Use of Vibracore Sediment Acquisition Monitoring (V-SAM) in the Field – Data Collection and Processing to Optimize Sediment Dredging Design

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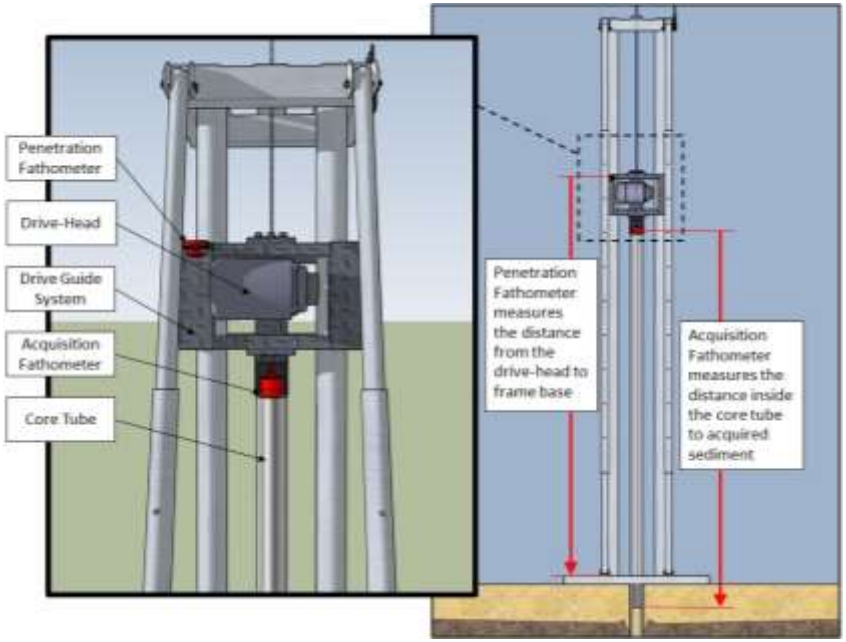
Background

- Environmental Sediment dredge design relies on quality data
- Vibracoring
  - Reliable tool
  - Recent improvements: introduction of Vibracore Sediment Acquisition Monitoring (V-SAM)



- Cores processed utilizing V-SAM produce more accurate estimations for depth of contamination

Processing Sediment Cores Using V-SAM Data

- Preparation
  - Team coordination
  - Equipment
- Processing
  - Receiving Cores
  - Applying V-SAM data
  - Logging and Sampling
  - Processing
- Outcomes
- Lessons learned

Provide an opportunity, offer encouragement and support, and watch what the team can grow to accomplish

Team Coordination

- Knowledge
  - Understanding what V-SAM data is capturing and why we are applying it
- Communication
  - On-board team and processing need to be in sync.

Team Coordination

- Consistency
  - Teams build experience together and identify best practices, patterns, and adaptations necessary to accomplish the task at hand efficiently
- Enthusiasm
  - Excitement regarding the possibilities of a new technology or application

Equipment

- Conventional Methods and V-SAM overlap equipment needs with respect to processing
- Processing facility should not be a low priority during planning
  - Designate core cutting, sampling, storage, and clean areas
  - Well supplied
  - Secure and comfortable
- Safety and Success go hand in hand
  - Pick the right tool for the job

Equipment Unique to Processing V-SAM Sediment Cores

- Heavy duty paper liner
  - As a writing surface
- Ideally a long table to handle the complete length of core

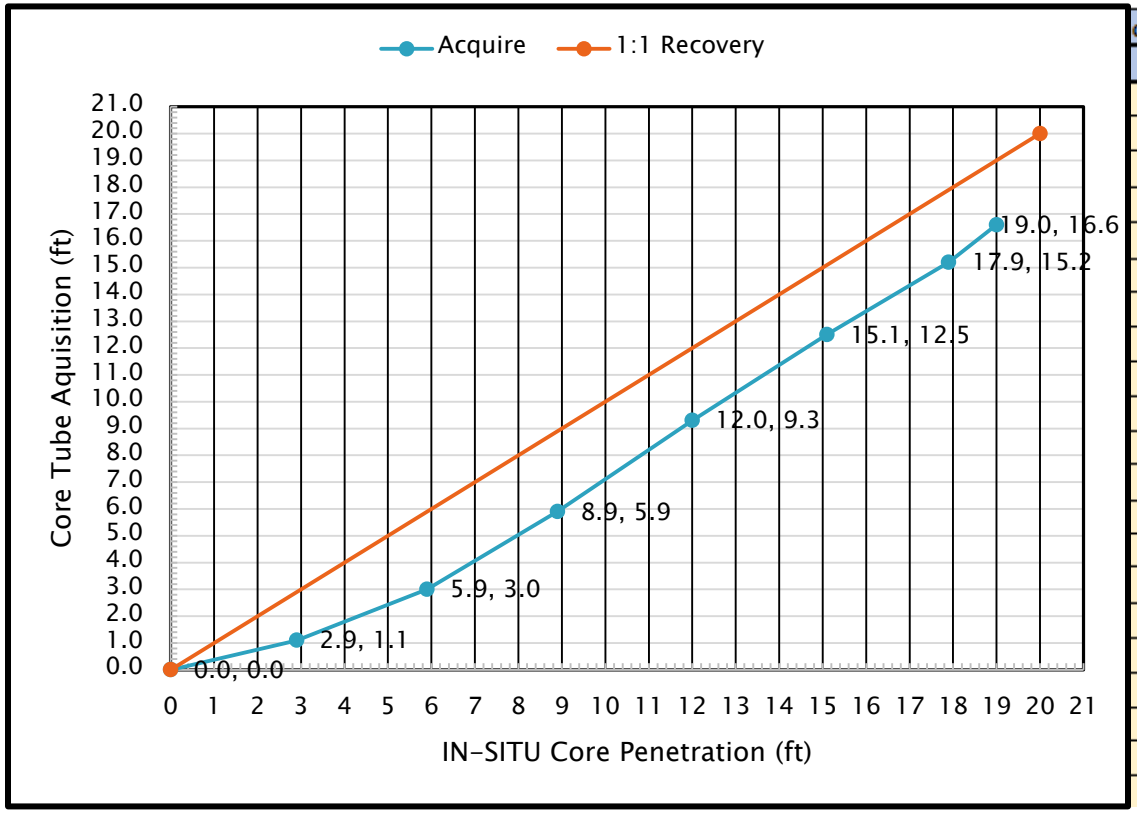
Receiving Cores

- Core type, length, and transfer process varies depending on project scope
- Cores should be clearly labeled
  - Rejected cores may be retained depending on storage capacity and acquisition log
- Acquisition Logs reviewed

Applying V-SAM Data

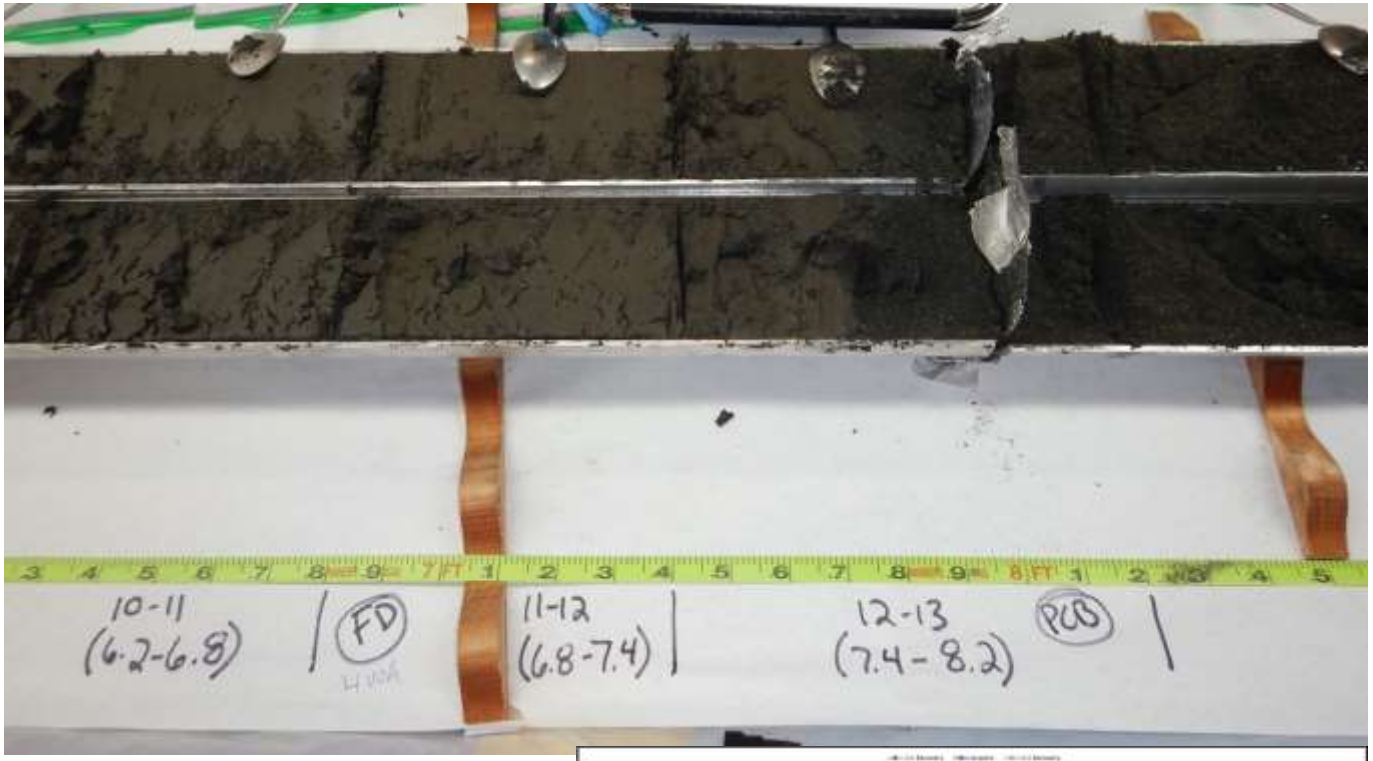
- When ready to process the sediment core the processing team
  - Verifies core ID
  - Confirms headspace measurements
  - Cuts the core
  - Set engineer-scale measuring tape along the core's length
  - Marks depth intervals using the acquisition log

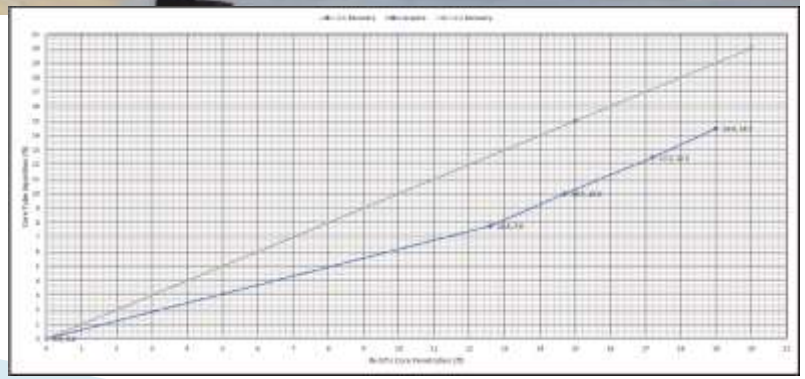
Acquisition Log



Core Cut Plan (ft.)	
In-Situ	Core
HS	3.2
0.0	0.0
1.0	0.4
2.0	0.8
3.0	1.2
4.0	1.8
5.0	2.4
6.0	3.1
7.0	4.1
8.0	5.0
9.0	6.0
10.0	7.1
11.0	8.2
12.0	9.3
13.0	10.3
14.0	11.4
15.0	12.4
16.0	13.4
17.0	14.3
18.0	15.3
19.0	16.6

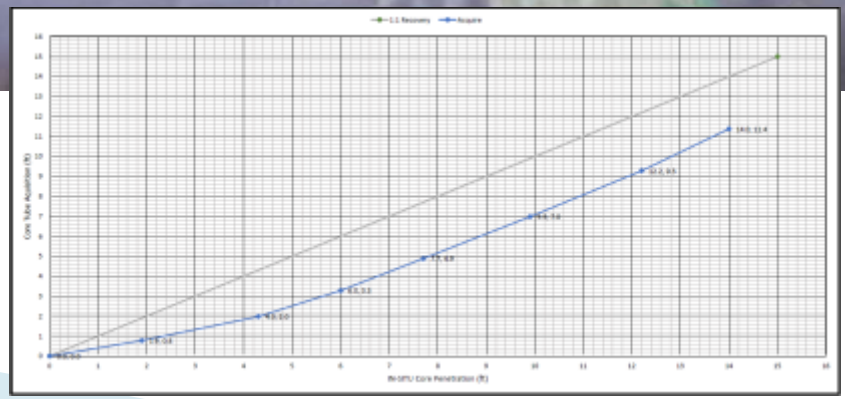
In-situ Intervals





	Core Cut Plan (ft.)	
	In-Situ	Core
	HS	~0.3
A	0.0	0.0
	1.0	0.6
	2.0	1.2
	3.0	1.9
	4.0	2.5
	5.0	3.1
	6.0	3.7
Cut	6.5	4.0
B	7.0	4.3
	8.0	4.9
	9.0	5.6
	10.0	6.2
	11.0	6.8
	12.0	7.4
Cut	12.8	8.0
C	13.0	8.2
	14.0	9.2
	15.0	10.3
Cut	15.7	11.0
D	16.0	11.3
	17.0	12.3
	18.0	13.4
Cut	18.6	14.0

In-situ Intervals



	Core Cut Plan (ft.)	
	In-Situ	Core
	HS	~0.3
A	0	0
	1	0.4
	2	0.9
	3	1.3
	4	1.8
	5	2.5
	6	3.3
	Cut	4
B	7	4.2
	8	5.2
	9	6.2
	10	7.1
	Cut	8
C	11	8.1
	12	9.1
	13	10.2
	14	11.4
	Cut	

Logging and Sampling

- Split the core
  - Using dedicated utensil for each interval
- Photograph
  - Capture sediment core and interval marks
- Log the sediment
- Sample according to sampling plan

Logging

- A qualified professional records observations:
  - Physical characteristics of the sediment
  - Obvious chemical characteristics
  - Depth of contacts
  - Structures
  - Debris
- These observations can be reviewed in real time with the acquisition curve
  - Potential benefits include identifying patterns and informing plans for the current and future sampling events
  - Expanding experience and knowledge regarding V-SAM

Sampling

- Efficient and accurate sampling is enhanced by applying V-SAM and associated processing methods

Outcomes

- Higher resolution site characterization
  - Accurate Depth of Contamination
  - Material quantities
  - Debris
- Excited scientists, engineers, clients, and regulators!
  - Set up for success as the project moves into advanced phases

Lessons Learned

- Hard to see the stars when the sun is shining
  - Overcoming well regarded previous best practices with new advanced methods

- Goals
  - Avoid reverting to conventional methods
  - Avoid combing conventional methods and V-SAM methods in processing
  - Seek more opportunities to employ V-SAM and further develop the technology and its application

Questions?