That’s Some Fish Story
What the Asian Carp Controversy Can Tell Us about Science, Sustainability, and the Future of the Great Lakes Watershed

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Photo: Milwaukee Journal Sentinel
A Short Story about Asian Carp

- Species
  - Silver Carp
  - Bighead Carp
- History in US
- Biology
- Environmental Impacts

Photo: Great Lakes Fisheries Commission
Bow-hunter on Illinois River being hit by silver carp

Photo: Daily Mail
Current Distribution of Asian Carp in US

Map: NPR
A river reversed, a problem created

The Chicago and Calumet rivers were once tiny waterways that trickled into Lake Michigan. Beginning in 1900 the city dug a series of canals that reversed their flows so they could carry the city's waste into the Mississippi River basin, and away from the lake — the city's drinking water source. A push is now under way to engineer a system to re-establish the natural hydrological divide between Lake Michigan and the Mississippi.

Sources: Great Lakes Fishery Commission
Other Great Lakes Invasive Species

Sea Lamprey
*Petromyzon marinus*

**Origin**: Atlantic ocean  
**Introduced**: 1835 (Lake Ontario)  
**Impacts**: Parasite on fish; devastation of whitefish, lake trout, chub in ‘40s and ‘50s; in all the Great Lakes, esp. Huron  
**Costs**: $13 million / year for control

Zebra Mussel
*Dreissena polymorpha*

**Origin**: Caspian Sea  
**Introduced**: 1988  
**Impacts**: Displacement of native clams and mussels; clogging of water intake pipes; has spread to all GLs, Mississippi River, and inland lakes  
**Costs**: Several hundred million $ / year
How the Debate Is Usually Framed

State vs. State

Environment vs. Industry

Industry vs. Industry

Sustainability
- Environment
- Economy
- Equity
Other Asian Carp Narratives

RE: Science and Sustainability

Fear and loathing
Environmental Apocalypse
National emergency
Denial
Self-interest

Photo: Absolute Michigan
Other Asian Carp Narratives

RE: Science and Sustainability

Conflict
Cooperation
Technology
Scientific uncertainty
Opportunity

Fear and loathing
Environmental Apocalypse
National emergency
Denial
Self-interest

Photo: Absolute Michigan
Uncertainty

Validity of eDNA detection techniques

Other factors:

• Experimental nature of electric barrier
• Potential efficacy of lock closure
• Timing of carp entry into Lake Michigan
• Impact upon Great Lakes ecosystem
Electric fish barrier tested for safety

Although a $9 million electric barrier to protect the Great Lakes from giant Asian carp was constructed in early 2006, the Coast Guard and Army Corps of Engineers are still conducting safety tests for barge operators and haven’t put it into permanent operation. The carp, which could transform the Great Lakes’ fishery and make the lakes far less appealing to boaters, are only a two-day swim from Lake Michigan.

How electric barriers could turn back Asian carp

1. Migrating Asian carp are repelled by an electrical current shot through an array of steel bands lining the canal bottom.
2. The intensity of the electrical field increases as the fish swim toward the center of each array.
3. Two arrays are needed to provide redundancy and to allow for maintenance. The original barrier is also being rebuilt.

Historically, the Chicago River flowed into Lake Michigan. Chicagoans reversed the flow of the river over a century ago to flush their sewage into the Mississippi River basin. The project meant creating an artificial connection between the Mississippi and the Great Lakes, and that has opened the door to biological chaos.

NOTE: Diagram not to scale
Opportunity

• Rare chance to prevent invasive species takeover before it happens
• Asian Carp as profitable commodity for export or local consumption
• Reconsideration of Chicago’s hydrology:
  ─ Wastewater treatment upgrades
  ─ Long-term water supply sustainability
The future: Are barriers the answer to undo damage?

A potential scenario would re-establish the hydrological divide between Lake Michigan and the Mississippi River basin that the Chicago canals destroyed more than 100 years ago.

The red blocks represent general areas where the canals might be plugged. Water to the west of the blocks would flow toward the Mississippi; water to the east would flow to Lake Michigan. This would have big implications for commercial navigation, as well as sewage and floodwater management – issues that will be addressed in a forthcoming federal study.

Sources: Great Lakes Fishery Commission; Journal Sentinel research
Toward a Sustainable Future?

Proposed ecological separation of Great Lakes and Mississippi River watersheds

• Blockage of carp from Lake Michigan
• Return of water to Great Lakes basin
• Improved water quality of Chicago’s wastewater treatment
• Investment in transportation infrastructure
Coda: Some Fish Stories We Tell

Visceral
- Epic battles and encounters
- Fear of attack
- Revulsion

Environmental
- Fisheries depletion
- Animal cruelty
- Invasive species
- Sustainability

Cultural
- Nostalgia for non-industrial fishing
- Fishing as craft and art

Personal
- The big one that got away
- Intergenerational connections
- Zen fishing