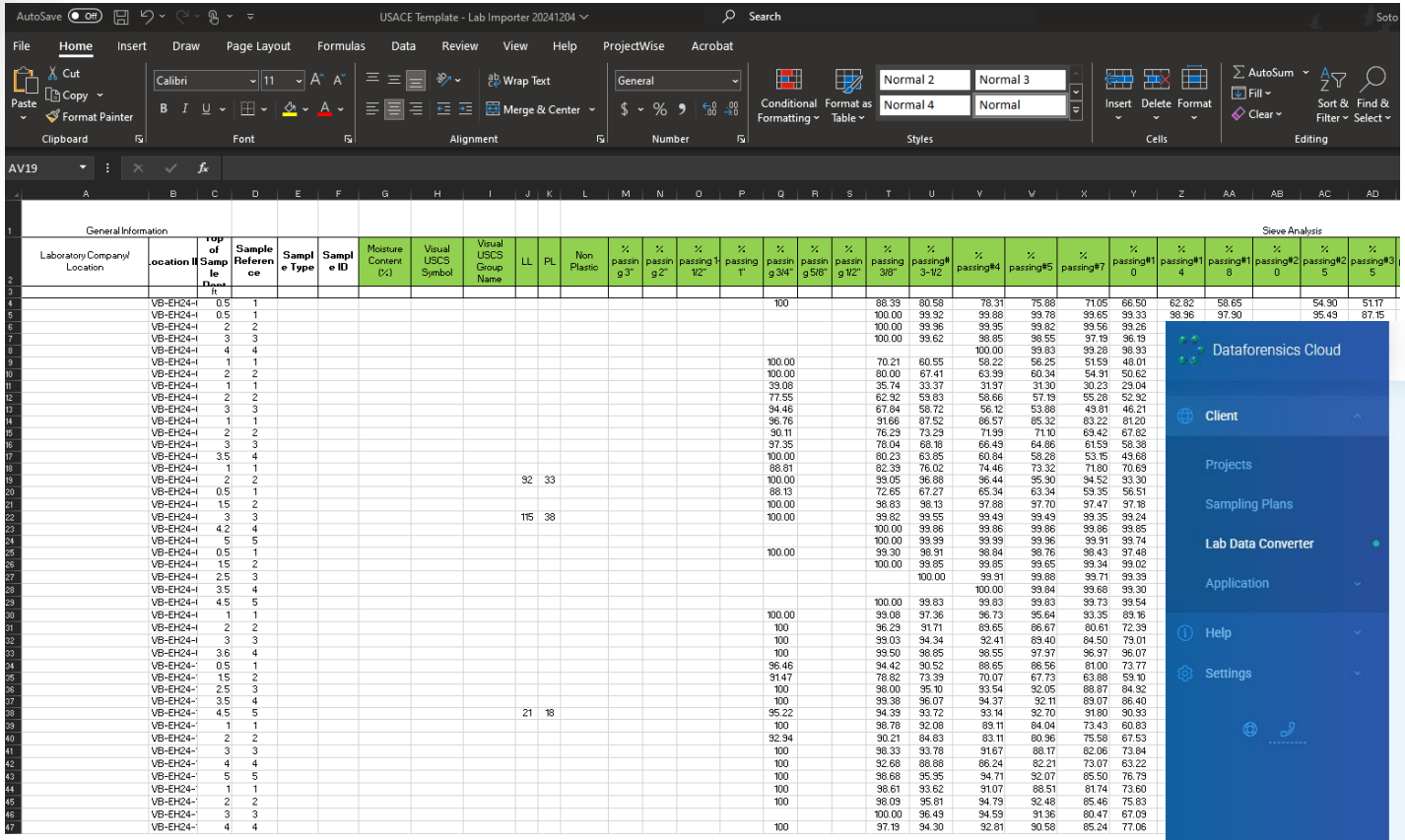
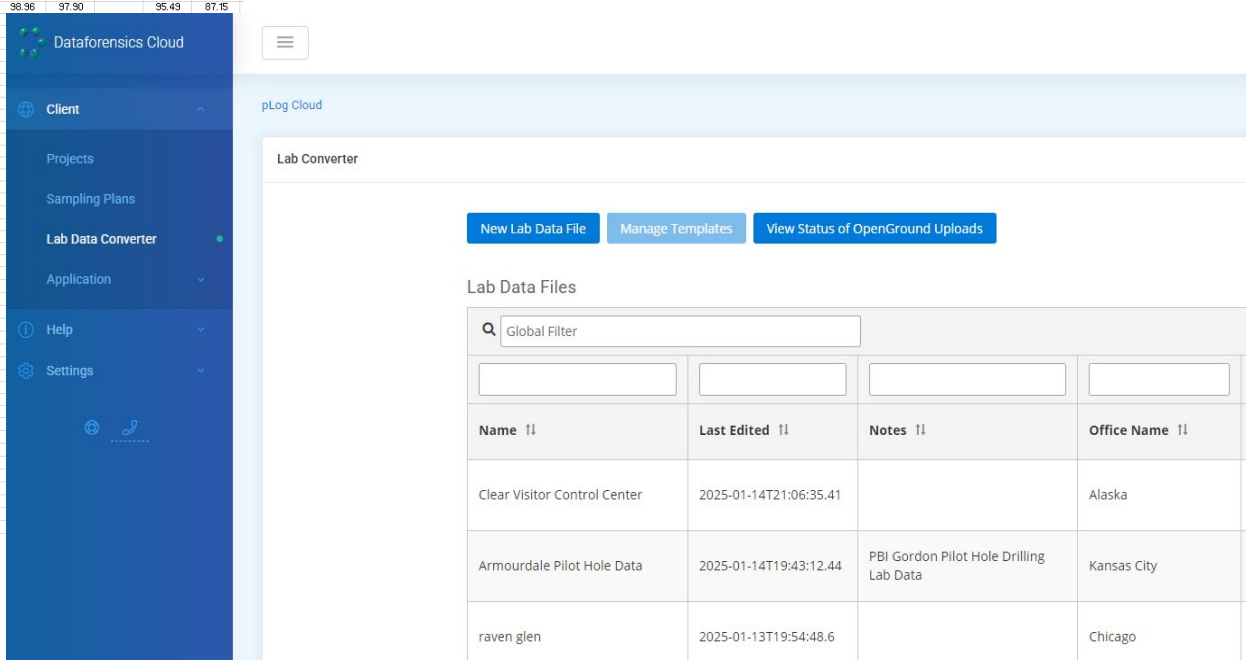
Data Entry

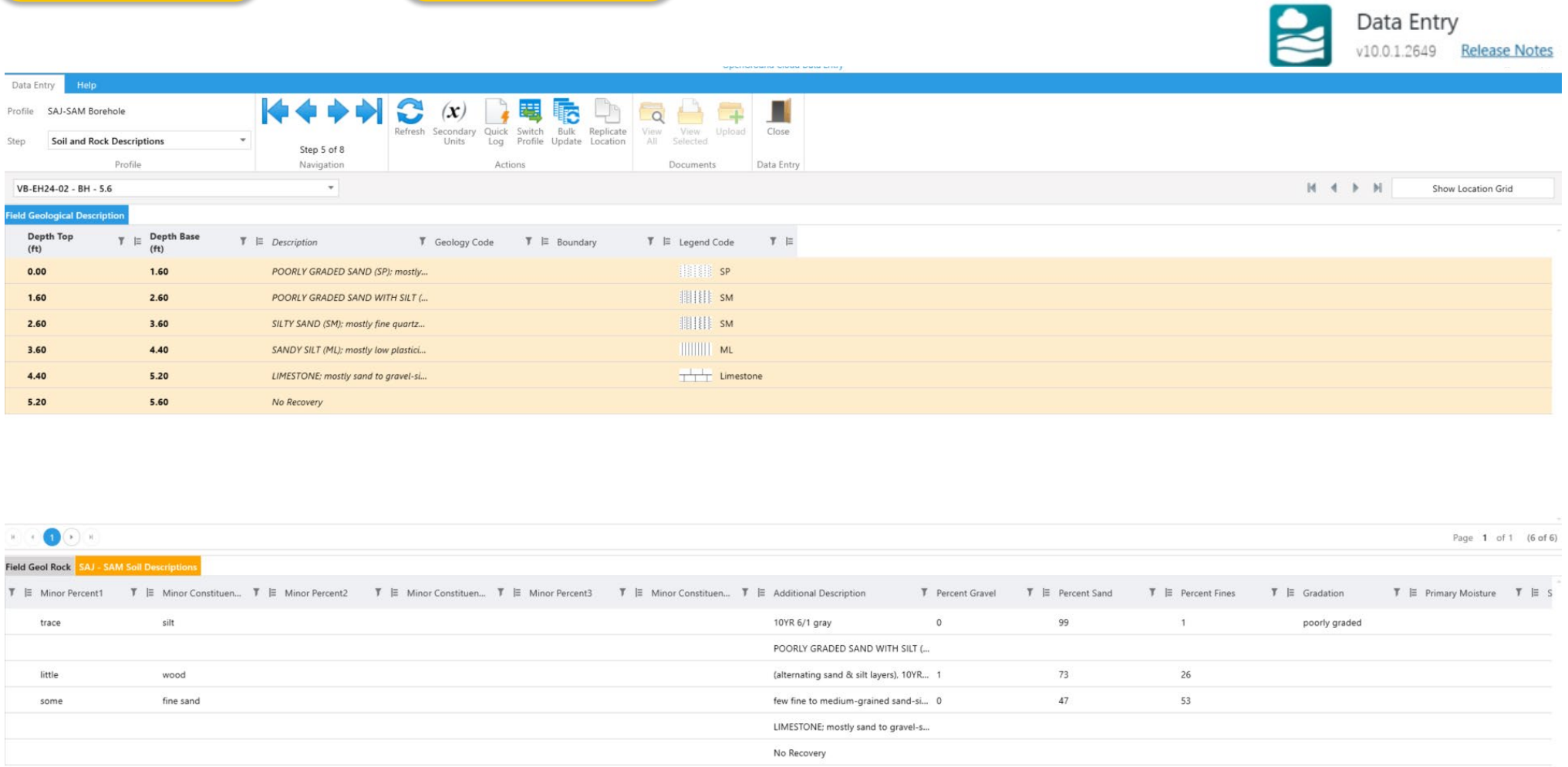
- Laboratory data entry



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



Data Entry → Data Management



- **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

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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
Everglades City, Collier County
2. HOLE NUMBER: VB-EH24-02
3. DRILLING AGENCY:
4. NAME OF DRILLER: Palmer McClellan
5. EQUIPMENT:
6. DIRECTION OF BORING | DEG FROM VERTICAL | BEARING:
7. THICKNESS OF OVERBURDEN: 5.6'
8. DEPTH DRILLED INTO ROCK:
9. TOTAL DEPTH OF BORING: 5.6'
10. COORDINATE SYSTEM: NAD 1983 StatePlane Florida East FIPS 0901 Feet | VERTICAL: MLLW
LOCATION COORDINATES: N: 556698.00 E: 528430.00 | LOCATION METHOD:
11. DATE BORING: STARTED May 29 2024 | COMPLETED May 29 2024
12. HAMMER TYPE | EFFICIENCY (%):
13. SIZE AND TYPE OF BIT:
14. ELEVATION SURFACE: -5.2'
15. ELEVATION GROUND WATER:
16. TOTAL NUMBER CORE BOXES:
17. SIGNATURE AND TITLE OF INSPECTOR:

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
			POORLY GRADED SAND (SP); mostly fine quartz SAND; trace silt, 10YR 6/1 gray	100									Vibracore
-6.80	1.60			100	1	0	99	1				SP	Vibracore
			POORLY GRADED SAND WITH SILT (SP-SM); mostly fine-grainedsand-sized quartz, little wood debris, few silt, 10YR 4/1 dark gray	100									Vibracore
-7.80	2.60			100	2	0	95	5				SP-SM	Vibracore
			SILTY SAND (SM); mostly fine quartz SAND; dark gray, little wood, (alternating sand & silt layers), 10YR 4/1 dark gray	100									Vibracore
-8.80	3.60			100	3	1	73	26				SM	Vibracore
			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									Vibracore
-9.60	4.40			100	4	0	47	53				ML	Vibracore
			LIMESTONE; mostly sand to gravel-sized limestone, little fine to medium sand-sized quartz, 10YR 7/1 light gray	100									Vibracore
-10.40	5.20												
			No Recovery	0									
-10.80	5.60		Borehole finished at 5.6										

-9 -14

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

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5. EQUIPMENT:
6. DIRECTION OF BORING | DEG FROM VERTICAL | BEARING:
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8. DEPTH DRILLED INTO ROCK:
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10. COORDINATE SYSTEM: NAD 1983 StatePlane Florida East FIPS 0901 Feet | VERTICAL: MLLW
LOCATION COORDINATES: N: 556698.00 E: 528430.00 | LOCATION METHOD:
11. DATE BORING: STARTED May 29 2024 | COMPLETED May 29 2024
12. HAMMER TYPE | EFFICIENCY (%):
13. SIZE AND TYPE OF BIT:
14. ELEVATION SURFACE: -5.2'
15. ELEVATION GROUND WATER:
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ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	LABORATORY: Gravel	Sand	Fines	LL	PI	MC	ASTM Class	REMARKS
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-6.80	1.60			100	1	0	99	1				SP	Vibracore
			POORLY GRADED SAND WITH SILT (SP-SM); mostly fine-grainedsand-sized quartz, little wood debris, few silt, 10YR 4/1 dark gray	100									Vibracore
-7.80	2.60			100	2	0	95	5				SP-SM	Vibracore
			SILTY SAND (SM); mostly fine quartz SAND; dark gray, little wood, (alternating sand & silt layers), 10YR 4/1 dark gray	100									Vibracore
-8.80	3.60			100	3	1	73	26				SM	Vibracore
			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									Vibracore
-9.60	4.40			100	4	0	47	53				ML	Vibracore
			LIMESTONE; mostly sand to gravel-sized limestone, little fine to medium sand-sized quartz, 10YR 7/1 light gray	100									Vibracore
-10.40	5.20												
			No Recovery	0									
-10.80	5.60		Borehole finished at 5.6										

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Data Entry → Data Management → **Reporting**

FENCE DIAGRAM

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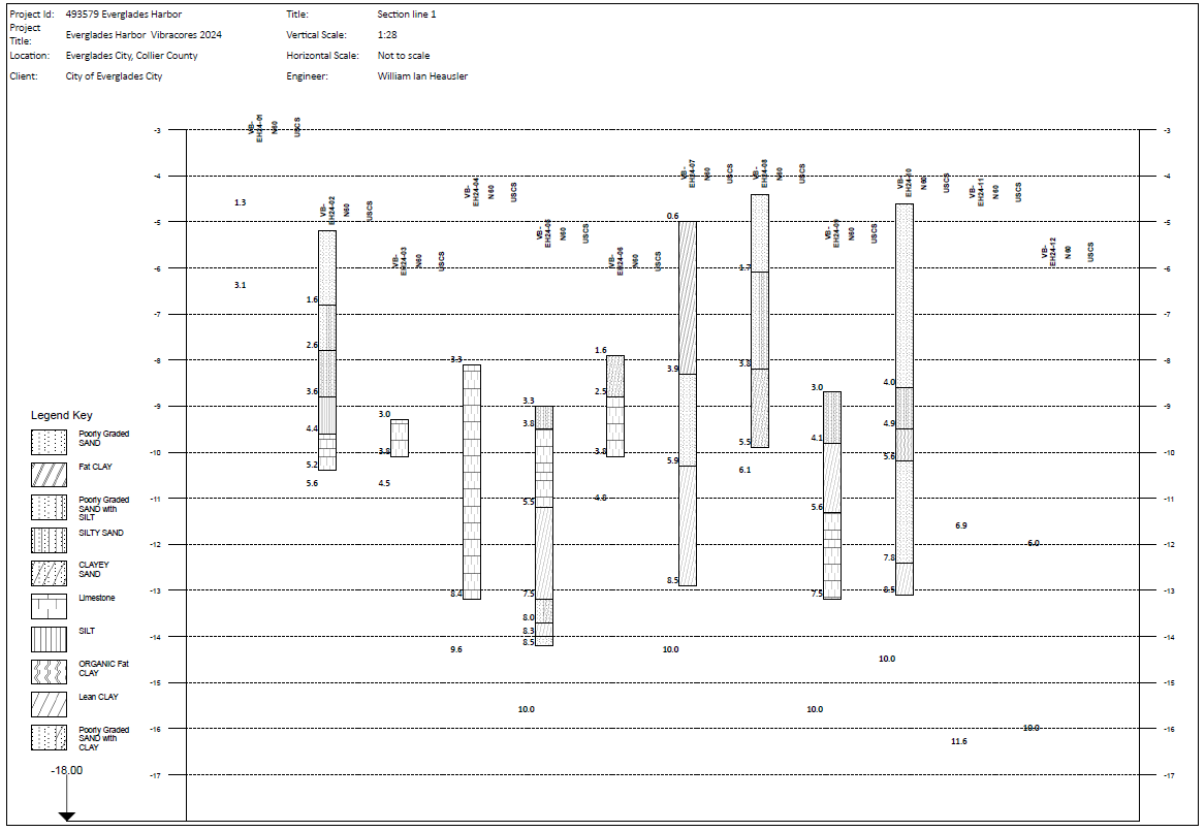

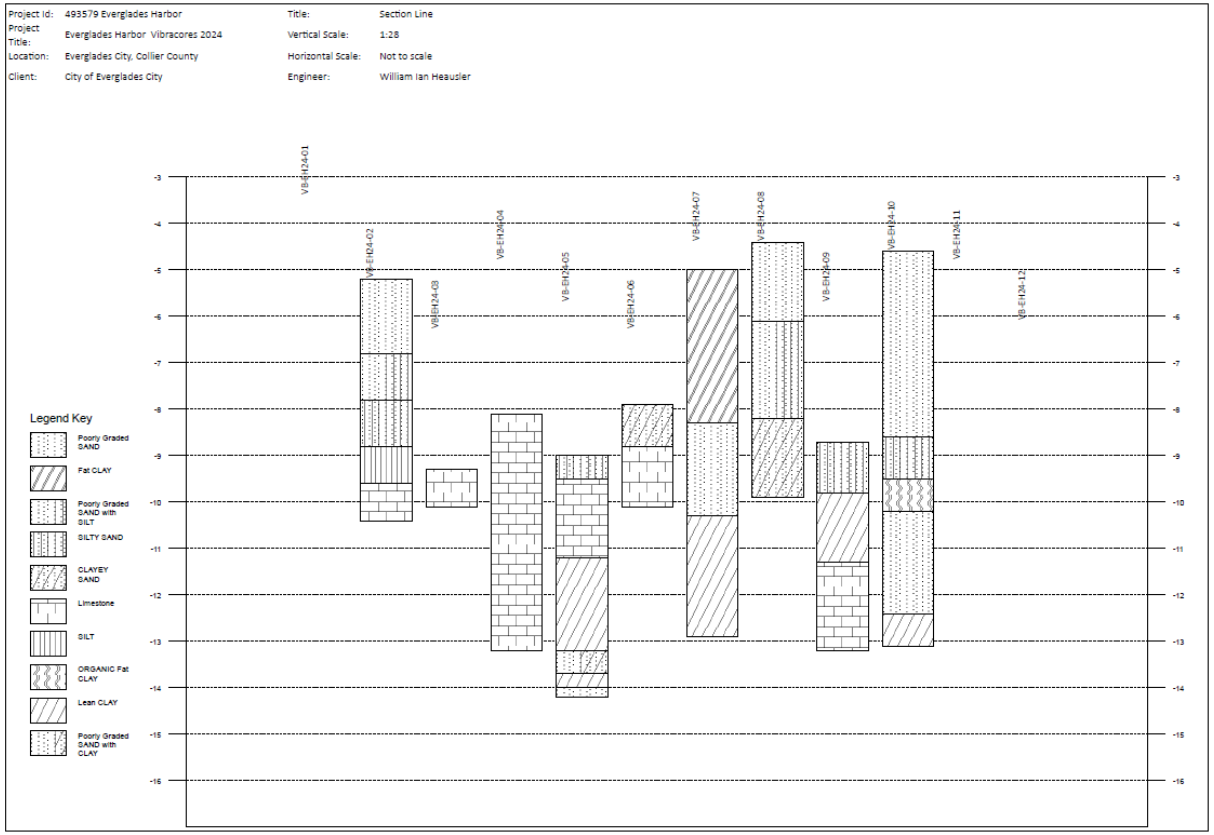

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Data Entry → Data Management → **Reporting**

GRANULARMETRIC REPORT

Excel Extension
v10.0.1.1778 Release Notes

Granularmetric Report Depths and elevations based on measured values				LOGO	
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 USCS:	Shell	Munsell:		Laboratory Name:	

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
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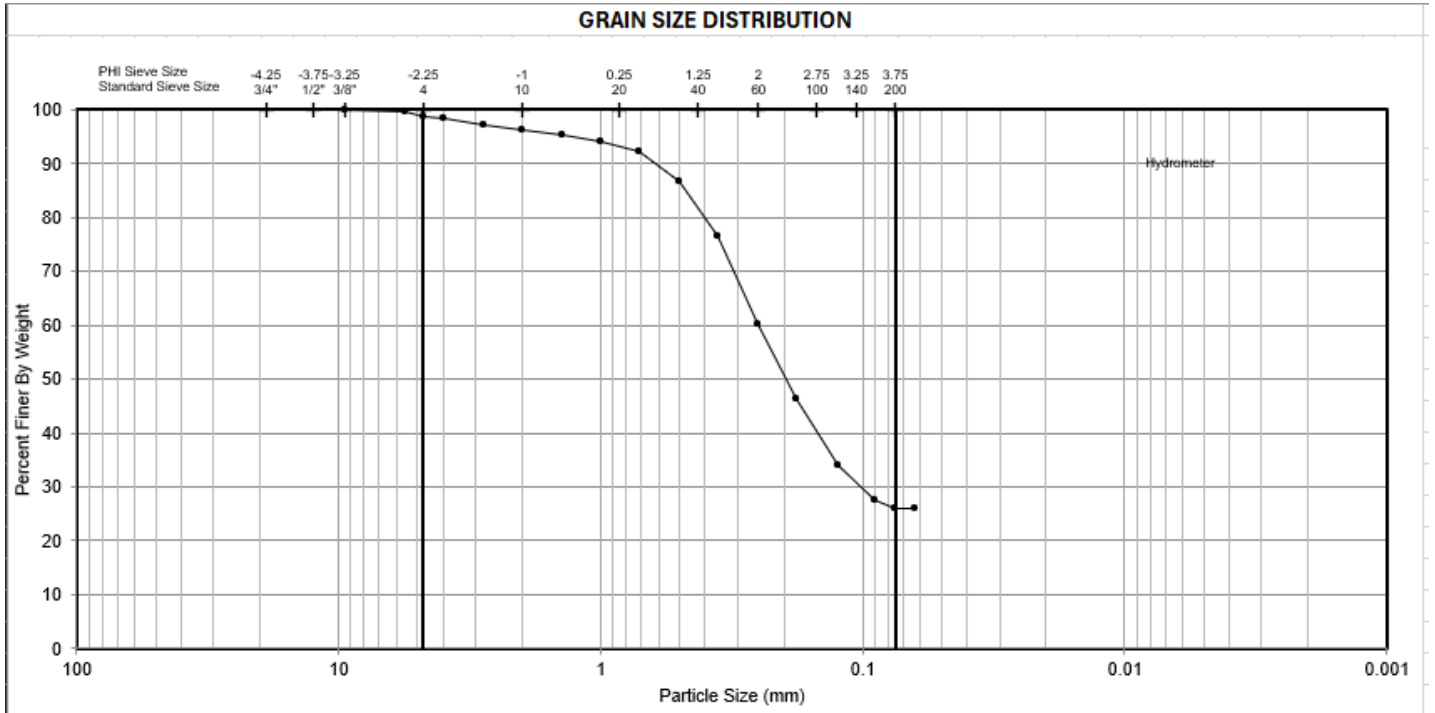

GRAVEL		SAND			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbo	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information	
VB-EH24-02 #3		-8.2	SM	25.95			2.37	1.75	-1.38	5.45	1.22	Project Name:	rglades Harbor Vibracores 20
Comments:												Analysis Date:	
Depths and elevations based on measured values												Analyzed By:	
												Easting (X, ft):	528430
												Northing (Y, ft):	556698
												Horizontal System:	
												Vertical System:	MLLW

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:

- Accessible
- Foster collaboration
- Visualization
- Reporting

Disadvantages:

- Significant updates in progress
- Learning curve

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.

THANK YOU!

STEPHANIE SOTO
STEPHANIE.SOTO-RIOS@USACE.ARMY.MIL

ELIMAR TORRES-PADILLA
ELIMAR.TORRES-PADILLA@USACE.ARMY.MIL