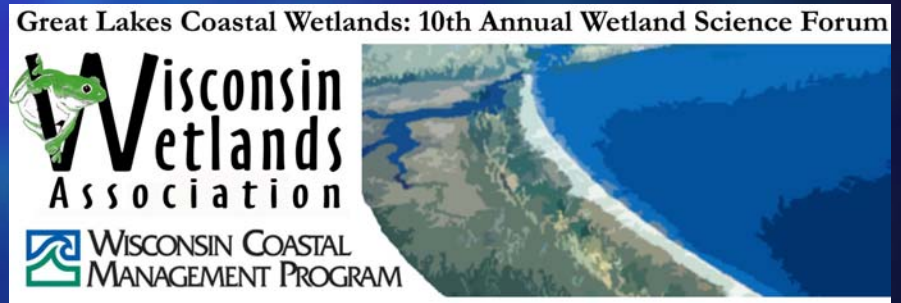



Cat Island Chain Restoration, Green Bay

Victoria Harris, UW Sea Grant



January 27, 2005

An aerial photograph of a coastal wetland, likely in Southern Green Bay. The image shows a dense network of water channels and marshes, with various shades of blue and green. The water channels are irregular and interconnected, creating a complex pattern across the landscape. The marshes are interspersed between the channels, showing a mix of green and brownish tones. The overall scene is a typical representation of a coastal wetland ecosystem.

Southern Green Bay historically provided diverse coastal wetland habitats for fish and wildlife

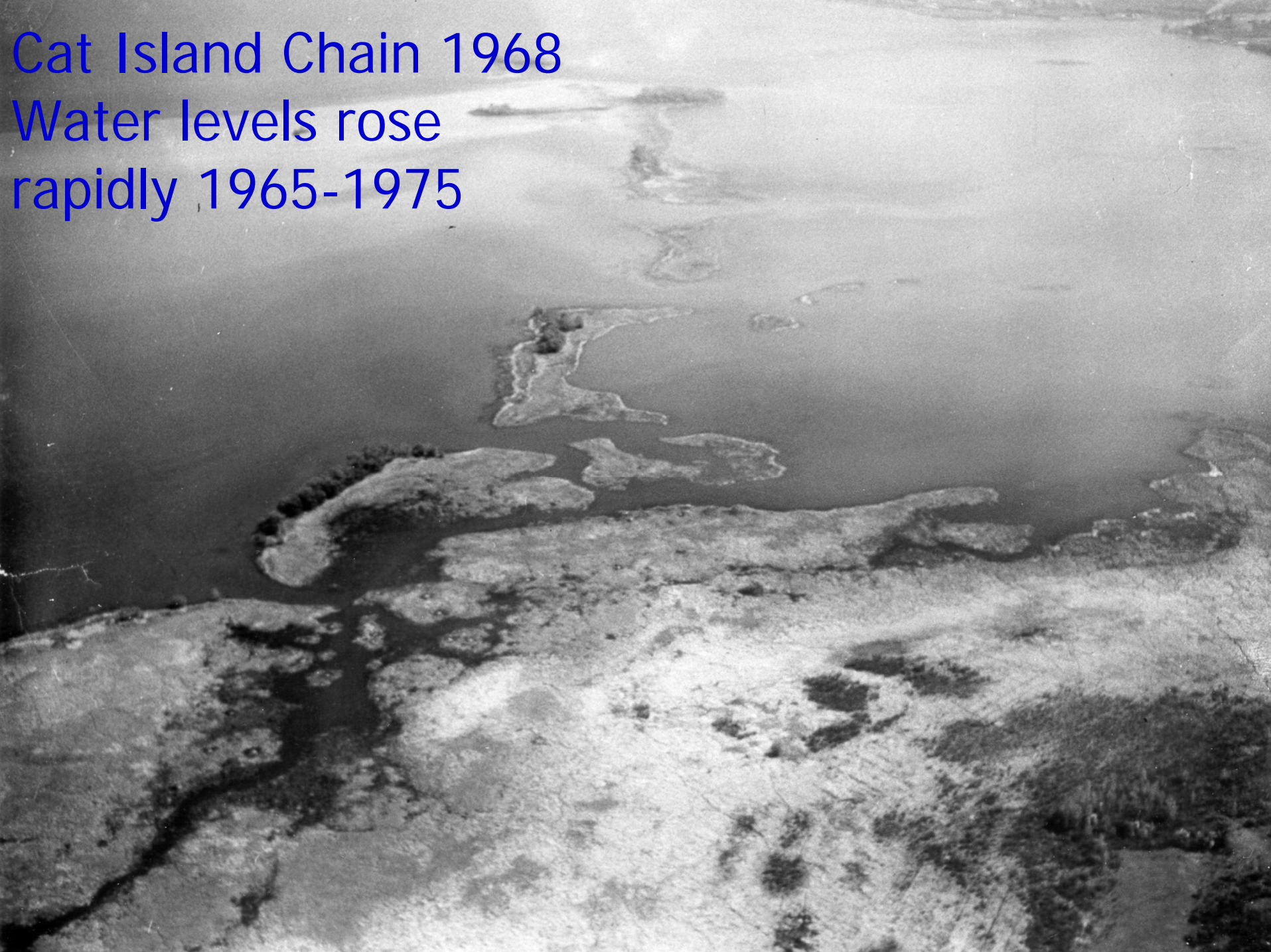
- Expansive emergent marshes (e.g. Duck Creek delta)
- Numerous small islands
- Beaches and mud flats
- Submerged aquatic plant beds

Photo by
Tom Erdman 19

1938 Air Photo of Cat Island Chain and Duck Creek Delta



Cat Island Chain 1968
Water levels rose
rapidly 1965-1975



An aerial photograph showing a coastal wetland area. The image is divided into several regions, each labeled with white text. At the top, there are several long, narrow islands or points of land. Below these, a larger area of water is visible, followed by a marshy area with a network of waterways. In the foreground, there is a large, brown, excavated area, likely a construction site, and a road. The overall scene depicts a complex landscape of water, land, and human activity.

Long Tail Point

Cat Island

Bass Islands

Duck Creek Delta Marsh

Landfill

I-43 Construction

90% of Coastal Wetlands
Lost from Southern
Green Bay

Agriculture

Photo by
WDNR 1969



Little Tail Point

Long Tail Point

Photo by
Tom Erdman
1970

Peter's Marsh

Cat Island Chain

Duck Creek Delta

Rock dikes hardened
the shoreline

Municipal incinerator
and landfill

Bayport Dredge Spoil Disposal
in Atkinson's Marsh

Rising Great Lakes water levels and severe storms in 1970s caused wetland and island erosion





Bass Islands

Willow Is.

Cat Island

Navigation Channel

Lone Tree Is.

Grassy Is.

Green Bay Islands during
low water levels in 1966

Photo by
Tom Erdman



Willow Island

Cat Island

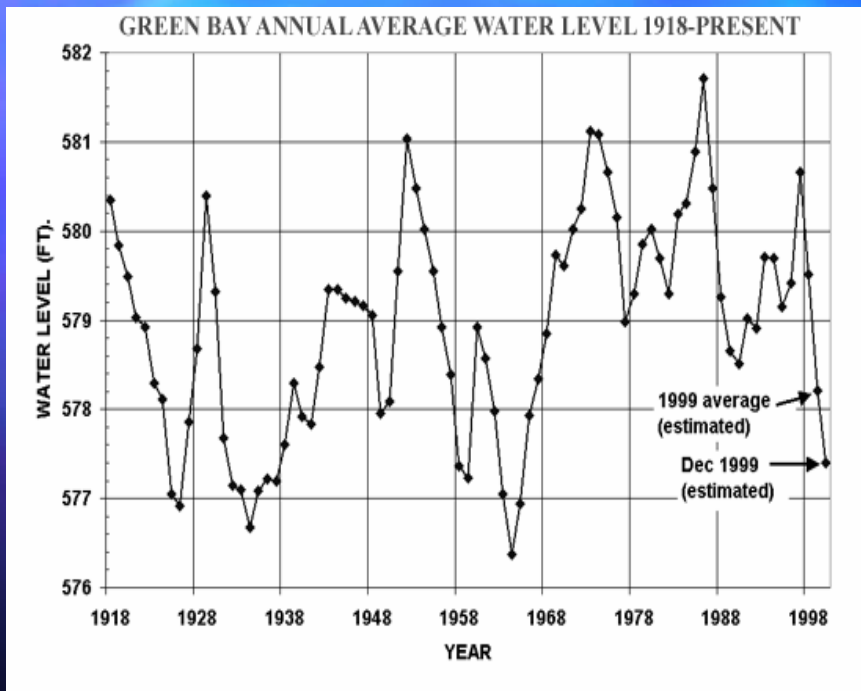
Lone Tree Island

Green Bay Islands during
high water levels in 1976

Grassy Island

Photo by
Tom Erdman

Islands survived historical water level fluctuations – Why not now?



- Water levels rose rapidly to record highs and remained elevated for two decades
- Repeated severe spring storms
- Shorelines hardened by rip rap deflect wave energy and exacerbate erosion
- Poor water clarity from runoff pollution reduced aquatic vegetation and their wave dampening benefits



- ❑ RAP Key Action: Protect remaining wetland habitats and restore coastal habitats where possible
- ❑ 1991 Risk Assessment identified habitat loss as the greatest threat to long-term ecosystem health of Green Bay
- ❑ 1994 Habitat Restoration Workshop identified Cat Islands restoration as the top priority
- ❑ Runoff pollution also must be controlled

RAP Biota & Habitat Committee examined other successful restoration projects



Toronto



Lake Onalaska

Hamilton Harbor (not shown)



Col. Sam Smith Park



Tommy Thompson Park

Each year 150,000 m³ must be dredged from Green Bay and Fox River Shipping Channel



Cat Island Ecosystem Restoration

- Several proposals by RAP from 1989 - 96
- Section 204 Water Resource Development Act Agreement with Brown County in 1996 (max \$ 5 million)
- Partnership between USACE, Brown Co., and RAP Biota & Habitat (US FWS, WDNR, UW Sea Grant and others)



Goals



Photo by WDNR 1969

- Restore diversity of island and aquatic habitats
- Recreate 1960s island "footprint"
- Provide protection for recovering submerged aquatic plant beds and marshes
- Enhance spawning and nursery grounds for various fish species (e.g. yellow perch, musky, pike, walleye, sunfish)

Goals



- Restore nesting habitat for waterfowl, shorebirds, and water birds
- Provide beneficial use for clean dredge spoils from Green Bay navigation channel
- Enhance public benefits from fishing and wildlife viewing, while minimizing human disturbance and construction impacts

Phased Project

1. Feasibility Study and Environmental Assessment (draft report being revised)
2. Hydrodynamic modeling (2004)
3. Detailed Plans and Specifications (2005)
4. Construction (if accepted by Corps and Brown County after public review)

How clean is "clean"?

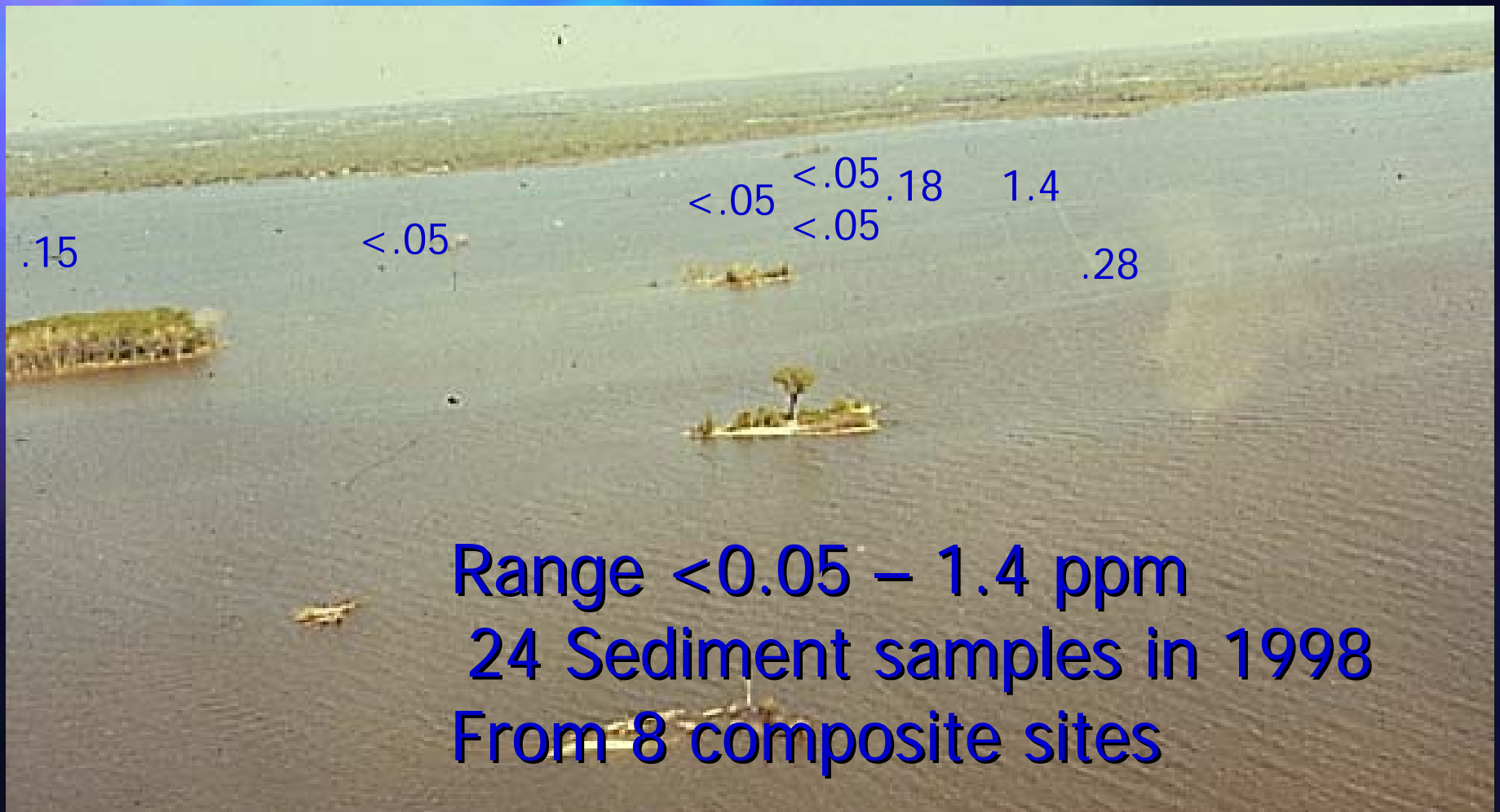
STAC Recommendation:

- Use cleanest dredged materials from outer channel to rebuild the Cat Island chain (higher in sands and lower in contaminants)
- Total PCBs should not exceed background (max of 0.1 ppm), 2.5 times less than Fox River cleanup goal



Willow Island 1969 (DNR)

Background PCB Concentrations in Vicinity of the Cat Islands



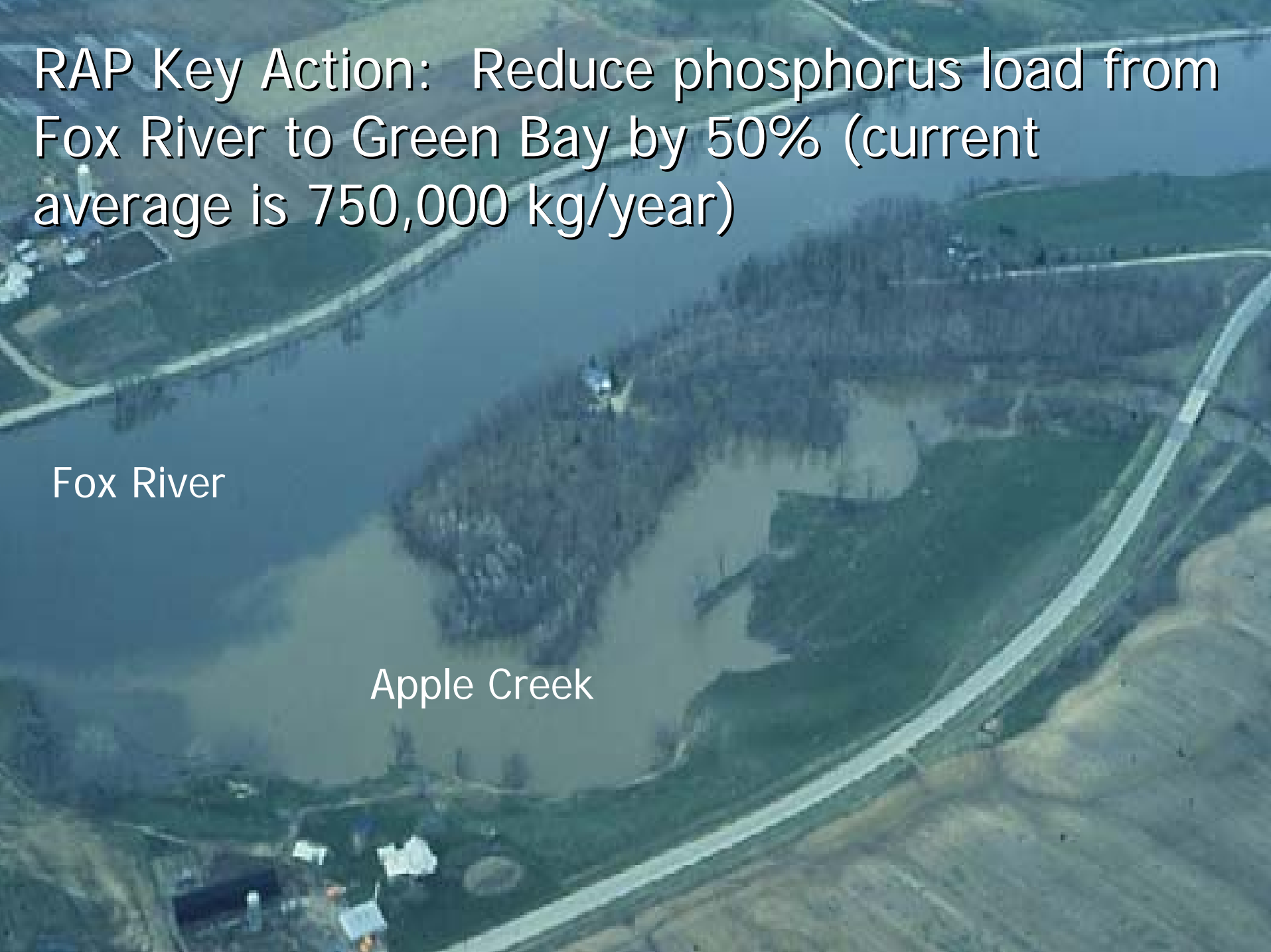
Legal Requirements


- Environmental Assessment
- Lakebed Grant
- Water Quality Certification

RAP Key Action: Reduce phosphorus load from Fox River to Green Bay by 50% (current average is 750,000 kg/year)

Fox River

Apple Creek



An aerial photograph of a harbor area. On the left, there are several large industrial buildings with complex roof structures. In the center, a large, dark, rectangular basin is visible, likely a turning basin. The water is a dark blue-grey color. The overall scene is industrial and urban.

East River
Contributes up to 44%
of annual TSS load

Fox River
Harbor Turning Basin

RAP Key Action: Reduce sediment and
suspended solids inputs from watersheds by
50%