Sediment Sampling 101

Understanding Equipment and Methods to Meet Your Project Needs

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Objectives

- Sediment: What is it?
- Sediment Surveys
  - Biological
  - Chemical
  - Physical
  - Dredging
- Types of Equipment
  - Grabs/dredges
  - Corers
  - Drill rigs
- Basic information needed to provide the best quality RFPs

Michael Mettler

- Mr. Mettler has extensive experience as a group manager, project manager, and field supervisor, and brings over 25 years of experience in all types of environmental sampling with a specialty in sediment sampling. Having been involved with almost every aspect of sediment projects (from permitting and planning to execution and reporting) he has a tremendous wealth of knowledge to pull from.
- Mr. Mettler has personally collected thousands of sediment samples from over 20 states using a wide range of sampling equipment such as surface grabs, piston corers, and vibracore technology. He has worked on everything from small dock dredging projects to very large multi-year/multi-phase remediation projects on bodies of water ranging from swamps and ponds to large rivers, lakes, and oceans.

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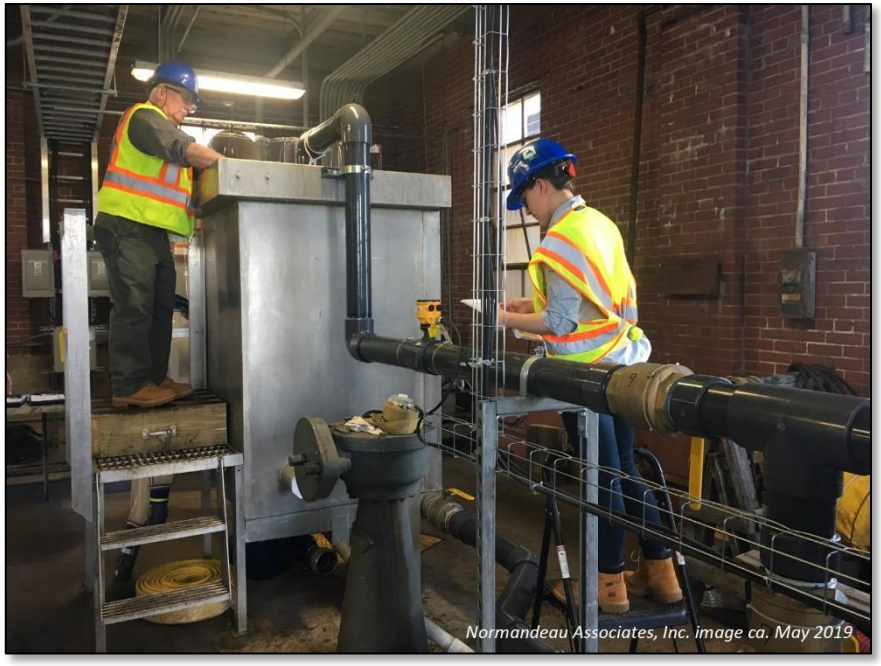

Normandeau Associates, Inc. image ca. May 2019

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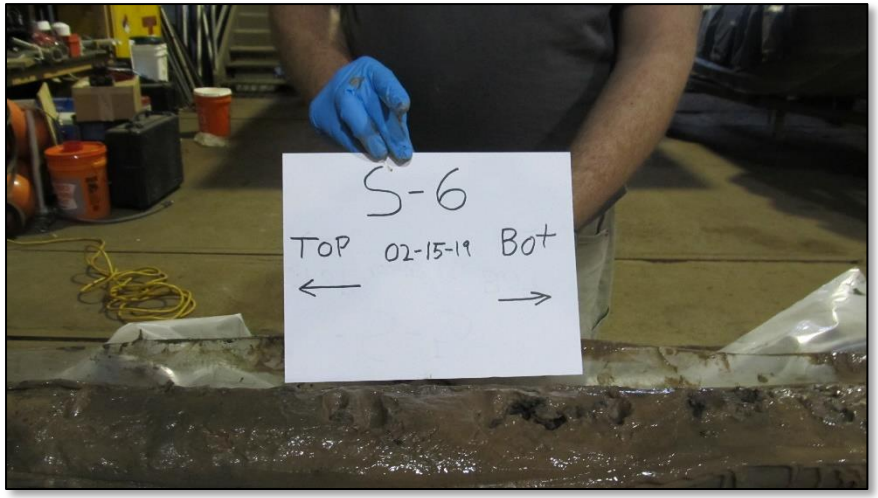
Sediment



- Sediment is any material that settles out of the water column to the bottom of the water body.
- For most sediment surveys, we are concerned with the loose, unconsolidated sediments that lie on the surface of the river, lake, or ocean bed.

Sediment Surveys

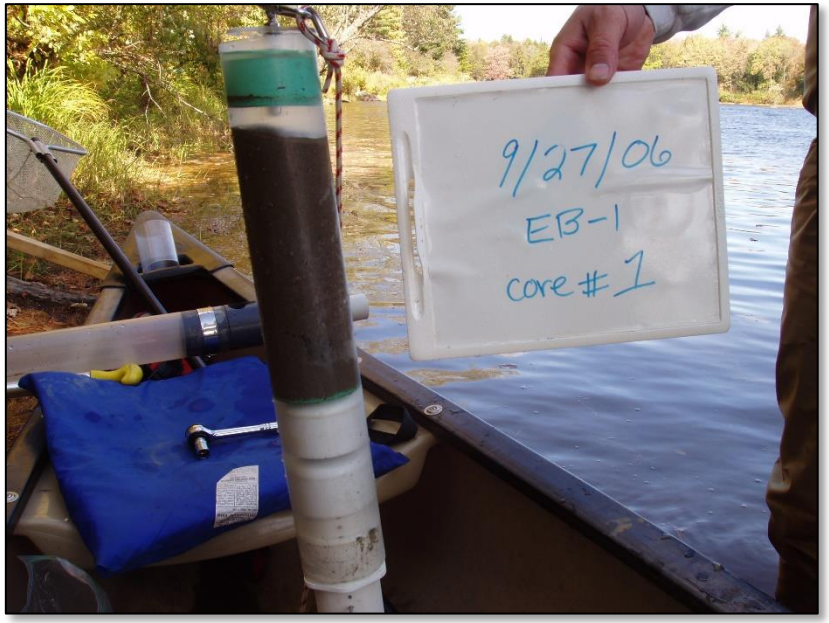
- Biological
  - Benthic macroinvertebrate
  - Bio-active zone
  - Toxicology

Sediment Surveys

- Chemical
  - Known
    - Nature
    - Extent
  - Unknown
    - Site investigations
    - Background
    - Due-diligence

Sediment Surveys

- Physical
  - Grain Size
  - De-watering properties
  - Treatability
  - Stabilizing/amending
  - Geo-physical properties
    - Shear strength
    - Compression strength



Sediment Surveys

- Dredging
  - Sometimes all three surveys in one
  - Done in phases
  - Specific depth

Types of Equipment

- Grabs/Dredges
  - Ponar- Ekman- Peterson- Van Veen- etc.
    - Surficial sediment (less than one foot)
    - Good for
      - Initial investigations
      - Recent deposition investigations
      - Biological investigations (macroinvertebrates)
      - Risk assessments

Types of Equipment

- Grabs/Dredges
  - Disadvantages
    - Difficult to know exactly how deep you sampled
    - Decontamination can be difficult and time consuming
    - Can be prone to washouts
  - Advantages
    - Inexpensive
    - Fast
    - Large volume
    - Less specialized equipment and training needed

Types of Equipment

- Corers
  - Gravity
    - A corer that is a specified length with stabilizing fins that is dropped into the water column and strikes the bottom under its own power
    - Disadvantages
      - Hard to control
      - Inaccurate
      - Bow wave
      - Compression
    - Advantages
      - Much like a grab sampler (fast and inexpensive)
      - Can provide deeper information than a grab sampler

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Types of Equipment

- Corers
  - Hand/Piston
    - A corer that is manually driven into the sediment
    - Disadvantages
      - Can only go as deep as can be pushed by hand
      - Specialized equipment and training
      - Limited, to be used in shallow water
    - Advantages
      - One continuous core
      - Fast
      - Can be easily cut into sections for depth information
      - Can be used where boats cannot go

Types of Equipment

- Corers
  - Vibracore
    - Uses a device to vibrate a core into the sediment
    - Disadvantages
      - Specialized equipment and training
      - Will only go through loose unconsolidated materials (not good with coarse material)
      - More IDW
      - Bulleting
      - Cannot guarantee a depth
    - Advantages
      - Gold standard
      - One continuous core
      - Fast
      - Can be easily cut into sections for depth information

Types of Equipment

- Drill rig
  - Direct push, sonic, hollow stem auger, etc.
    - Uses a mechanical rig to “drive” a rod or tube to a desired depth
    - Disadvantages
      - Very costly
      - Specialized equipment and training
      - Does not capture the soft material very well
      - Samples in small segments
      - Small volume of sample
    - Advantages
      - Can sample more competent material
      - Typically can go to greater depths

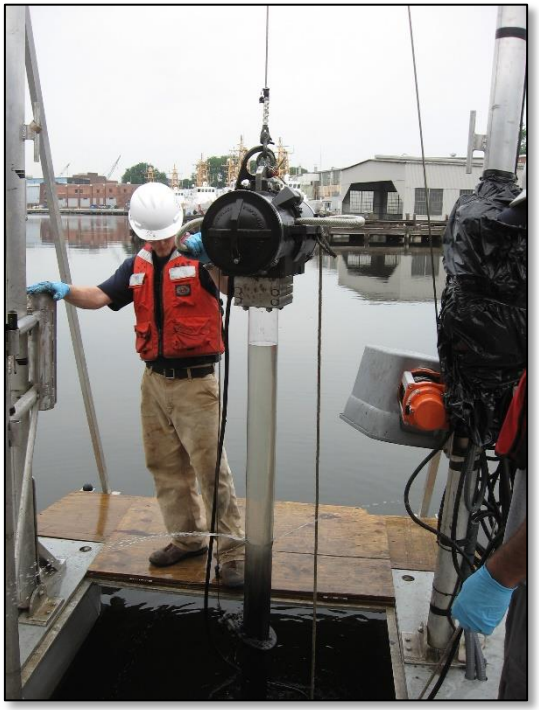
Questions to answer in the RFP in order to get better bids:

- Water depths?
- Access?
- Any known utilities, hazards, or obstructions?
- Any project specific needs (i.e., 40hr OSHA, safety training, PPE, etc.)?
- Depth of sample?
- Volume of sample?
- What analysis or criteria will the sediment be analyzed for?

Final Thought:

Ambiguity leads to inflated price and incomparable proposals.

Questions?



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Thank You

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