

# Fox River PCB Sediment Remediation Site, Wisconsin

Introduction to Environmental Science  
March 8, 2012



James Hahnenberg

Photo from Wikipedia

# **Today's discussion**

- **Fox River - PCBs**
- **Progress**
- **Results**
- **Other stuff**

# **Fox River PCB cleanup**

- **Largest environmental sediment cleanup: 8 million cubic yards**
- **~\$800 million cleanup cost**
- **PCBs: primary risk driver**
- **Lower PCB levels in fish in completed areas**

# It takes a team

- WDNR technical lead & EPA enforcement lead
- *Superfund*
- Responsible parties pay for cleanup
- Oversight by WDNR/EPA



Agency  
oversight  
team

Photo courtesy of Boldt

# Carbonless copy paper production 1954–1971



**NCR Paper**  
ELIMINATES  
CARBON PAPER

FOR THOSE WHO THINK YOUNG.

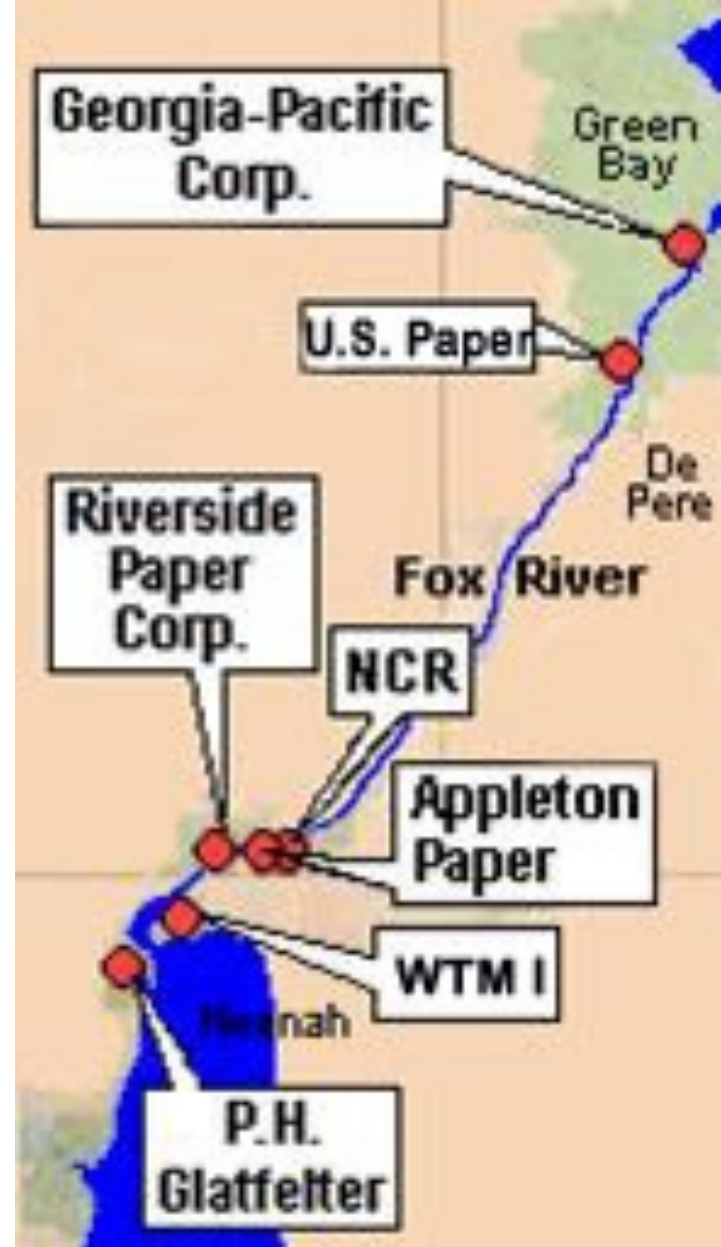
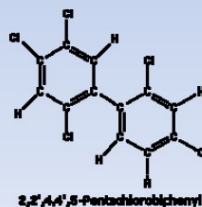
**"NCR PAPER saves us its total annual cost... every six months."**  
— PEPSICO COMPANY, New York, N.Y.

ASK YOUR LOCAL PRINTER OR FILING SUPPLIER ABOUT NCR PAPER.

**NCR**

## Site Background

Between 1954 and 1971, NCR Corporation and Appleton Papers sold carbonless copy paper made with polychlorinated biphenyls (PCBs).



Modified from Green Bay Press Gazette

# Fish Advisories (since 1976)



Black Crappie



Bluegill



Brown Trout

Monitoring (ecological)



Carp



Channel Catfish ✓



Chinook Salmon



Northern Pike



Rock Bass



Rainbow Trout



Smallmouth Bass ✓



Splake



Sturgeon

Monitoring (human health)



Walleye



White Bass



White Fish



White Sucker



White Perch



Yellow Perch

**PCB HEALTH ADVISORY**  
for Fox River-downstream from De Pere Dam

\*Minimum size for Smallmouth Bass = 14 inches

Enjoy your day of fishing and have a tasty, healthy meal of fresh-water fish.  
For the health of your kids, please follow this health advice. Eat the following fish with caution from this water. These fish contain PCBs.

1) Eat no more than 1 meal per week (52 meals per year) of...

2) Eat no more than one meal per month (12 meals per year) of...

3) Eat no more than one meal every two months (6 meals per year) of...

4) DO NOT EAT...

Walleye under 14 inches  
Northern Pike under 25 inches  
Black Crappie under 9 inches  
Sheepshead under 10 inches  
Walleye 16-22 inches  
Northern Pike above 25 inches  
Black Crappie above 9 inches  
Sheepshead 10-13 inches  
Carp  
Channel Catfish

Bluegill  
Rock Bass  
Yellow Perch  
Smallmouth Bass  
White Perch  
White Bass

When preparing fish from these waters, remove the skin and all fat before cooking. Do not use juices from the cooked meat.

See your fishing regulations book for legal size limits.

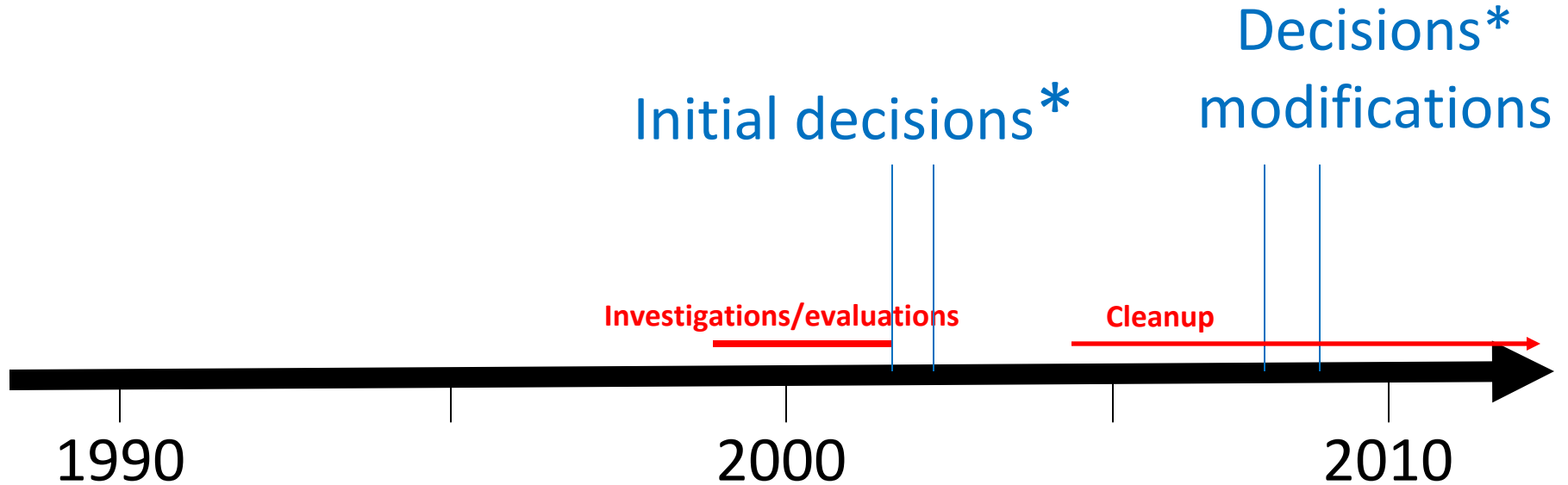
Recommended by the Wisconsin Department of Natural Resources and the Division of Public Health. Call the local DNR office 920-492-5000 for a copy of the state-wide advisory.

# **Fox River & Green Bay Fishers**

- **~50,000 fishers**
- **2,000-5,000 eat Fox River & Green Bay fish**

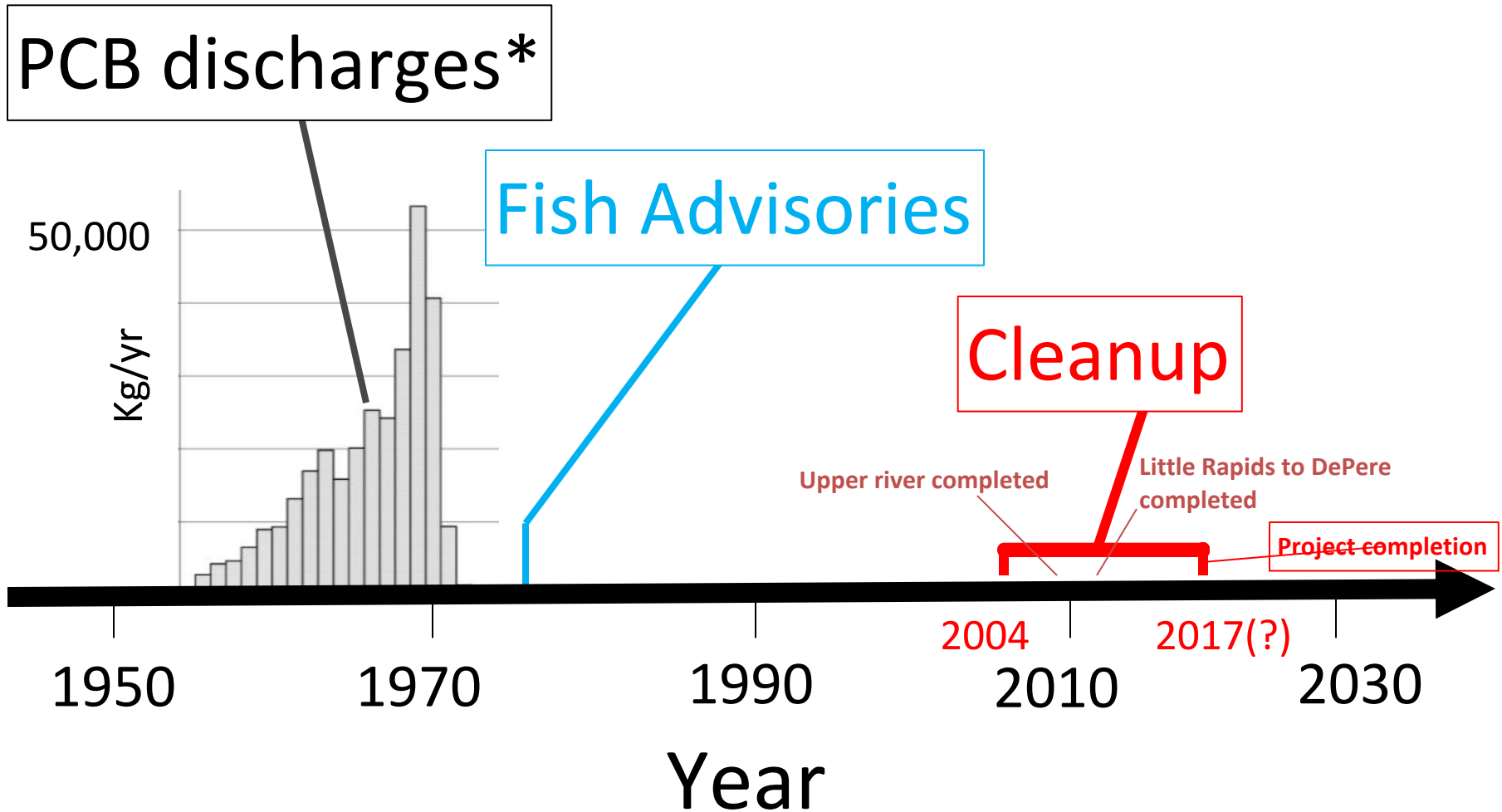


# Superfund timeline



\* Record of Decision (i.e., “ROD”)

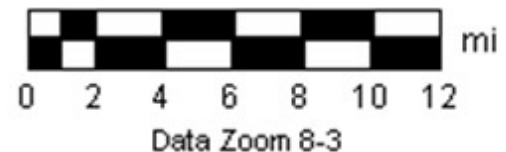
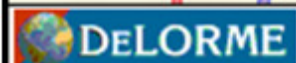
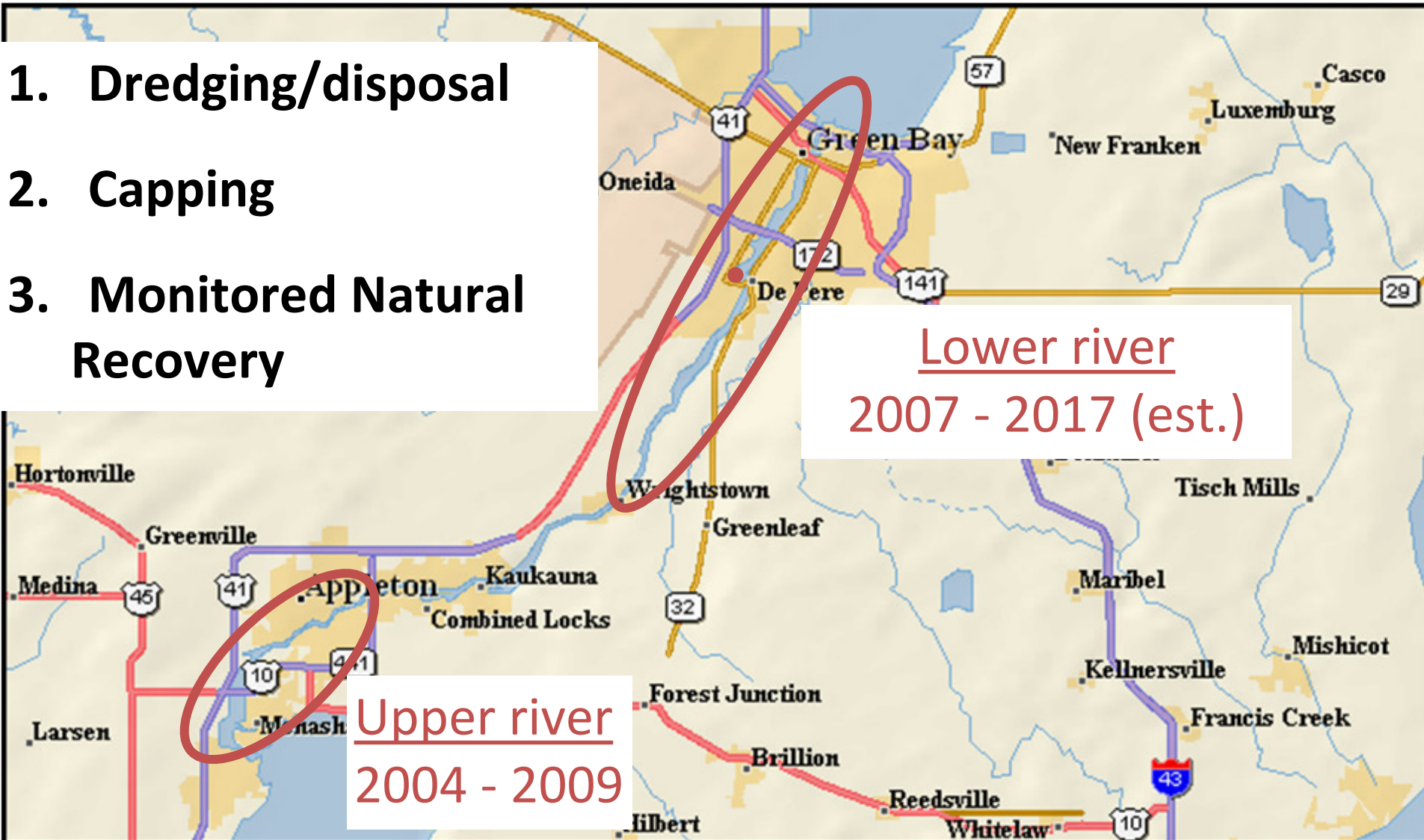
# Site history



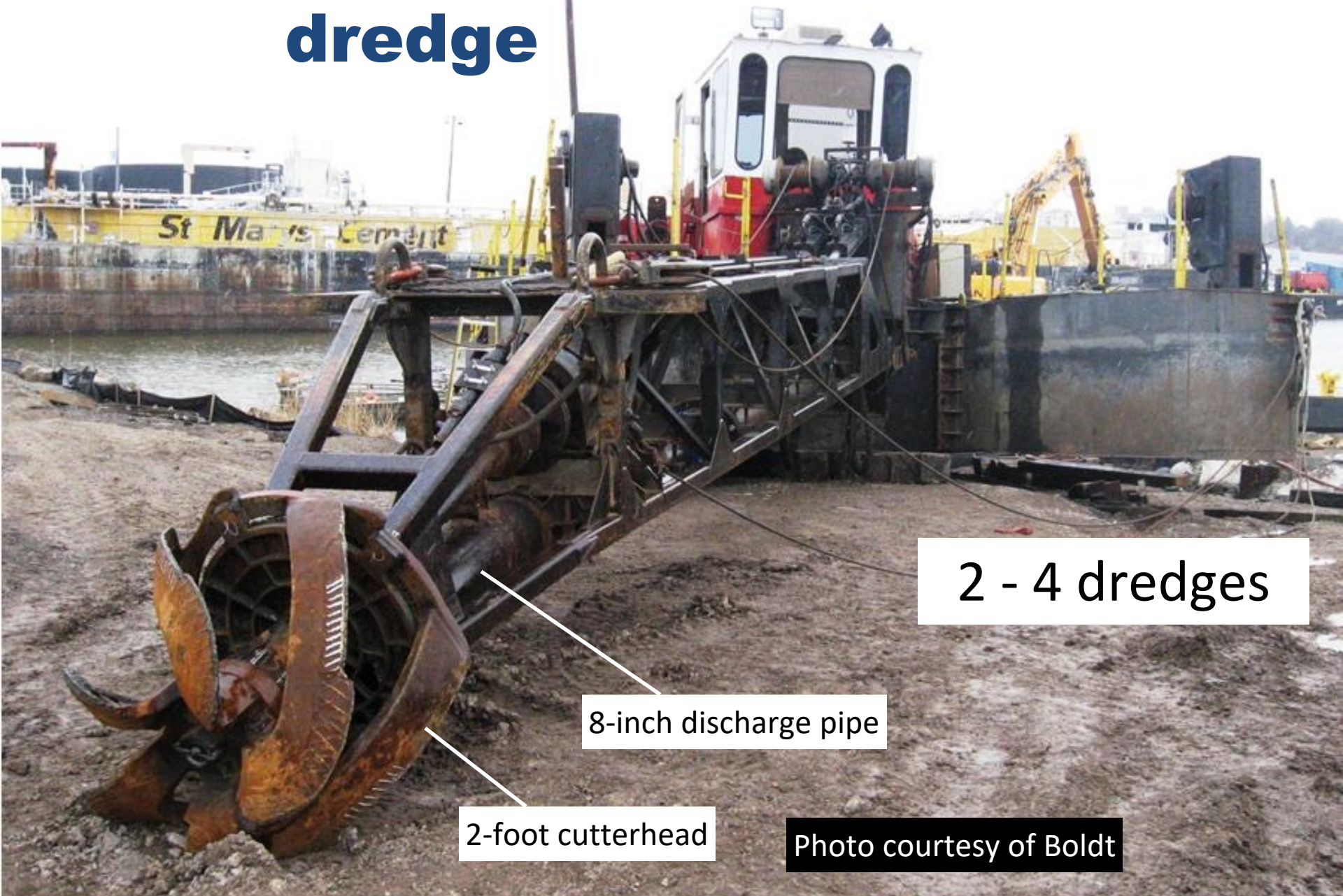
\* From: WDNR, 1999, Technical Memorandum 2d.

# Cleanup

1. Dredging/disposal
2. Capping
3. Monitored Natural Recovery



# Hydraulic cutterhead dredge



2 - 4 dredges

8-inch discharge pipe

2-foot cutterhead

Photo courtesy of Boldt

# Mud/water separation



Courtesy of the Fox River LLC.

# Sediment disposal



Photo courtesy of Boldt

# Caps: sand placed over sediment

1-RA-08-SP-A-4 N-6"-RS

Sand cover  
(6" – 15")

Sediment

Photo courtesy of Boldt oversight team

# Armor stone placement (7" – 18")



Photo courtesy of Boldt oversight team

9/8/2011  
OU3-CA13B-1-1-E12  
7 1/2" Gravel

## **Armor stone**

0.75 inch stone

Photo courtesy of Boldt oversight team



Geotextile tubes Separates  
mud from water

During cleanup

Restoration

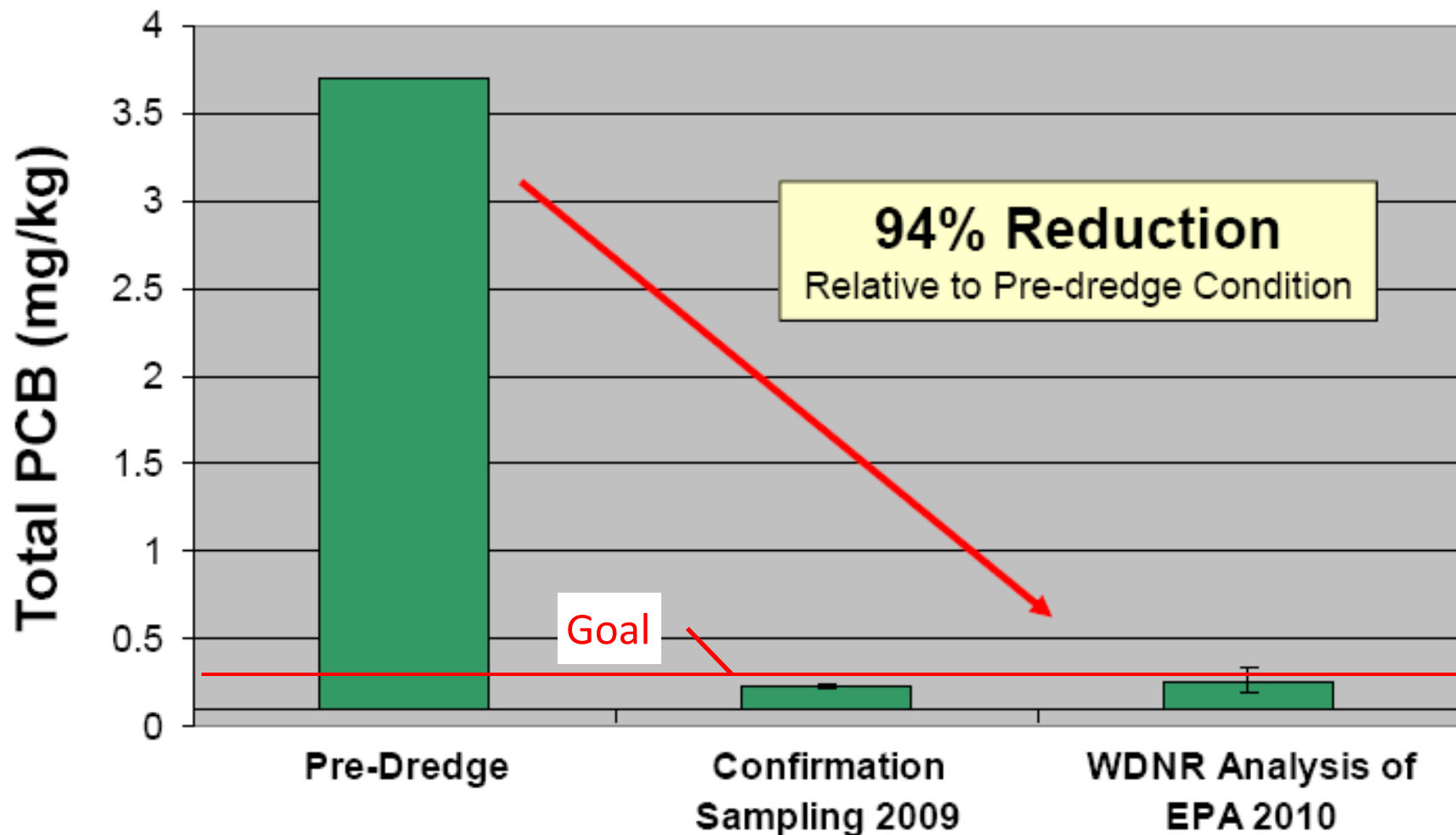


# Environmental results - upper river



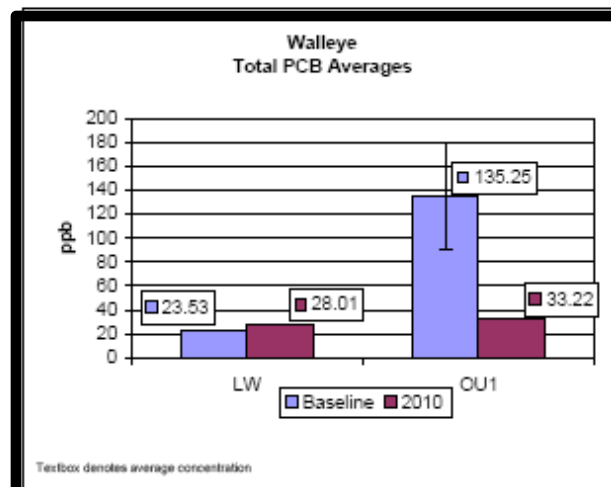
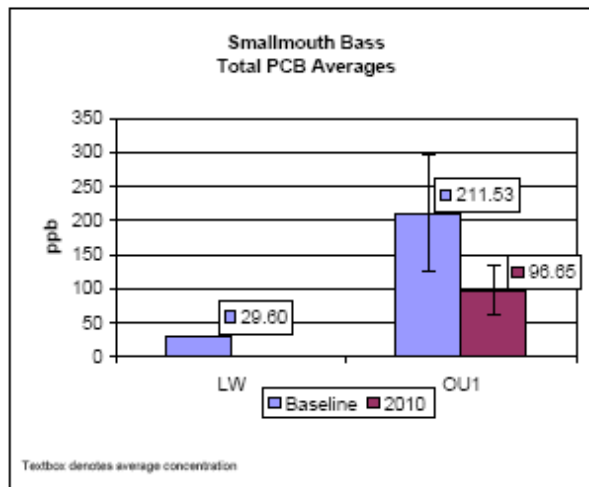
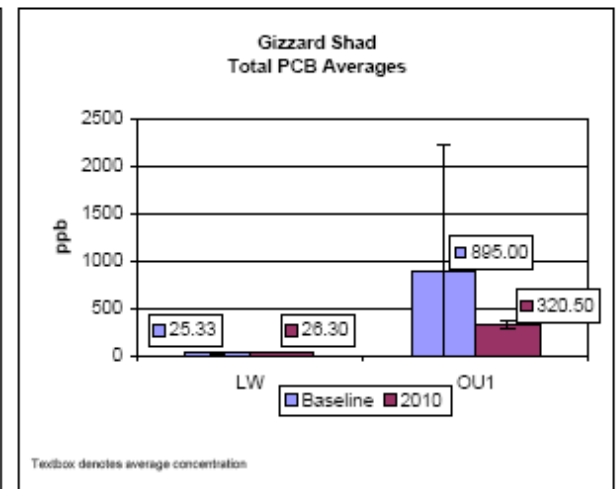
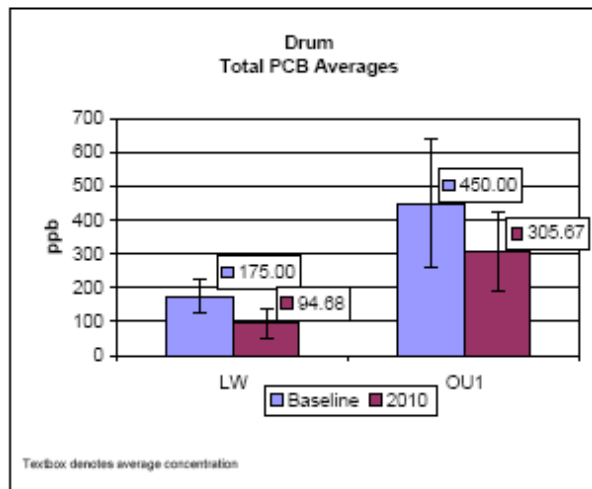
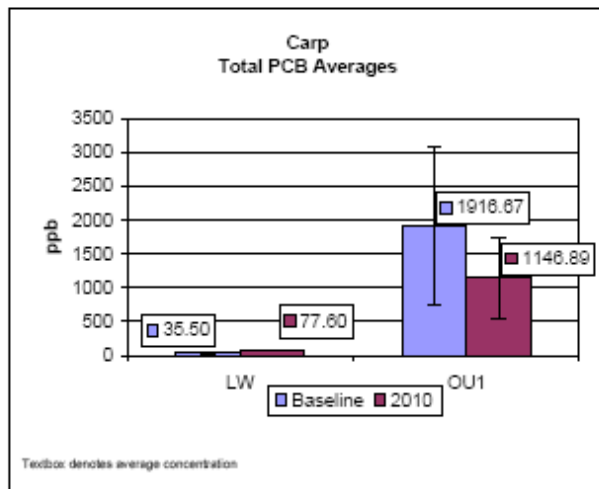
Photo from Ann Schell

# Total PCB Concentration in Surface Sediments Little Lake Buttes Des Morts, WI (Upper river)




From: Boldt oversight team

# PCBs in upper river fish

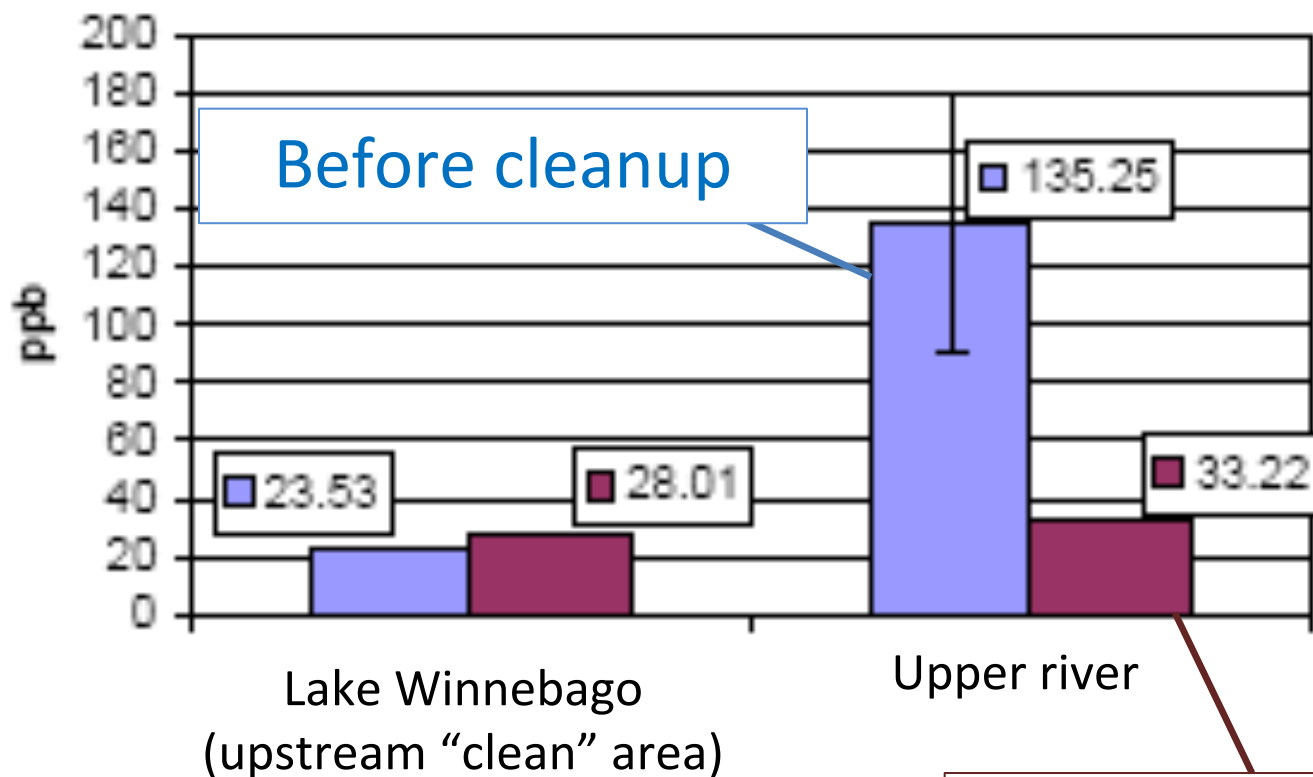


Next  
slide

From: GW Partners and LLC, Preliminary draft, Year Zero  
Summary Report, Lower Fox River OU1, May 2011.

GW Partners		
Figure 4-2		
Fish Average Concentrations and 95% Confidence Intervals		
SCALE: NTS		PROJECT ID: 10g007
Date: 04-18-11		FIG 4-2
PREPARED BY: SGL		
CHECKED BY: JBM		

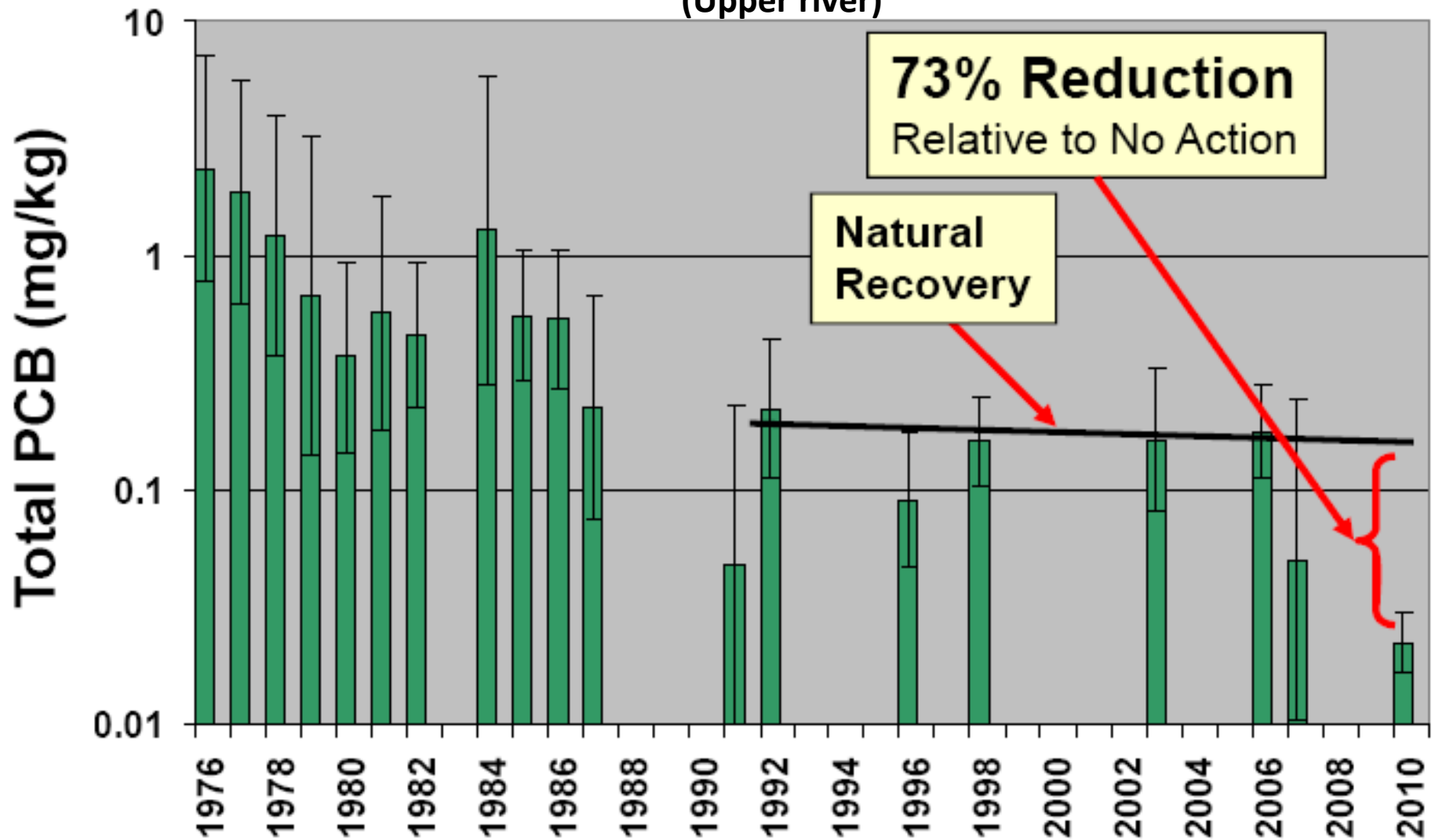
## Walleye PCB concentrations Upper river



After cleanup  
(75% reduction)

# Total PCB Concentration in Walleye Fillets Little Lake Buttes Des Morts, WI \*

(Upper river)



From: Boldt oversight team

# Economics

## PCB removal dredges up work for local companies

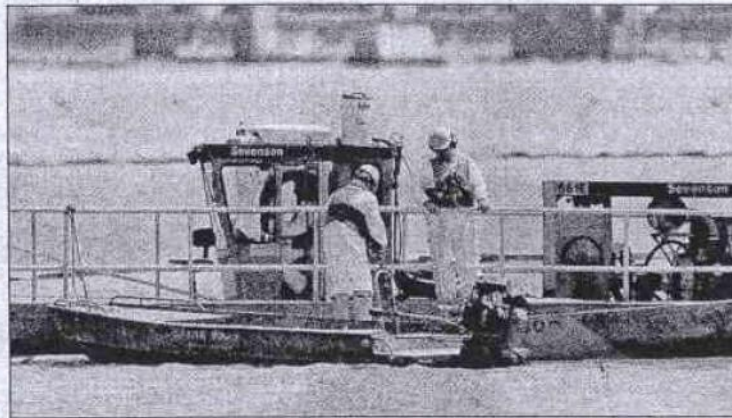
River project has generated state, regional revenue

BY TONY WALTER

twalter@greenbaypressgazette.com

The negative environmental impact of PCBs in the Fox River is providing a positive economic result for many local companies.

The 10-year project that includes removing polychlorinated biphenyl sediment from the Lower Fox, treating it in a process plant under construction, and hauling it to a Calumet County landfill has resulted in \$200 million in contracts to local, regional



Fox River PCB cleanup site workers float on a dredging barge offshore from Fort Howard Avenue in De Pere. **File/Press-Gazette**

and state companies, project officials say.

"We definitely wanted to hire local companies," said Ray Mangrum, project manager for Tetra Tech, the company in charge of the river cleanup project.

"We just bid it out to locals."

Tetra Tech is supervising construction of a 247,800-square-foot processing facility at the river's mouth.

Feb. 2008 Green Bay Press Gazette

### More online

For archived coverage, go to [www.greenbaypressgazette.com/foxrivercleanup](http://www.greenbaypressgazette.com/foxrivercleanup).

cific Corp.'s Broadway plant. Dredging of almost 4 million cubic yards of PCB-contaminated sediment is scheduled to begin in May south of the De Pere dam and eventually cover the river portions north of the dam to the bay.

It will be the largest PCB river remediation project in the world and is estimated to cost about \$600 million, although the paper mills responsible for dumping the PCBs — a waste material from the production of carbonless

countability.

The processing center is the first of its kind, something Mangrum said he designed on a napkin.

"Everybody in the world with a major sediment project will come here to see what's going on," said Stephen McGee, project coordinator for Tetra Tech.

They will see that the majority of the work is being provided by local companies and laborers. Mangrum said there will be about 140 workers on site through the winter and 85 to 100 working at the center when it becomes operational.

"I've worked all over the U.S. and these are the best

► See PCB, A-2

- \$300 million+ for cleanup work contracts
  - 35 - 140 jobs/year since 2004
- (mostly April to November)

# Environmental careers

- Masters degree usually needed (don't doubt yourself)
- Hiring windows (“Timing is everything”\*)
- “Foot in door” (e.g., internships, state, local jobs, etc.)
- **Contacts!**

\* Hesiod, Greek didactic poet (~800 BC):

“Observe due measure, for right timing is in all things the most important factor.”

# Questions/Discussion



Photo courtesy of Boldt oversight team



# ***The Great Lakes Song***

**The Earth Tones' 15th Anniversary Concert**

**Bill Tong, Karen Reshkin, Mary Ann Suero**

**U.S. EPA - Region 5**

**Chicago, IL - April 20, 2011**

**Video by Bill Tong**