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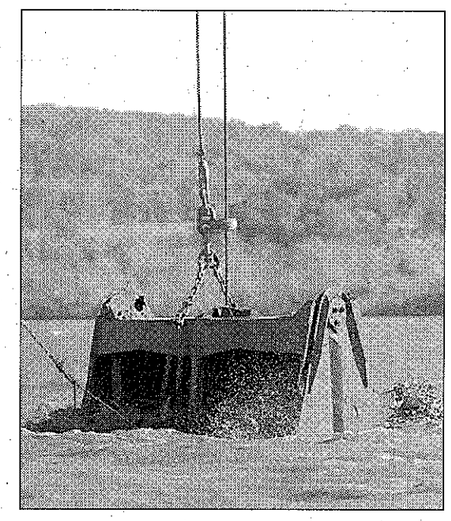
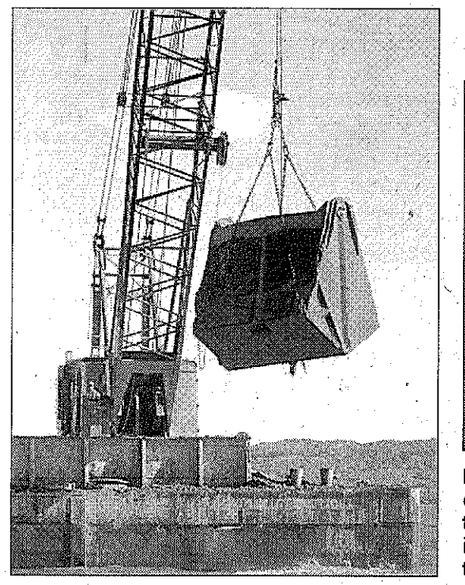
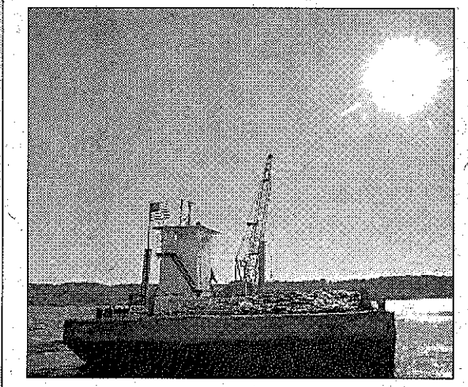
Step by step: A long trip for lake sludge







ABOVE: Scientist John Marlin holds a bottle of water from the Illinois River showing how much sediment exists at Eastport Marina in East Peoria. **RIGHT:** A crane with a cable arm clamshell plunges into the water to dredge the sediment from Lower Peoria Lake.

LEFT: The crane deposits a load of sediment onto a river barge. **ABOVE:** A barge prepares to transport the muck to Creve Coeur, where it will be loaded onto a truck and transported to a former landfill site in Pekin.

MUD TO PARKS PROGRAM

It's a dirty job: Scientist dredges up way to put topsoil to good use

By PAUL WOOD
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EAST PEORIA — Some of the best soil in the world washes into the Illinois River every day, where it clogs shipping and recreational channels.

Elsewhere in Illinois, developers pay good money to have soil dug out and moved by trucks to their sites.

It isn't easy to dredge river mud onto barges, then take it where it's needed to cover a landfill or create a park, but that's exactly what scientists from Champaign are having done.

Black, heavy earth from the bottom of Lower Peoria Lake, a widening of the Illinois River, is now drying on top of the clay liner of the closed Pekin Landfill.

When the trucks dump it, water doesn't run out. It maintains its shape, and it's possible to walk on it — if you don't mind ruining your Keds.

Mud from the same source is growing grasses and weeds at a future Chicago lakefront park that was formerly the U.S. Steel South Works plant on the South Side.

John Marlin, who oversees the project as a senior scientist at the Illinois Department of Natural Resources'

Bottom of the lake to the top of a park

The mud: Enough sediment to cover a football field 10.5 miles deep
The barges: Seven of them, each with a load equal to 75 tractor-trailers
The trip: Up the Illinois River to Lake Michigan and the U.S. Steel South Works park site.
The cost: $275,000
Who pays: $25,000 grant from East Peoria; $250,000 from the Illinois Department of Natural Resources
PAUL WOOD

Clean Water Act has really decreased a lot of the pollution, and it has become diluted."

Darmody has taken an earthy approach to the soils in conversation.

"This mud has to go through a ripening process. It comes out of the lake as toothpaste batter; it sort of looks like wet cement. It has to dry out, then undergo weathering," he said.

The mud, fresh from being under the pressure of several feet of water, is too compacted to be useful for growing

Waste Management and Research Center in Champaign, said he can't see any downside to the work.

The two Illinois River lakes at Peoria have enough dredgeable sediment to cover a football field 10.5 miles deep, Marlin said, and it's not doing anybody any good where it is.

The sediment has turned Lower Peoria Lake so shallow that you could walk across large parts of it, if slogging knee-deep in mud is your idea of a good time.

There's far more than enough mud to fill seven barges, each one with a load equal to 75 tractor-trailers. The barges take two days to make the trip up the Illinois river to Lake Michigan.

"There's a real savings to the streets and highways of Illinois, especially Chicago," Marlin said. "If trucks were doing this, there'd be the wear and tear on the roads, not to mention the congestion."

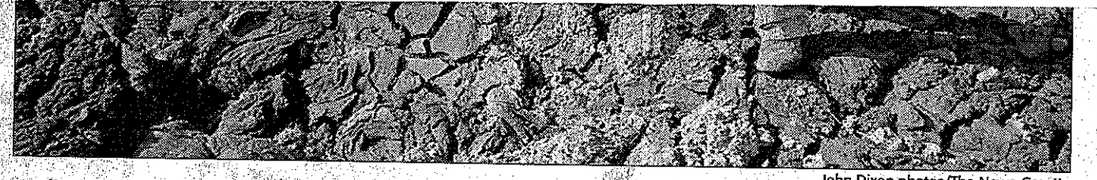
The seven-barge Chicago shipment costs about $275,000. The South Works project was paid for by a $25,000 grant from the city of East Peoria, and $250,000 from the Illinois Department of Natural Resources.

Creating new land

The Mud To Parks Program was first funded in February 2003, when Lt. Gov. Pat Quinn's office found Marlin a grant of $75,000 as seed money to begin the first project, shipping mud from Peoria Lake to the South Works site.

With money from the city of Chicago and the state — and donation of the land by U.S. Steel — a new Chicago park is being born literally from the ashes and refuse of the South Works site.

It's a 550-acre parcel that lines Lake Michigan about 10 miles south of the Loop. The land was taken from the lake beginning a century ago, when the South Works used its slag, molten metal refuse, to build up its plant, once the biggest steel mill in the world. What remains is a desolate and soilless wasteland where almost nothing could grow.



John Dixon photos/The News-Gazette

Marlin, a senior scientist at the Illinois Department of Natural Resources' Waste Management and Research Center, walks across the spongy surface of week-old sediment at the Pekin Landfill. The muck was dredged up from Lower Peoria Lake and transported by barge and trucks to the landfill site.

Quinn said Marlin came to him about five years ago with the idea of using dredging to take soil from where it was harmful to where it was helpful.

Marlin had been intrigued since he saw the bottom of Urbana's Crystal Lake dredged, with the soupy mud trucked to the old Champaign landfill.

The idea has proved more practical than Quinn at first thought.

"It has worked out very well for the state, and helped a number of environmental initiatives," he said, adding that the project won a national award from the Council of State Governments last year.

Quinn said that as chairman of the Illinois River Coordinating Council, he'd like to see Marlin's idea expanded to the river and all of its tributaries, including the Sangamon, which feeds the silty reservoir lakes in Decatur and Springfield.

Mud with a history

Marlin's projects have used limited amounts of mud to this point; the project capping the Pekin Landfill is "a demonstration" and not entirely as cost-effective as he'd like. It was funded with $200,000 from an environmental settlement with Dynegy Inc.

Rich Cahill is one scientist who has reservations about dredging-to-topsoil projects on a very large scale.

A senior chemist emeritus at the State Geological Survey in Champaign, Cahill is concerned about the decades of industry along the Illinois River, and what those industrial plants deposited in rivers and soils, before the dangers of arsenic and lead were well-understood.

"Upstream from Peoria, you get closer to more pollution sources. Up by LaSalle-Peru, in the 1920s, the river started to look like the Rhine, lined with smelters and coal mines," Cahill said.

Dredging deeper means going into that lax industrial past — and digging up metal deposits from decades ago, Cahill said.

"I have to give credit to John for considering the environmental consequences," he said. "His projects are on a pretty small scale; to do serious damage you need to move a lot more mud than John did."

Still, Cahill is concerned that Marlin's success will lead businesses or governments to move to a much larger scale without appreciation of the consequences.

Besides raising hazardous chemicals, deep dredging can shift channels and affect islands that provide habitat for water life.

It might not be cost-effective, either, if dredgers don't prevent even more silt from flowing into a lake, Cahill said.

"If you dig a hole in the lake and it fills up again in five years, you've spent a fair amount of money without a lot of results," he said.

Marlin, whose research funded several of Cahill's studies, agreed there are places in the river that have excessive metals. He said he's also concerned, as are Illinois State Water Survey scientists, about maintaining islands for biodiversity.

What's in the mud?

Marlin said there would be some concerns if there were excessive metals in sediment used for lawn topsoil because children could come in contact with bare spots. But in a park setting like the Chicago project, this is not a great concern.

Illinois River soils have been approved for park use by the Illinois Environmental Protection Agency.

Robert Darmody is a UI professor of pedology, the science of soils. His research has found that the sediments have high natural fertility and water-holding capacity.

Illinois River sediments have elevated levels of heavy metals, Darmody wrote in a recent research paper, which might be important if they are used as garden or agricultural soil, but "if properly managed, these relatively uncontaminated ... sediments can make productive soils and ... metal uptake of plants grown in these sediments is generally not a concern."

"Chicago used to dump its sewage down the Illinois River," he noted. "The fight away.

"Soil needs to form structure as it dries; it cracks like hard concrete. Polygons form, then cracks between polygons, and it slowly dries out as it goes through freezing and thawing until it becomes more granular" and useful.

The entire process can take a couple of years, Darmody said.

And though there are some metals, such as zinc, he said the Illinois River soil is better than what it's replacing on the south side of Chicago.

When U.S. Steel dumped its slag and cinders into Lake Michigan to create new land, Darmody said, "that made for lousy soil."

Urban soils in general are often contaminated by lead from car exhausts and lead-based paint dust.

"The cost of removing it is pretty high," Darmody noted.

From wetlands to park land

Michael Murphy, a botanist with the Illinois Department of Natural Resources in Champaign, has studied what grows in the Illinois River mud.

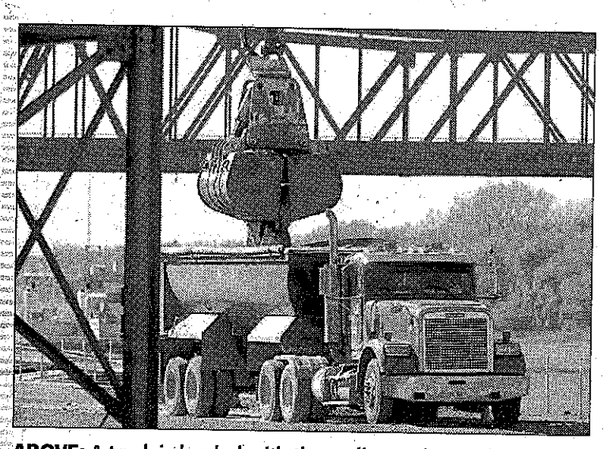
If you thought that corn or grass is most likely to sprout from the dried mud, you'd be wrong.

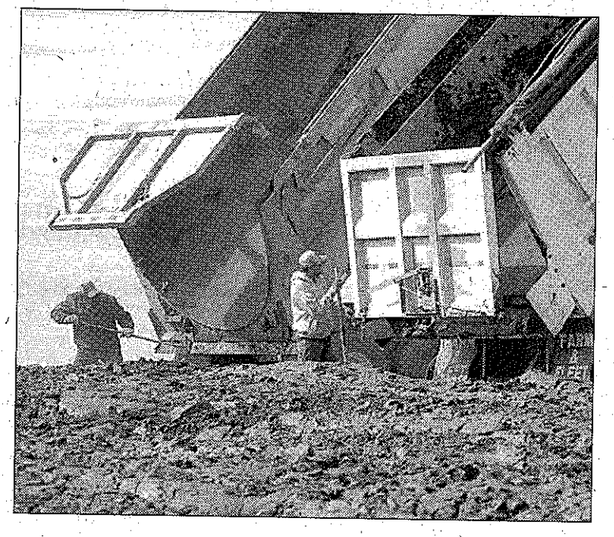
"Most of the plants that germinated were native wetland species," Murphy said. "The sedge family is one of the largest in Illinois. Virtually everything we found was a native wetland species, though a lot of them wouldn't even germinate."

At the Chicago park, plants have been allowed to grow at random for now. There's not much coming up you'd want for a park, though, Murphy said.

"Most of the species you'd want in a park are exotic species," he said of our turf-centered world. "Of the ones you'd want in lawn or park, virtually all of them are European plants."

Murphy is an exponent of wild native grasses but yields to a consumer demand for the more manicured look found in city parks.





ABOVE: A truck is loaded with the sediment from a barge in Creve Coeur before being taken to the Pekin Landfill. **NEAR RIGHT:** At the landfill, Tim Archdale, left, and Rob Eaton unload the trucks. **FAR RIGHT:** Archdale spreads the muck to dry.