A Decade of Experience with Beneficial Use of Sediment in Illinois

By John C. Marlin
Illinois Sustainable Technology Center
Prairie Research Institute
University of Illinois
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Many Collaborators Made the Mud to Parks Projects Possible Including:

- The Illinois Scientific Surveys within the Prairie Research Institute at the University of Illinois
- Illinois Department of Natural Resources
- University of Illinois (NRES)
- Artco Fleeting, Midwest Foundation and several other private companies
- Cities of Chicago and East Peoria, Chicago and Fon du Lak Park Districts, and other units of local government
- Political leaders including Gov. Pat Quinn, former Cong. Ray LaHood, and Attorney. Gen. Lisa Madigan, former Lt. Gov. Corrine Wood.

Fresh Water Bodies are losing about 1 % of their capacity annually to sedimentation.

Sediment removal will be increasingly important as means of addressing this issue.

Much sediment can be viewed as a resource out of place and may be useful if returned to the land.

Many areas near waterways and water bodies need soil for landscaping, remediation and restoration.

Clean sediment can help address these issues if returned to the land as soil.

Anticipated Sediment Accumulation in Illinois Water Supply Reservoirs 1990--2030

- Lake Decatur 8 million cu.yds.
- Lake Bloomington 1.6 “
- Lake Taylorville 4.7 “
- Lake Springfield 8.4 “
- All W. S. Res. 153.0 “

Illinois state Water Survey

Millennium Reserve:

Calumet Core Project Area and Expansion Area

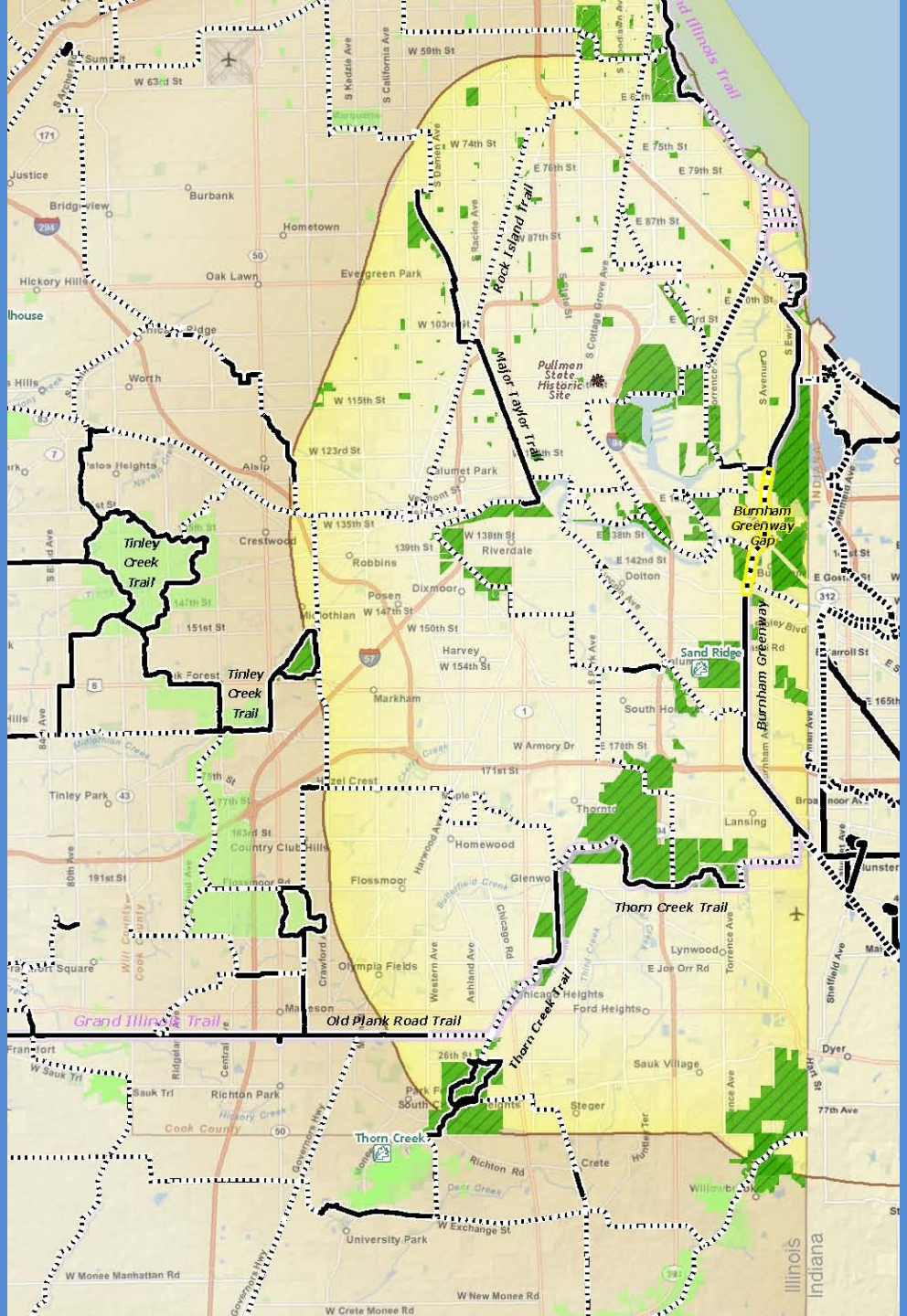
Nature Centers

Trails

- Existing
- Planned
- Grand Illinois Trail
- Millenniun Reserve Lands
- Publicly Owned/Managed Green Space

Millennium Reserve Project Zones

- Core Boundary
- Expansion Zone

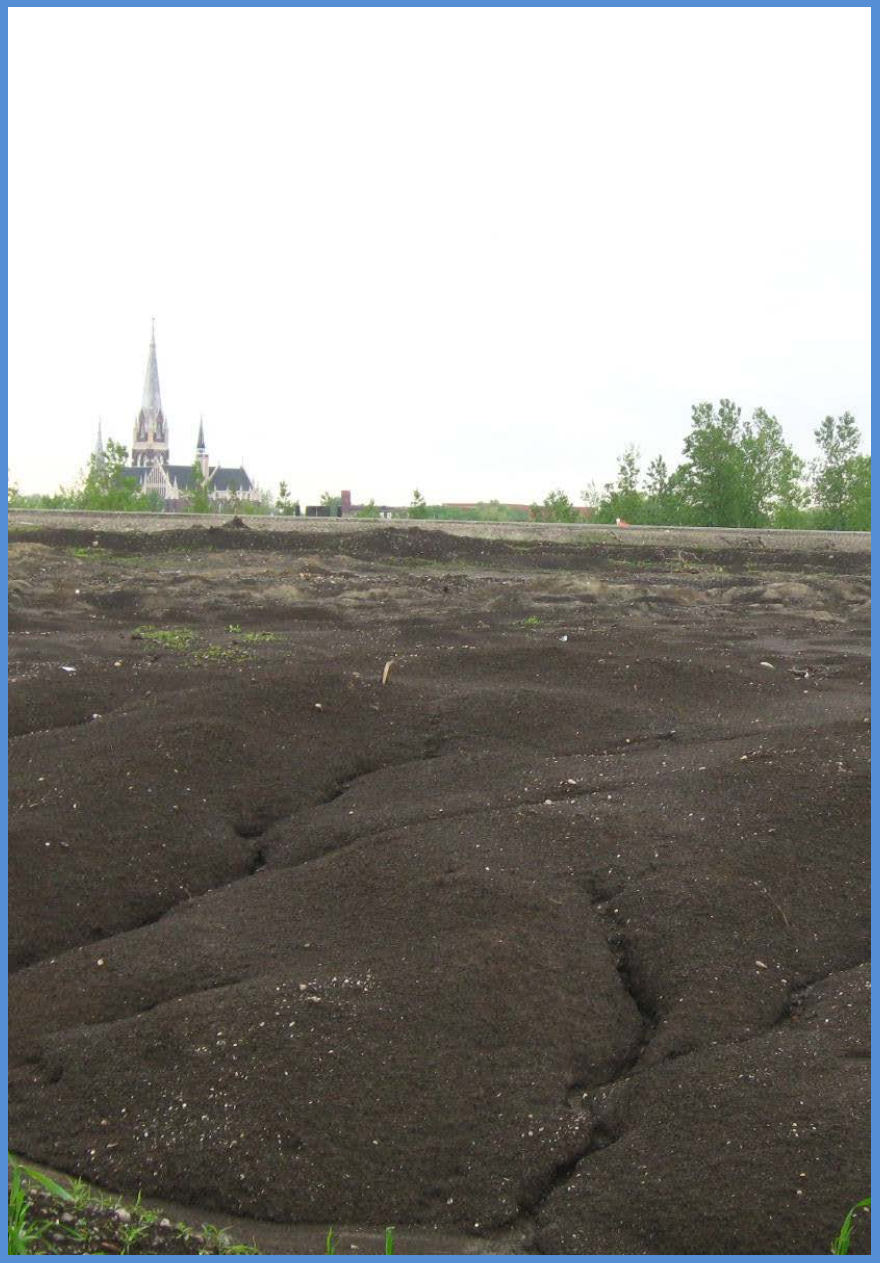


State of Illinois

Illinois Department of Natural Resources

“Clean” Urban Soil

Reclaimed topsoil from Lower Peoria Lake



Beneficial Use as Soil can

Restore economic and ecological values in aquatic systems

Provide soil for restoration and remediation

Reduce truck traffic in urban areas

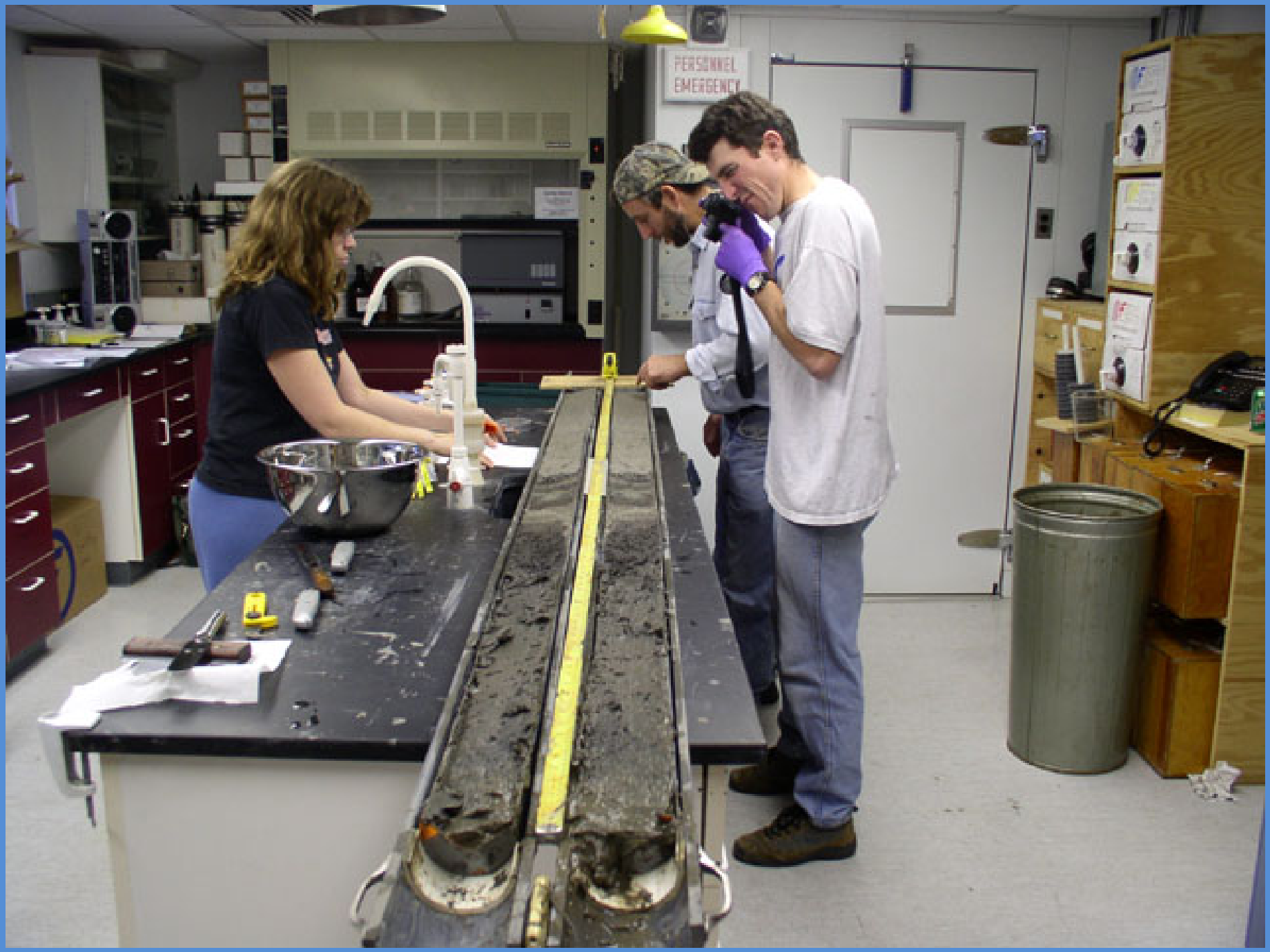
Reduce the need for taking soil from one area to benefit another

Testing Lower Peoria Lake Sediment for Agricultural Soil Characteristics

- Texture and particle size
- Basic fertility and nutrients
- Organic matter
- pH
- Cation exchange capacity

RESULT: Sediment deposited in the lake is generally similar to natural central Illinois topsoil.


STATE OF ILLINOIS


PERSONNEL
EMERGENCY

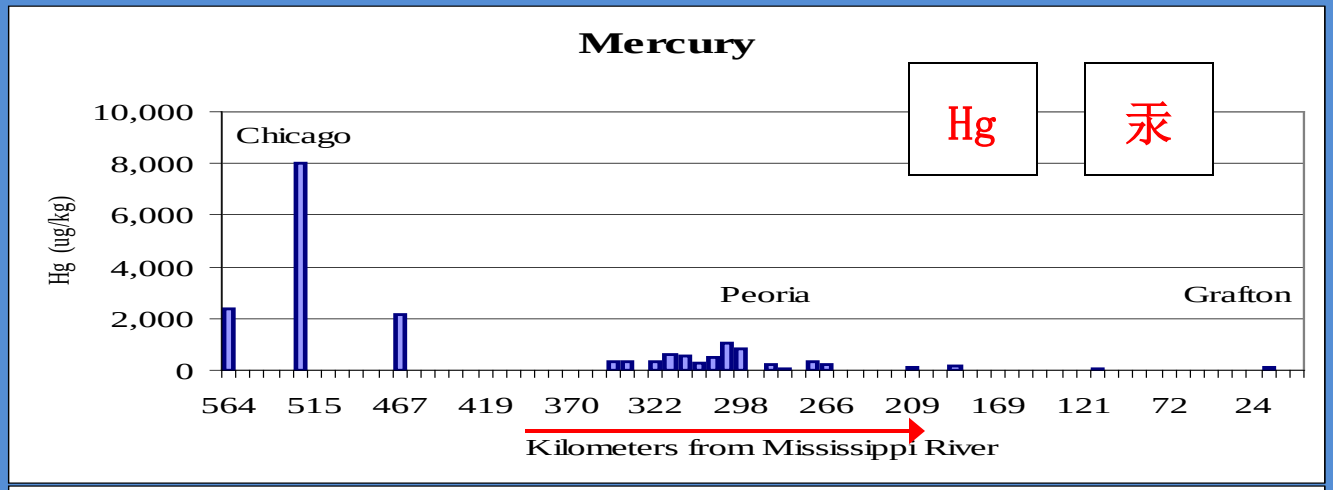
Recently deposited uniform material from near the navigation channel in Lower Peoria Lake flows easily from trucks

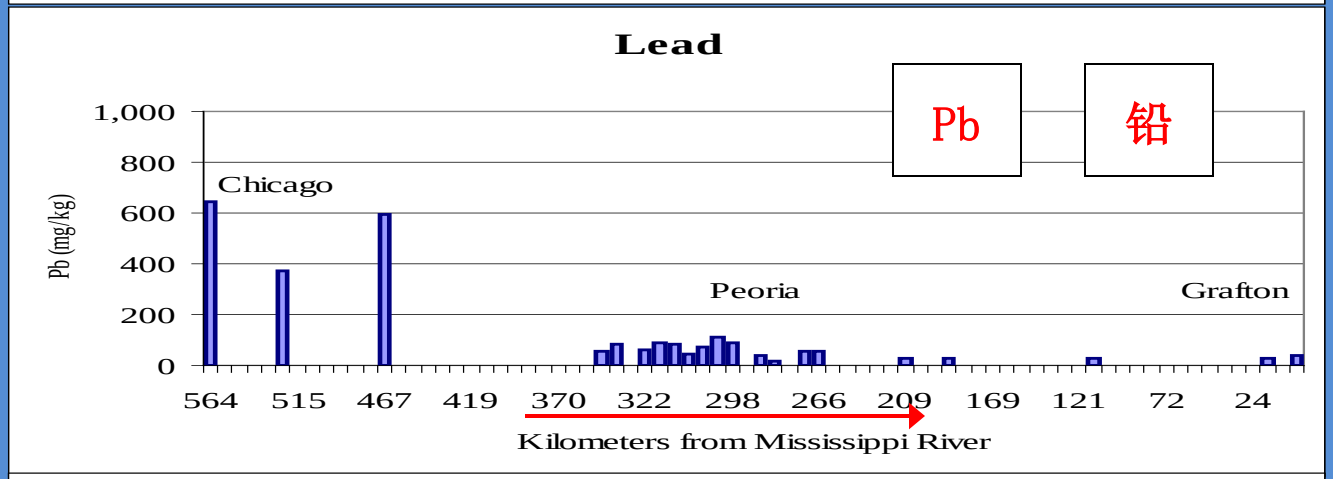
Lower Peoria Lake sediment with a peaty layer under recently deposited material is almost granular

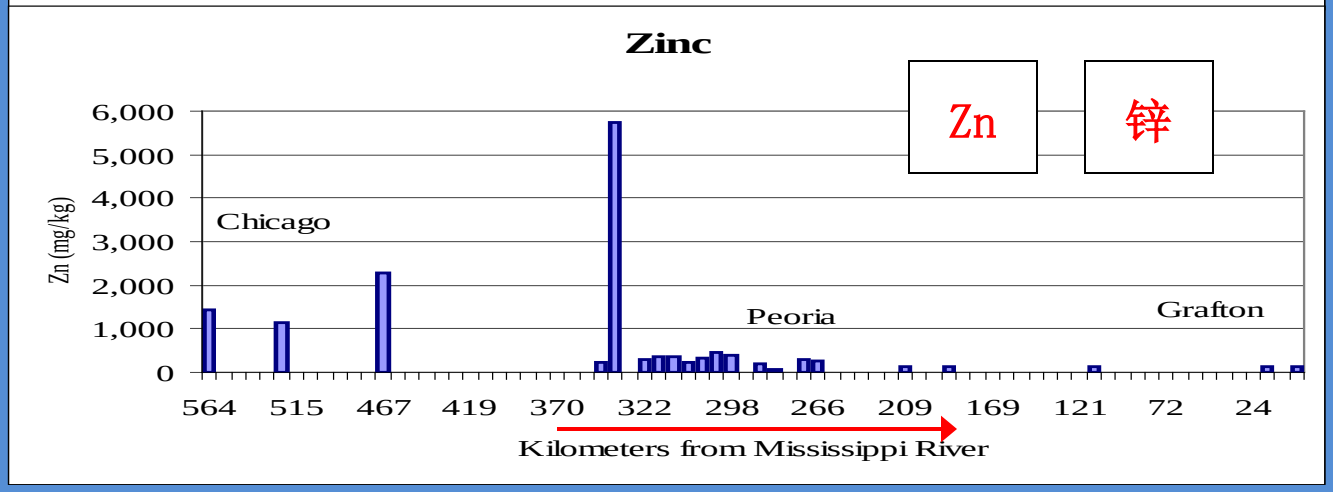
Light gray sticky material below the recently deposited sediment layer from near Lower Peoria Lake shore is hard to handle

Contaminant Testing

- 24 metals
- 22 pesticides
- 7 PCB arachlors
- 72 semi-volatile organics, including PAH





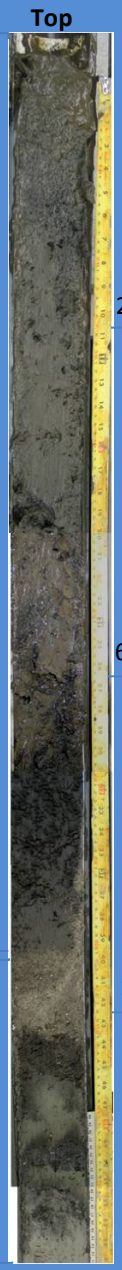


Levels of selected metals in Illinois River sediment from Chicago to Grafton --ISGS

564 km

24 km

Core 197 From Lower Peoria Lake Chemical (mg/kg) and Agronomic Properties



Arsenic	5.3
Lead	40
Copper	39
Nickel	33
Zinc	190
PCB 1254	0.078
BAP	0.240

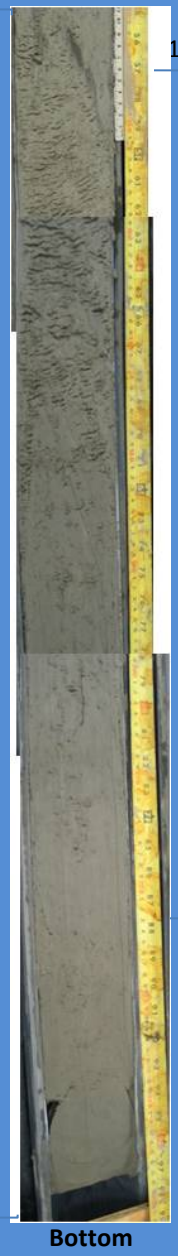
Texture	SiL
% SOM	4.6
K^+	175ppm

Texture	SiCL
% SOM	5.3
K^+	138ppm

Arsenic	3.8
Lead	17
Copper	26
Nickel	32
Zinc	90
PCB 1254	<0.035
BAP	<0.072

Texture	SL (70% Sand)
% SOM	3.9
K^+	43ppm

Arsenic	2.6
Lead	8.9
Copper	14
Nickel	16
Zinc	41
PCB 1254	<0.022
BAP	<0.044



Texture	SiCL
% SOM	1.9
K^+	70ppm

East Port Marina, East Peoria, IL.

- Use innovative dry dredge with concrete pump directly to trucks
- Remove sediment from dock area
- Provide reclaimed topsoil to urban redevelopment sites
- ongoing


IL 9370 KF

Walton Lake, Litchfield IL.

- Mechanical dredging from temporarily drained lake
- Placed directly in trucks
- Add depth to aquatic habitat
- Provided reclaimed topsoil to new water treatment plant, and park district sites including archery range
- Completed 2013


STUTZ
CAT


CAT
320C L
CAT

US Steel South Works Site, E. Peoria to Chicago, IL.

- Mechanical dredging from Lower Peoria Lake
- River barges took wet sediment to Chicago where it was trucked on site for placement
- Provide topsoil for extension of lakefront park system
- Three phases completed

April 22, 2004

Sept. 19, 2012

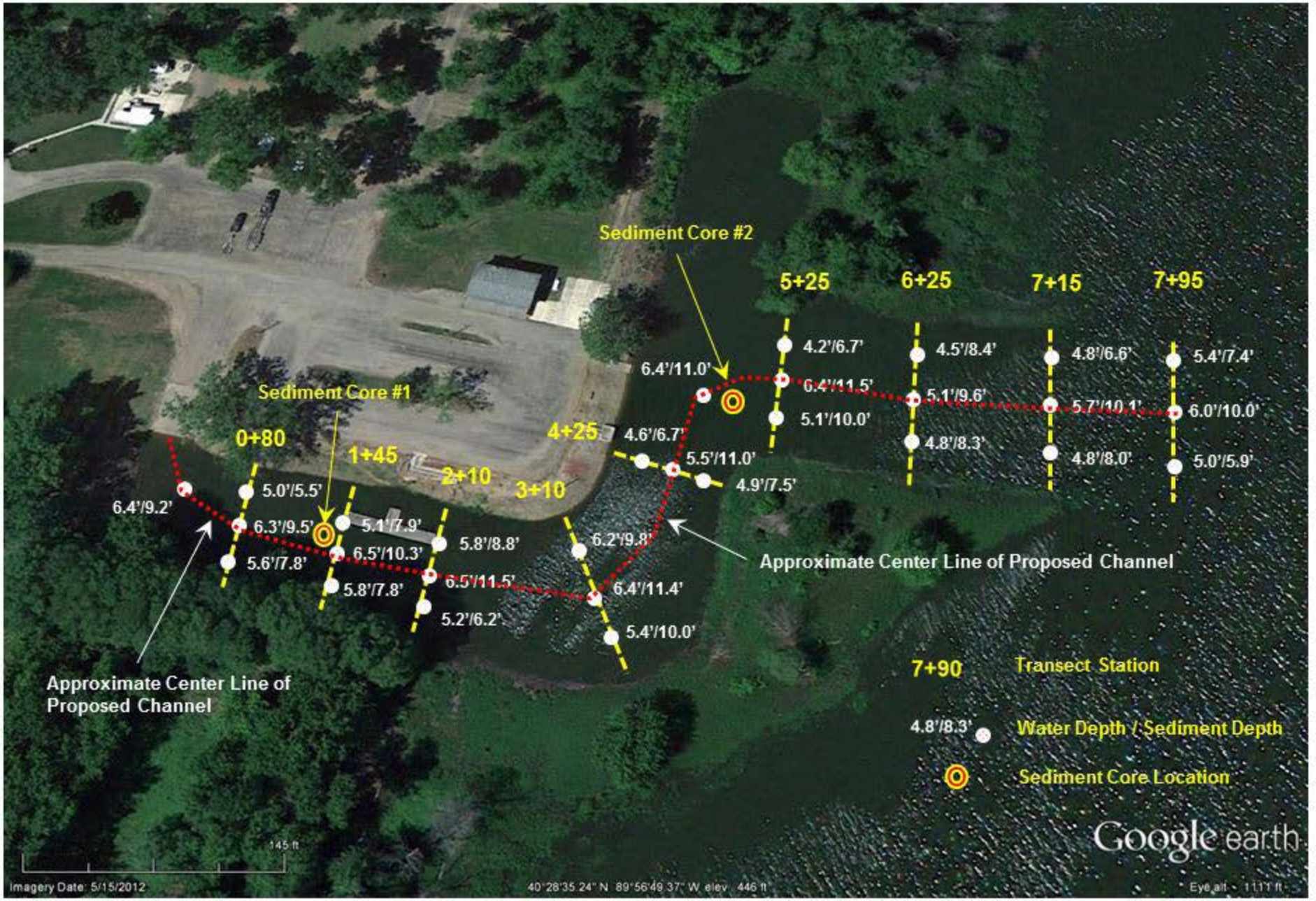
Fox Waterway Agency, Cooper's Farm Dewatering Facility Antioch Twp., Lake Co. IL.

- Specially designed settling and dewatering basins
- Allow rapid dewatering of hydraulically dredged sediment
- Reclaimed topsoil is then trucked to a drying area to develop soil structure


Ann Rd
N Elmore Rd
Chain O Lakes State Park

Rice Lake State Fish and Wildlife Area Fulton Co., IL.

- Mechanically dredge boat ramp using small lake barges
- Truck wet sediment 6 miles to Banner Marsh SFWA
- Provide reclaimed topsoil to strip mined area to enhance wildlife plots at Banner Marsh State Fish and Wildlife Area


Sediment Core #2
5+25
6+25
7+15
7+95
4.2'/6.7'
6.4'/11.0'
6.4'/11.5'
5.1'/10.0'
4.5'/8.4'
5.1'/9.6'
4.8'/8.3'
4.8'/6.6'
5.7'/10.1'
4.8'/8.0'
5.4'/7.4'
6.0'/10.0'
5.0'/5.9'
Sediment Core #1
0+80
1+45
2+10
3+10
4+25
6.4'/9.2'
5.0'/5.5'
6.3'/9.5'
5.6'/7.8'
5.1'/7.9'
6.5'/10.3'
5.8'/7.8'
5.8'/8.8'
6.5'/11.5'
5.2'/6.2'
4.6'/6.7'
5.5'/11.0'
4.9'/7.5'
6.2'/9.8'
6.4'/11.4'
5.4'/10.0'
Approximate Center Line of Proposed Channel
Approximate Center Line of Proposed Channel
7+90
Transect Station
4.8'/8.3'
Water Depth / Sediment Depth
Sediment Core Location
145 ft
Imagery Date: 5/15/2012
40°28'35.24" N 89°56'49.37" W elev 446 ft
Eye alt 1111 ft
Google earth


March 18, 2005 Banner Marsh


July 7, 2007 Banner Marsh

Other Mud to Parks Projects

- Reclaimed soil for a park at the Celotex site in Chicago (pending)
- Fish channel and floodplain hardwood enhancement at Woodford Co. SFWA (pending)
- Soil for a park in an old industrial site at Sterling (Pending)
- Pekin Landfill, Tazewell Co., IL.
- Lake Decatur, Decatur, IL.
- Banner Marsh SFWA, Fulton Co., IL.

Some Thoughts and Questions

- For the foreseeable future, sediment is a renewable resource
- Can lake managers cooperation on dredging equipment and contracting?
- Should reclaimed topsoil be stockpiled for future use?
- Can sediment be blended with biosolids and compost to create a high quality manufactured soil?
- Is there a need to regulate the removal and relocation of topsoil?
- Do dredging regulations need updating?

Some Issues to Consider for the Future of Beneficial Use

- Bond “guidelines” limit options for use
- How procurement rules relate to cost, selection of engineers, and timing
- How to enhance intra- and interagency review and cooperation
- How can the concept be commercialized