

# **IRREVERSIBLE REACTION: ILLINOIS RIVER TO WATERWAY**

15th Biennial Conference on the  
Management of the Illinois River System

Dick Lanyon  
Peoria, Illinois  
October 28, 2015

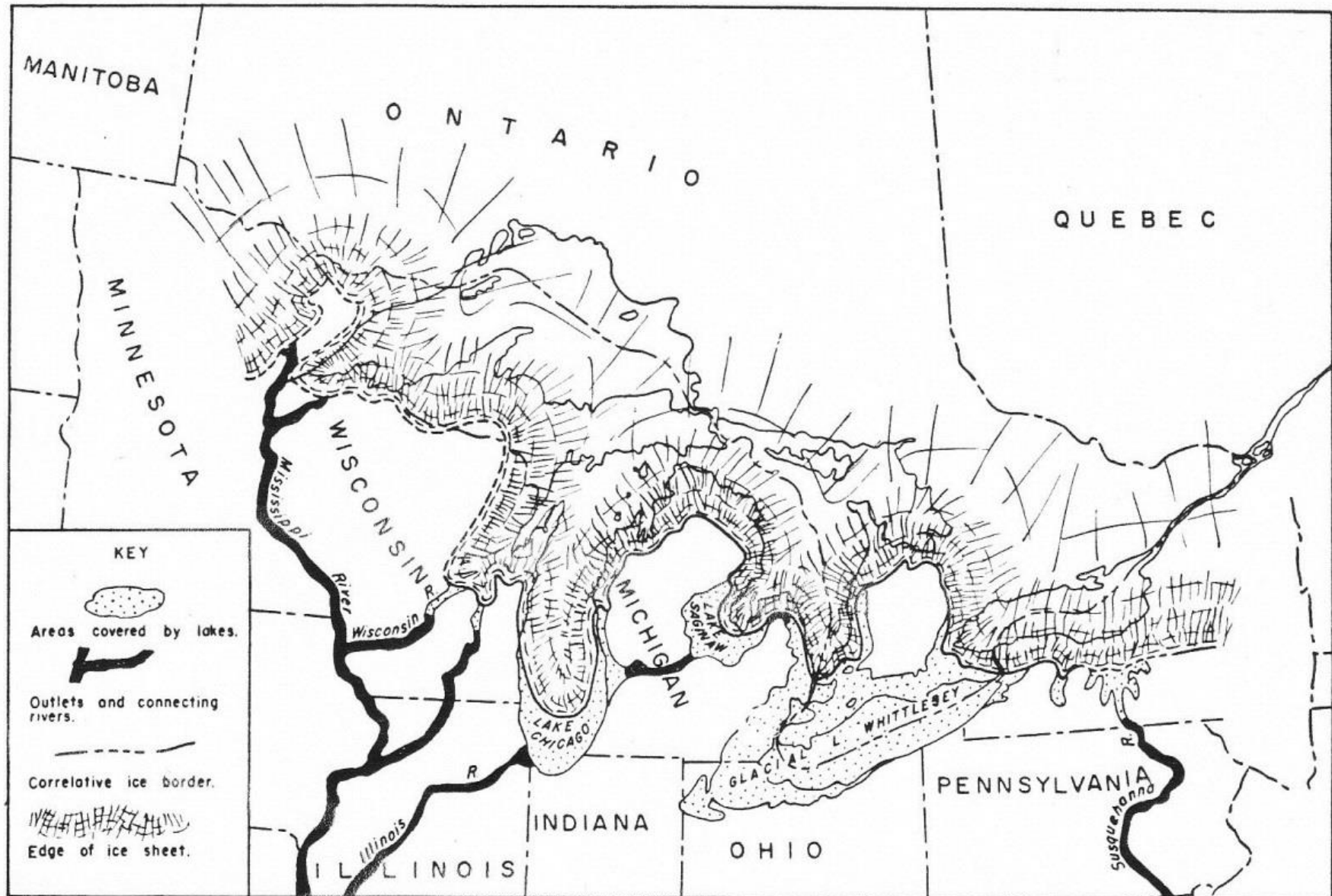
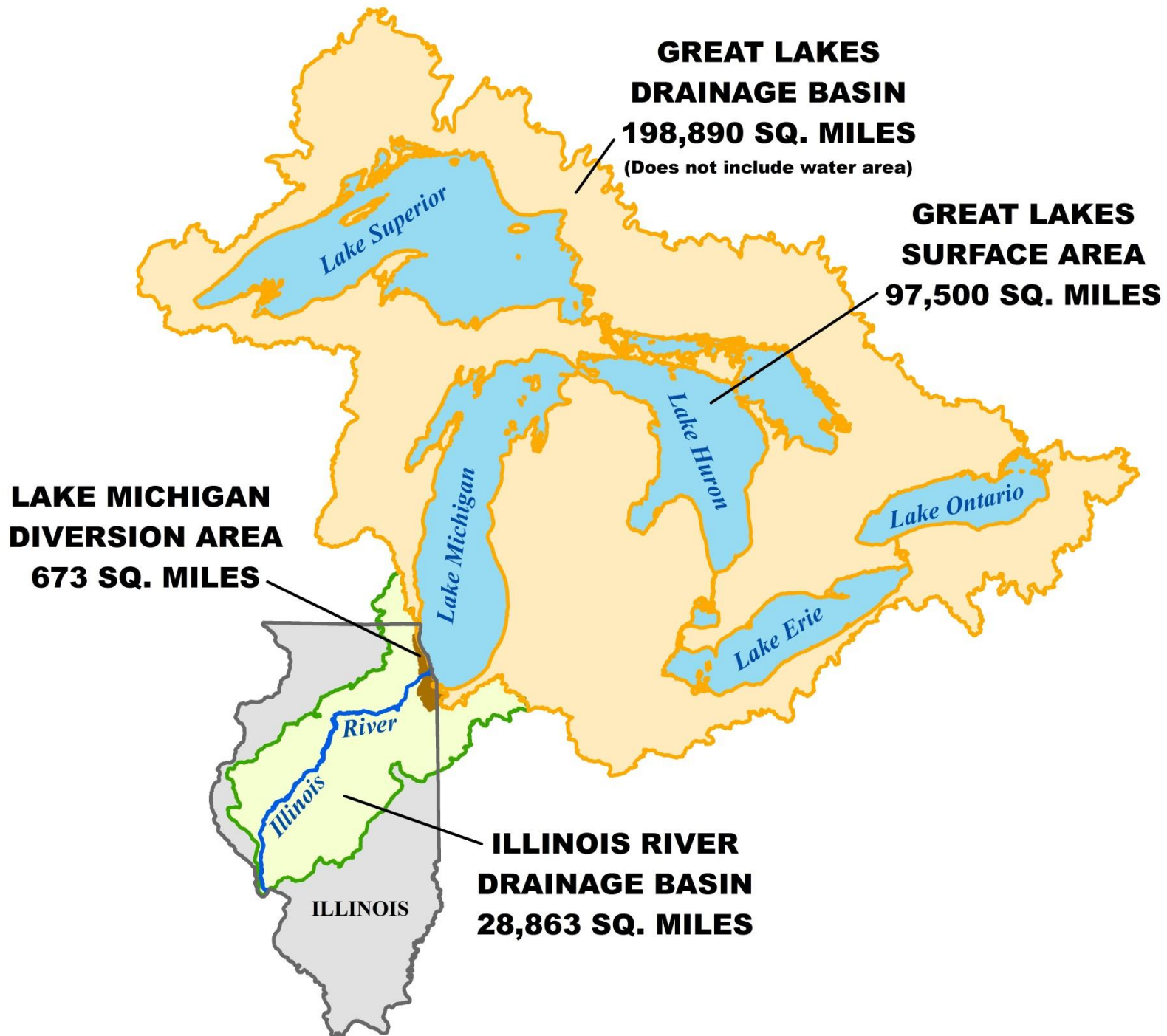
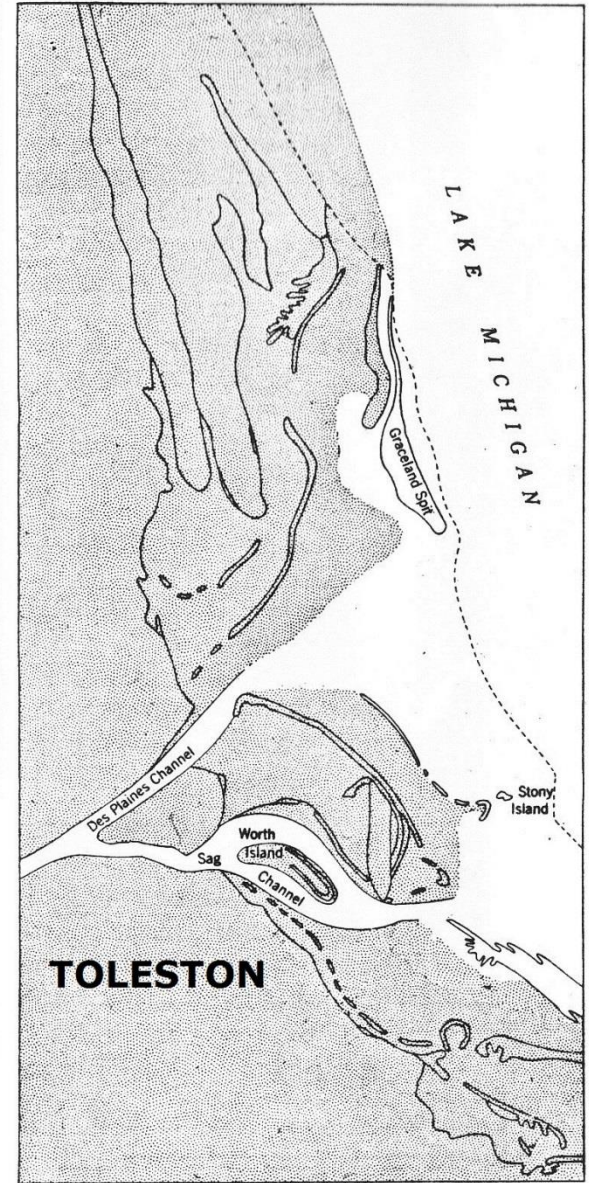
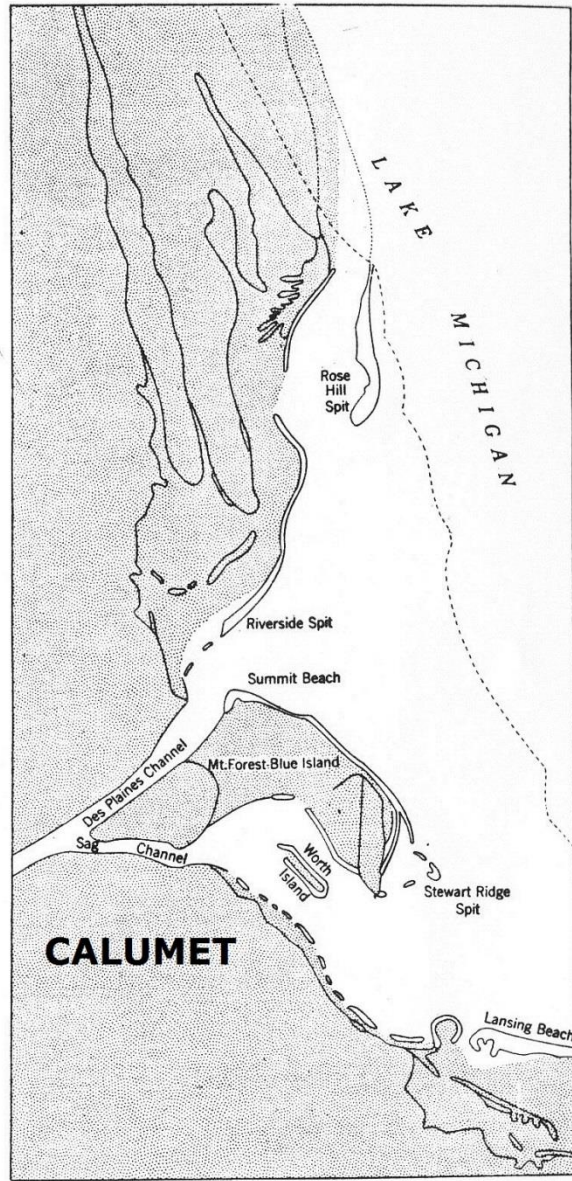
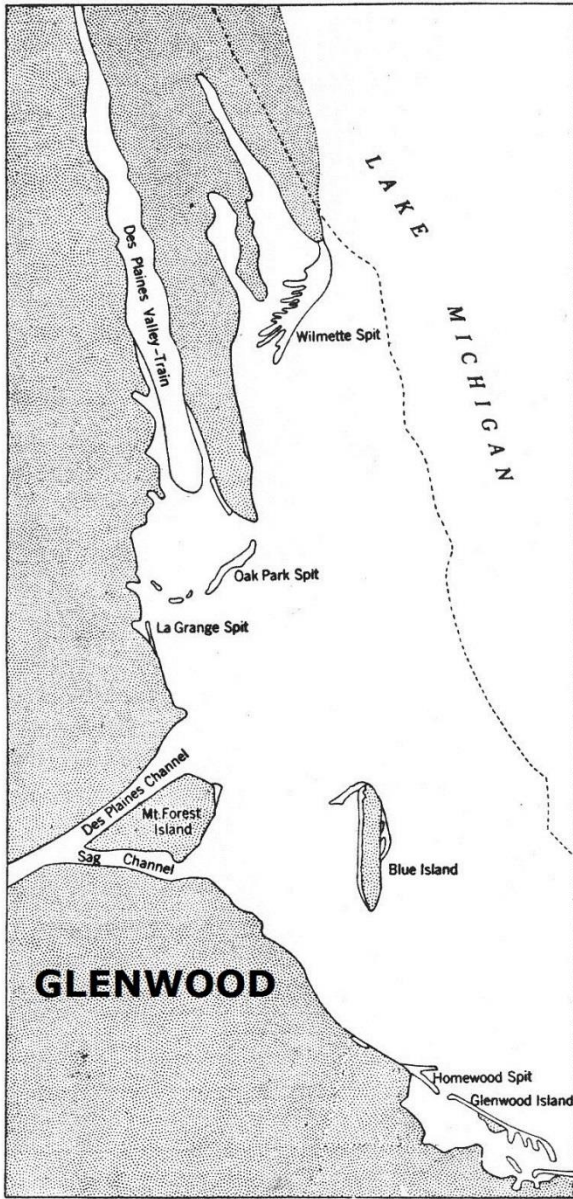


FIG. 49.—Glacial lakes Whittlesey, Saginaw, and Chicago. *After* Leverett, Frank, and Taylor, F. B. *The Pleistocene of Indiana and Michigan and the history of the Great Lakes*: U.S.G.S. Mon. 53, pl. 16, 1915.





**FORMERLY THE OUTLET OF LAKE MICHIGAN**



Turning from the Des Plaines River into Portage Creek  
Jolliet and Marquette envisioned a navigable connection  
between the Mississippi River and Great Lakes



## **LOCKS 3 AND 4 NEAR LOCKPORT, 1905**

**ILLINOIS AND MICHIGAN CANAL, 96-MILES TO NAVIGATE PAST  
THE RAPIDS AT LOCKPORT, JOLIET, DRESDEN HEIGHTS, AND  
MARSEILLES TO REACH THE HEAD OF NAVIGATION  
ON THE ILLINOIS RIVER, 1836 TO 1848**

# EARLY DEVELOPMENTS AND ECOLOGICAL CHANGES

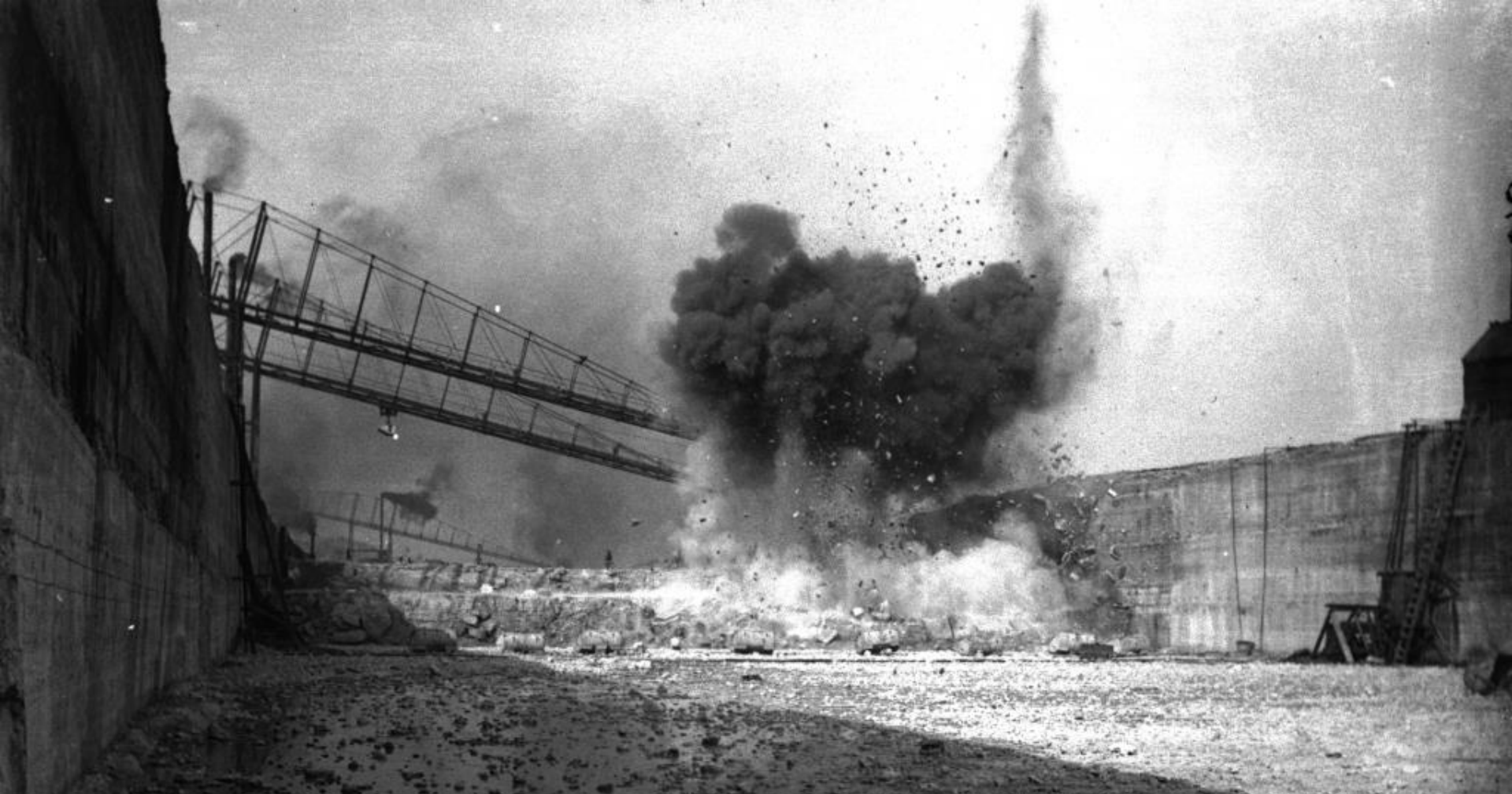
- 1860 Cultivation of floodplain
- 1872 Henry Dam built
- 1877 Copperas Creek Dam built
- 1880s Common carp introduced
- 1889 LaGrange Dam built
- 1893 Kampsville Dam built

# PROMOTING THE DEEP WATERWAY

Numerous avenues were opened to promote the deep waterway between the Great Lakes and Mississippi River. The Illinois River Improvement Convention in Peoria on October 11, 1887, drew over 600 delegates from cities along the waterway and other interested organizations.

Congressional support was lacking as there was no federal policy on water resource development.



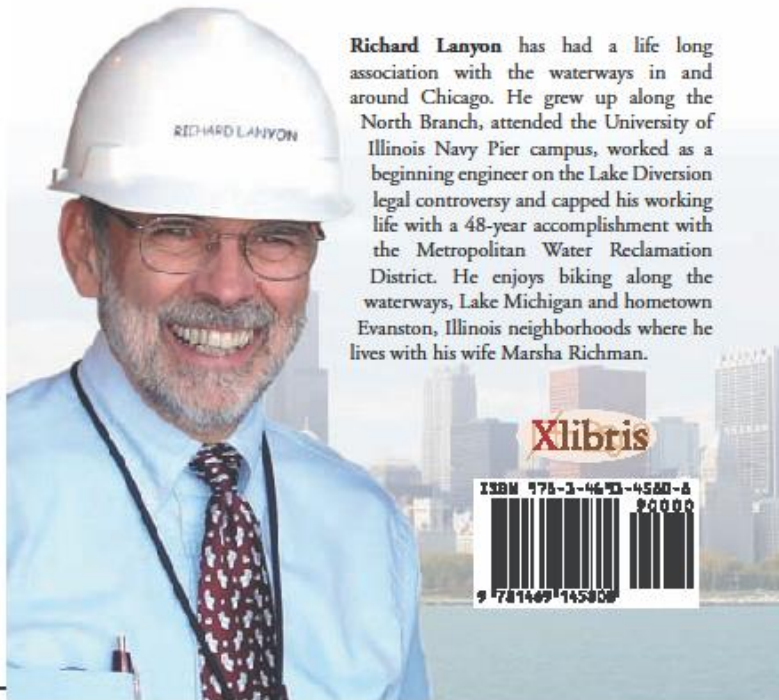


378 Sec. 10 5-22-95. 4:10 P.M. J  
500L<sup>2</sup> Dynamite Blast.

CHICAGO'S SANITARY PROBLEM INTERVENED

RESULTING IN THE FIRST LEG OF THE DEEP WATERWAY  
OPENED IN 1900 AND PAID FOR BY LOCAL TAXPAYERS

To accomplish the reversing of the flow of a river wouldn't be possible today. But to Chicago near the end of the 19th Century it became a matter of survival. It is an unlikely place for a large city, with flat topography, poor drainage, next to a lake and near to a river into the continent. Those conditions in the 1800s appealed to westward expansion pioneers who traveled by water. A city was born, the railroads replaced water transport, population surged, and the lake was both water supply and toilet. The river became overwhelmed with the commerce of a port city and with sewage. It stank at times. Flooding from the interior tore through the city to get to the lake. What to do? Without sewage treatment it was decided to breach a sub continental divide, send the sewage away and save the lake. It received legislative blessing with the promise of a navigable canal. Chicago's own shoulder-to-the-wheel determination made it work. The river was transformed into a canal flowing the other way.



**Richard Lanyon** has had a life long association with the waterways in and around Chicago. He grew up along the North Branch, attended the University of Illinois Navy Pier campus, worked as a beginning engineer on the Lake Diversion legal controversy and capped his working life with a 48-year accomplishment with the Metropolitan Water Reclamation District. He enjoys biking along the waterways, Lake Michigan and hometown Evanston, Illinois neighborhoods where he lives with his wife Marsha Richman.

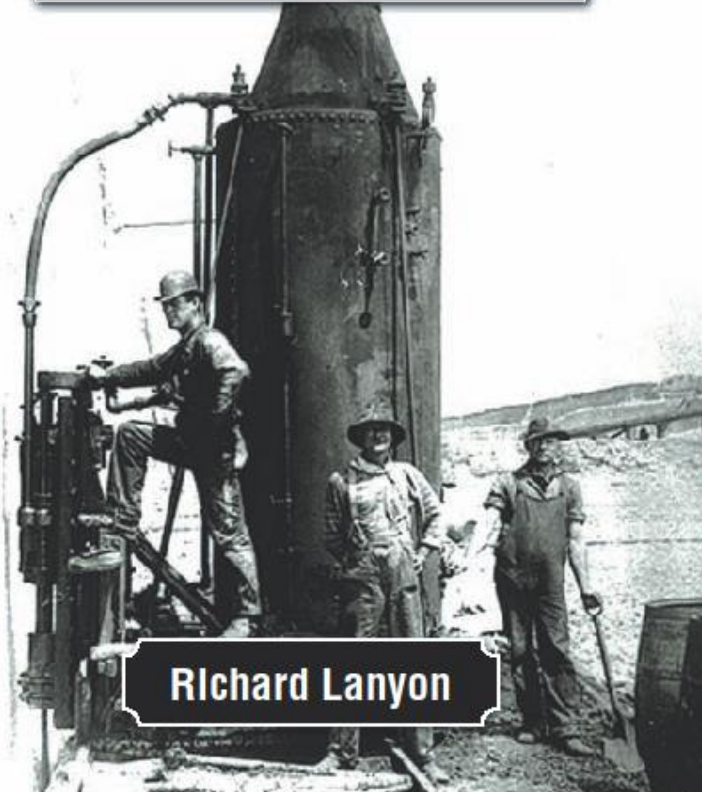
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BUILDING THE CANAL TO SAVE CHICAGO

LANYON

# Building The Canal To Save CHICAGO



**Richard Lanyon**

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Building the Canal to Save Chicago

<http://buildcanalsavechicago.org>

# FEDERAL AUTHORIZATIONS

The 1899 Rivers and Harbors Act authorizes the Corps to manage navigable rivers, thus requiring the Sanitary District of Chicago to obtain permits for work on canals and rivers.

In 1907, Congress authorizes the Corps to manage the Illinois River for navigation from LaSalle to Grafton.

POWERHOUSE

OVERFLOW  
DAM

LOCK



9845-12-28-1907

SANITARY & SHIP CANAL EXTENSION DEVELOPED  
WATER POWER AND THE HIGH LIFT LOCK, 1907



3857-1-3-1908

Economy Power and Light attempted to build a dam near the mouth of the DuPage River in 1908, but was stopped by litigation and a flood



CALUMET-SAG CHANNEL CONSTRUCTED 1911 TO 1922  
SIZE IS LIMITED DUE TO LAKE DIVERSION LITIGATION  
REVERSED THE CALUMET RIVER FLOW

# ILLINOIS RIVER ACTIONS/IMPACTS

- |       |  |
|-------|--|
| 1911  | Fish kill Morris to Meredosia                |
| 1918  | High water kills mature timber               |
| 1920  | Pollution degradation documented             |
| 1921  | Thompson Lake drained for farming            |
| 1920s | Three major floods                           |
| 1920  | Chicago begins sewage treatment construction |
| 1923  | Fish kill upper river to Chillicothe         |
| 1930  | 41 drainage & levee districts to date        |

# ILLINOIS PROJECT FOR ILLINOIS WATERWAY

By referendum in 1908, voters authorized the state to build five structures, Lockport, Brandon Road, Dresden Island, Marseilles and Starved Rock. Corps approval was granted in 1920 and construction began in 1921.

Illinois runs out of money in 1930 without completing the work.



# FEDERAL PROJECT FOR ILLINOIS WATERWAY

Due to the U.S. Supreme Court Decree reducing lake diversion in 1930 Congress authorizes the Corps to take over the state project and the work is completed in 1933.


For the same reason Congress authorized construction of the La Grange and Peoria Lock & Dams and these were constructed 1936 to 1939.

# CALUMET-SAG CHANNEL FEDERAL IMPROVEMENT I

Navigation interests persuade Congress in 1935 to authorize the Corps to build three wide passing places in the narrow channel allowing barges easier access to the Calumet industrial area in Illinois and Indiana.

Construction is completed in 1939.

# CALUMET-SAG CHANNEL IMPROVEMENT II

A large red barge is shown on a wide river channel. The barge is long and narrow, with a flat deck and high sides. It is moving towards the viewer, leaving a wake in the water. The riverbanks are lined with bare trees and some snow, suggesting a winter or early spring setting. The sky is clear and blue.

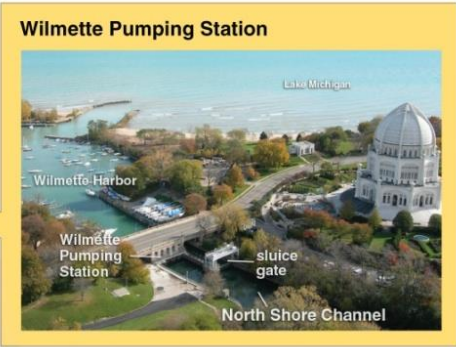
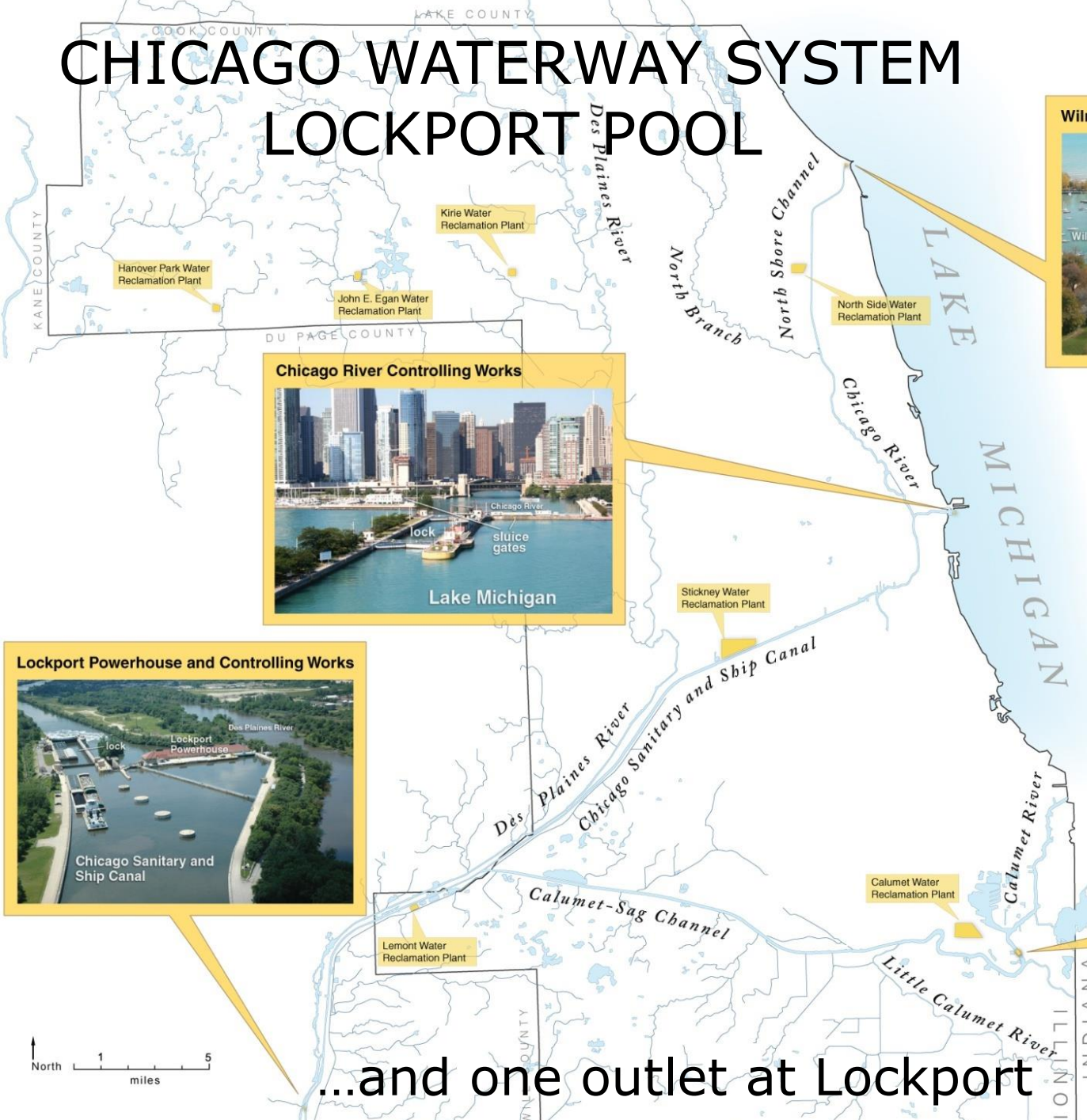
1946 Congress authorizes the Corps to widen the channel, build new bridges, build a new lock at 130<sup>th</sup> Street and improve the intervening Little Calumet River.

Construction begins in the 1950s and is completed by 1965.

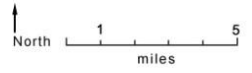
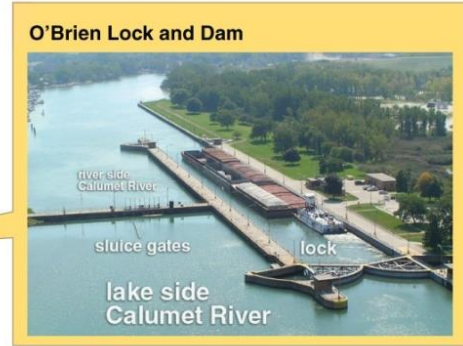
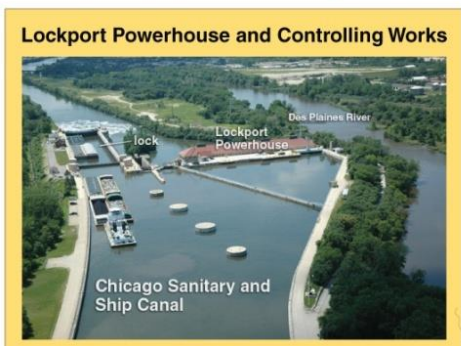
# ILLINOIS RIVER ACTIONS/IMPACTS

- 1931 Peoria begins sewage treatment
- 1933 Lock & Dam construction completed
- 1972 CWA funded treatment upgrades
- 1990s River recovery documented
- 1991 Zebra mussel appears from upstream
- 1994 Bighead carp appears from downstream
- 2000 Emiquon/Thompson Lake restoration

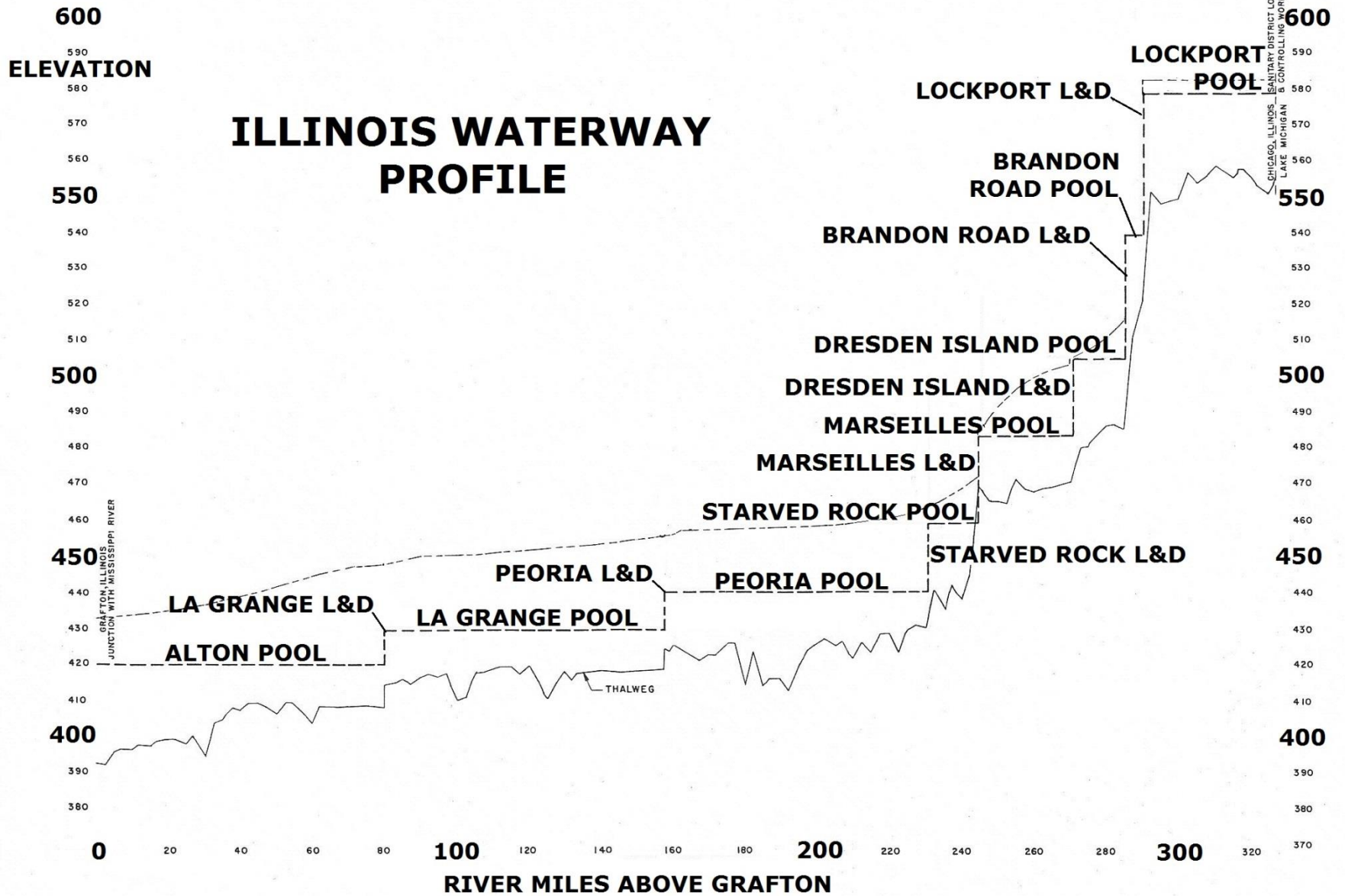
# CHICAGO WATERWAY SYSTEM LOCKPORT POOL



77-mile network of canals with three inlets on lakefront...



...and one outlet at Lockport



THREE DISTINCT REACHES

# PRINCIPAL WATERWAYS OF THE UNITED STATES



U. S. ARMY ENGINEER DISTRICT, CHICAGO, 219 SOUTH DEARBORN STREET, CHICAGO, ILLINOIS 60604

Illinois Waterway – An Important Link

# HISTORICAL PERSPECTIVE

- Jolliet & Marquette vision to I&M Canal: 1673 to 1848 = 175 years
- I&M Canal to Illinois Waterway: 1848 to 1933 = 85 years
- Illinois Waterway to the Present: 1933 to 2015 = 82 years
- Federal Water Act of 1965 requires state goals and standards: 1965 to 2015 = 50 years
- Illinois River Concern and Conferences: 1985 to 2015 = 30 years
- The path forward is long and tortuous





# ILLINOIS RIVER

This may be what you want,...

# ILLINOIS WATERWAY



...but this is what we have

# The Hydrologic Cycle



Preserving and protecting the hydrologic cycle was not mandated



Fishable, swimmable, but not drinkable

# THE WATERWAY IS A PRODUCT OF THE WATERSHED

- Prairie ecology was replaced by rural and urban cultural development over the last 200 years
- Urban development paves over the watershed disrupting the hydrologic cycle
- Rural development drains and tills the watershed disrupting the hydrologic cycle
- Both rural and urban development add chemicals that harm the environment
- Clean Water Act goal "...to restore and maintain the chemical, physical and biological, integrity of the Nation's waters..." NOT SO EASY TO ACHIEVE

# URBAN PAVEMENT



# THE WATERWAY IS A PRODUCT OF THE WATERSHED

## Urban deliverables and actions

- 6 Standard Metropolitan Statistical Areas include 14 counties
- MWRD Chicago seven plants in aggregate are the largest point source in the Mississippi River Basin
- Point sources and urban stormwater are regulated under the CWA and NPDES permits
- USEPA water quality criteria and state standards regulate what is discharged to the environment
- Strong advocacy to meet the CWA goal

An aerial photograph of a rural landscape. The foreground features a white, two-story house with a dark roof and a blue shed, surrounded by green grass and trees. The middle ground is dominated by a large, irregularly shaped green field. The background consists of a patchwork of golden-brown and green fields, separated by thin lines of trees or roads. The overall scene is a typical rural agricultural setting.

# RURAL PAVEMENT

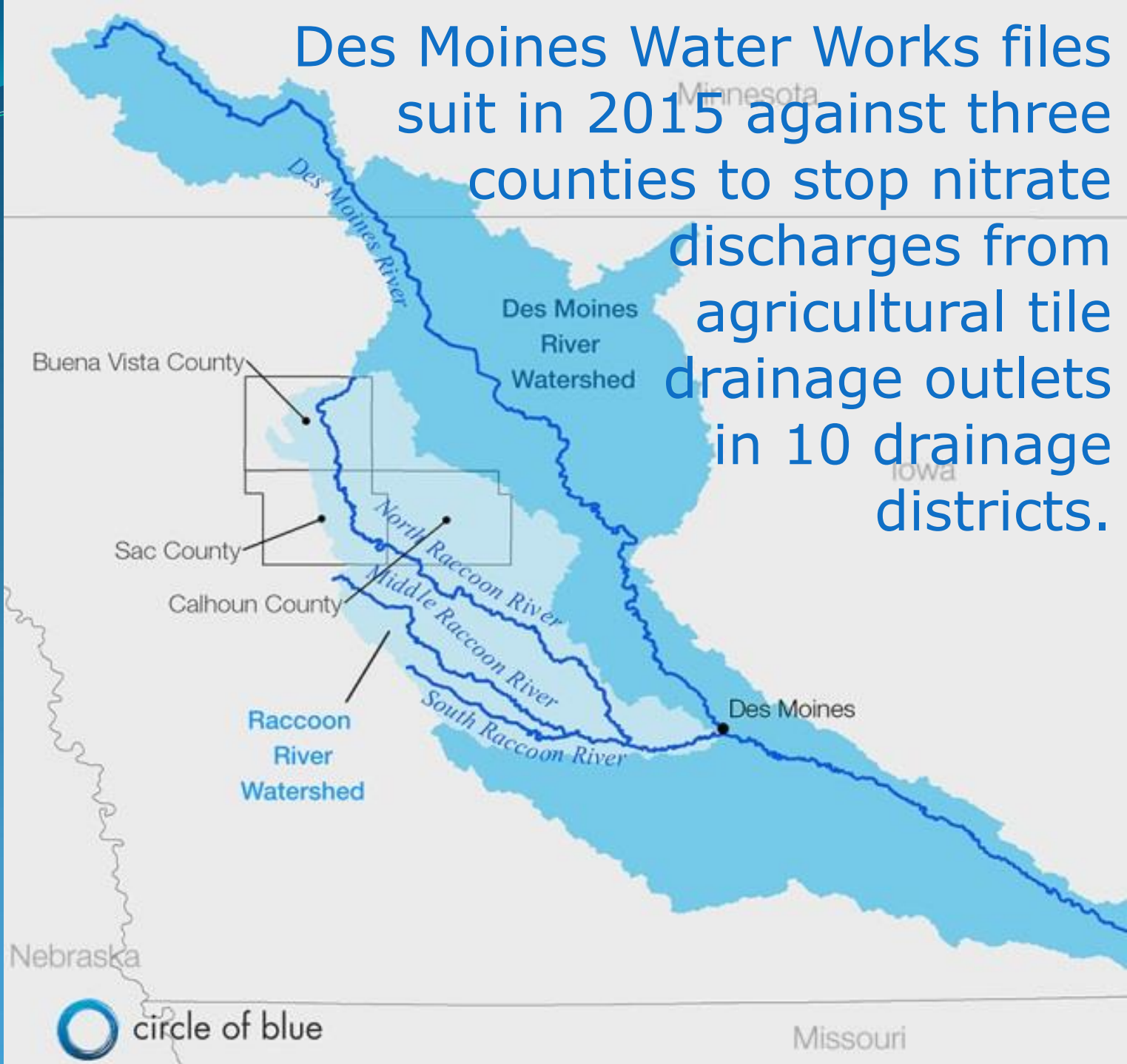


# THE WATERWAY IS A PRODUCT OF THE WATERSHED

## Rural deliverables and actions

- About 14 million acres of cropland
- Tiles and ditches drain the land
- Chemical application for crop control/production
- Agricultural/rural drainage is not regulated under the CWA
- Incentives and voluntary efforts are promoted
- Successes are few and far between
- Little advocacy to meet CWA goals

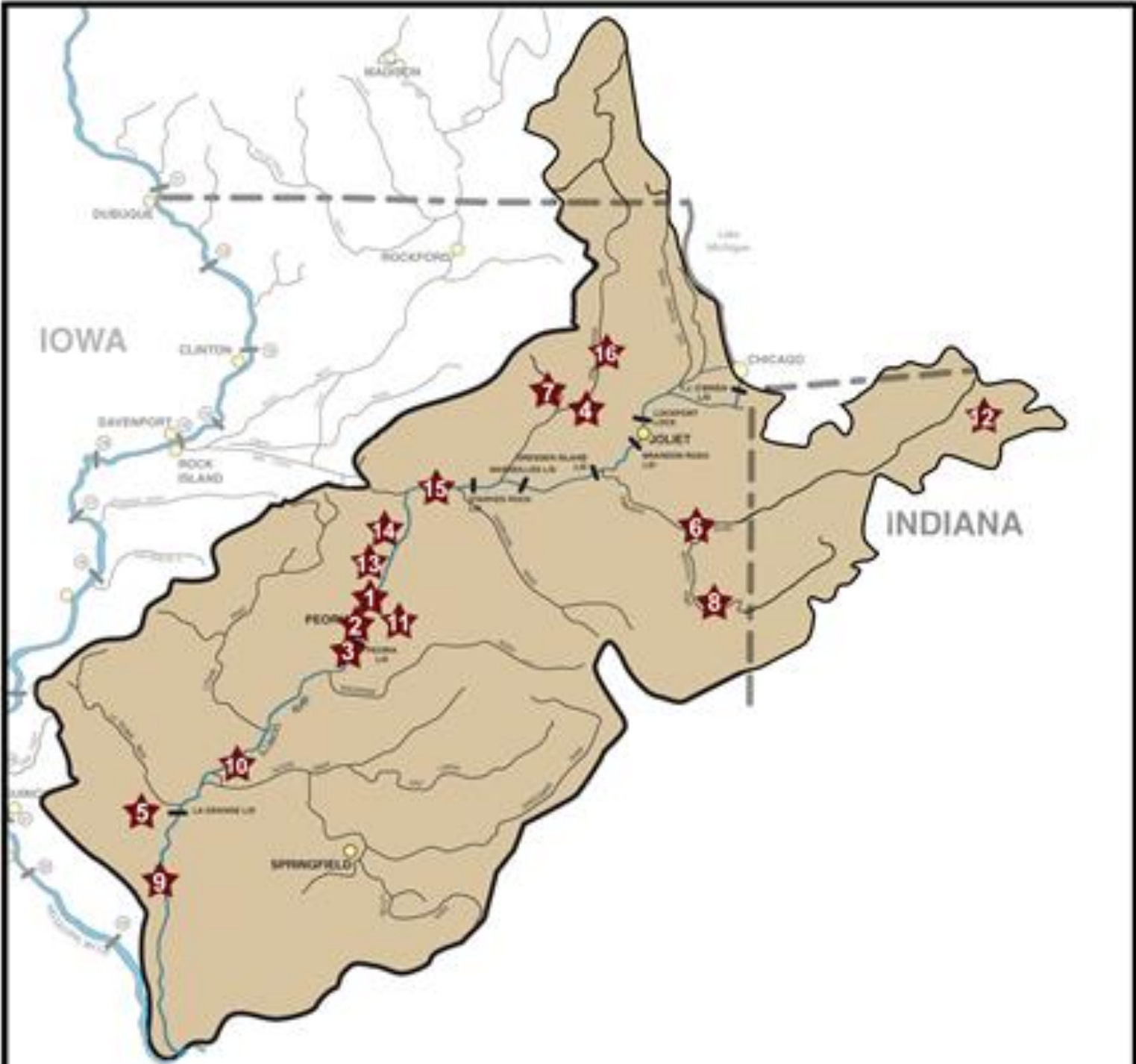
Des Moines Water Works files suit in 2015 against three counties to stop nitrate discharges from agricultural tile drainage outlets in 10 drainage districts.





# FLOODPLAIN/FLOODING

- About 400,000 acres Hennepin to Grafton
- About 200,000 acres within 34 drainage & levee districts (1)
- 200,000 acres is about 0.5% of Illinois cropland
- 3 million acre-feet of flood storage in all districts (1)
- 1.5 million acre-feet in 10 districts with 200 population between Lewiston and Hardin (1)
- Compensate landowners for breaching the levee when flood storage is needed ala May 2011 Birds Point-New Madrid floodway



# FLOODPLAIN/ECOLOGICAL RESTORATION

- “The Illinois River Basin has experienced the loss of ecological integrity due to sedimentation of backwaters and side channels, degradation of tributary streams, increased water level fluctuations, reduction of floodplain and tributary connectivity, and other adverse impacts caused by human activities. ” (from ACOE/IDNR Illinois River Basin Restoration Plan, 2007)
- HEAL THE WATERSHED OF ADVERSE HUMAN CAUSED IMPACTS FIRST, THEN RESTORE THE WATERWAY



Collecting  
lots of data  
to feed  
the quest for  
clean water,  
but will we  
ever find it?

# ILLINOIS WATERWAY WATER QUALITY

- Gulf hypoxia issue ongoing
- State nutrient strategy ongoing
- Kicking the can down the road by talk, talk, talk
- IT IS A WATERWAY, NOT A RIVER
- 40 CFR 131.11(g) six conditions to remove a designated use:
  - 3. Human caused conditions or sources of pollution...(unregulated agricultural drainage, etc.)
  - 4. Dams, diversions or other types of hydrologic modifications...(channels, dams, levees, locks)



# POSTER AQUATIC NUISANCE SPECIES FOR THE CHICAGO AREA WATERWAYS



Silver carp



Bighead carp

# ILLINOIS WATERWAY INVASIVE SPECIES & ASIAN CARP

- Common carp introduced 130 years ago
- Zebra mussel appeared in 1991 from Great Lakes
- Bighead carp appears in 1994 from Mississippi River
- Congress authorizes demonstration barrier in 1996
- First barrier operational in 2002
- Airborne Asian carp hit the news in 2009 with reports that the leading edge is heading for Lake Michigan (leading edge riding motorcycles?)
- eDNA at first thought reliable was proved otherwise by 2011

1890 The Great Northern Railway  
The Great Northern Railway  
The Great Northern Railway  
The Great Northern Railway



1890 The bridge which illustrates the history of the Great Northern Railway. The bridge was built over the Great Northern  
of the West in 1890. The bridge was built in 1890. The bridge was built in 1890. The bridge was built in 1890.  
The bridge was built in 1890. The bridge was built in 1890. The bridge was built in 1890. The bridge was built in 1890.

# ASIAN CARP & GREAT LAKES

- Asian carp found in Lake Erie have not established a sustainable population
- Despite many positive eDNA results, no Asian carp found upstream of the Brandon Road L&D, 40 river miles from Lake Michigan
- Chicago canals lack habitat and food
- Asian carp can taste the water from Chicago and know better than to go there
- Proposed barriers in canals would require re-plumbing the Chicago area, not justifiable
- Lake States continue to lose in court



We should  
have had  
Asian carp  
for lunch!

**Schafer Smoked Carp Chunk**

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*Thank You*