BRIDGING CONSERVATION & HAZARD MITIGATION PLANNING: A WORKSHOP FOR NATURAL RESOURCE PROFESSIONALS

August 3, 2025

ENVIRONMENTAL LAW • INSTITUTE®

PANEL 2: PARTNERSHIPS

Kristy Hawthorne, Executive Director, Licking County Soil and Water Conservation District, Case study with collaboration focus

Jennifer Fish, Director, Franklin Soil and Water Conservation District, Case study on leveraging state-local stormwater permitting and partnerships to scale nature-based solutions

Gabe Powers, Director of Land Preservation and Natural Resources, McHenry County Conservation District, Case study with nature-based solutions focus

Zachary Christin, Research Economist, Equilibrium Economics, Leveraging Partnerships and Tools to Secure Funding and Develop Policy

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LICKING COUNTY SOIL&WATER CONSERVATION DISTRICT

Collaboration is Key in a Rapidly Developing Watershed

Collaboration is Key in a Rapidly Developing Watershed

Licking County Ohio:

- 682.4 square miles of land area
- 105 river miles
- Population 2024: 184,89
- Population 1990: 128,300

Soil & Water Conservation Districts

Ohio Department of Agriculture

The Division of Soil and Water Conservation provides leadership and services that enable Ohioans to conserve, protect, and enhance soil, water, and land resources.

- A sub-division of local government, each county has a Soil & Water Conservation District office
- Locally led, conservation focused
- Partners with local, state and federal agencies to accomplish goals

Welcome to the Division of Soil & Water Conservation | Ohio Department of Agriculture

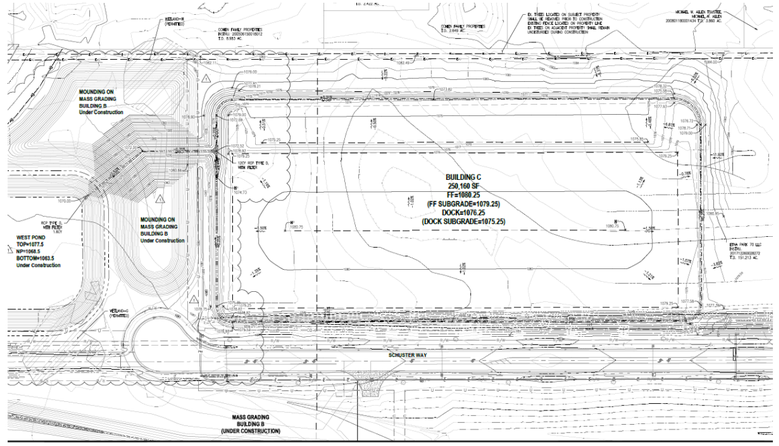
LICKING COUNTY SOIL & WATER CONSERVATION DISTRICT

Licking County Soil & Water Conservation District

Locally Led Areas of Focus:

- Agriculture
  - Soil Health
  - Water Quality
- Education
  - Youth – in classrooms
  - Adults - workshops
- Urban
  - Stormwater management

www.LickingSWCD.com



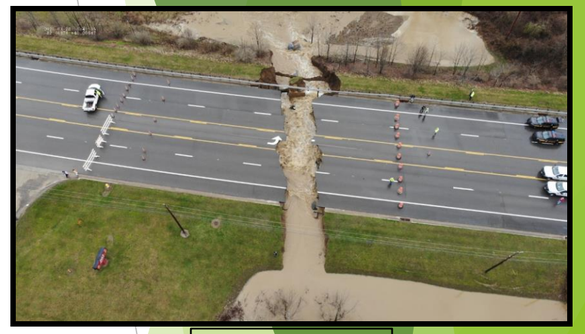
LICKING COUNTY SOIL & WATER CONSERVATION DISTRICT

Collaboration is Key in a Rapidly Developing Watershed

Granville

South Licking Watershed Conservancy District

- A corporation of the State of Ohio with the ability to implement projects on a watershed scale for the benefit of all communities and property owners within the watershed.
- Requires an adopted Watershed Work Plan (Official Plan) - serves as the charter for the Conservancy District to implement flood damage reduction and watercourse protection projects.
- Improvements to lessen the frequency and extent of flooding.
- Provide for long term maintenance of major waterways.
- Value of the Plan benefits must exceed the costs. Estimate monetary value of reduced flooding benefits.
- Conservancy District can acquire easements and levy an assessment to facilitate the Plan improvements.



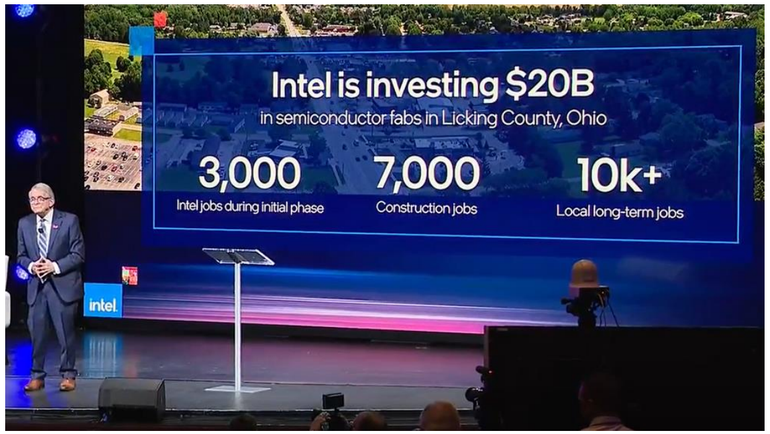
Heath

Newark

www.SLWCD.org

LICKING COUNTY SOIL & WATER CONSERVATION DISTRICT

Collaboration is Key in a Rapidly Developing Watershed

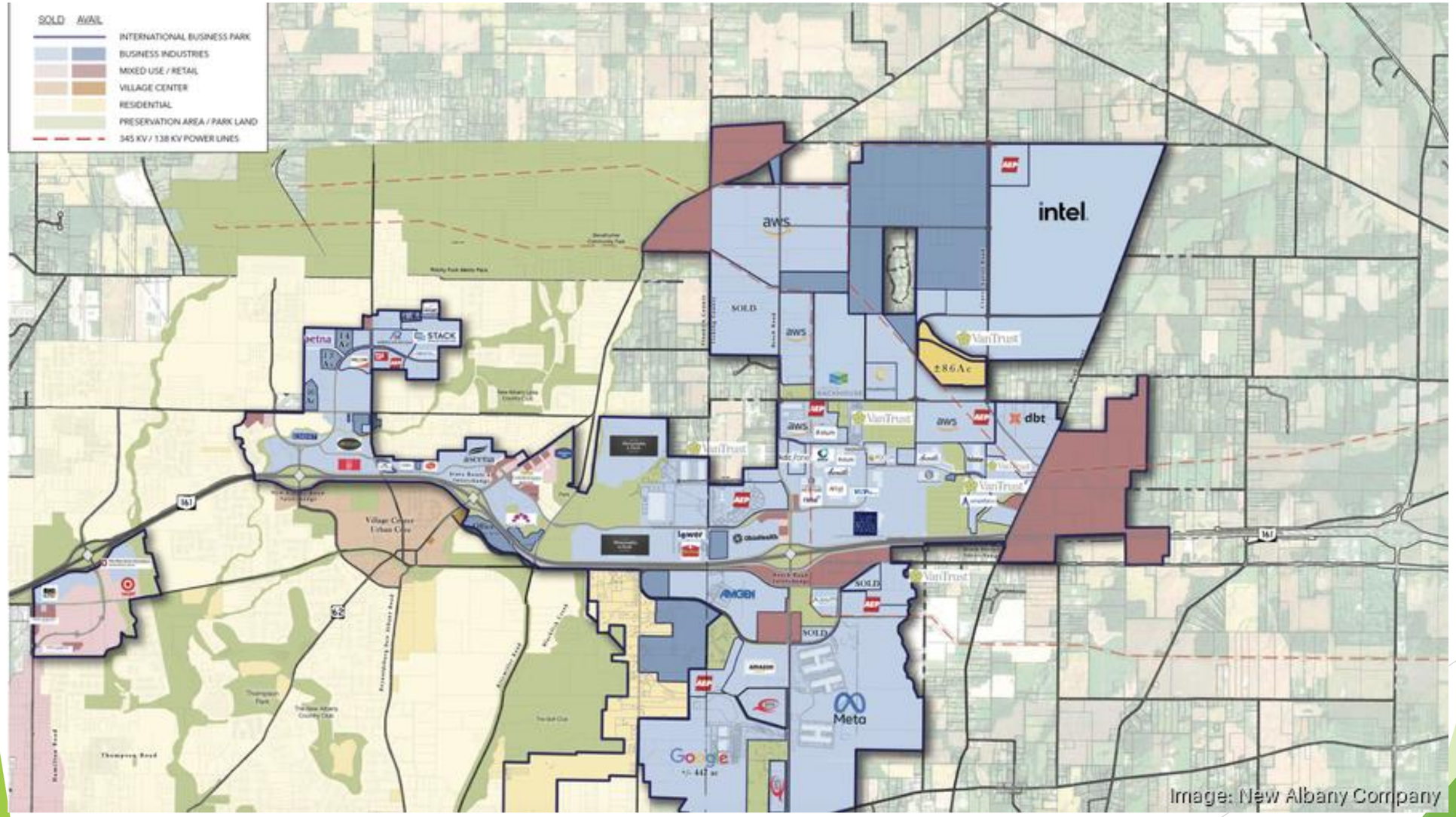


Initial announcement
January 20, 2021

Water need for initial 2 fabs: 5 MGD

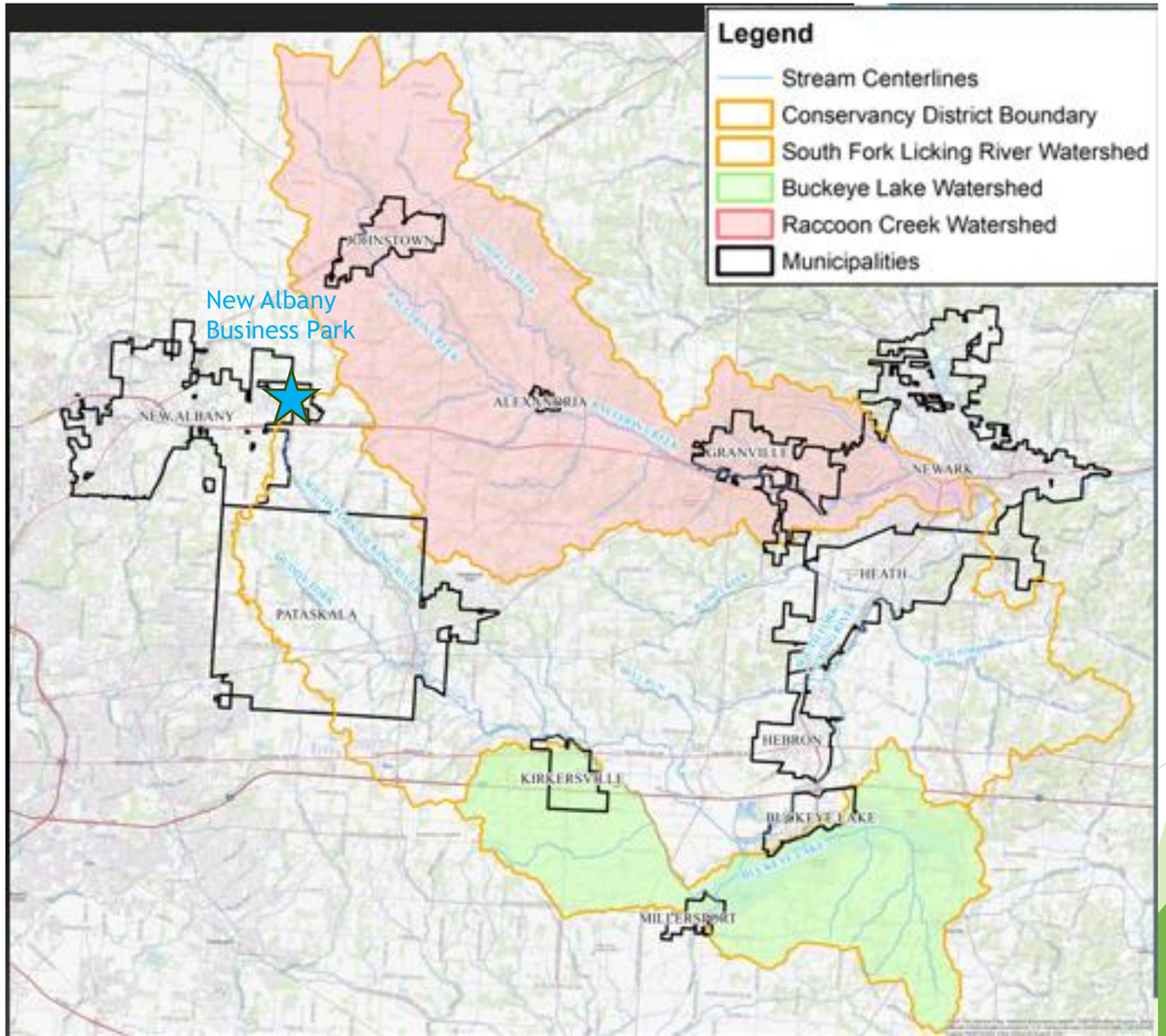
Land use: 1,000 acres

Collaboration is Key in a Rapidly Developing Watershed



Collaboration is Key in a Rapidly Developing Watershed

- Covers the entire South Fork Licking River Watershed throughout Licking, Fairfield, Perry Counties
- Total Square Miles 288
  - Main Stem South Licking: 141
  - Raccoon Creek: 103
  - Buckeye Lake: 44
- Includes numerous townships, Buckeye Lake and surrounding communities, the Cities of Heath, Johnstown, Pataskala; portions of New Albany and Newark; the Villages of Alexandria, Granville, Hebron, Kirkersville.



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Collaboration is Key in a Rapidly Developing Watershed

Licking County Commissioners 2D Flood Model

Modeling Status: 2D Hydraulic Model

Validation Visual

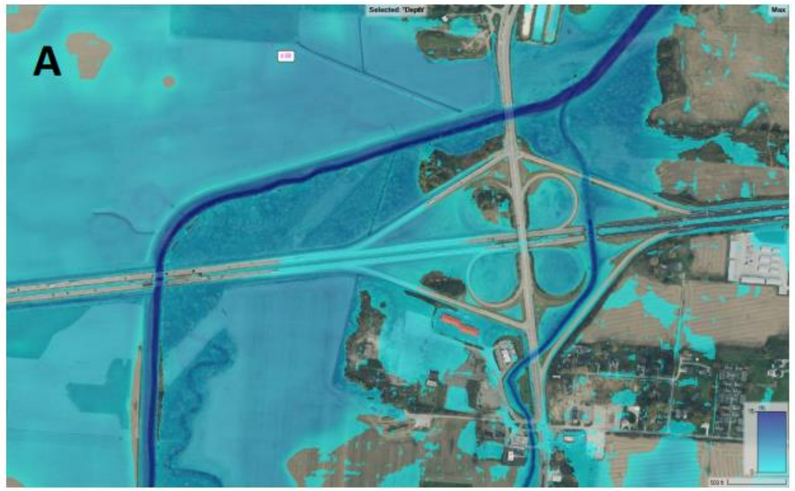
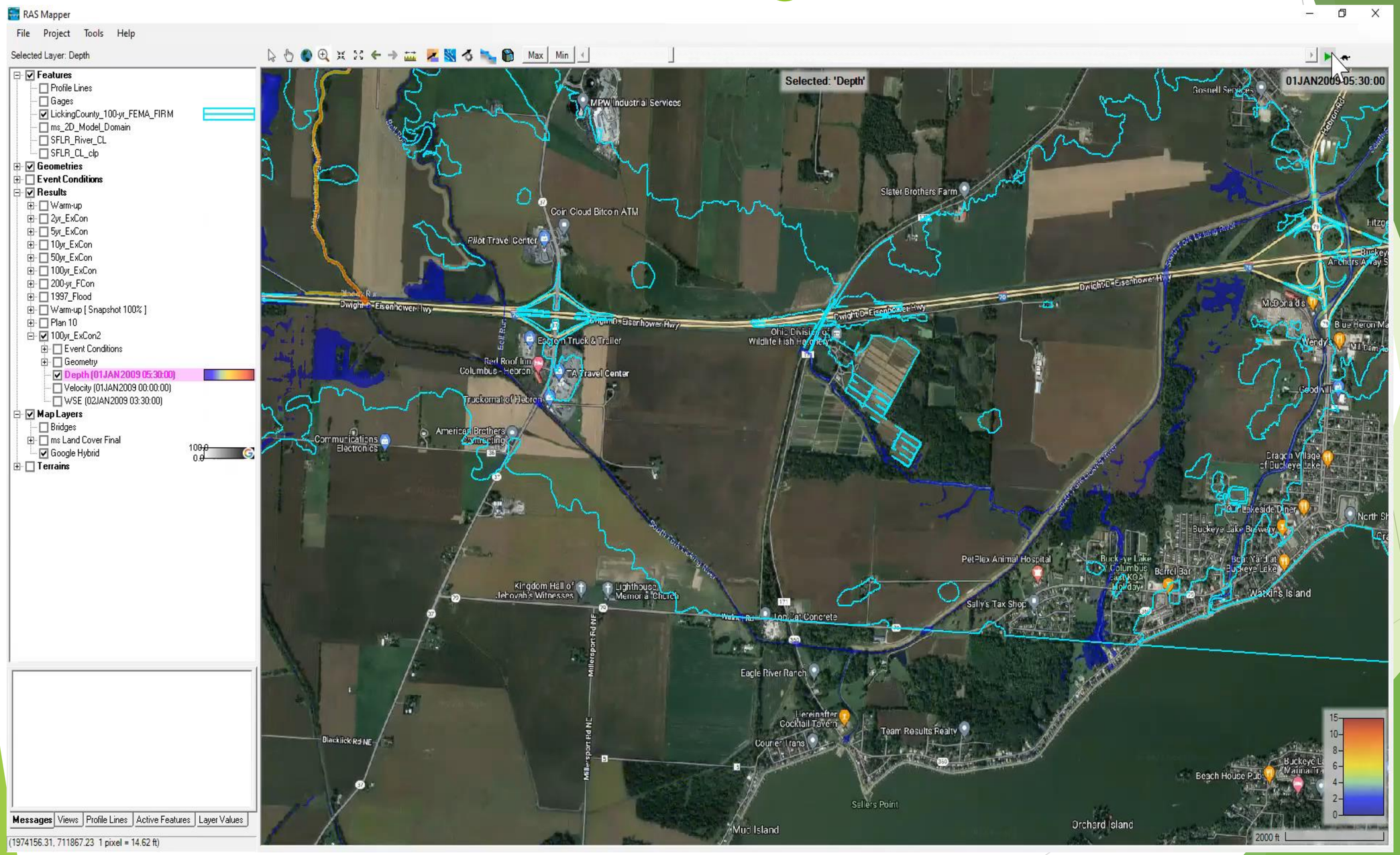


Image A is the 2D HEC-RAS calibration for the March 2020 event, showing max. flooding depth.
The images on left are screen shots captured during the March 2020 event. **Image B**: Looking Northwest **Image C**: Looking East

LICKING COUNTY SOIL & WATER CONSERVATION DISTRICT

2-D Modeling



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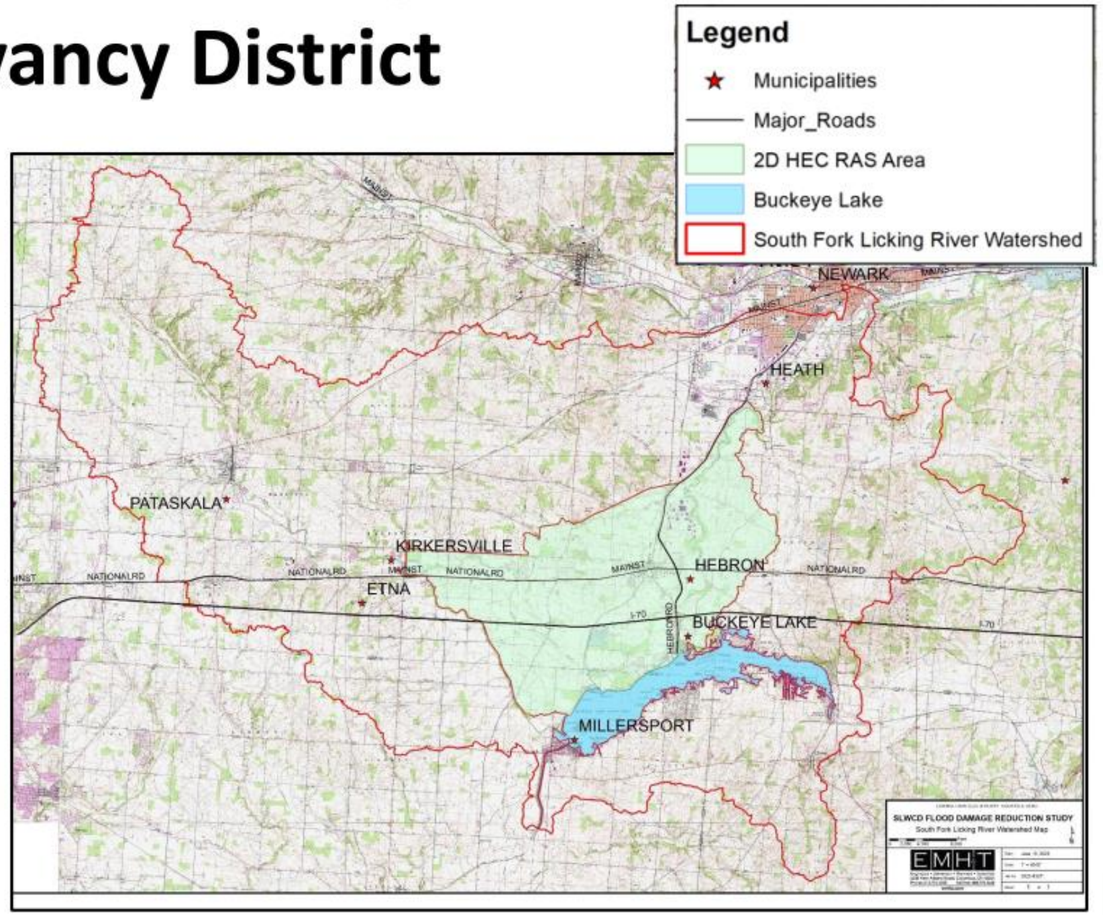
Collaboration is Key in a Rapidly Developing Watershed

Flood Damage Reduction Study - South Licking Watershed Conservancy District

- South Fork Licking River Watershed: 185 square miles in Licking, Fairfield and Perry Counties (not including Raccoon Creek)
- Detailed hydrologic (HEC-HMS) model of the watershed area outside of the 2D HEC-RAS model area. Calibrated to USGS stream gauge at Kirkersville
- Integrated HEC-HMS and 2D HEC-RAS models used to estimate flood damages to properties and buildings under existing conditions and with the implementation of potential hydrologic solutions to reduce flood damages
- Hydrologic solutions include dry dams throughout the upstream watershed



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Licking County Commissioners receives FEMA Hazard Mitigation Assistance Grant

- Working with the 2-D model and the South Licking Watershed Conservancy District Flood Damage Reduction Study, the FEMA grant will explore flood mitigation projects in the Main Stem of the South Fork Licking River Watershed.
- Innovative, nature-based storage options will be considered and evaluated towards the upstream reaches of the watershed which will allow for excess flows to be stored and slowly released back to the river, lessening peak flood conditions.

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Projects in Watershed Management Grant
Flood Damage Reduction Study Raccoon Creek

This Planning Study will seek to gather the various reports, models and other documents pertaining to the identification of existing flood hazards within the Raccoon Creek watershed, and potential flood damage prevention measures. The goal will be to assimilate the acquired models into a single hydrologic and hydraulic model for the watershed, so that the model can be utilized by the SLWCD as part of this planning study. The planning study will identify both hydrologic and hydraulic solutions to mitigate flood damages in the Racoon Creek watershed; the planning study will also consider existing information regarding channel blockages and channel bank erosion to assist in identifying a long-term plan for channel obstruction removal and stream channel stabilization/restoration. Other watershed initiatives may be identified as part of this planning study based on coordination with the SLWCD and other watershed stakeholders.

MUSKINGUM WATERSHED CONSERVANCY DISTRICT

LICKING COUNTY SOIL & WATER CONSERVATION DISTRICT

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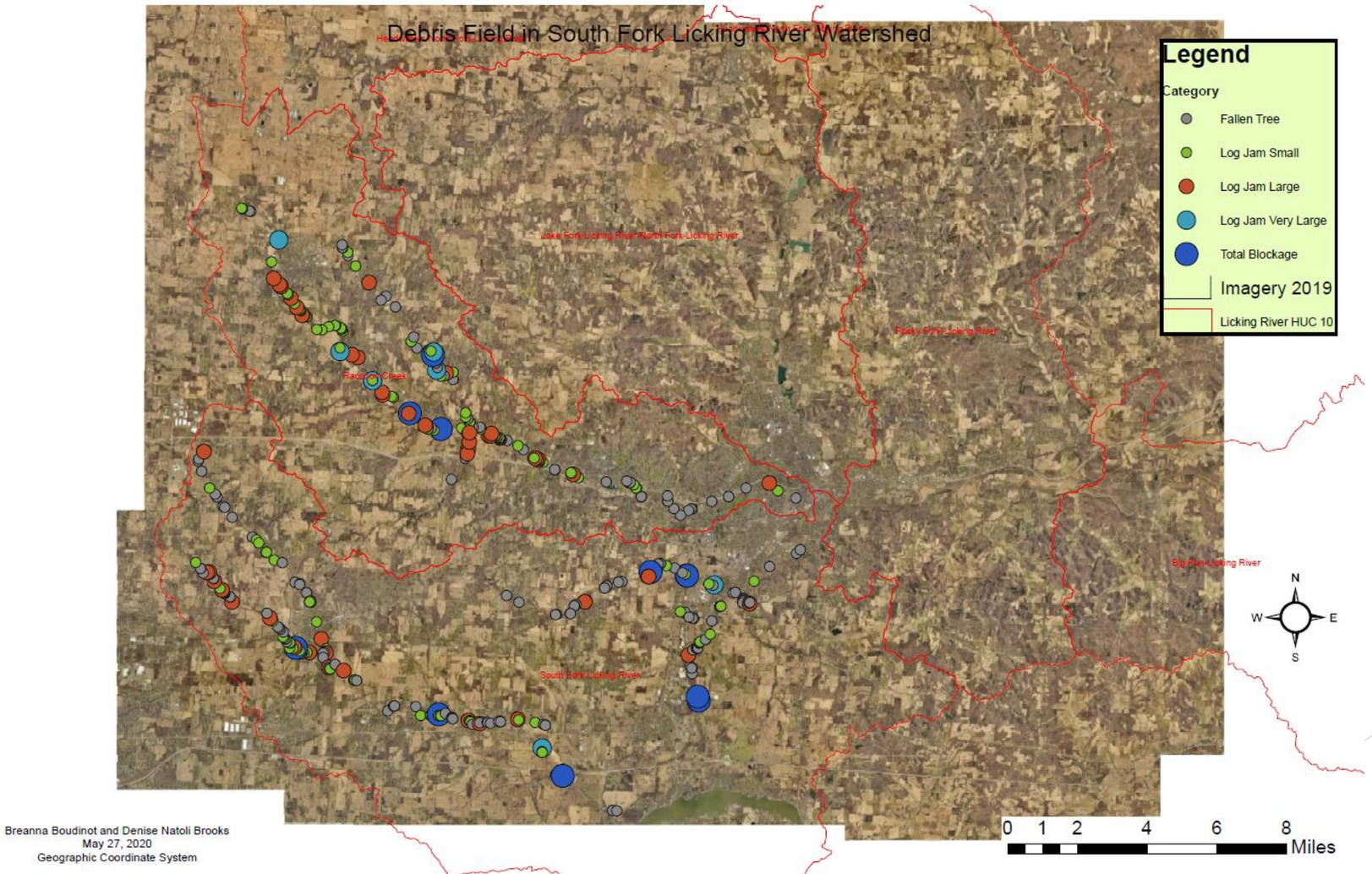
AmeriCorps Member 2020 Log Jam Mapping Project



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AmeriCorps Member 2020 Log Jam Mapping Project

	Lobdell Creek	Raccoon Creek	Ramp Creek	South Fork	Muddy Fork	Unnamed Tributary	TOTAL
Fallen Tree	17	49	24	99	24	17	**230**
Log Jam Small	10	50	3	27	15	2	**107**
Log Jam Large	2	20	3	14	8	3	**50**
Log Jam Very Large	2	3	1	1	0	0	**7**
Total Blockage	1	2	3	4	1	0	**11**
Total per Waterway	**32**	**124**	**34**	**145**	**48**	**22**	405

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Woody Debris Removal Grant

- HEC RAS 2D Model: Purpose is to conduct an inundation analysis of logjams in the South Licking Watershed which experience increased flooding due to these blockages. The outcome would facilitate prioritization for removal of log jams by max benefit to reduce flood risk.

US Army Corps of Engineers®

- **Section 208 – Snagging and Clearing for Flood Control**
- Provide removal of accumulated snags and other debris from waterways and to clear stream channels in the interest of flood control.

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This exercise will challenge that “automatic response” process and challenge the leadership to actually talk to each other and make decisions as a true “UNIFIED COMMAND.”

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Collaboration is Key in a Rapidly Developing Watershed

2025 LRH Licking River Tabletop Exercise

Background/ Overview | Purpose | Objectives | Guidelines | Roles and Responsibilities | Planning and Assumptions | Scenario Introduction | Tuesday Afternoon, ... | Th →

Guidelines

- Provide mutual respect for each other and for our fellow agencies.
- Understand that we are all in a resource poor environment (human, material, and financial) and we must make the very best of all community resources.
- Listen to what each person has to say and do not try to talk over or hurry their response; you will have your turn.
- You cannot use what you don't have...no pretend resources (unless you actually have them or have written agreements to activate them).

2025 LRH Licking River Tabletop Exercise

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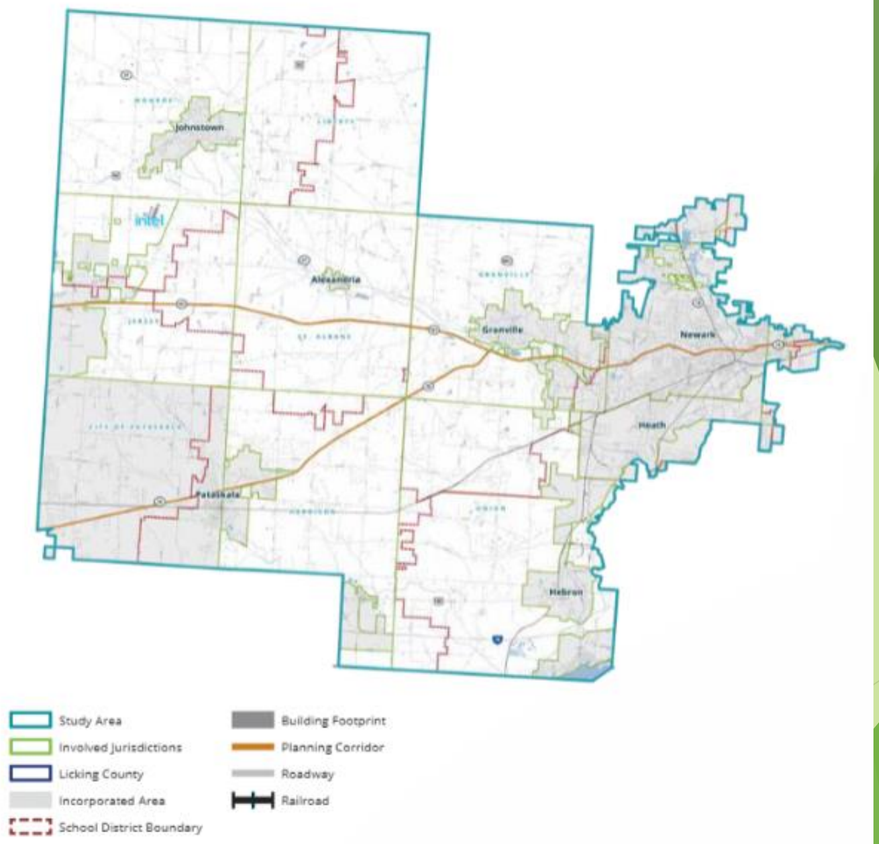
communities of Licking County
FRAMEWORK
shaping tomorrow together

FRAMEWORK is an initiative to shape the future of fifteen Licking County jurisdictions that will be most immediately affected by rapid growth in Licking County with an eye toward the county as a whole.

15 jurisdictions focused on understanding the impacts—and identifying the potential benefits—of anticipated investments from the public and private sectors, catalyzed by the investment from Intel.



[Framework – Shaping Tomorrow Together (frameworklc.org)](https://frameworklc.org)

Convened by the Thomas J. Evans Foundation

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Unite for Nature

Fulfilling the need to understand the various environmental and conservation focused organizations in the county. A Licking County Foundation Grant was secured to do a survey of local, state and federal agencies to complete a SWOT analysis, introduce partners for collaboration and determine gaps that need filled.

Strengths (internal) ▪ Diversity of perspectives and environmental focus areas ▪ Dedication to Licking County ▪ Experience (govt, local, state, federal) ▪ Expertise (technical, knowledge base) ▪ Passion / care ▪ Collective network / impact ▪ Exciting opportunities ▪ Education ▪ Sense of community ▪ The Reporting Project ▪ Willingness to engage (teams, volunteers) ▪ Data ▪ We still have green spaces ▪ Reputation of partners	**Weaknesses** (internal) ▪ Funding ▪ Grant writing ▪ Staffing ▪ Marketing / Public Relations ▪ Undefined org structure ▪ Understanding impact of high tech development ▪ Duplication of efforts ▪ Lack of zoning ▪ Diversity of geographical representation ▪ Reactive culture ▪ Time constraints ▪ Prioritization ▪ Opportunity to connect with and influence decision makers ▪ Lack of business/corporate involvement
Opportunities (external) ▪ Speak with one voice ▪ Public motivation / support ▪ Growing interest (momentum) ▪ Job opportunities ▪ Tap into younger generations ▪ Development funding ▪ Corporate partnerships (connecting to their sustainability goals) ▪ Collaboration / partnerships ▪ Synergy ▪ Timing is right ▪ Thoughtful, unified messaging ▪ Large-scale collaboration sets a precedent ▪ Share resources ▪ Chance for change ▪ Nurture cultural land ethic	**Threats** (external) ▪ Speed of growth ▪ Fear of the unknown ▪ Limited jurisdiction / resources ▪ Development (pace and companies) ▪ Lack of comprehensive plan / preparedness ▪ Transparency ▪ Politics / government ▪ Inadvertent competition between collaborators ▪ Large corporations ▪ Land prices ▪ Urgency – window of time for conservation may not last forever

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Collaboration is Key in a Rapidly Developing Watershed

COLLABORATIVE POLYCENTRIC GOVERNANCE: THE REINVIGORATION AND REVITALIZATION OF RURAL AMERICAN GOVERNMENT

by

John Niebergall Williams

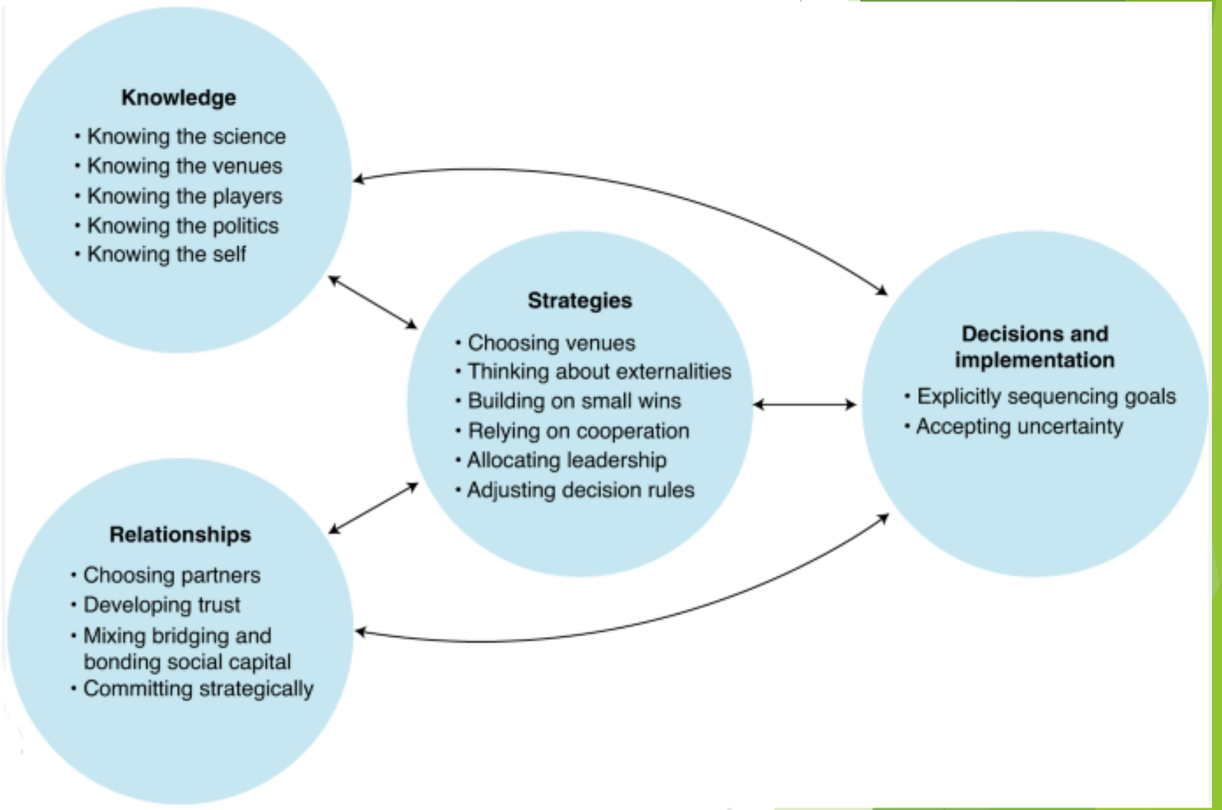
A Capstone Project Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Law and Policy

Liberty University

2024



Collaborative governance involves stakeholders in decision making as a political system with multiple decision centers participating in a flexible approach to civic governance.

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www.LickingSWCD.com

Kristy Hawthorne
Executive Director

KristyHawthorne@LickingSWCD.com

Franklin Soil and Water Conservation District

Creating Conservation Solutions for Over 70 Years

Partnerships and Funding for Conservation

Bridging Hazard Mitigation Planning Workshop with ELI and SWCS
Costa Mesa, California August 3, 2025

Jennifer Fish
Director
jfish@franklinswcd.org

Franklin County Ohio

Stormwater Regulations: NPDES Permit

- In 1993 the US EPA gave the Ohio EPA authority to issue stormwater permits through the National Pollutant Discharge Elimination System (NPDES).
- Suddenly, every municipality with a storm sewer system is responsible for 5 objectives:
  - Educate 50% of their residents on how these systems work, and how residents impact stormwater.
  - Involve residents in activities that prevent stormwater pollution.
  - Find and eliminate non-stormwater discharges in the system.
  - Ensure development activities don’t pollute runoff.
  - Educate their own staff on how to prevent stormwater pollution.

These objectives overlap with traditional SWCD programs

Funding/partnerships

28 local government grants largely focused on stormwater

& state matching funds

With some private donor and grant funding mixed in.

State Funding

Funds are in the Ohio Department of Agriculture Budget.

Challenge: Rural vs. Urban Tension

Solution: Make sure we are visible and provide value at the

Local Funding

Funds are from county, cities and townships

Challenge: Leveraging support to go above the minimum stormwater standards

Solution: Meet local stormwater needs while providing meaningful programming that is valued by partners.

Leveraging Partnerships

Regional Programming

Watershed and Community Groups

Businesses

Grants available due to partnerships:

Urban Ag Critical Infrastructure Grant

Support & scale up local food production and distribution for small farms and gardens (5 acres or less)

For-profit or not-for-profit

Conservation Mini Grants

Assist conservation implementation projects.

501c non-profits, governments, schools

Columbus Tree Assistance Program

Assist native tree plantings on private property and increase canopy cover in Columbus.

Organizations, private landowners or informal groups (neighbors)

Columbus Business Rebates

Reduce stormwater runoff with G.I. from land managed by businesses and orgs in Columbus.

For-profit and non-profit orgs and businesses

Community Backyards Rebates

Reduce stormwater runoff from residential sources with rain gardens, rain barrels, native plants, and improve soil with compost bins.

Residents

Franklin Soil and Water Conservation District

Creating Conservation Solutions for Over 70 Years

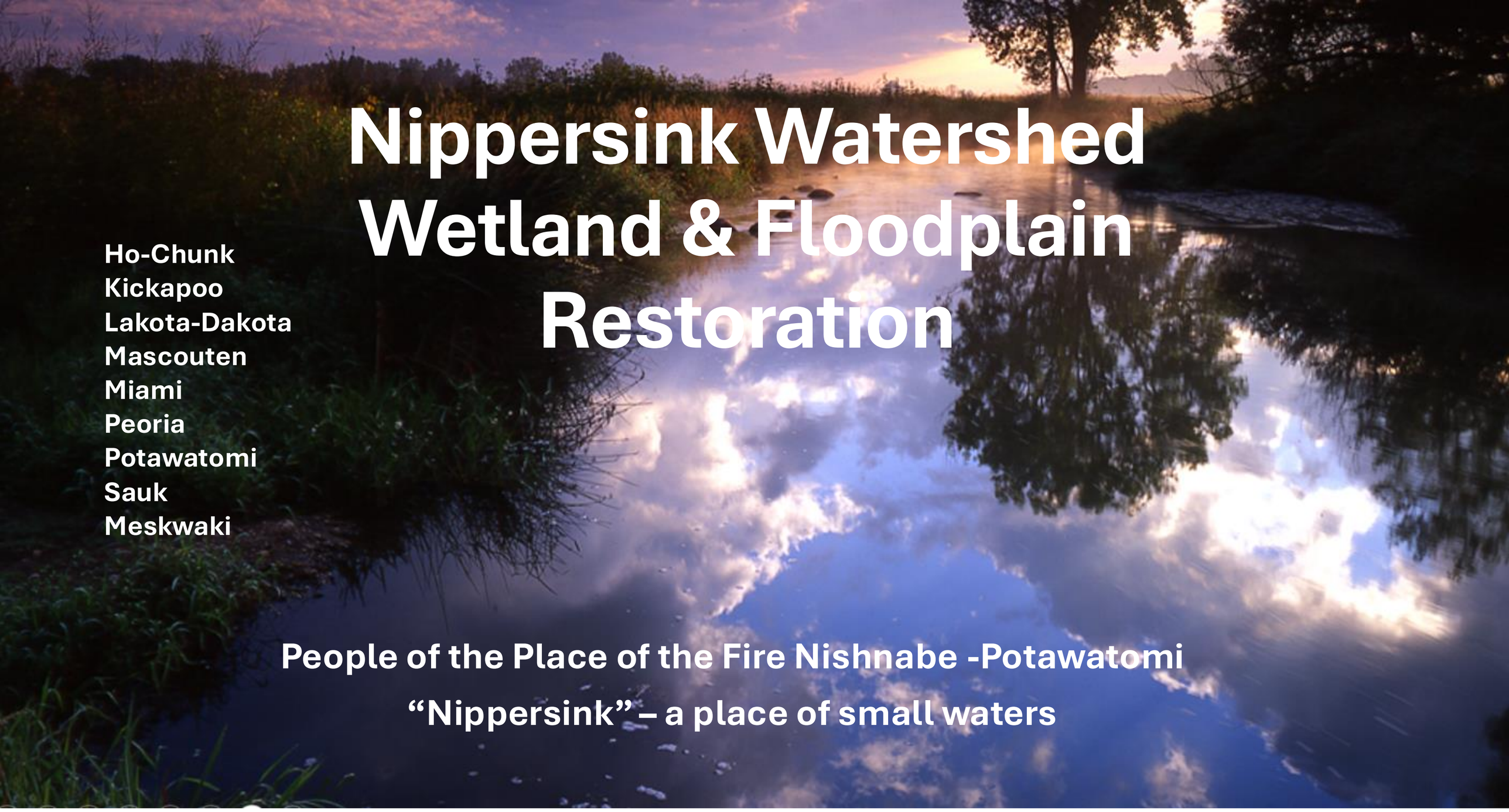
Thank You

Jennifer Fish

jfish@franklinswcd.org

Stay in touch!
Sign up for our newsletters

Sign up for our Backyard Conversation newsletter for monthly water quality tips and events.
Sign up for e-Partner Updates for less frequent e-mails about District happenings including grants.



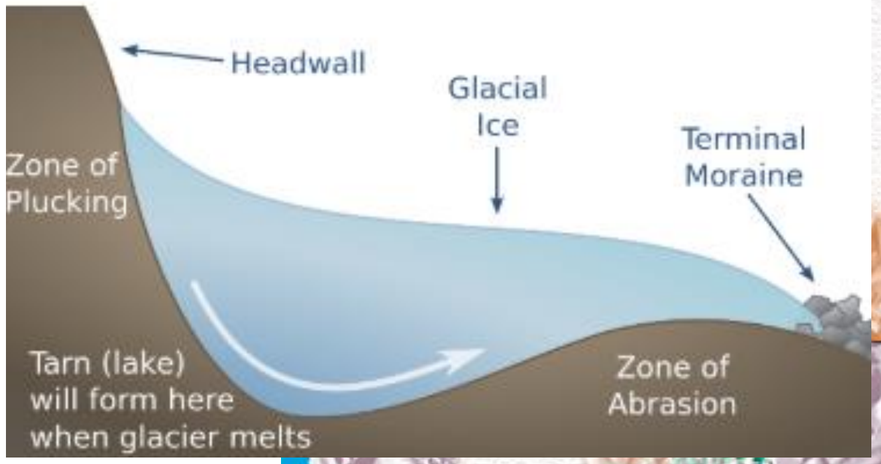
Nippersink Watershed Wetland & Floodplain Restoration

Ho-Chunk
Kickapoo
Lakota-Dakota
Mascouten
Miami
Peoria
Potawatomi
Sauk
Meskwaki

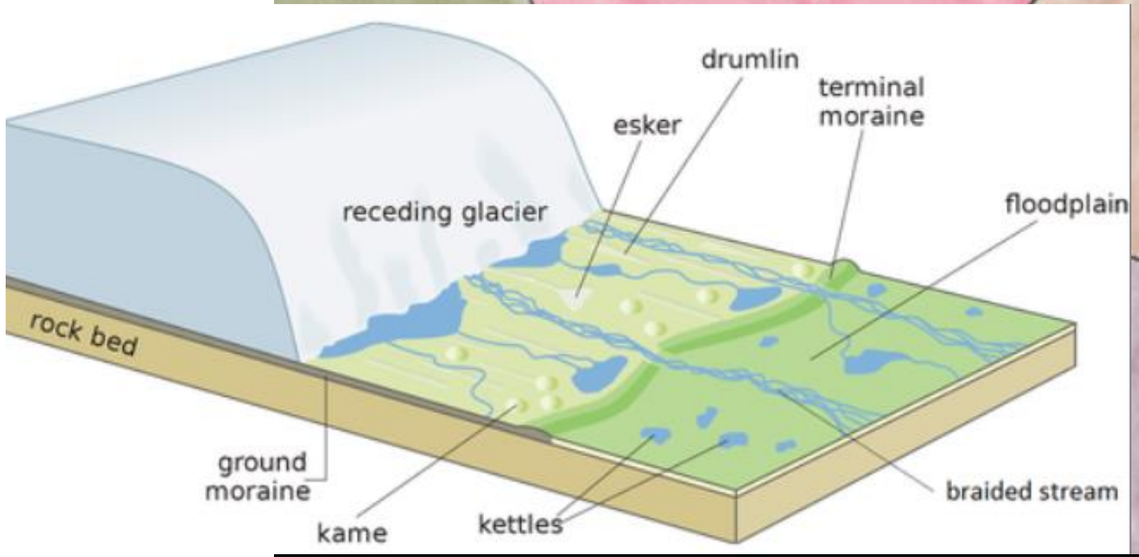
People of the Place of the Fire Nishnabe -Potawatomi

“Nippersink” – a place of small waters

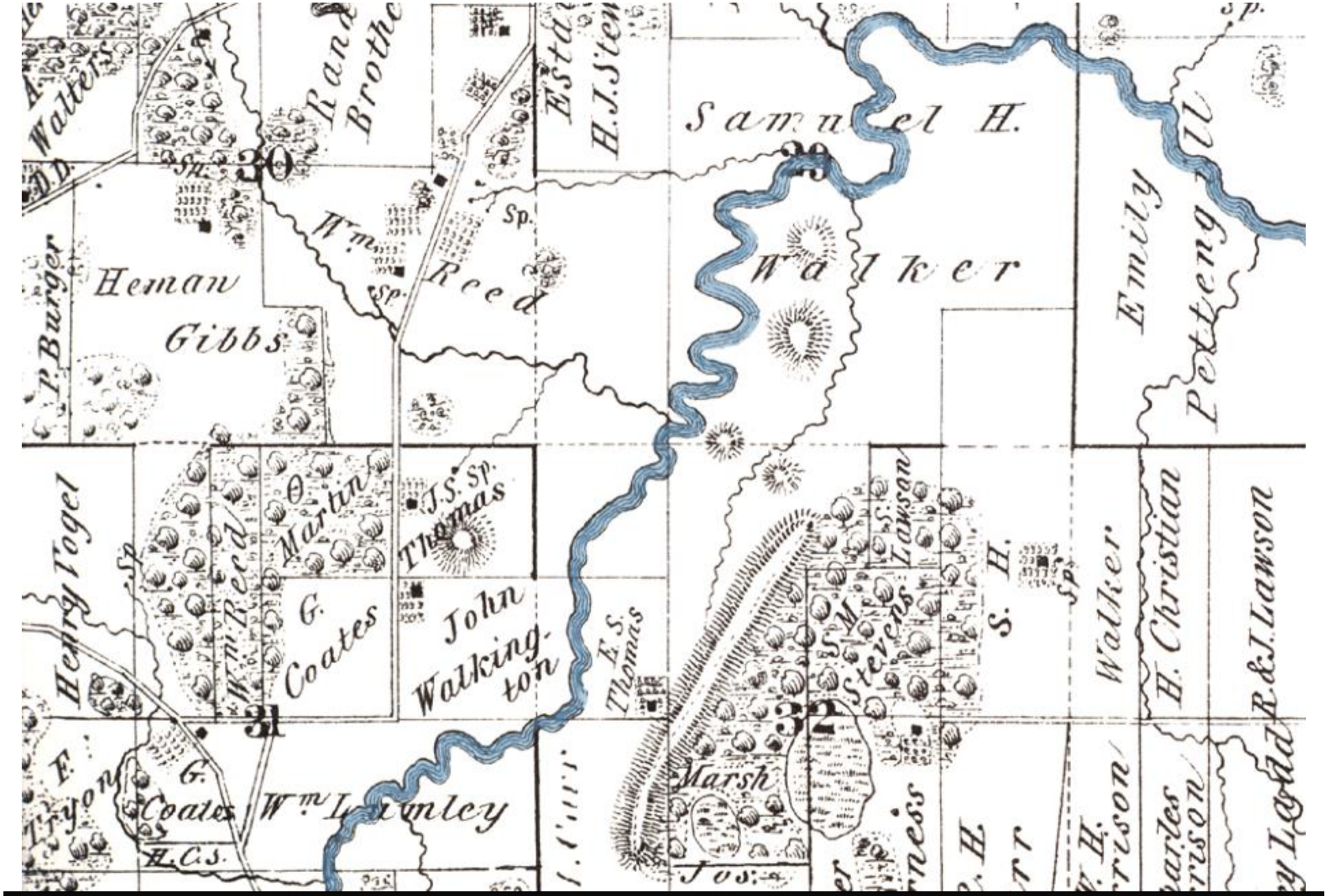
Buried under ICE



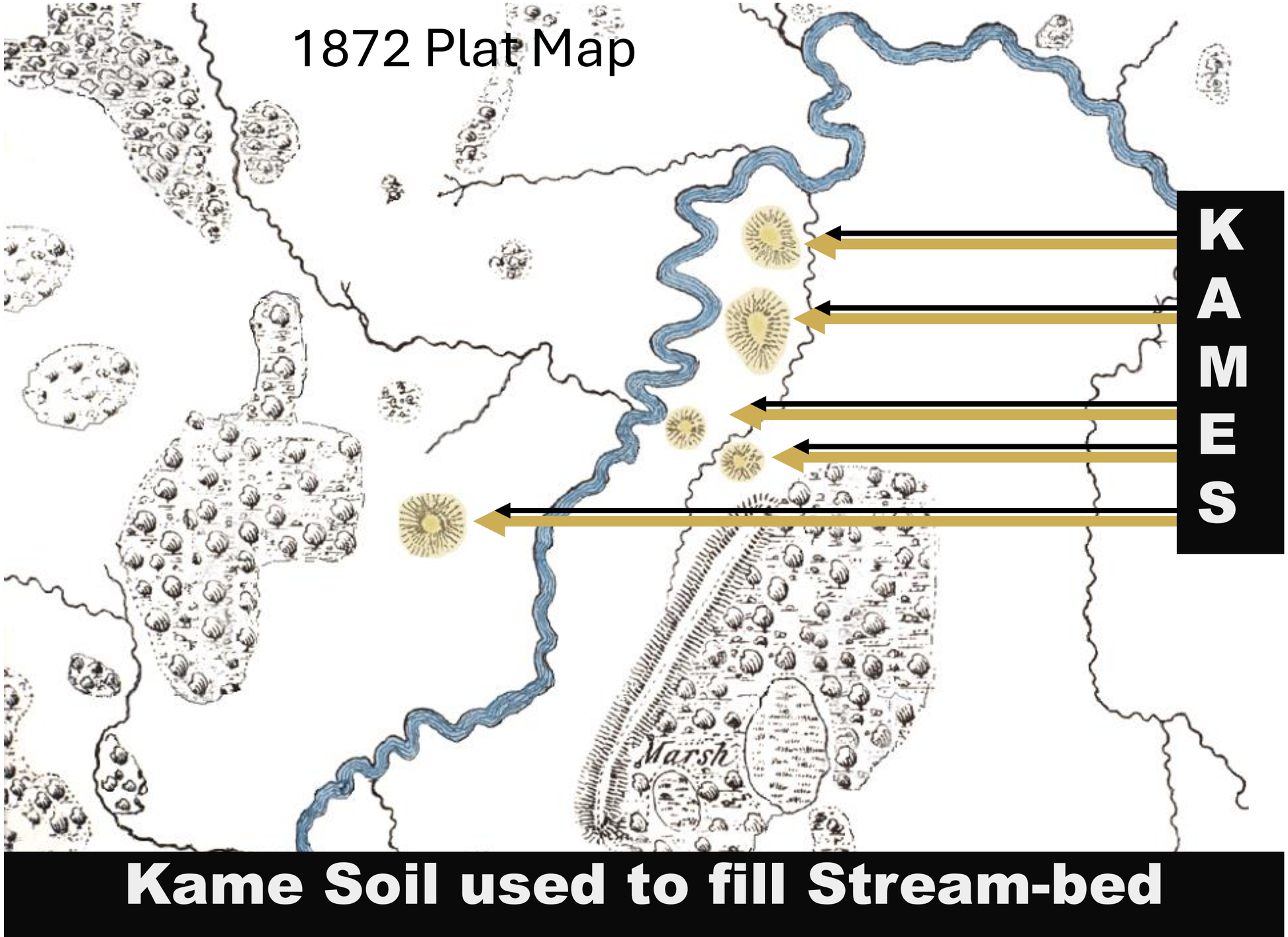
18,000 Years Ago



14,000 Years Ago



1872 Plat Map


1872 Plat Map
KAMES
Marsh
Kame Soil used to fill Stream-bed

Drainage Begins:

- Ditches Excavated
- Water Tables Lowered
- Waters Straightened
- Flows Expedited

Small waters

become subterranean

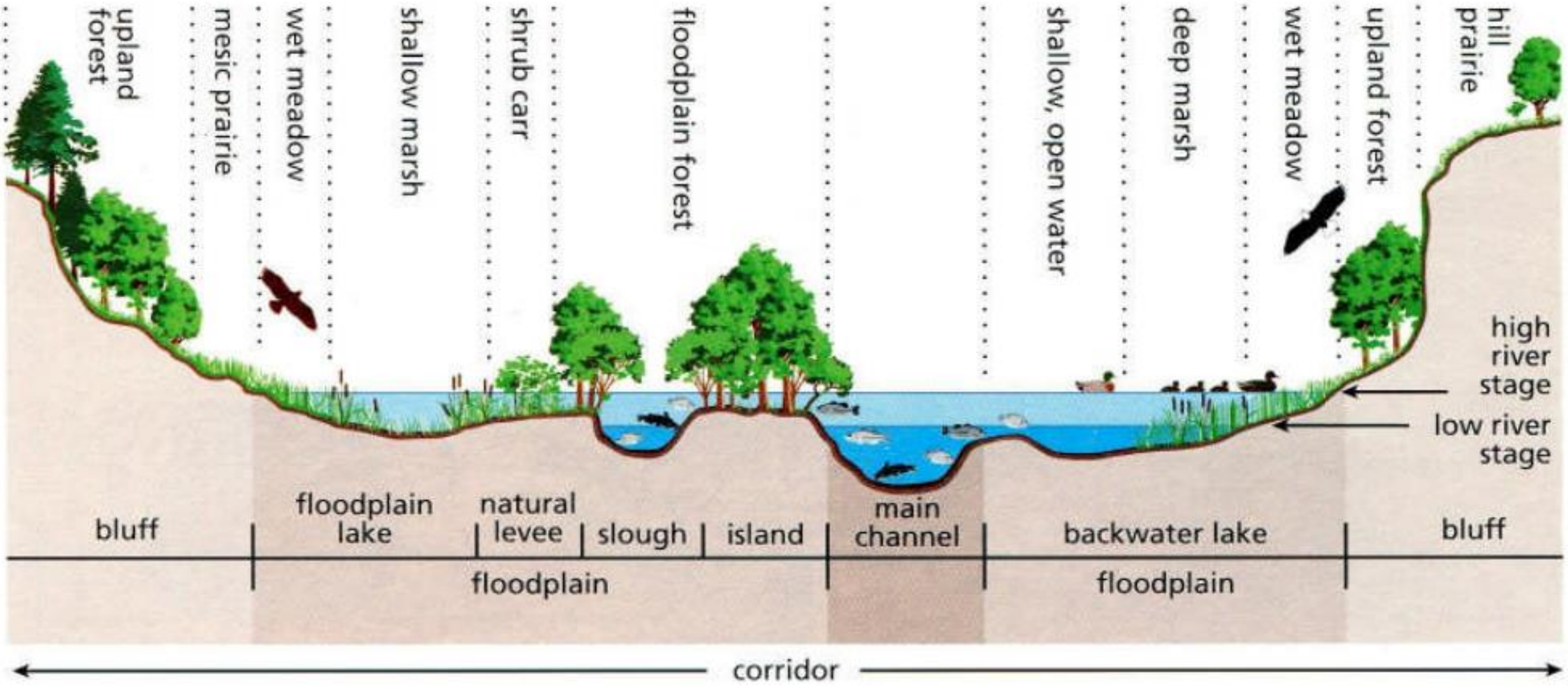
THE WETLANDS INITIATIVE

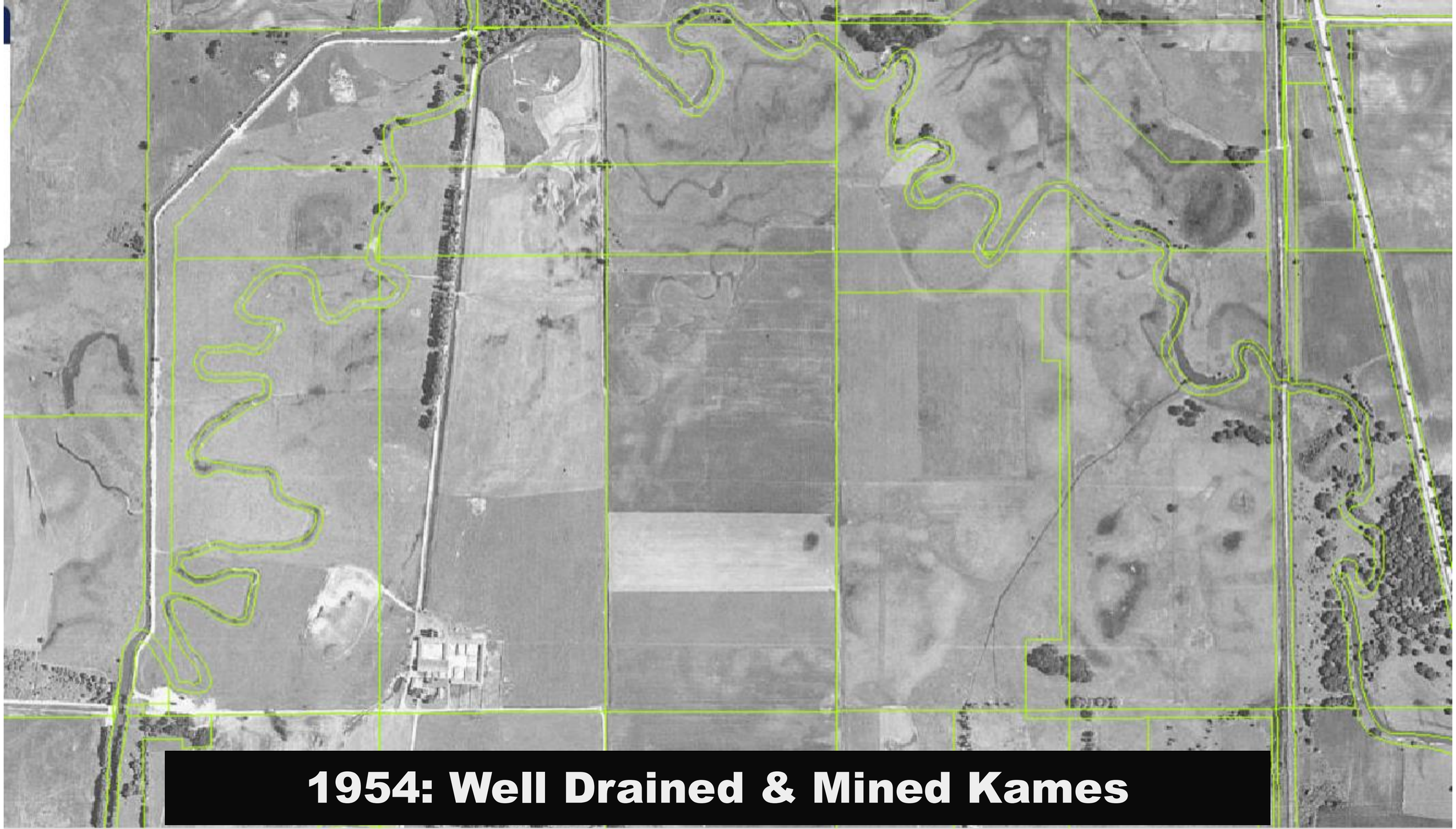
The Wetlands Initiative

estimates 1935 IL tile 6x globe

Riverine Cross Section

Milhous, et. al.





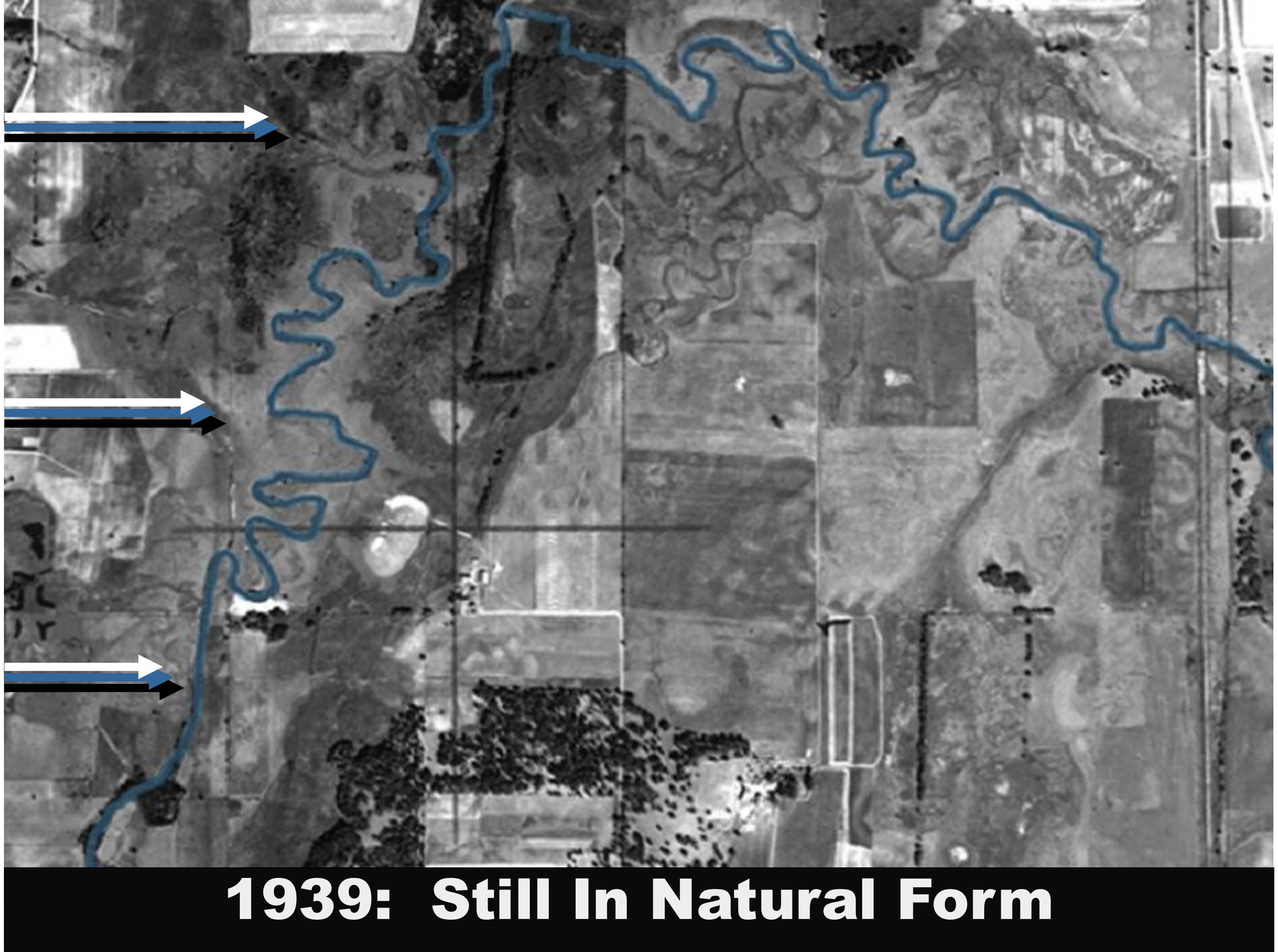
1954: Well Drained & Mined Kames

Agriculture Products Grown

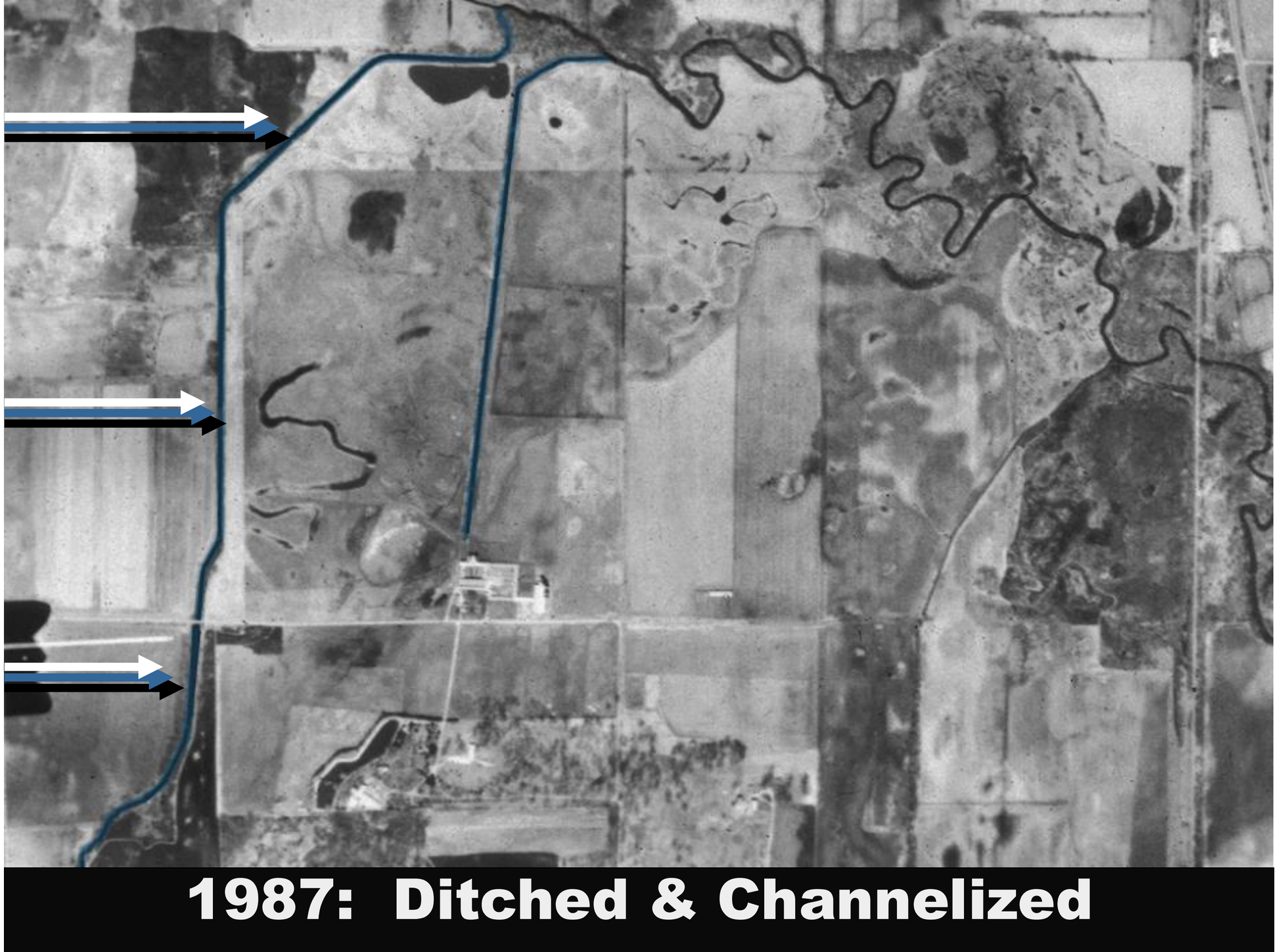
Agriculture Products Grown

Externalities:

- Water Quantity
- Flood Storage
- Water Supply
- Water Quality
- Biodiversity & Habitat



1939: Still In Natural Form



1987: Ditched & Channelized


Before


190E

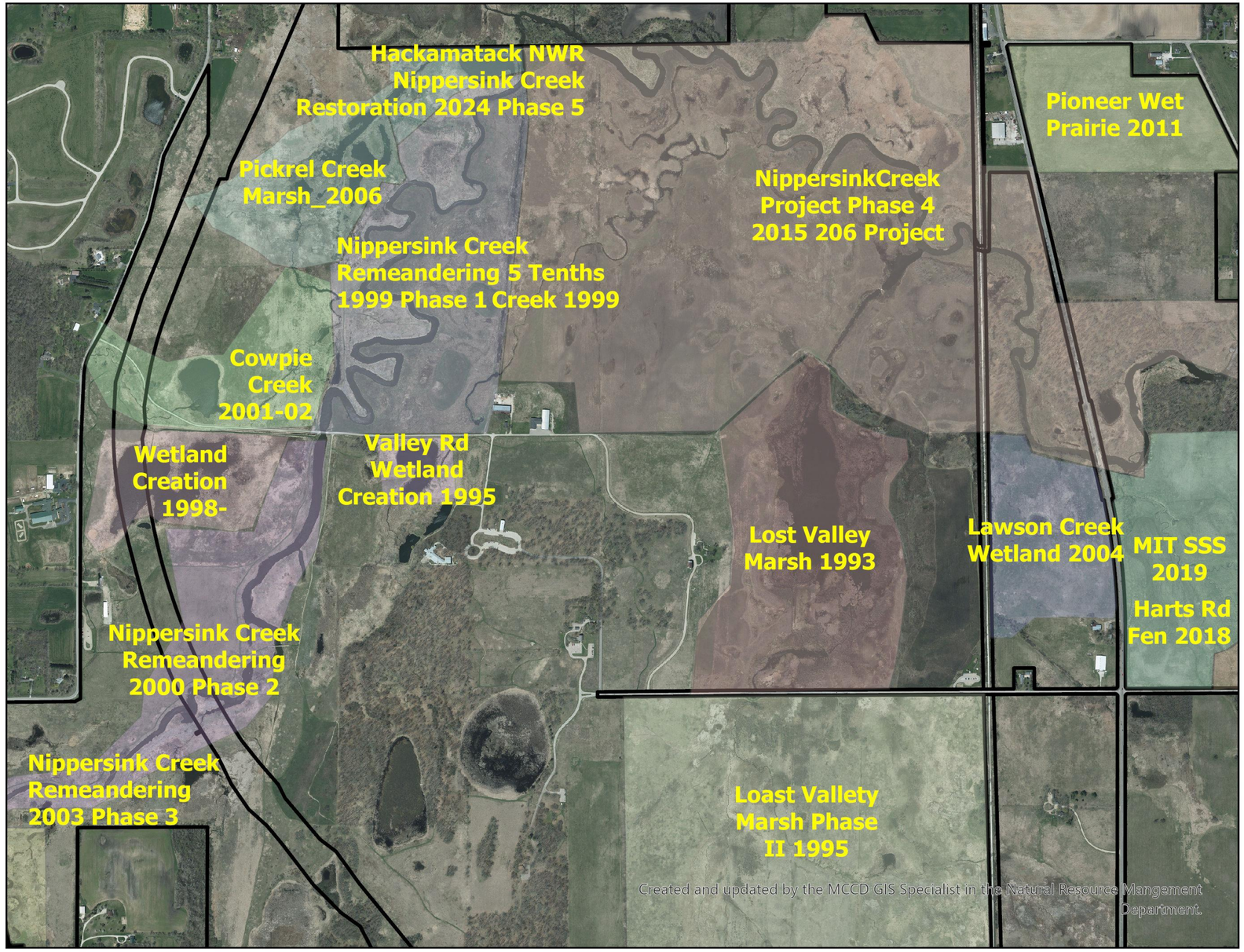

CAT
CATERPILLAR
CAT
CAT


After

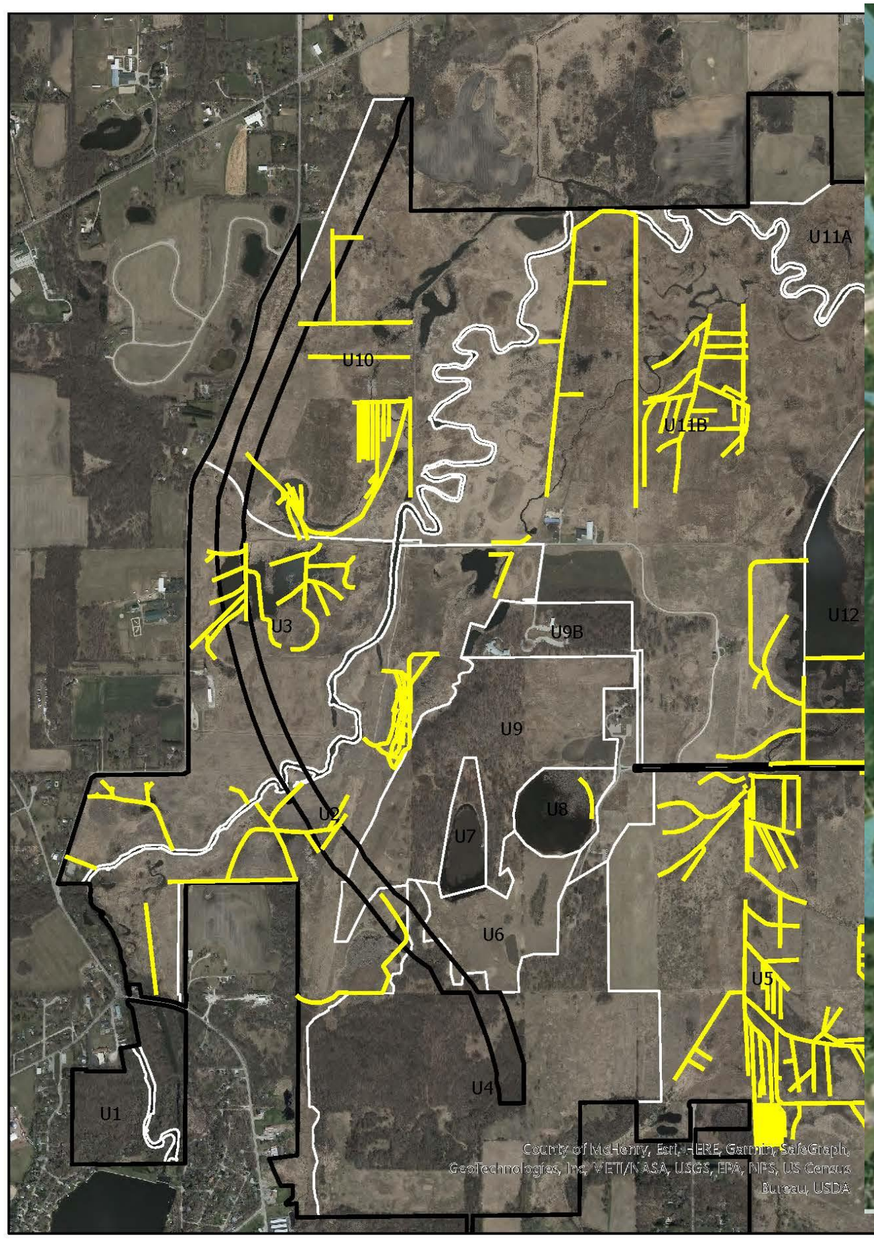

PHASE 1
PHASE 2
PHASE 3
After

N

Ecological Reference Projects Current Conditions
LRC -2022-00616

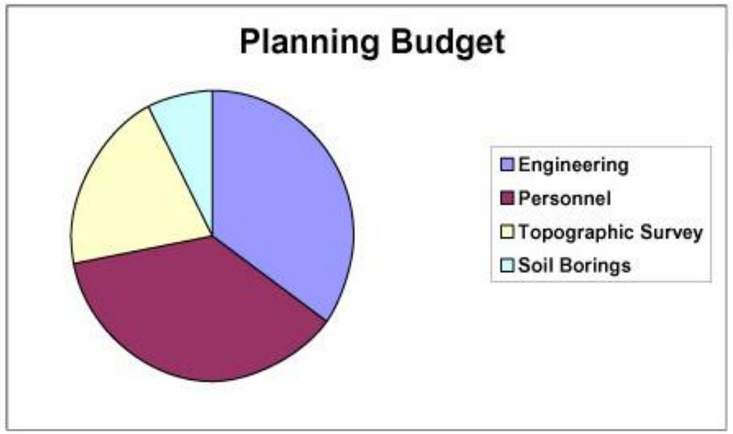


Glacial Park
Nippersink Project Tile removal



~2,000 Acres
~2 Billion Gallons

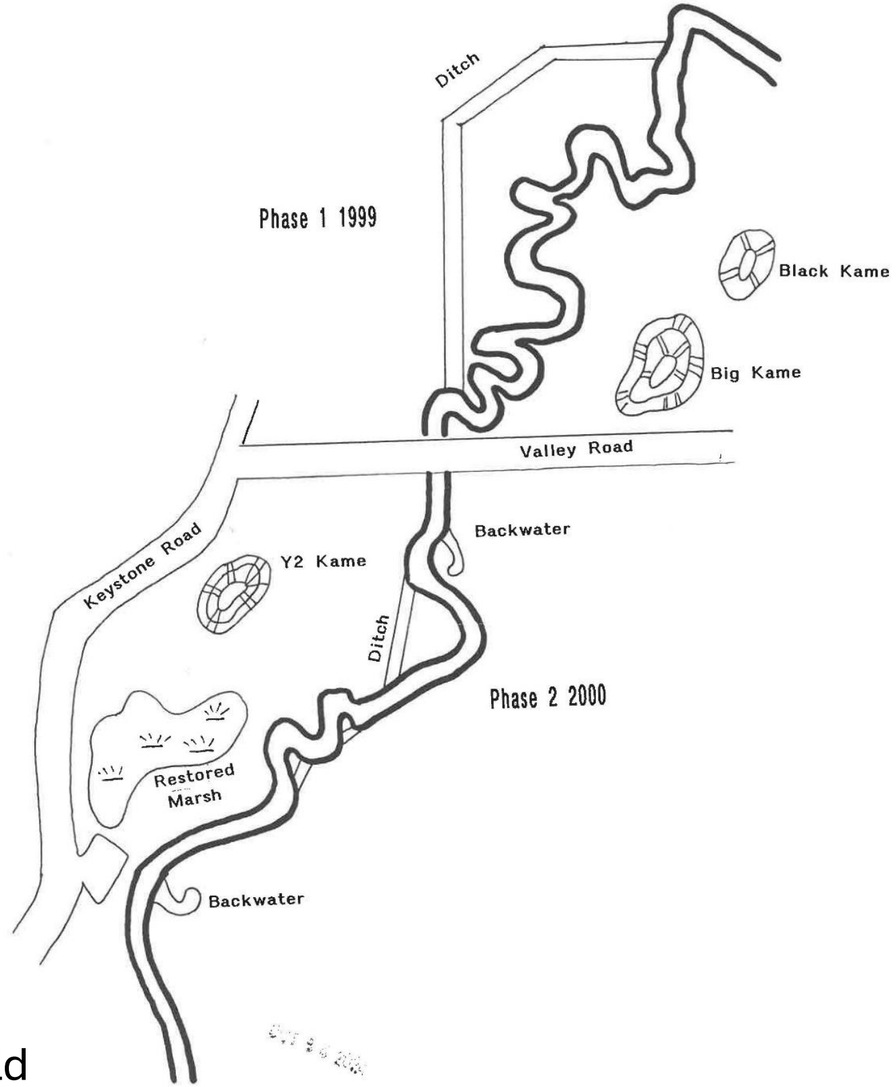
0 0.5 1 2 Miles



Engineering	$ 19,000
Personnel	$ 20,000
Topographic Survey	$ 11,300
Soil Borings	$ 4,000
Total	$ 54,300

Engineering was provided free of charge from the U.S. Army Corps of Engineers.
Personnl represents MCCD labor for all aspects of planning.

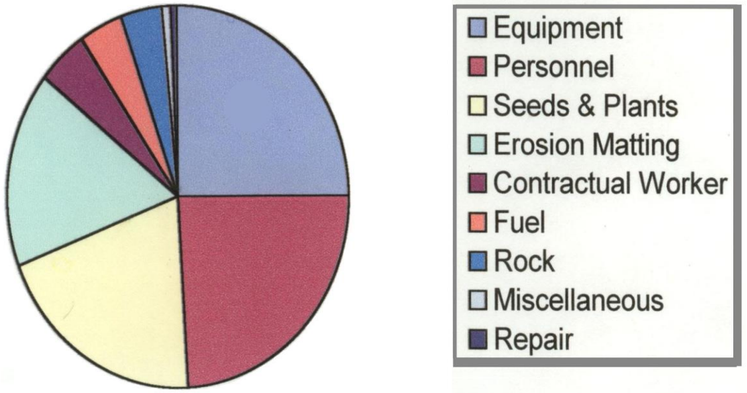
10,200 feet meander
5,200 feet grading
1,100-ton rock placed
165k cu yd soil moved-kame rebuild
1,200 tile removed
225,000 plugs
22 miles e-mat



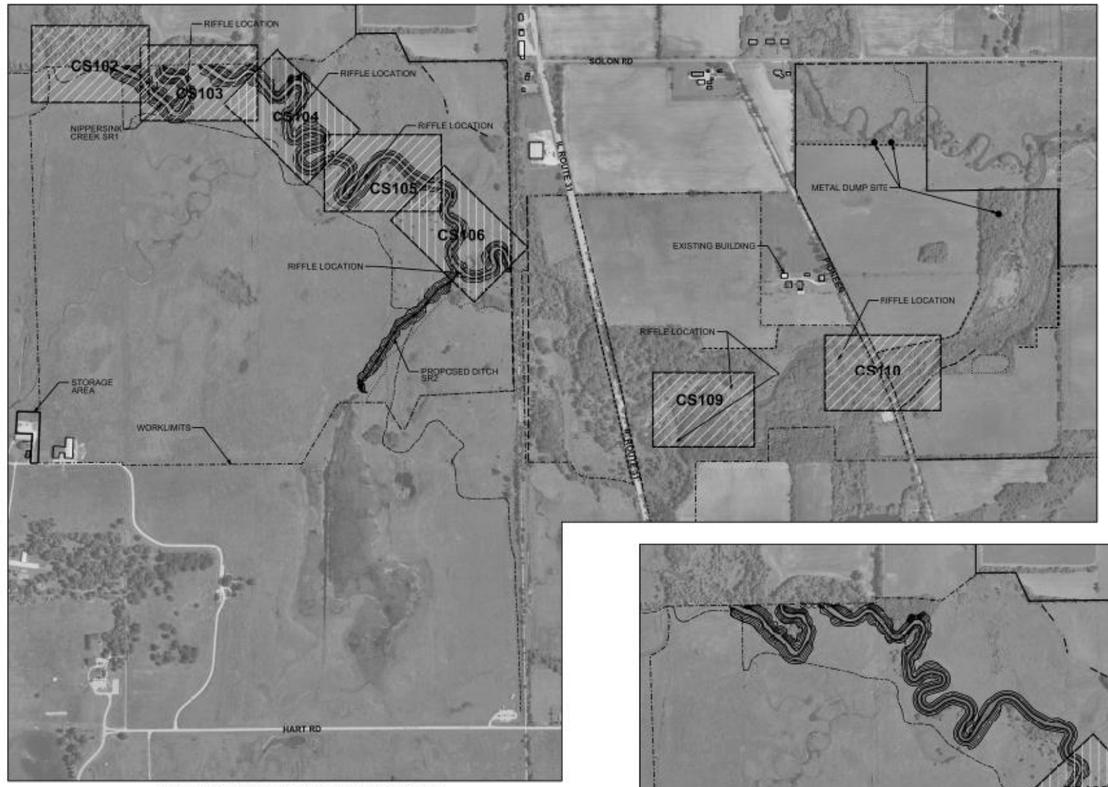
Nippersink Creek

Dechannelization Project

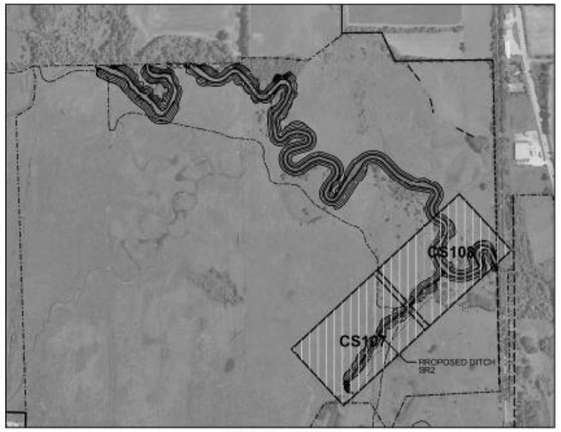
Implementation Budget



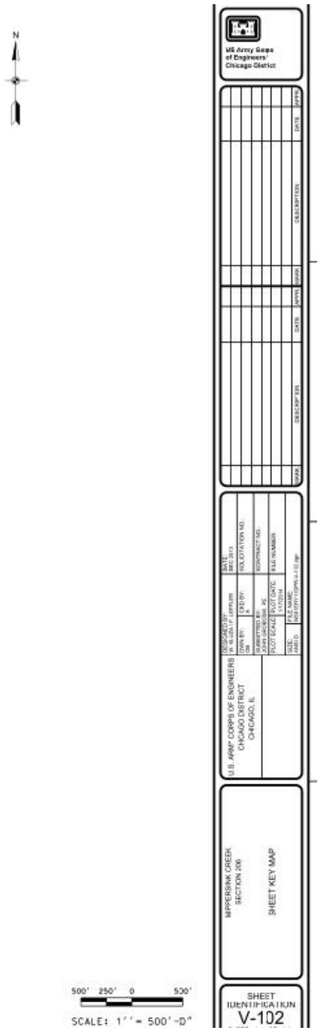
Equipment	$183,633
Personnel	$177,505
Seeds & Plants	$146,374
Erosion Matting	$122,191
Contractual Worker	$34,576
Fuel	$30,698
Rock	$26,879
Miscellaneous	$5,825
Repair	$5,000
Total	$732,681



SITE LAYOUT AND RIFFLE LOCATIONS ALONG NIPPERSINK CREEK



SWALE AND DITCH LAYOUT

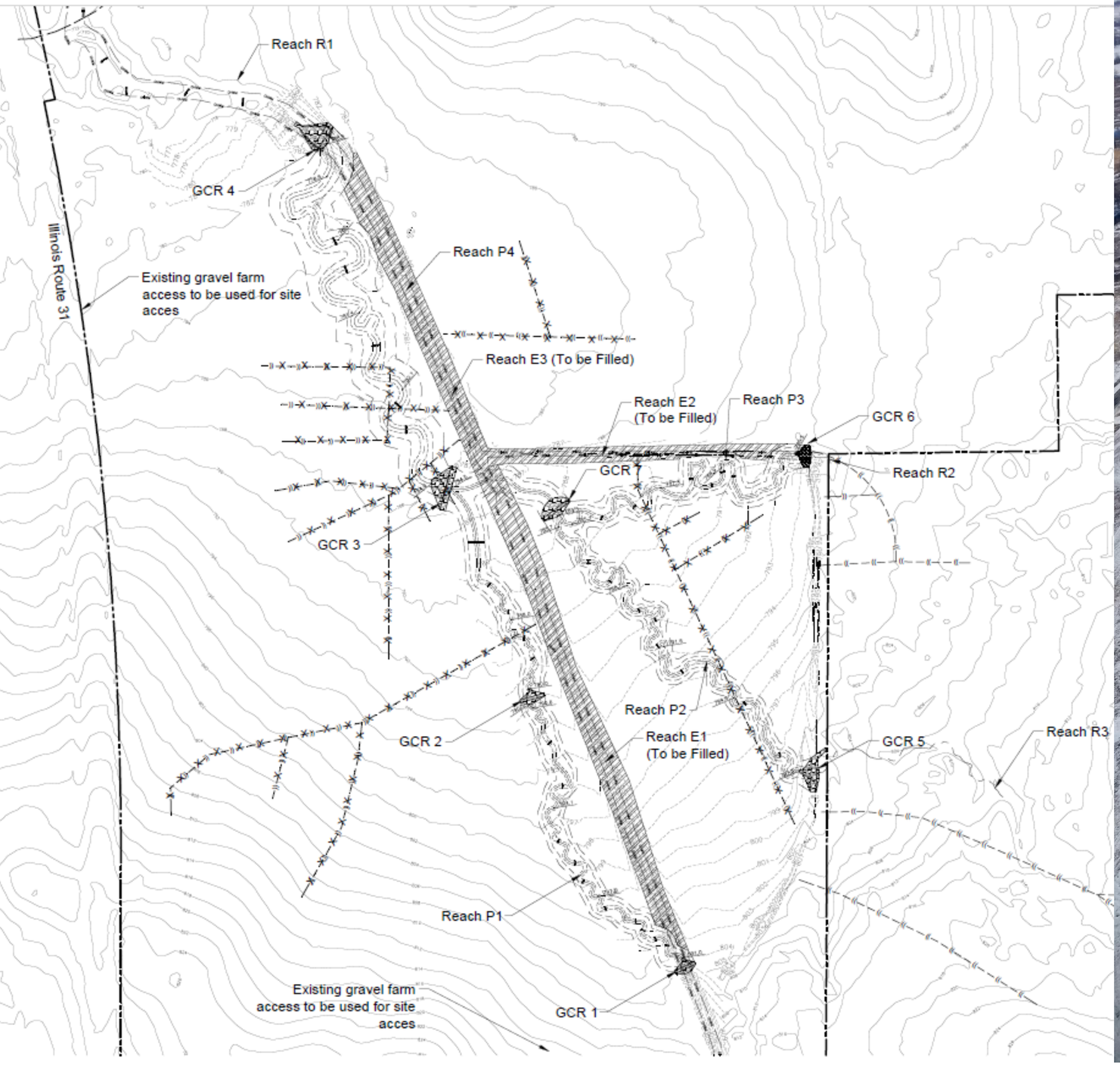


Nippersink Creek Aquatic Ecosystem Restoration Project:

Bank Grading 2:1 & 7 Riffle Installations
- -floodplain connection (2-4')

Ecological enhancement 550 acres:
- -275 acres sedge meadow
- -98 acres wet prairie
- -100 acres wet mesic savanna

NIPPERSINK CREEK 206 PROJECT COSTS	
	Amount ($)
Feasibility	138,000
P&S Plans & Specifications	100,000
Construction	4,665,570
LERRD Lands, Easements, ROW, Relocations, Disposals	2,600,000
Monitoring	25,000
TOTAL	7,528,570
NOTE: First $100,000 is 100% federally funded	
Total Shared project	7,428,570
Fed Share (65%)	4,828,571
Non Fed share (35%)	2,600,000
Total Fed	4,928,571
Total Non Fed	2,600,000


Reach R1
GCR 4
Illinois Route 31
Existing gravel farm access to be used for site acces
Reach P4
Reach E3 (To be Filled)
Reach E2 (To be Filled)
Reach P3
GCR 6
GCR 7
Reach R2
GCR 3
Reach P2
Reach E1 (To be Filled)
GCR 2
GCR 5
Reach R3
Reach P1
Existing gravel farm access to be used for site acces
GCR 1

School Springs Stream & Wetland Mitigation Bank

Project: Restore 5,035 Linear Feet Stream & 30 acres of wetland (20) and prairie (10)

Expeditures	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**Totals To Date**
Engineering	$ 26,197.39	$ 5,325.00	$ 617.30						$ 32,139.69
Seed	$ 29,512.73	$30,796.00	$ 5,098.16	$19,321.31	$ 19,935.00				$ 104,663.20
HydroMonitor	$ 5,041.48	$ 168.28		$ 809.82					$ 6,019.58
Construction & Materials		$11,100.00							11,100.00
Invasives Mgt		$ 3,651.16	$14,996.50	$29,988.00	$ 28,421.76	$ 24,999.80	$ 24,945.00	$ 25,000.00	152,002.22
Est. Staff Costs w/ benefit	$ 10,000.00	$65,000.00	$32,000.00	$32,000.00	$ 34,000.00	$ 35,000.00	$ 36,000.00	$ 36,000.00	$ 280,000.00
									$ 585,924.69
Revenues									
Stream					$218,400.00	$180,000.00	$ 74,880.00	$ 178,620.00	$ 651,900.00
Wetland					$ 74,880.00	$302,880.00		$ 624,000.00	$ 1,001,760.00
									$ 1,653,660.00
								Net:	**$ 1,067,735.31**
Unrealized Gains	**Current Cost Per Unit**						**Currently Available**	**Est. Performance Dependent**	
Stream (feet)	$ 780.00						1781	2265	$ 1,766,700.00
Wetland (acre)	$124,800.00						0	10.51	$ 1,311,648.00
									$ 3,078,348.00

$10,000 Engineering-Permit Denied

Ecosystem Engineering:

-Political Capital

-“Nuisance Wildlife” response

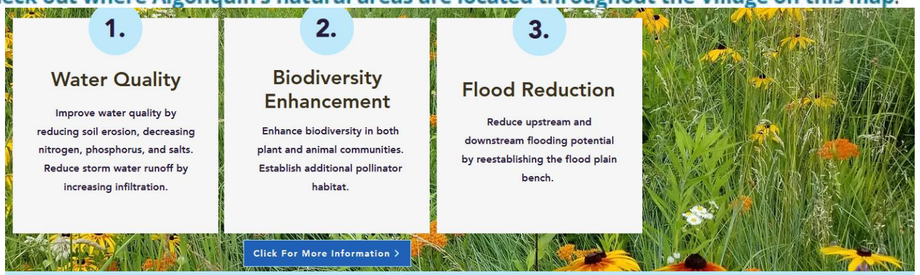
NATURAL AREA MAINTENANCE & CONSERVATION

SINCE 2000, ALGONQUIN HAS RETAINED OVER 750 ACRES OF NATURAL SPACE AND ACTIVELY MANAGED AND RESTORED MORE THAN 400 ACRES.

The Village of Algonquin is dedicated to preserving our environment and responsibly managing essential natural resources, such as groundwater, wetlands, and watersheds.

These efforts have contributed to a positive response from nearly 85% of residents in the **Algonquin Community Survey** regarding the preservation of natural areas.

Check out where Algonquin's natural areas are located throughout the Village on this map.



Before & After Restoration

BENEFITS OF ECOLOGICAL RESTORATION

VILLAGE OF ALGONQUIN

THE VILLAGE OF ALGONQUIN

owns and actively maintains over 750 acres of preserved open space. Over the past 25 years, over 400 of those acres have been restored utilizing plant species native to the state of Illinois. There are many benefits of our naturalization program.

Gaslight Park Bird and Butterfly Sanctuary

WATER QUALITY BENEFITS

- Reduction of nutrients and pollutants in stormwater runoff
- Increased Infiltration to Shallow Aquifers
- Erosion Control
- Flood Control

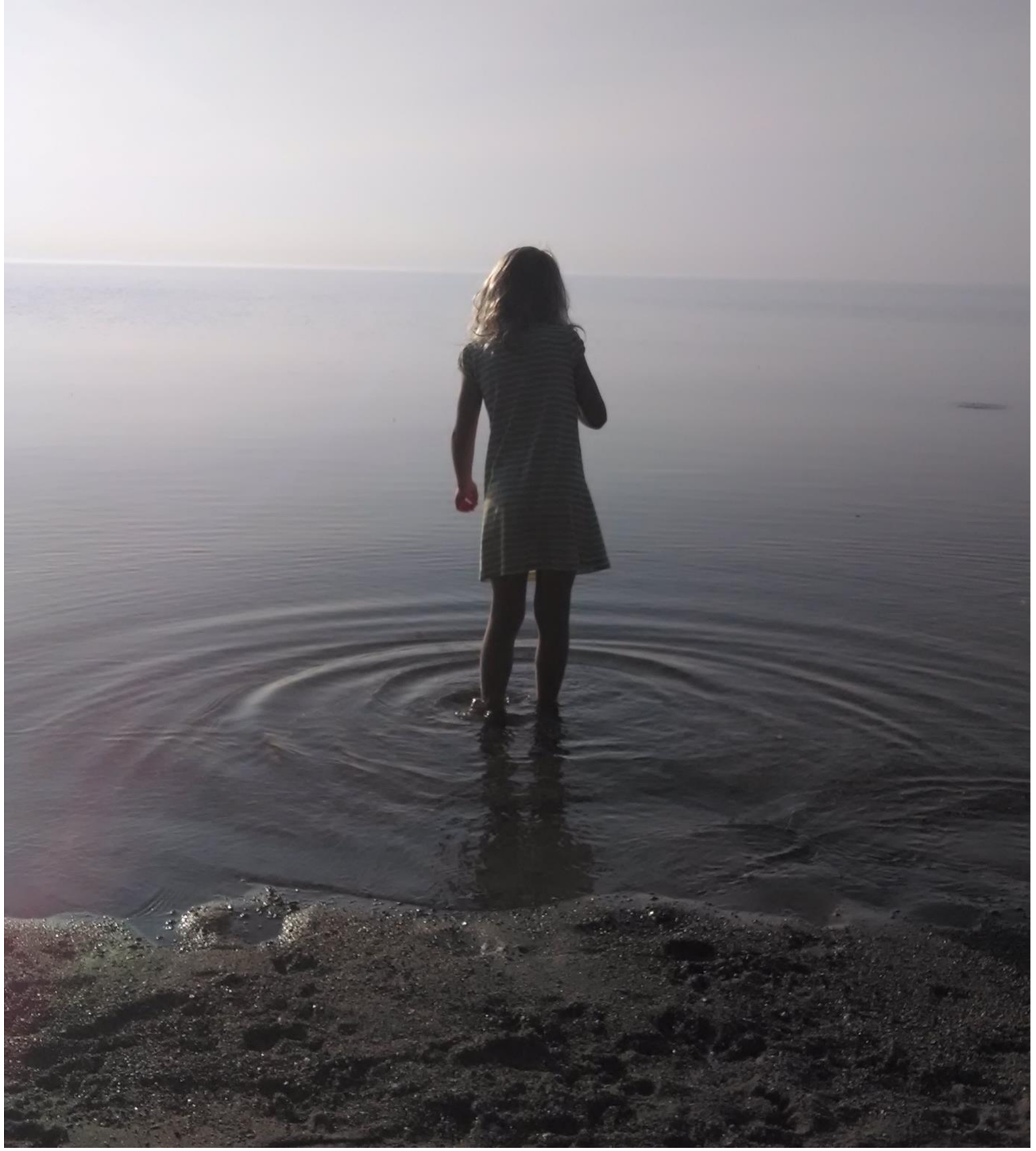
ENVIRONMENTAL BENEFITS

- Increased carbon sequestration
- Increased habitat for native insects and animals
- Increased biodiversity
- Expand and protect our rare native ecosystems
- Improved soil health

CULTURAL ECOSYSTEM SERVICES

- Improved aesthetics of restored areas
- Additional passive recreation opportunities
- Increased property values adjacent to restored natural areas

Big Dreams: Hope for Small Waters



Bridging Conservation & Hazard Mitigation Planning

Leveraging Partnerships and Tools to Secure Funding and Develop Policy

Environmental Law Institute Workshop

August 3, 2025

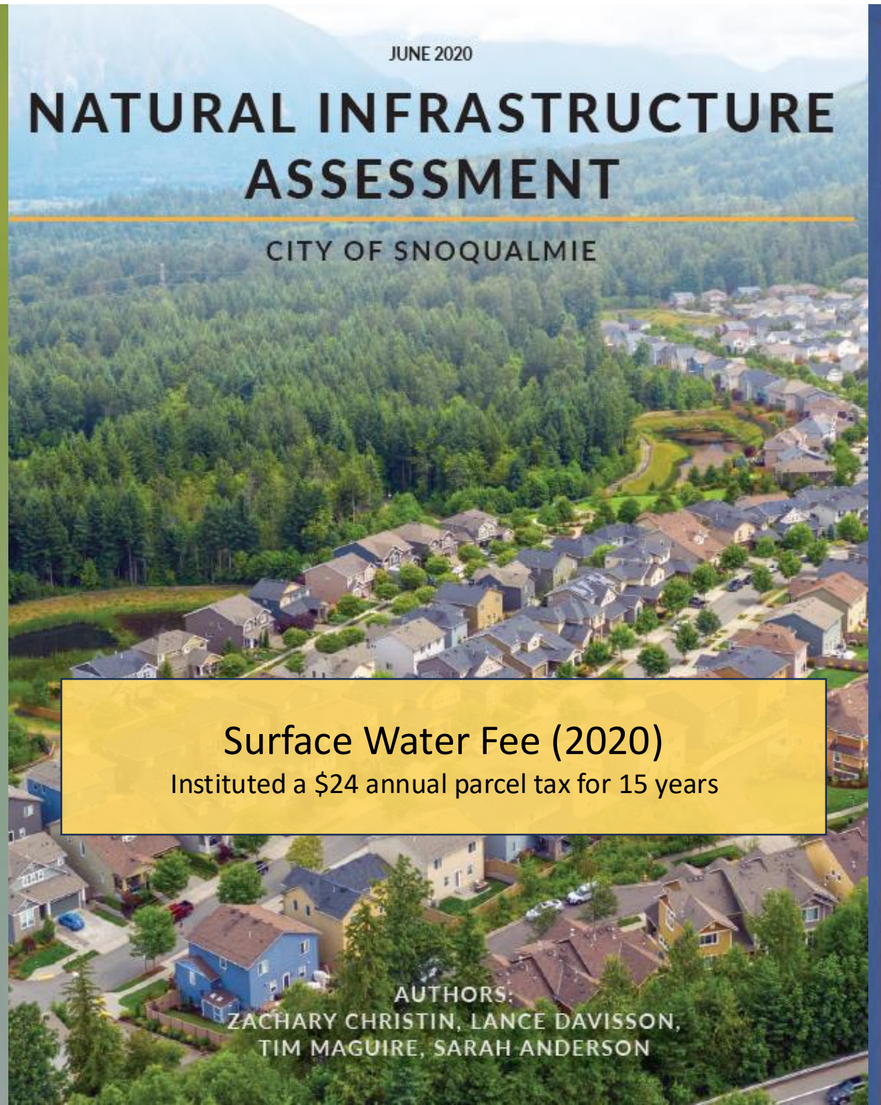
Equilibrium Economics

Pairing Hazard Planning with Policy

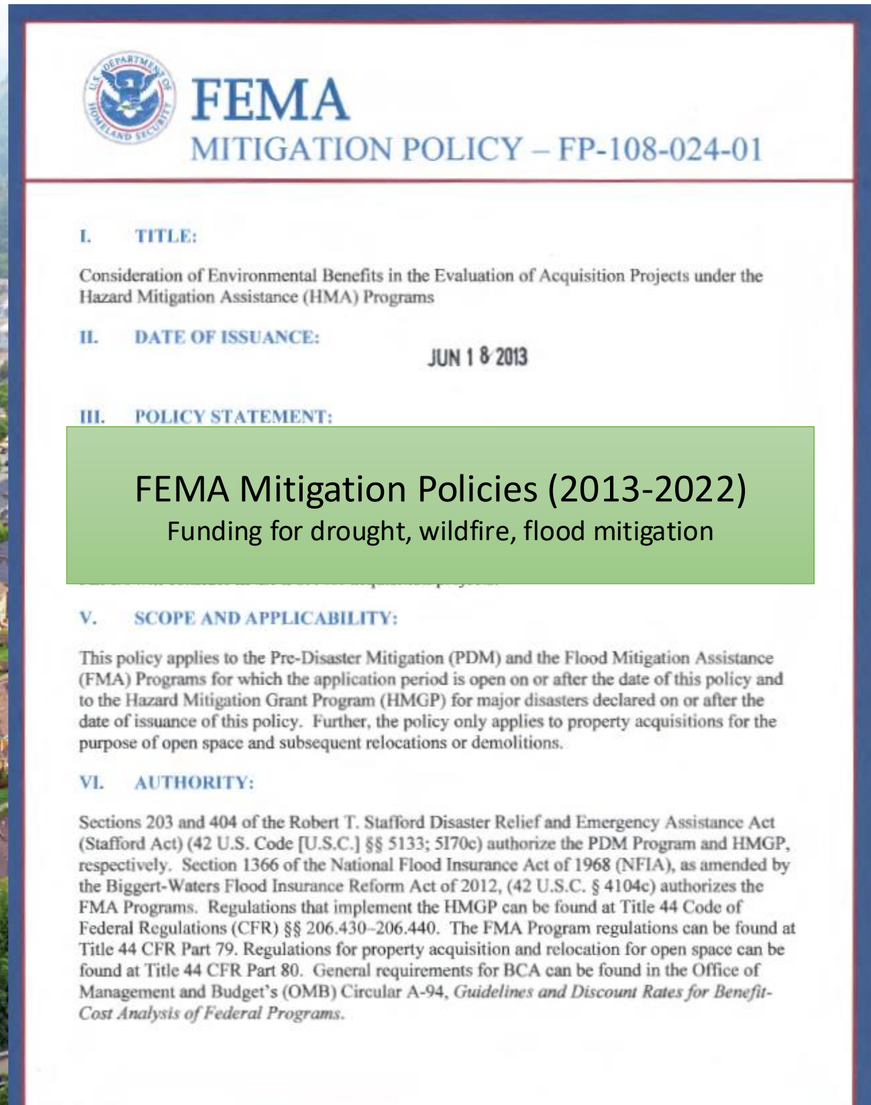
Leveraging tools and activating partnerships

Partnerships, Funding, and Policy Case Studies

Measure Q – Parcel Tax (2014)
Instituted a $24 annual parcel tax for 15 years



Surface Water Fee (2020)
Instituted a $24 annual parcel tax for 15 years


FEMA
MITIGATION POLICY – FP-108-024-01

I. TITLE:

Consideration of Environmental Benefits in the Evaluation of Acquisition Projects under the Hazard Mitigation Assistance (HMA) Programs

II. DATE OF ISSUANCE:

JUN 18 2013

III. POLICY STATEMENT:

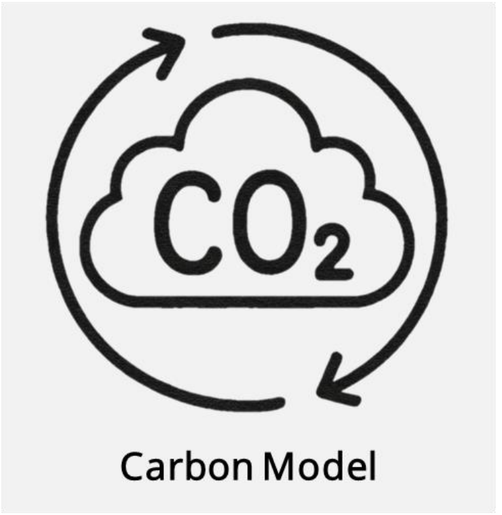
V. SCOPE AND APPLICABILITY:

This policy applies to the Pre-Disaster Mitigation (PDM) and the Flood Mitigation Assistance (FMA) Programs for which the application period is open on or after the date of this policy and to the Hazard Mitigation Grant Program (HMGP) for major disasters declared on or after the date of issuance of this policy. Further, the policy only applies to property acquisitions for the purpose of open space and subsequent relocations or demolitions.

VI. AUTHORITY:

Sections 203 and 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (42 U.S. Code [U.S.C.] §§ 5133; 5170c) authorize the PDM Program and HMGP, respectively. Section 1366 of the National Flood Insurance Act of 1968 (NFIA), as amended by the Biggert-Waters Flood Insurance Reform Act of 2012, (42 U.S.C. § 4104c) authorizes the FMA Programs. Regulations that implement the HMGP can be found at Title 44 Code of Federal Regulations (CFR) §§ 206.430–206.440. The FMA Program regulations can be found at Title 44 CFR Part 79. Regulations for property acquisition and relocation for open space can be found at Title 44 CFR Part 80. General requirements for BCA can be found in the Office of Management and Budget's (OMB) Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs.*

FEMA Mitigation Policies (2013-2022)
Funding for drought, wildfire, flood mitigation



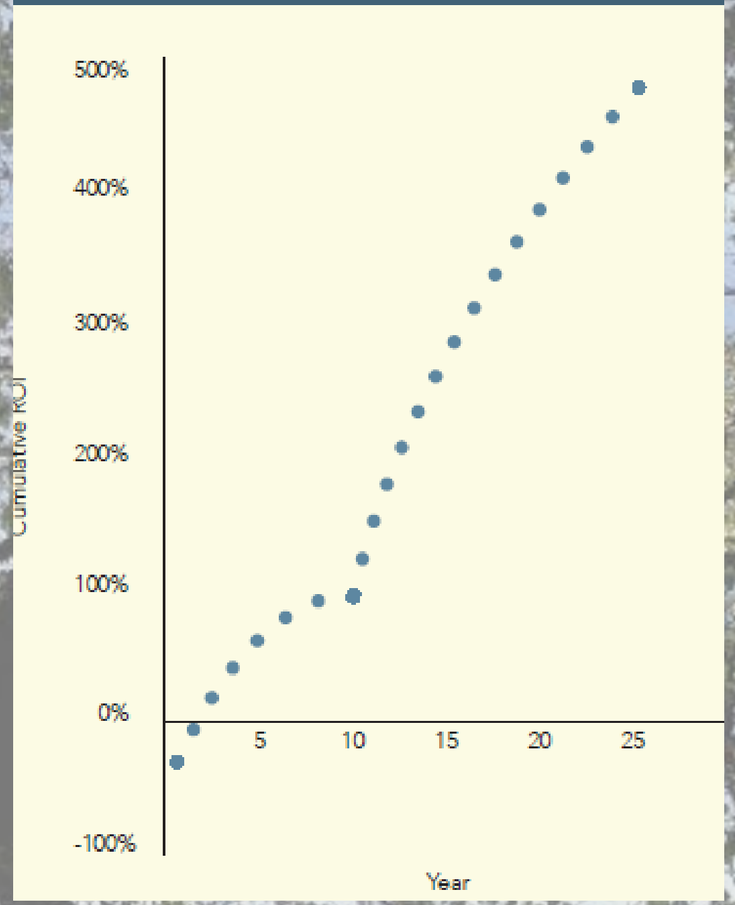
Ecosystem Service Framework

Case Study: Conservation District of Santa Cruz

TABLE 8: Summary of Bokariza MAR ROI Results

Cumulative Costs	Year 1	Year 5	Year 10	Year 15	Year 20	Year 25
Maintenance Costs	$5,000	$25,000	$50,000	$75,000	$100,000	$125,000
One-time Costs	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000
Opportunity Costs	$15,224	$76,120	$152,240	$228,360	$304,480	$380,600
TOTAL	$90,224	$171,120	$272,240	$373,360	$474,480	$575,600
Cumulative Benefits	**Year 1**	**Year 5**	**Year 10**	**Year 15**	**Year 20**	**Year 25**
Water Supply	$49,590	$247,950	$495,900	$1,406,250	$2,316,600	$3,226,950
Flood Control	$446	$2,230	$4,460	$6,690	$8,920	$11,150
Habitat	$960	$4,800	$9,600	$14,400	$19,200	$24,000
Total	$50,996	$254,980	$509,960	$1,427,340	$2,344,720	$3,262,100
TOTAL	$50,996	$254,980	$509,960	$1,427,340	$2,344,720	$3,262,100
Cumulative ROI	**Year 1**	**Year 5**	**Year 10**	**Year 15**	**Year 20**	**Year 25**
	-43%	49%	87%	282%	394%	467%

FIGURE 7: Cumulative Return on Investment of Bokariza MAR over Years 1-25



Case Study: Conservation District of Santa Cruz

SC3

Policy: Measure Q

Santa Cruz County-wide parcel tax
$87 annual per parcel
$7.5M per year

Case Study: City of Snoqualmie

TOTAL ANNUAL VALUE OF ECOSYSTEM SERVICES PROVIDED BY THE CITY-OWNED PORTION OF SNOQUALMIE'S URBAN FOREST:

Ecosystem Service	Low	High
Stormwater Retention	$5,760,484	$7,079,149
Carbon Sequestration	$45,820	$81,213
Water Quality	$57,472	$147,305
Total	$5,863,776	$7,307,668

$5.8M

TO

$7.3M

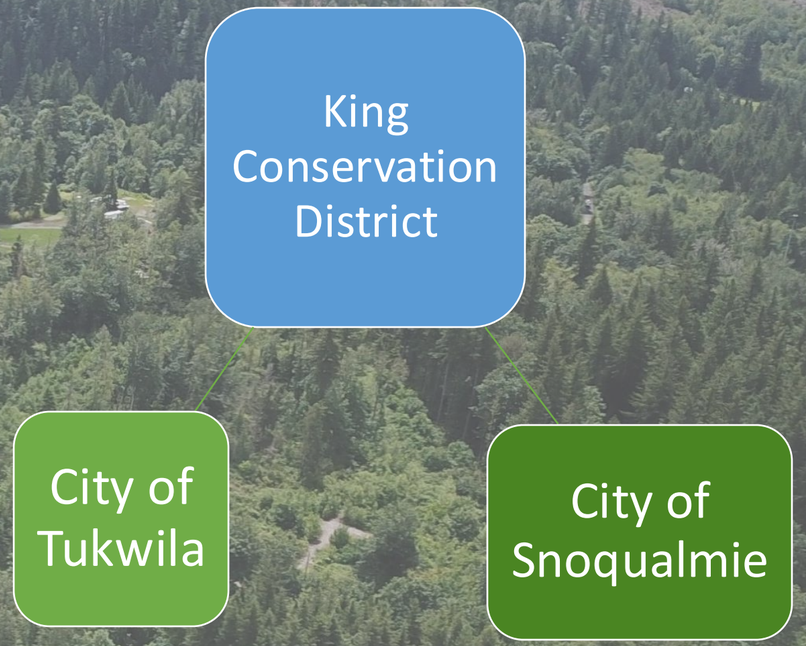
ANNUAL DOLLAR VALUE (IN MILLIONS) OF EVALUATED GOODS AND SERVICES GENERATED BY PUBLIC FORESTS

Case Study: City of Snoqualmie

Policy: Ordinance 1198 Amendment

Expanded the list of eligible utility-funded activities to include forest management

+$4.7M to +$5.7M increased funding from the stormwater fee increase



Case Study: Hazard Mitigation Applications

FEMA

June 2013

Mitigation Policy FP-108-024-01

2013 Introduction of ecosystem services in PDM and HMA grants using BCA tool

2016 Creation of Climate Resilient Mitigation Activities enabling water storage (aquifer storage) valuations

2017 Drought and wildfire mitigation projects become valid as CRMAs

2021 FEMA updates original 2013 values for more robust valuation and inclusion of more land cover types

Examples of CD Collaboration in Hazard Mitigation

PDM 2023

Shoreline, flood & groundwater resilience

City of Snohomish

Snohomish CD

HMGP PDM 2022

Watershed restoration & flood planning

King County

King CD

PDM 2019

Wildfire fuel reduction

UC Santa Cruz

Coastal San Luis RCD

HMGP PDM 2023

Multi-jurisdiction hazard mitigation planning

Washington County, OR

Multiple Water Districts

Other Applications of Ecosystem Service Framework

- Asset Management: Capital Investment Portfolio and Operating Budgets
- Risk Modeling: Monetizing Risk Abatement with BMPs
- Compost Program: Return on Investment of Compost and Biosolids Applications
- Tree Regulation: Using Ecosystem Service Value to Inform Tree Canopy Management and Critical Areas

Zachary Christin
Equilibrium Economics
Zchristin@eqmecon.com
(253) 282-2664

Thank you

Equilibrium Economics

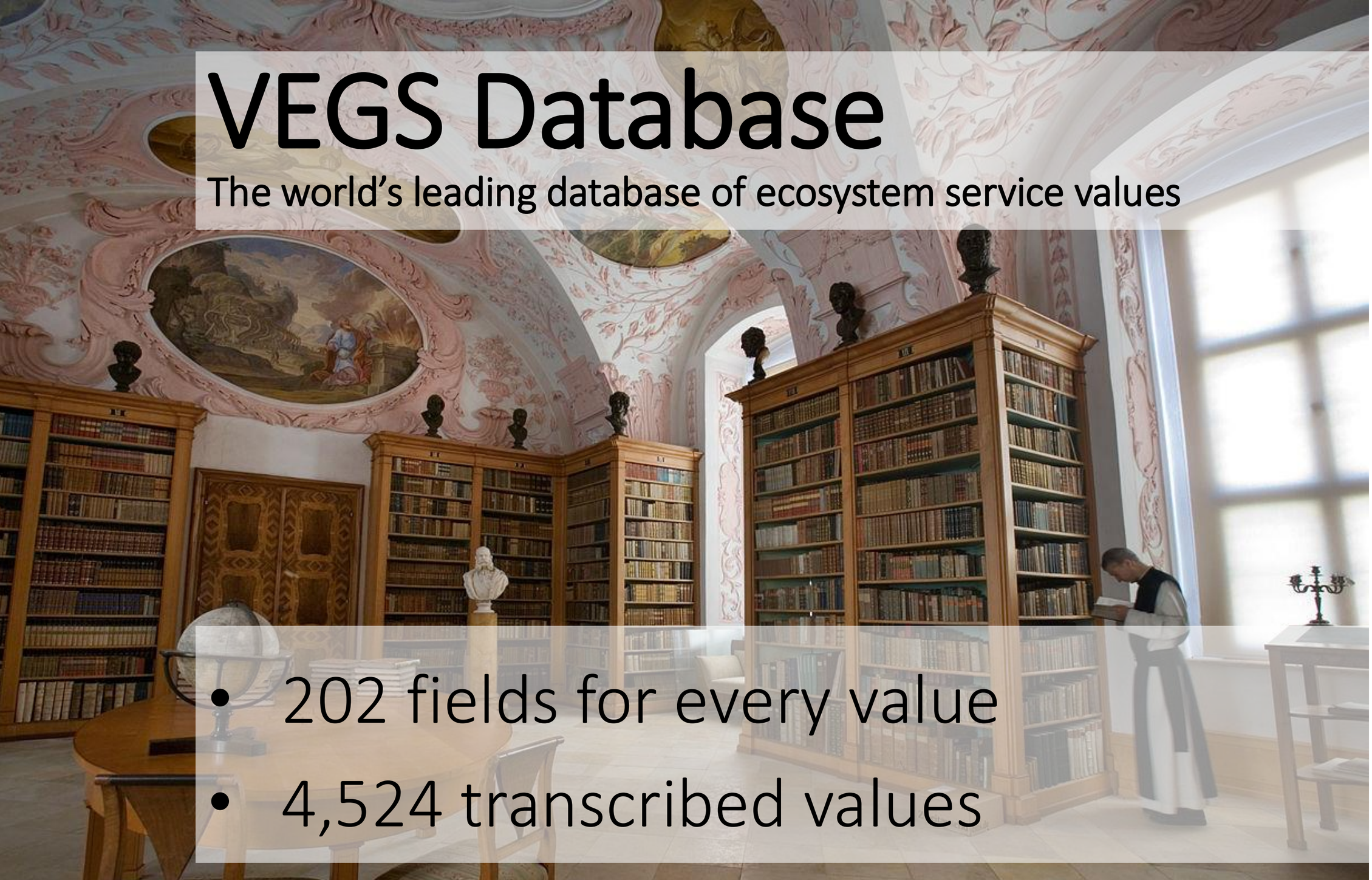
Backup

Ecosystem Service Model

Benefit Transfer Methodology

"…estimating nonmarket economic value by transferring available information from original studies already completed to the policy site."

USGS – Benefit Transfer Toolkit



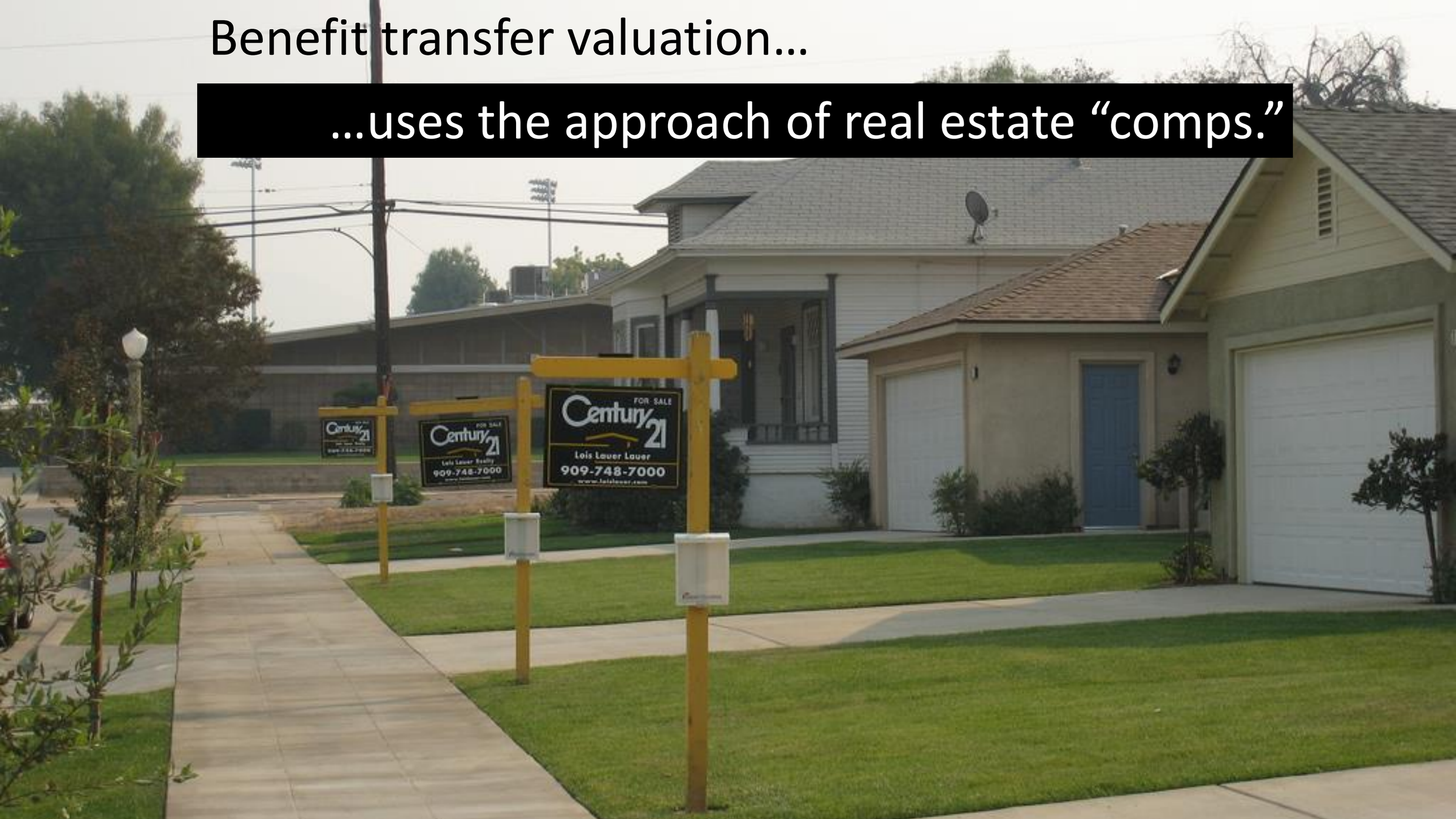
VEGS Database

The world's leading database of ecosystem service values

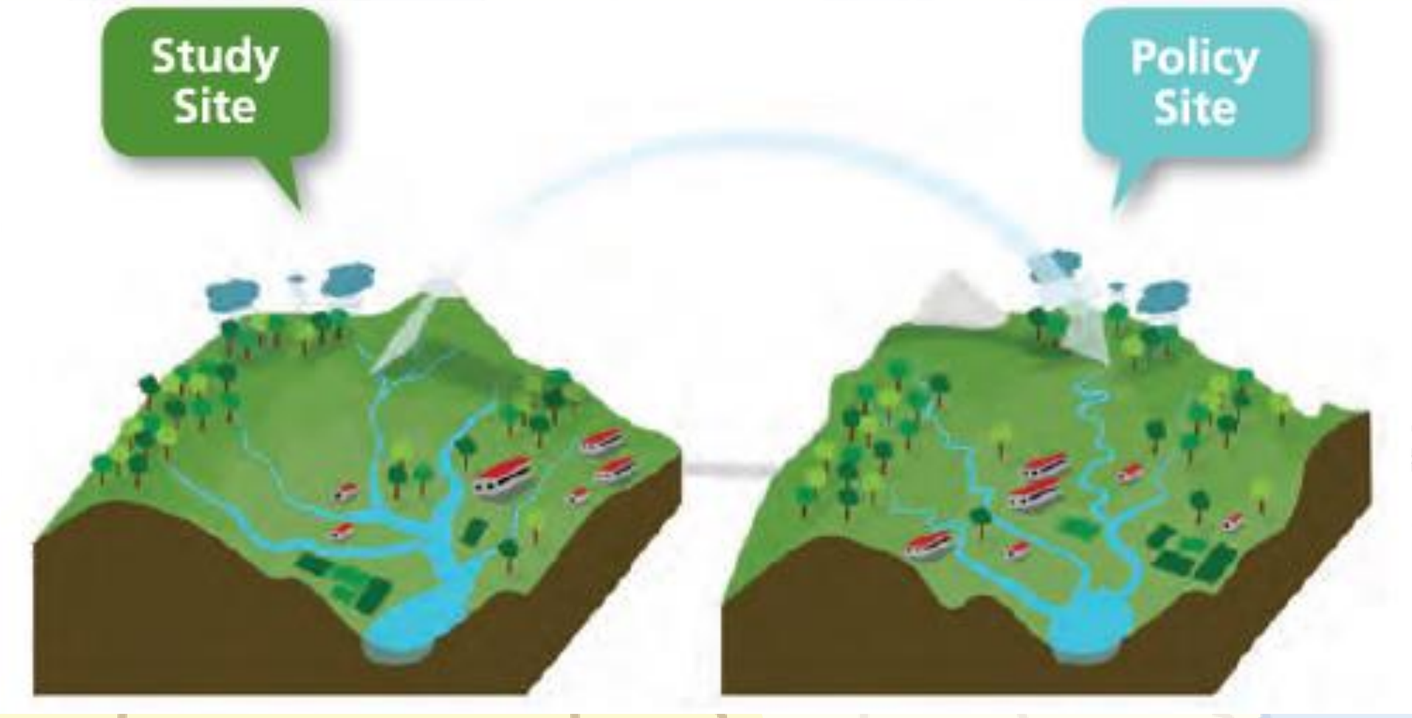
- 202 fields for every value
- 4,524 transcribed values

Benefit transfer valuation…

…uses the approach of real estate “comps.”



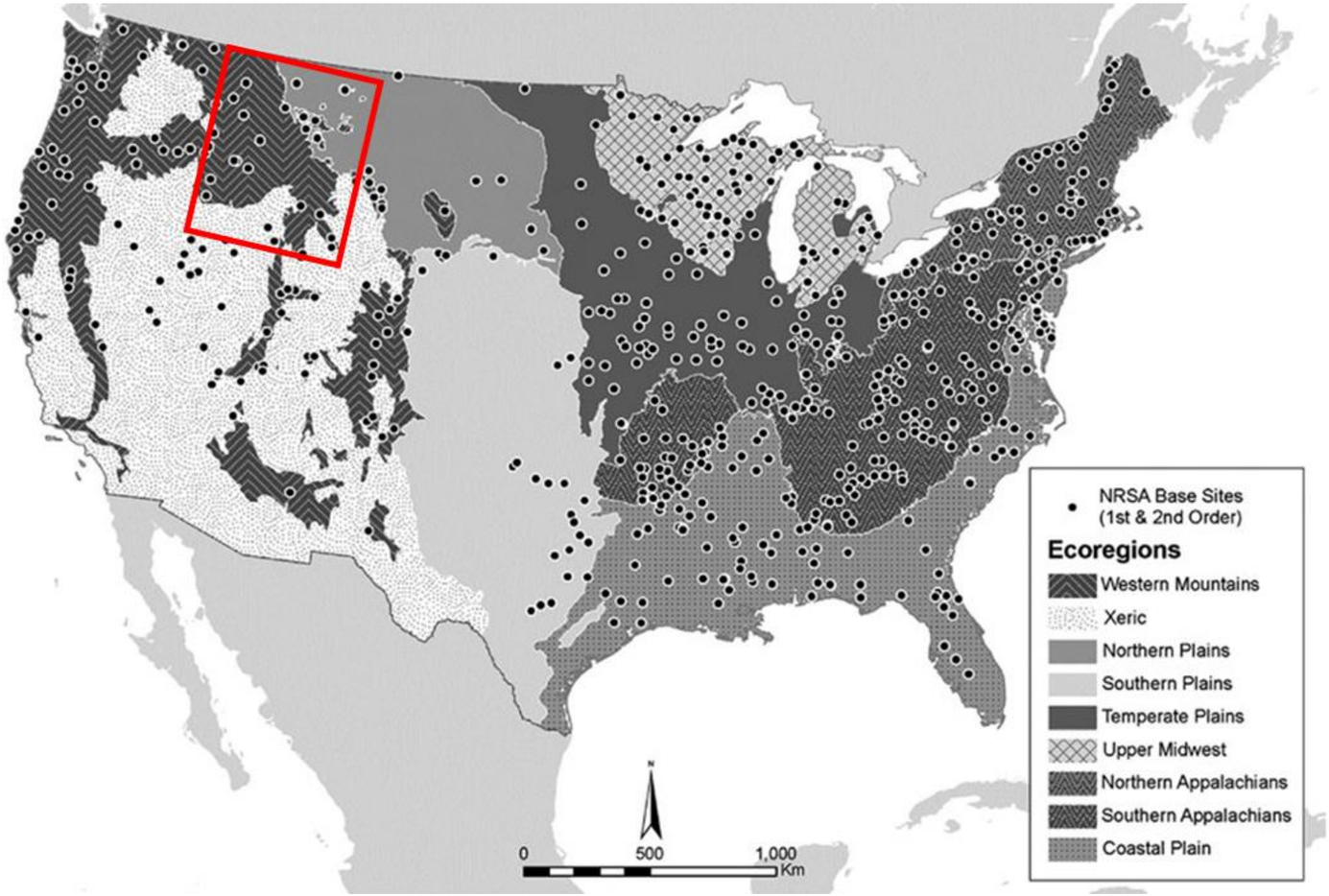
Applied



ate

ion

Example: Hill et al. 2014



Hill, B. H., Kolka, R. K., McCormick, F. H., Starry, M. A. 2014. A synoptic survey of ecosystem services from headwater catchments in the United States. Ecosystem Services 7: 106-115

COFFEE BREAK

3:00 PM-3:15 PM

ENVIRONMENTAL LAW • INSTITUTE®

BREAKOUT 2: PARTNERSHIPS

OBJECTIVES:

- EXAMINE WHAT MAKES CERTAIN PARTNERSHIPS EFFECTIVE
- IDENTIFY THE TOOLS OR RESOURCES NEEDED TO STRENGTHEN AND SUSTAIN THEM.

1. Partnership brainstorm and reflection (30 min)

- As a group, brainstorm all relevant partnerships that might be important for a multi-benefit nature-based project, organizing them on your flip chart in a table with the following columns:

Partner	Priorities/Stake in Project	Value to Project
	What are the partner's top priorities? Based on their priorities, how would they benefit from this project/why would they want to see it happen?	*What value (resources, expertise, funding, etc.) could the stakeholder bring to the table? What role could they play in the project?*

2. Reflection, Challenges, and Opportunities (30 min)

- Reflect on your experience with partnerships and discuss as a group, using the following guiding questions:
  a. What partnerships do you already have that do (or could) support hazard mitigation planning? Which of these partnerships have been the most effective, and what factors have contributed to their success?
  b. What challenges or barriers have you faced in forming or sustaining partnerships?
  c. What partnerships are missing or underdeveloped? Who else should be at the table? Are there local or regional agencies or organizations that you would like to partner with in your work but haven't yet?
  d. What tools or resources are needed to foster these partnerships? How could the hazard mitigation planning process support these partnerships?

CLOSING REMARKS

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THANK YOU!

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