



Moving toward Floodplain Restoration at Scale on the Illinois River and Upper Mississippi Basin: Valuing Ecosystem Services, Demonstrating Flood Reduction, and Policy Implications

Webinar for the Natural Floodplain Function Alliance

18 November 2013

Presenters:

K. Douglas Blodgett,
Director of River Conservation,
The Nature Conservancy in Illinois

Charles E. Theiling
Large River Ecologist
US Army Corps of Engineers
Rock Island District

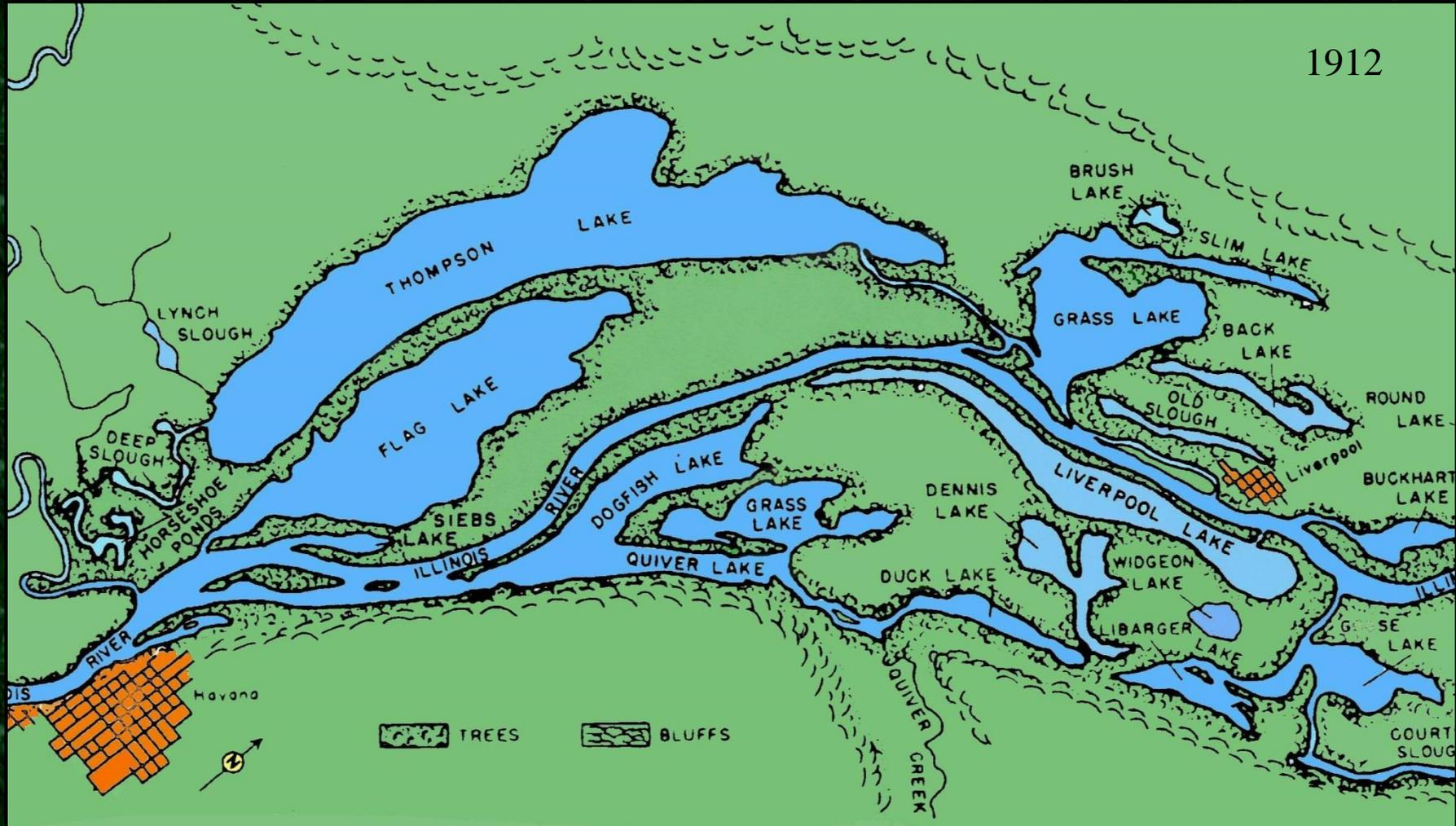


Two floodplain restoration sites of The Nature Conservancy during the Illinois River Flood of 2013

Part of a webinar for the
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by
K. Douglas Blodgett
Director of River Conservation
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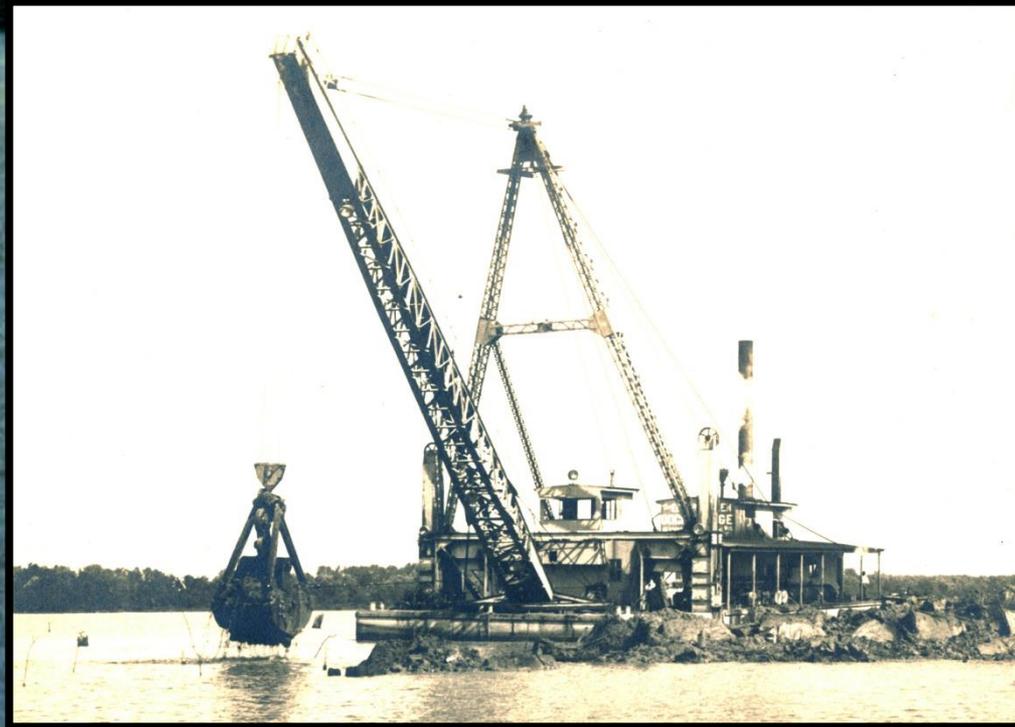


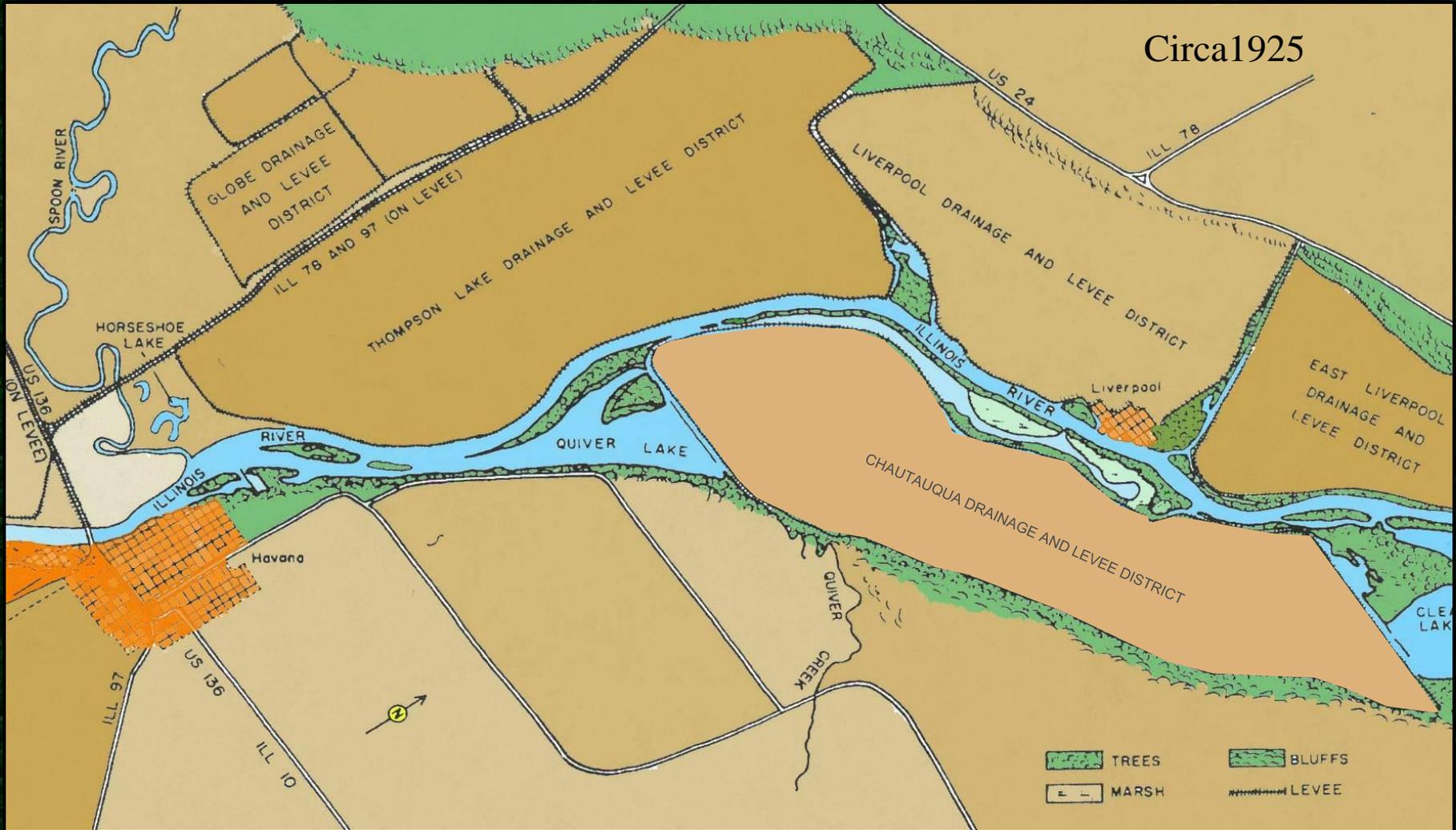
Adapted from a figure by the Illinois Natural History Survey





HAVANA — The three dredges that are working on Thompson Lake are throwing up a new levee in ‘Dan Hole’s Field’....



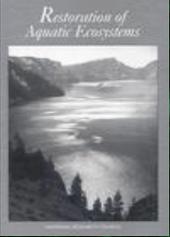


Adapted from a figure by the Illinois Natural History Survey



Some benefits of functional floodplain wetlands ...

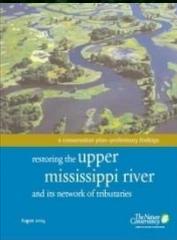
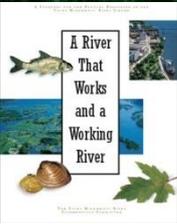
- Provide habitat for native plants and animals (aquatic and terrestrial, resident and migratory)
- Contribute to a more natural hydrology by storing storm water (moderates unnatural water level fluctuations, reduces flooding and associated damages, and provides base flow)
- Facilitate infiltration and groundwater recharge
- Store and process nutrients (e.g., nitrogen, phosphorous) and sediments
- Improve water quality
- Sequester carbon (helps reduce global climate change)
- Provide opportunities for recreation, education, and economic development



Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy. National Research Council, National Academic Press. Washington, D.C. 1992. 662 pp.



Illinois River Site Conservation Plan. The Nature Conservancy. 1998.



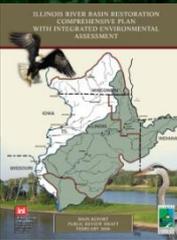
Restoration of functional floodplain is essential for restoring ecosystem health

Upper
re

Nature



Impact Statement for the UMR-IVVV Navigation Feasibility Study. US Army Corps of Engineers. 2004. 606 pp.



Illinois River Basin Restoration Comprehensive Plan with Integrated Environmental Assessment. Main Report, Public Review Draft. US Army Corps of Engineers. February 2006. 452 pp.



Emiquon Spunky Bottoms





Illinois River

Chautauqua National Wildlife Refuge

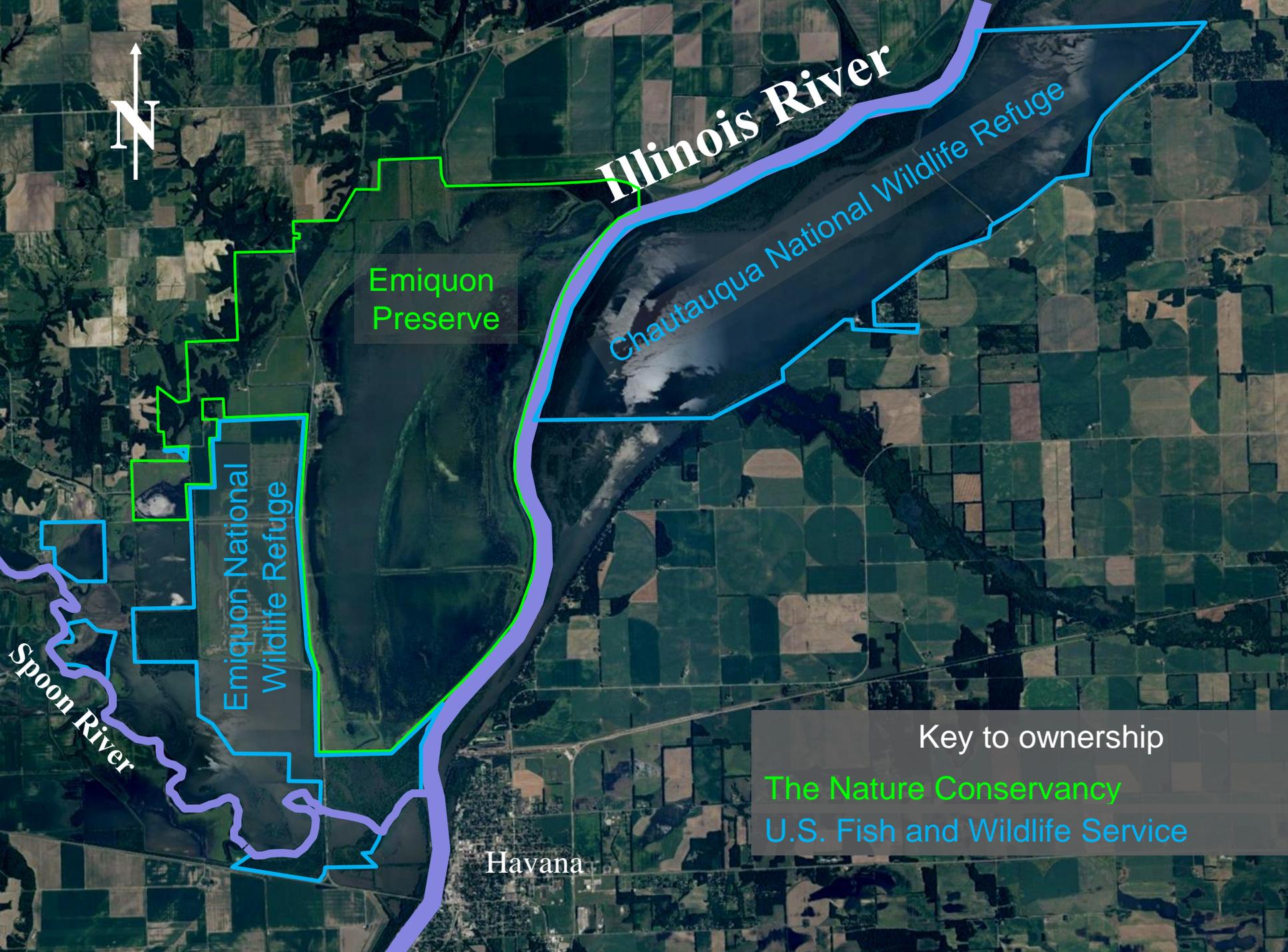
Emiquon Preserve

Emiquon National Wildlife Refuge

Spoon River

Havana

Key to ownership
The Nature Conservancy
U.S. Fish and Wildlife Service





More than 250 bird species observed to date
with many relatively rare species ...



including >90% of the wetland-associated T&E bird species



Public boating/fishing, waterfowl hunting, and education programs



A good morning in the marsh





CONSERVATION

Wetlands internationally important

Emiquon, Dixon among only 34 sites nationwide given designation



CONVENTION ON WETLANDS

CONVENTION SUR LES ZONES HUMIDES

CONVENCIÓN SOBRE LOS HUMEDALES

(Ramsar, Iran, 1971)



The Sue and Wes Dixon Waterfowl Refuge at Hennepin and Hopper Lakes in Putnam County



Yellow-headed blackbird

Photograph by L. B. Tomberlin



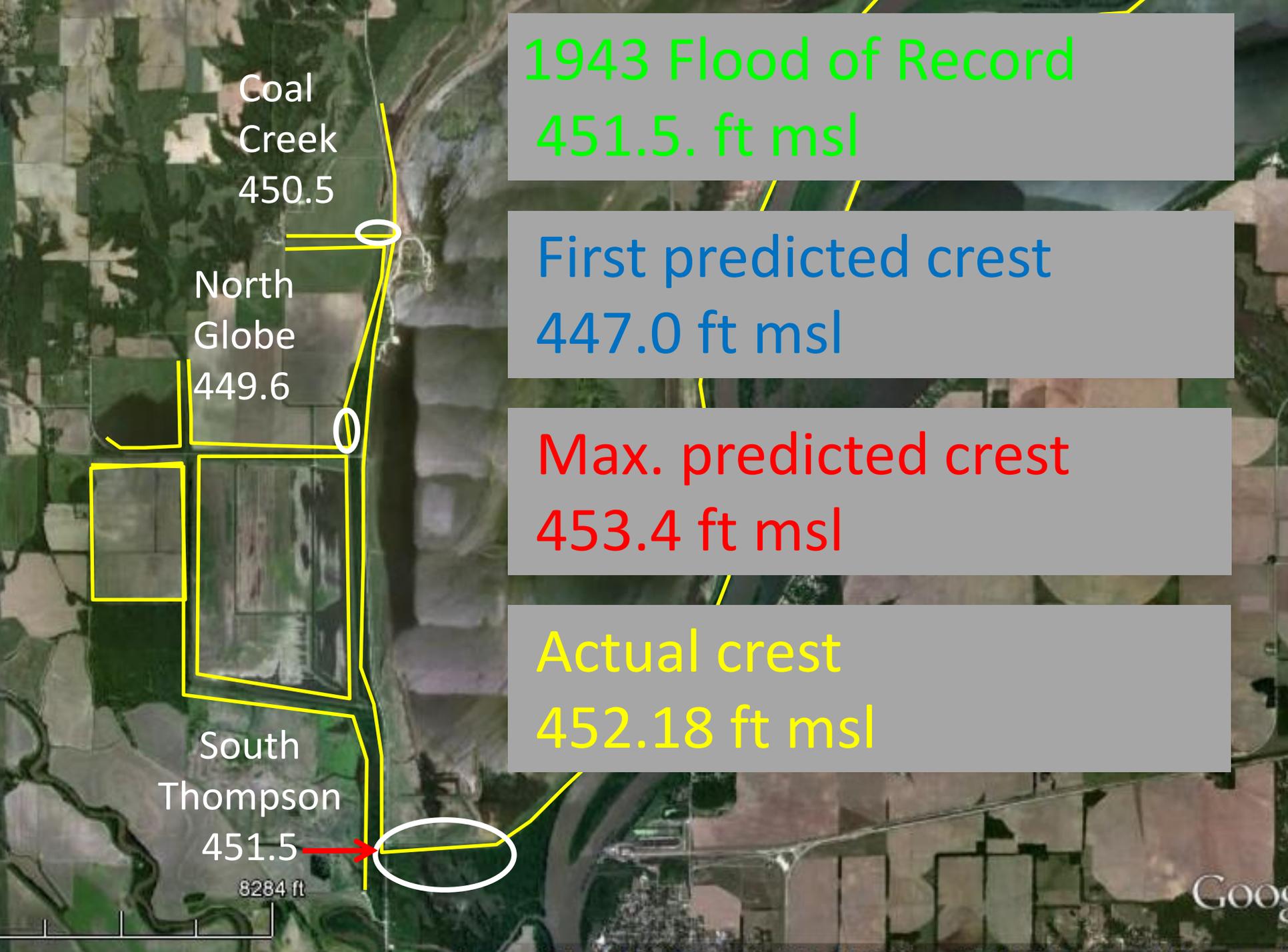
Black scudnowhank dragonfly

Illinois wetlands get international designation

Peoria sits on the Illinois River about 45 miles between two wetland complexes that have been recently designated as having international importance.

"What this adds up to is, this is a great day for the Illinois River. That, to me, is the summary message. We hope that this recognition will bring to some people's attention who aren't aware of all the good and exciting stuff that's happening in the central Illinois river valley." Boets says.





Coal
Creek
450.5

North
Globe
449.6

South
Thompson
451.5

8284 ft

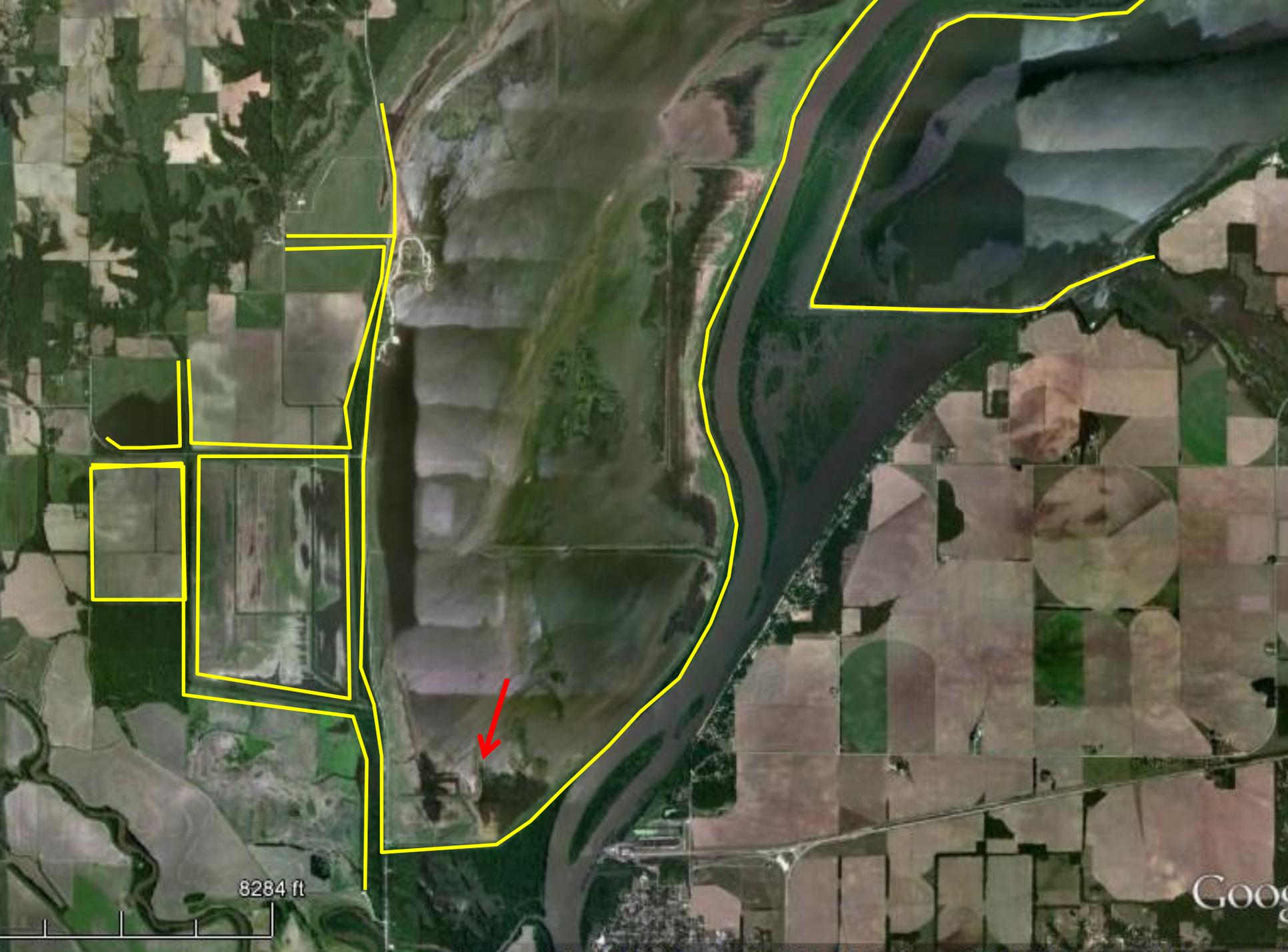
1943 Flood of Record
451.5. ft msl

First predicted crest
447.0 ft msl

Max. predicted crest
453.4 ft msl

Actual crest
452.18 ft msl

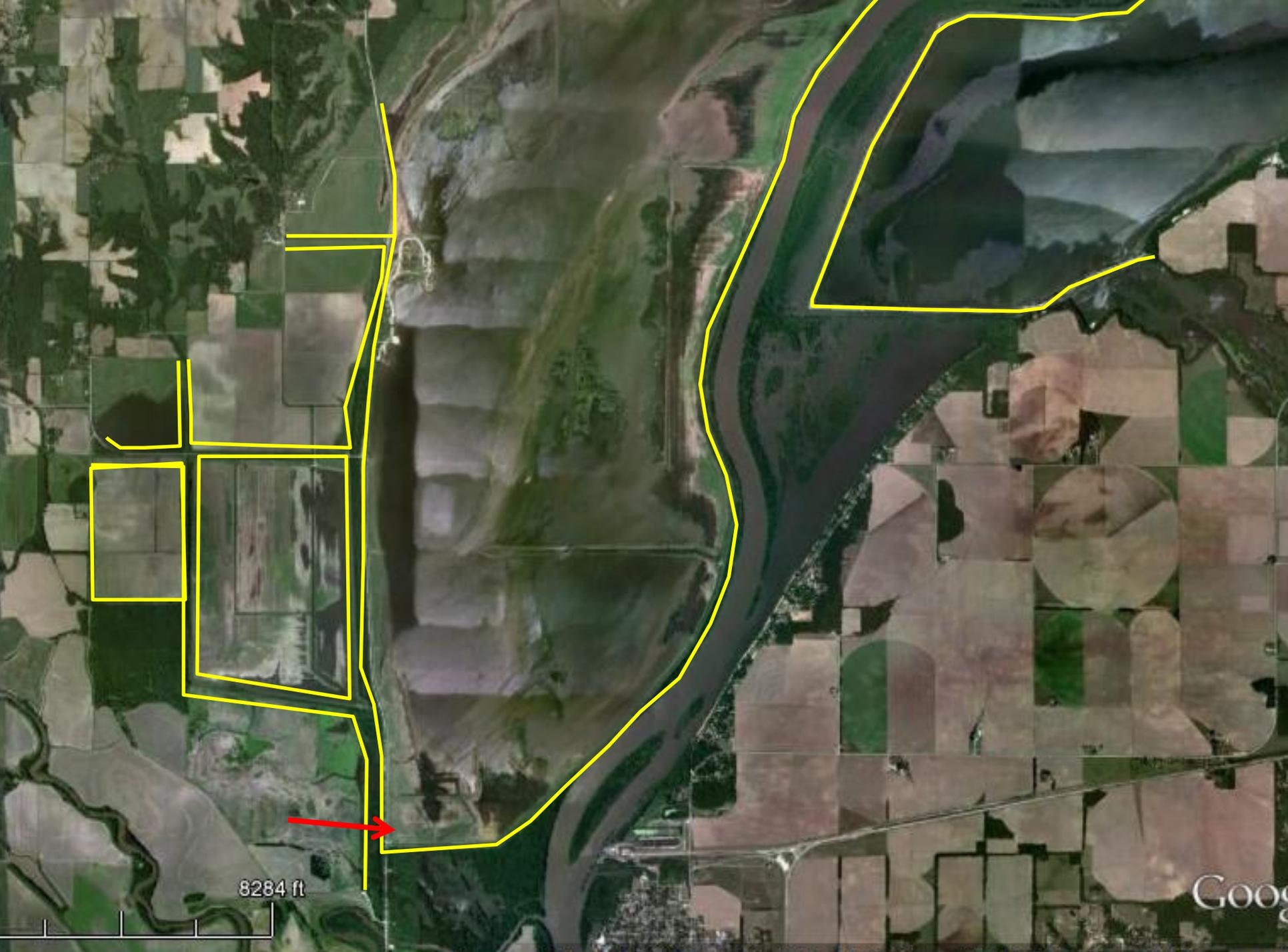




8284 ft

Google



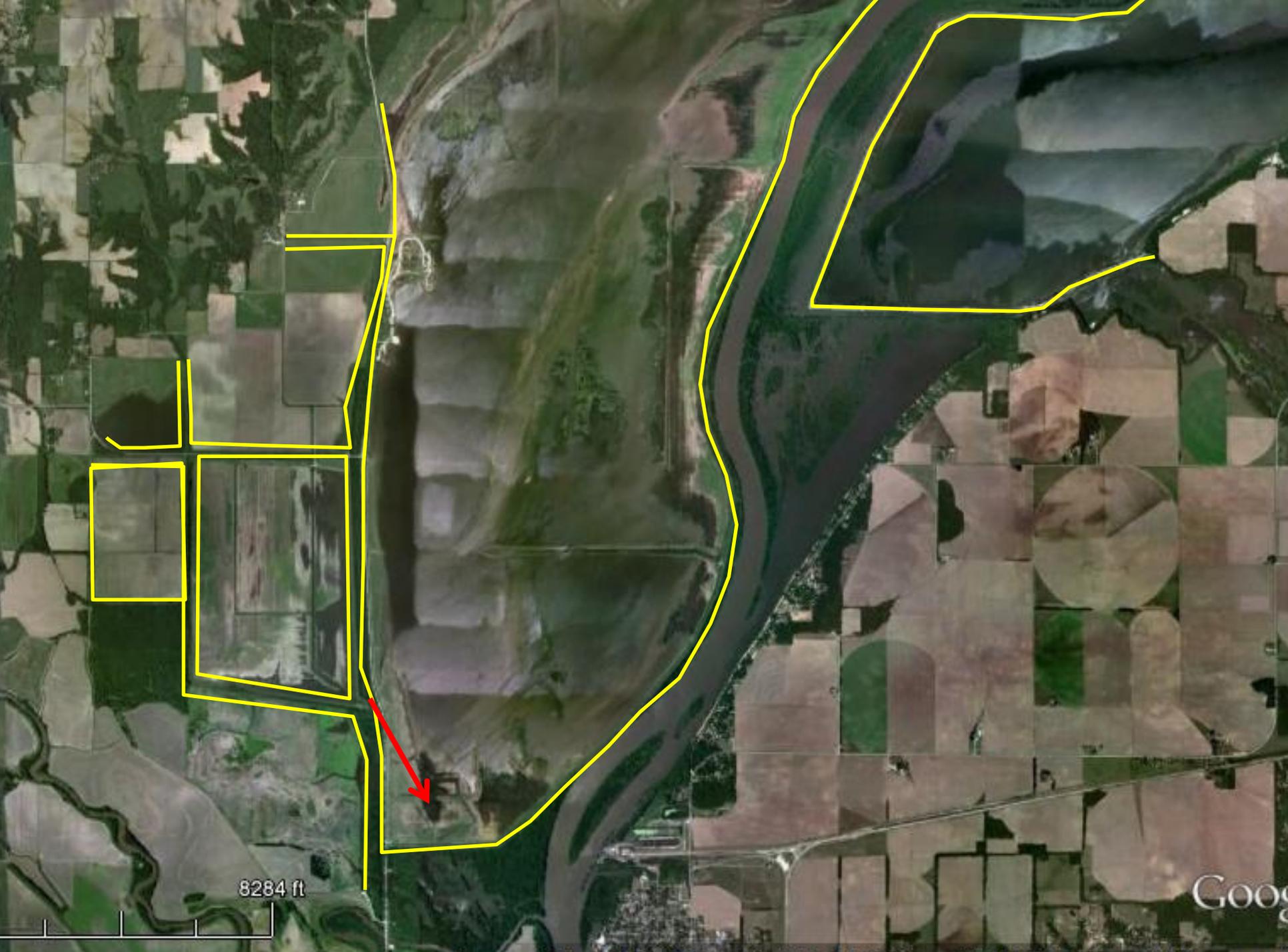


8284 ft

Goog







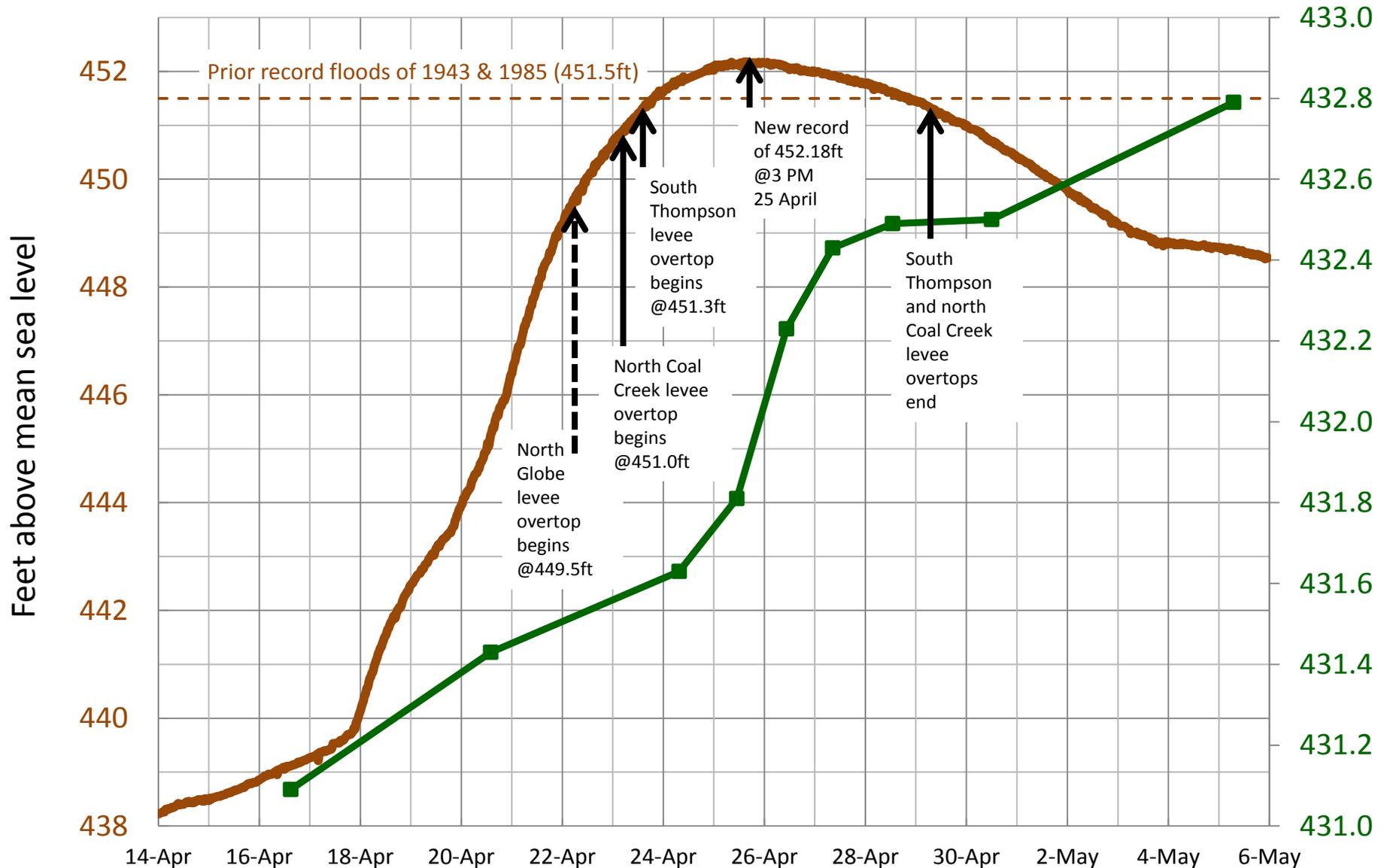
8284 ft

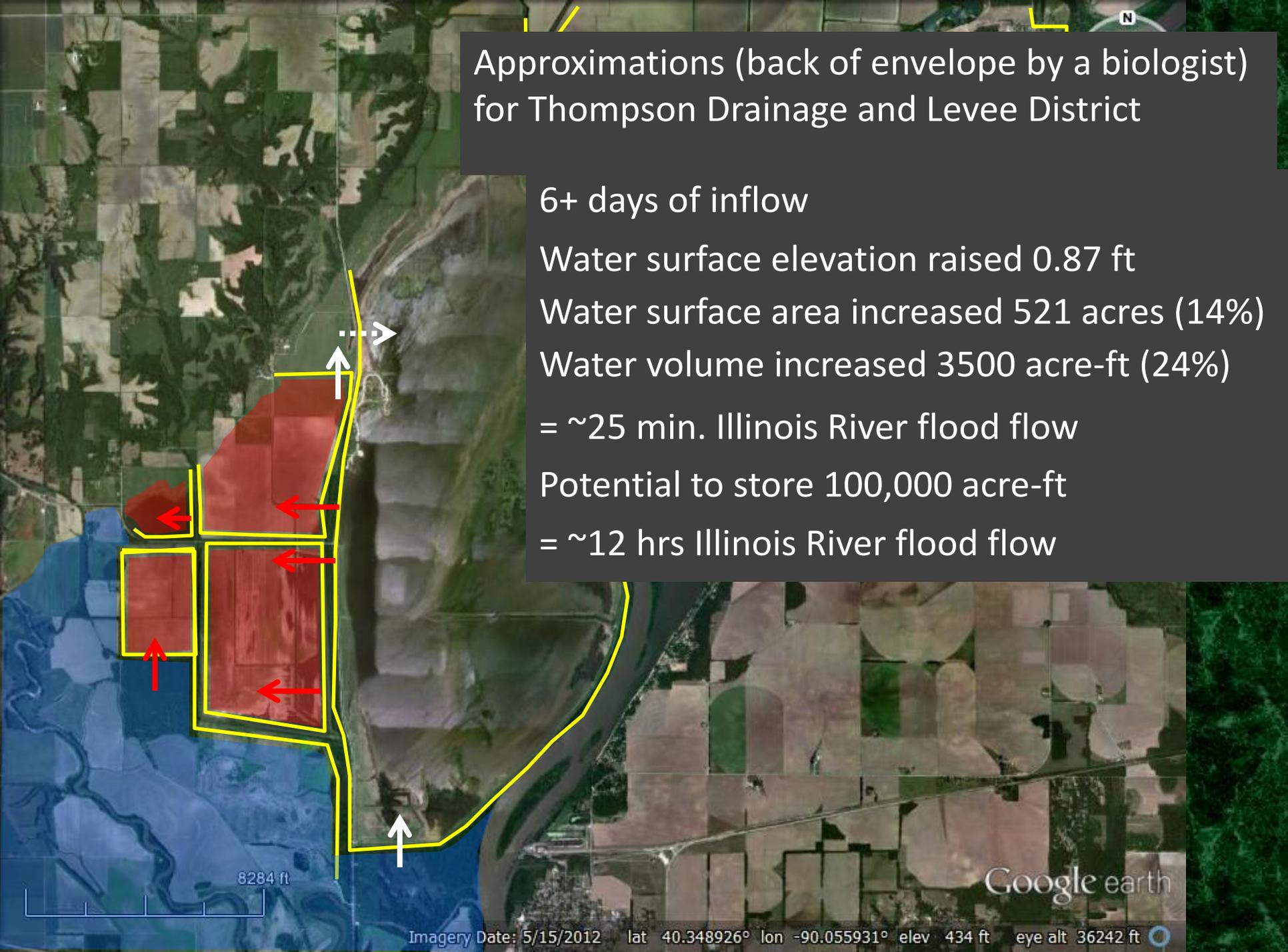
Goog



The record flood of 2013

Water surface elevations of the Illinois River @Havana and Emiquon





Approximations (back of envelope by a biologist)
for Thompson Drainage and Levee District

6+ days of inflow

Water surface elevation raised 0.87 ft

Water surface area increased 521 acres (14%)

Water volume increased 3500 acre-ft (24%)

= ~25 min. Illinois River flood flow

Potential to store 100,000 acre-ft

= ~12 hrs Illinois River flood flow

8284 ft

Google earth

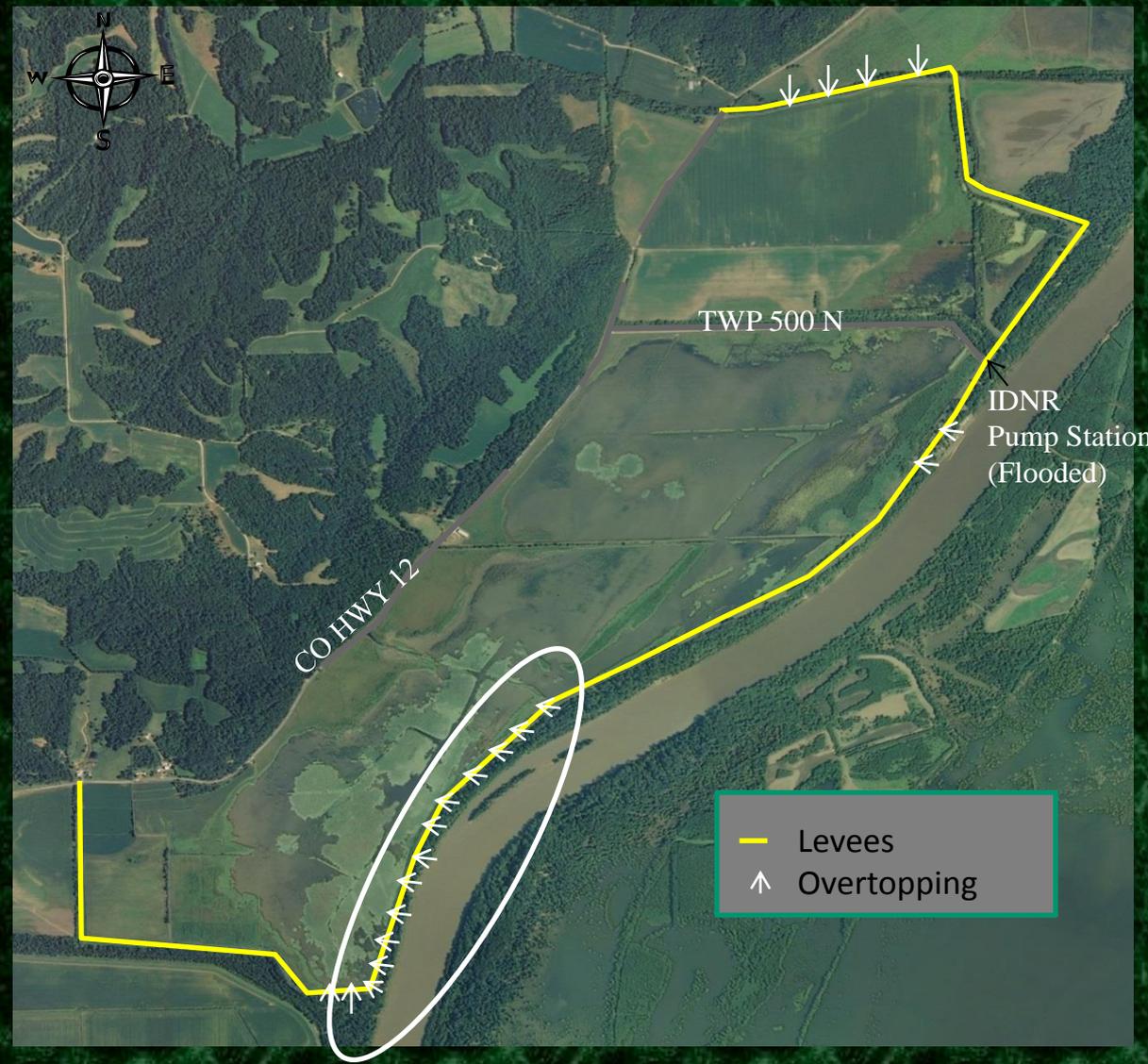


Emiquon Spunky Bottoms





The Great Flood of 2013 at Spunky Bottoms







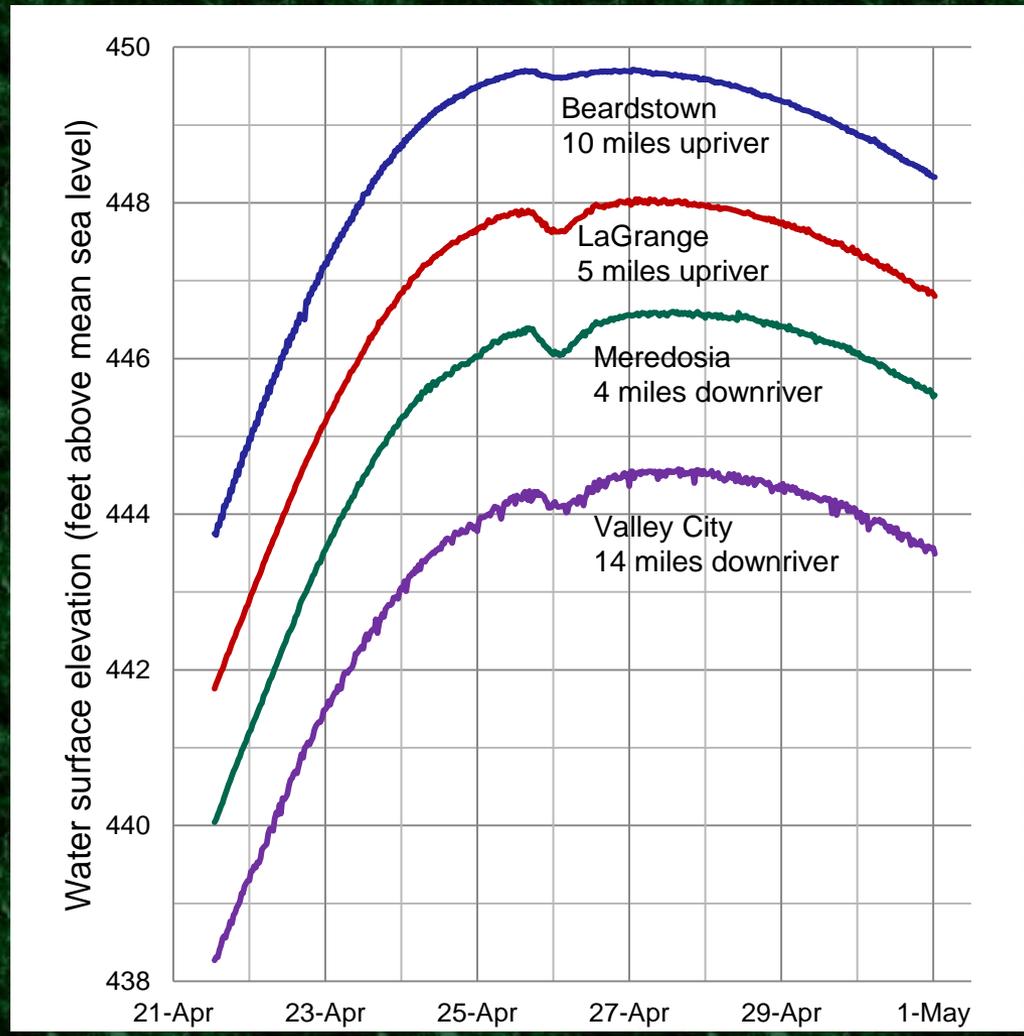




Effect of the Spunky Bottoms levee breach on the Illinois River

Rough approximations
(by a biologist):

- 17 ft head
- 8 hrs to fill
- 22,500 acre-ft stored
- = 2 ½ hrs of IR flood flow
- IR level dropped 0.3 ft
- Effects down- and upriver





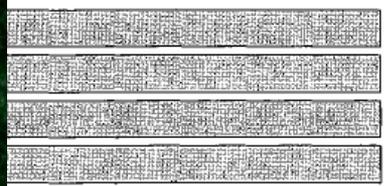
Contract Report 645

**An Analysis on Managed Flood Storage Options
for Selected Levees along the Lower Illinois River
for Enhancing Flood Protection**
Report No. 4: Flood Storage Reservoirs and Flooding
on the Lower Illinois River

by
Abiola A. Akanbi, Yanqing Lian, and Ta Wei Soong

Prepared for the
Office of Water Resources
Illinois Department of Natural Resources

June 1999



Illinois State Water Survey
Watershed Science Section
Champaign, Illinois

A Division of the Illinois Department of Natural Resources

Utilizing 17.6% (25,800 acres) of the drainage and levee districts on the lower Illinois River for flood storage could protect 40.7% (59,845 acres) of the drainage districts from overtopping during a 100-year flood event.



Effects on Illinois River water surface elevation

	Spunky Bottoms	Emiquon	
	April 2013	April 2013	<i>Potential</i>
Situation	Levee failure	Overtopping	?
Duration (days)	0.3	6+	?
Stored (acre-ft)	22,500	3,500	100,000
IL River flow equivalent (hrs)	2 ½	0.4	12
IR level drop (ft)	0.3 ft	?	?

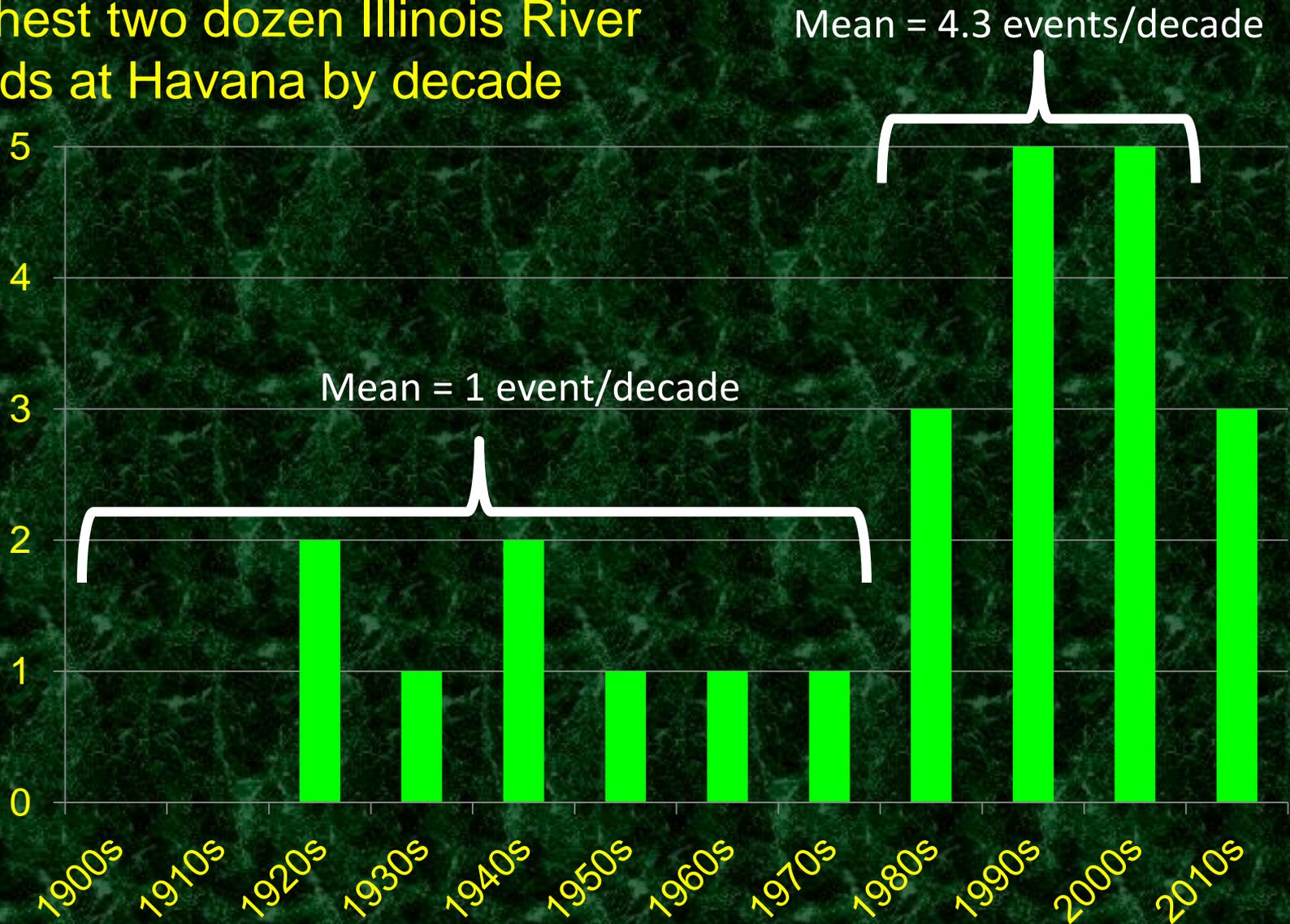


Great Flood of 2013 on the Illinois River





Highest two dozen Illinois River floods at Havana by decade



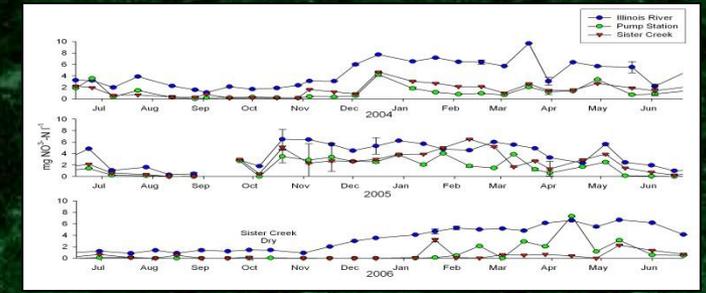


Post-flood investigations

University of Illinois Springfield

Illinois Natural History Survey

The Nature Conservancy





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