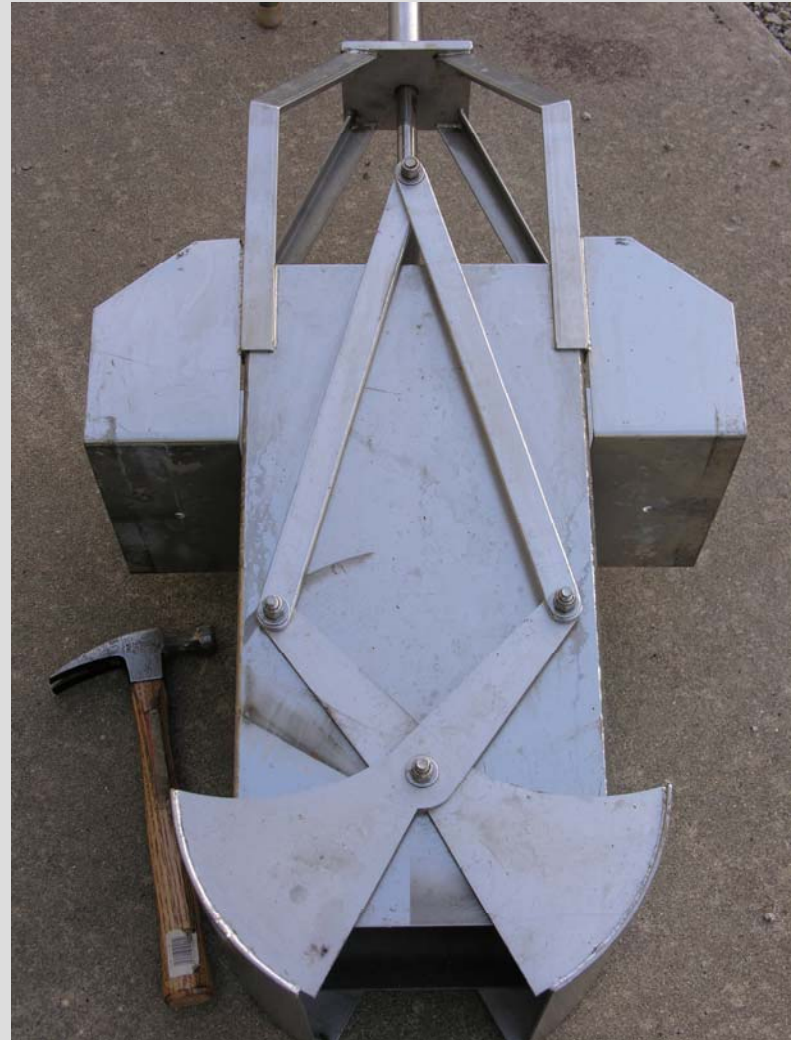


Sediment Sampling and Characterization Techniques for the Illinois River



ISWS Sediment Sampling Equipment

- Eckman Dredge
- Ponar Dredge
- Hand Corer
- Piston Corer
- Box Corer (shown)
- Vibrocore



ISWS crew vibrocoring at Big Lake Brown County IL

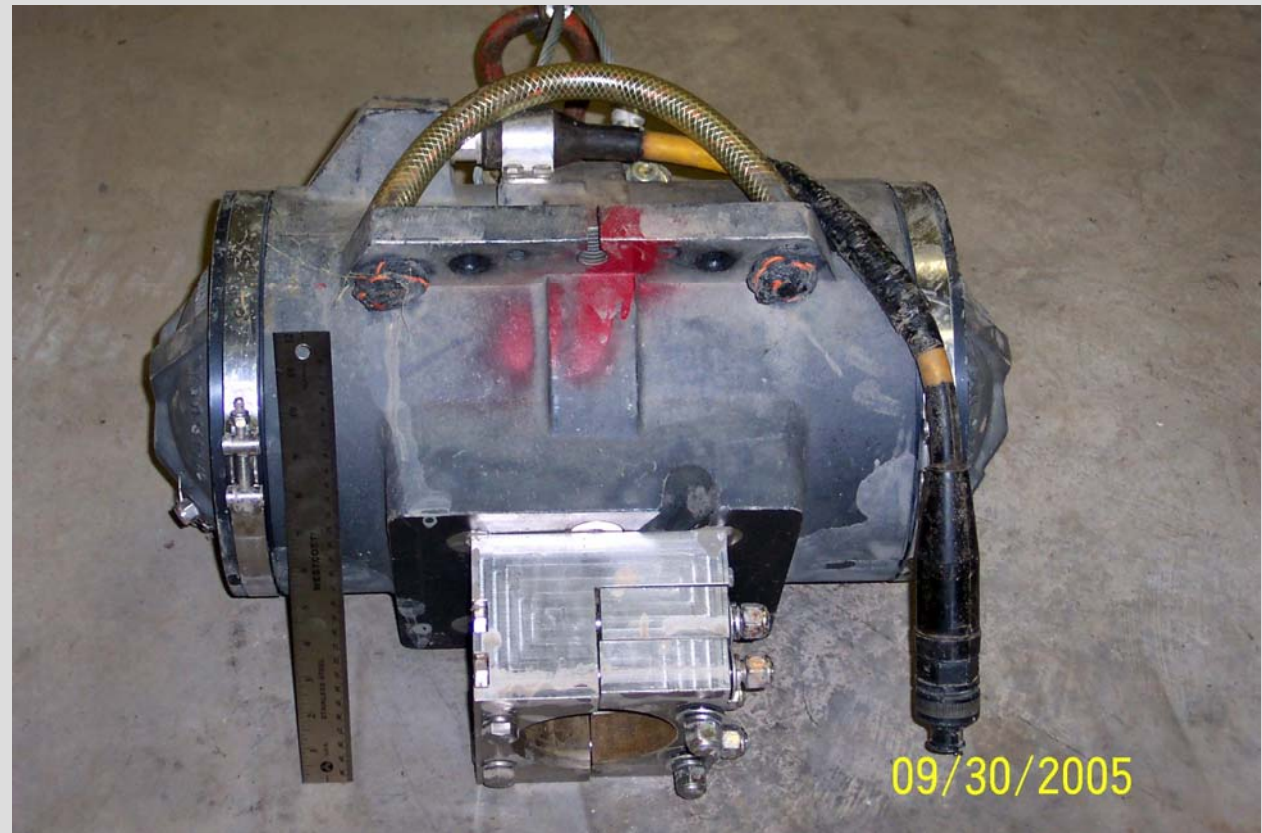


Vibrocore has four main components

- Vibrohead
- Drive Tube
- Liner
- Cutter nose and core catcher

Rossfelder P-3c Vibrocore

- 150lbs
- 3-Phase
450 volts
- 3450
vibration/
min
- 3600-5400
lbs force



Drive Tube specifications

- Schedule 5
(14 Gauge)
iron pipe
- OD= 4in
- Wall = .083
- 10 ft length



Liner Specs

- Custom extruded HDPE
- OD = 3.755"
- ID = 3.615"
- Wall = .070"
- Length = 10'
- Liners used for chem sampling are acid washed and DI rinsed, capped and sealed.
- Large diameter provides ample sample volume for almost any combination of analyses.



Cutternose and Core catcher assembly

- Cutter nose is turned from 4" 303 Stainless Steel pipe.
- Core catcher fabricated using .010 303 stainless
- Cutter is riveted to the drive tube prior to deployment.



Core catcher after
retrieving a
particularly stubborn
sediment core.



Operations for Vibrocoring

- Vibrocoring is done from an 18'6" pontoon boat.
- Loaded draft is approx 16"
- Vibocore is powered by 3-phase 450 volt 60Hz generator
- Winches and compressed air powered by 115 V AC generator



All vibrocoring occurs through a “moonpool” located approximately mid-ship



Putting the Pieces to Work



Rules of the Game

- Vibrocoring penetrates by using the vibrations along the tube to “liquefy” surrounding sediments and percussion from two eccentrics.
- Therefore vibrocoring works best in water logged heterogeneous materials.
- Vibrocoring yields a sample that is relatively undisturbed
- Cored length and percent recovery are impossible to predict but recovery will always be less than 100%
- The ability for air or water to fill the void created by extracting a sediment core determines how easily the core is retrieved and is an important factor affecting percent recovery.
- Large cobble, woody debris or non-hydrated clay lenses > 1ft. impede coring.

“But even the best laid plans oft do go awry”



Or even worse....





Video courtesy of Joel Dexter ISGS

Vibrocoring efforts to date

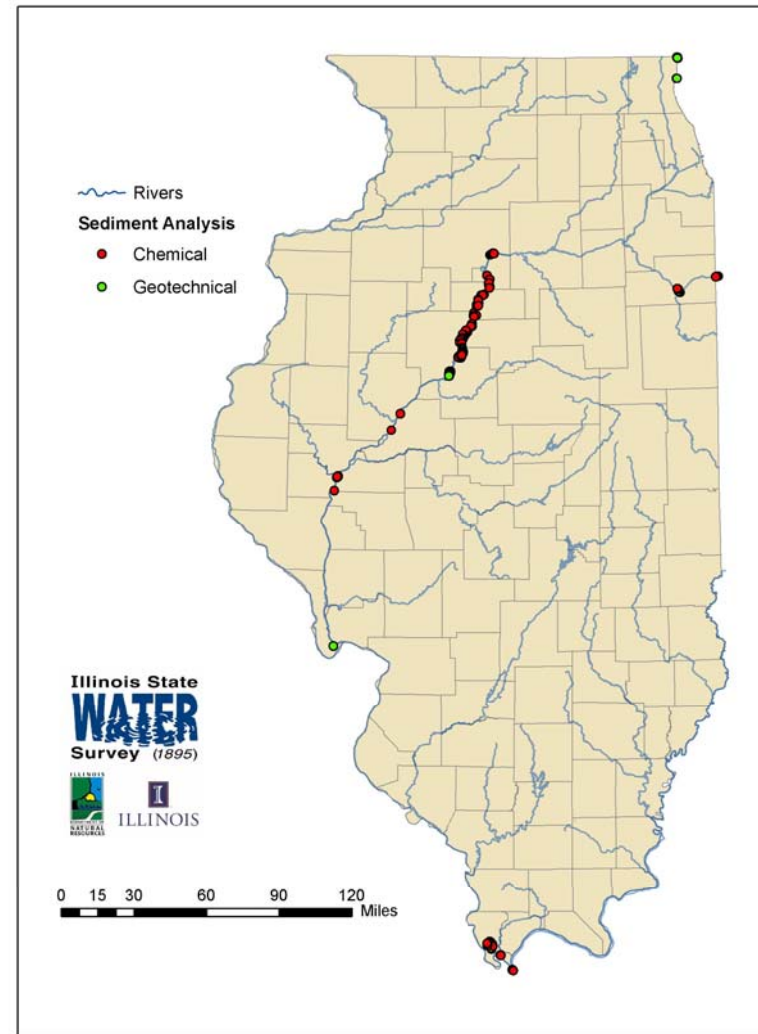
- ISWS Vibrocore has been in use since 2002
- Sampling has been done for federal, state local, and private entities.
- Work done in support of research, restoration and/or mitigation and river operations

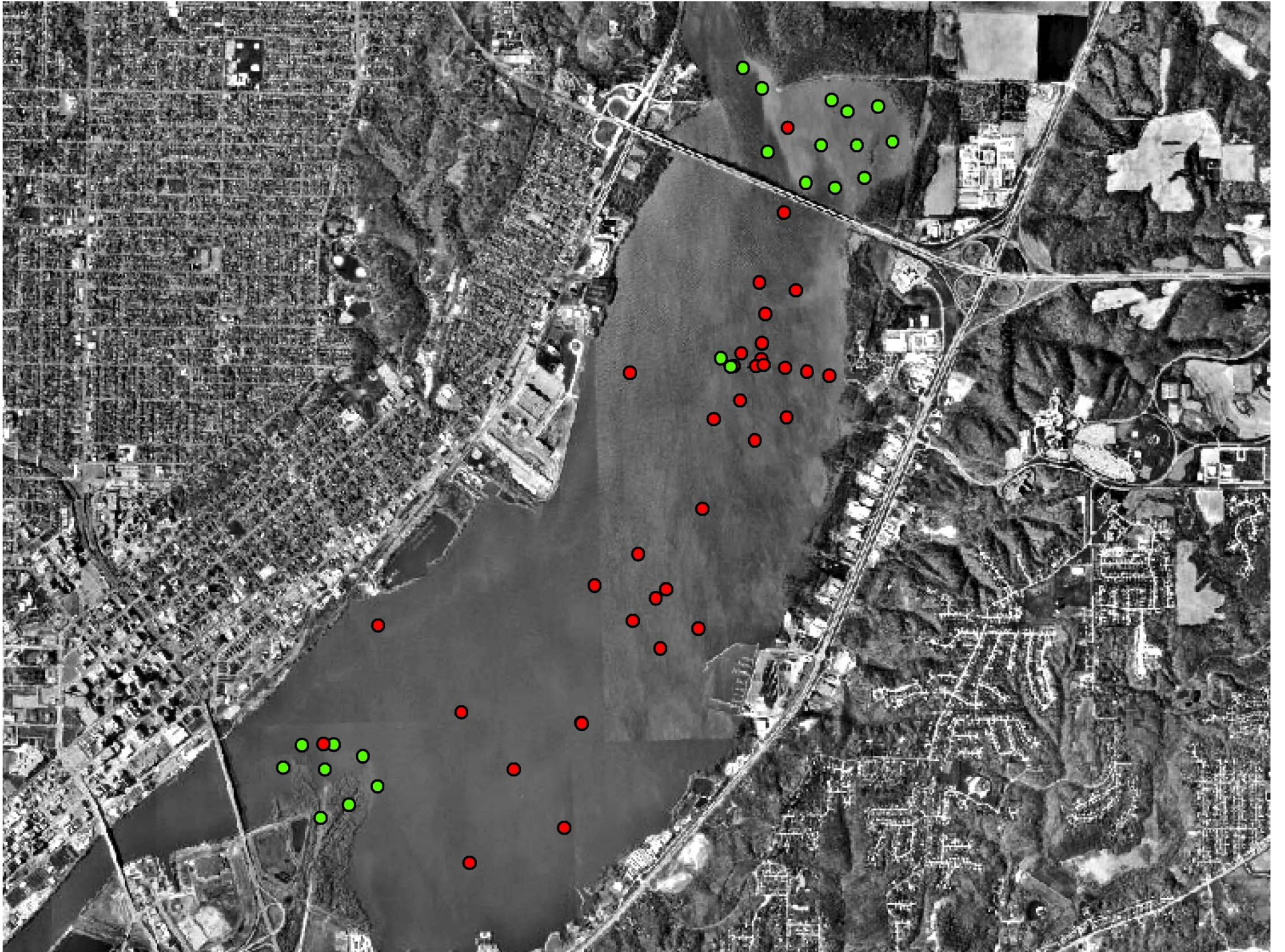


ISWS Vibrocoreing Locations

- 245 cores collected to date for 19 projects.
- Majority of efforts have been on Illinois River.
- Greastest concentration of Data is for Peoria Lakes

- Geotechnical Samples
- Chemical Samples







Video courtesy of Joel Dexter ISGS

Common Sediment Analyses

- Geotechnical
 - Unit weight
 - Particle size
 - Atterbergh limits
 - Percent moisture
 - Radioisotopes used for dating such as Cs^{137} , Pb^{210}



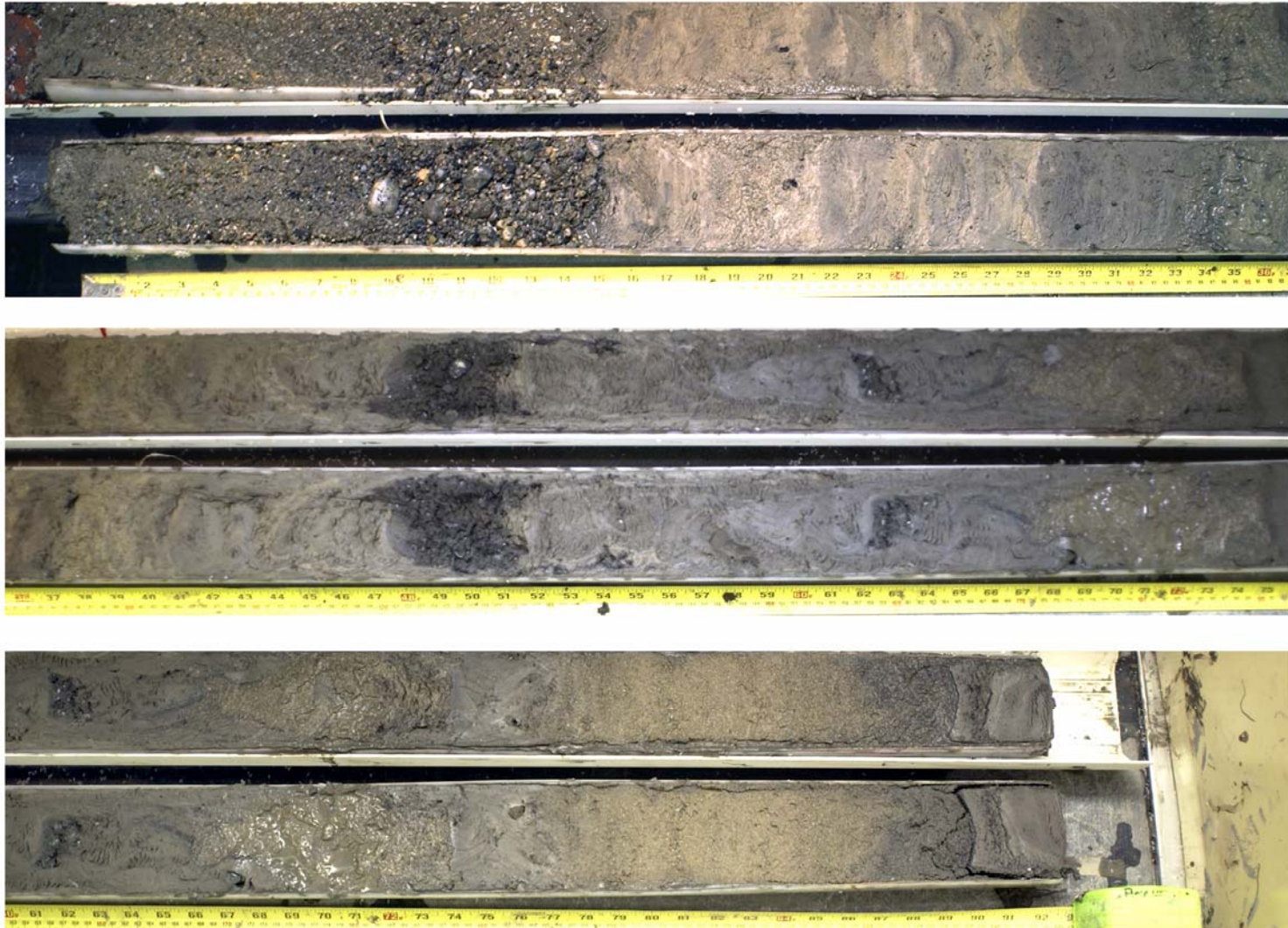
Common Sediment Analyses



- Chemical
 - Metals
 - Pesticides
 - PAHs
 - PCBs
 - Organics
 - Nutrients

Long cores provide information on how sediment quality and depositional environments have changed over time (Farm Creek delta)

ISWS 116

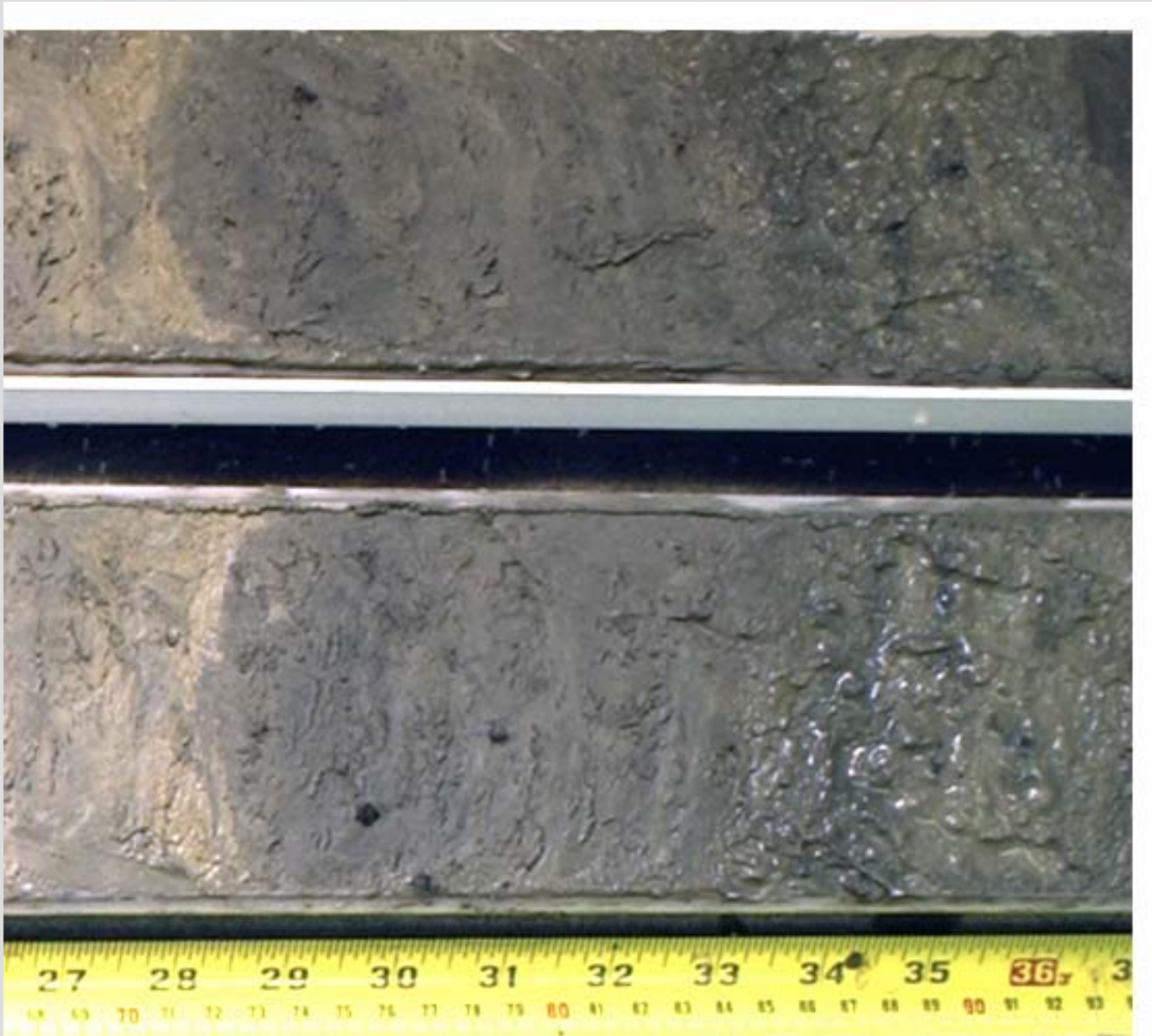


Provide insight into sediment characteristics and volumes at potential project sites

ISWS 116



In order to encourage the beneficial reuse of sediments



Thanks go to:



and to:



and finally to:

